INTERPRETATION DESIGN: BUILDING KNOWLEDGE FROM PRACTICE

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Abstract

This thesis seeks to understand the role of design in the practice of interpretation and distinguish its key characteristics as a multidisciplinary practice. Interpretation is practised in a range of contexts including heritage sites, museums and zoos and seeks to inspire, provoke and educate visitors. The content of interpretation projects may concern culture, history or the natural world. Interpretation design is the planned creation of environments that communicate information, ideas and messages to visitors. Designers seek to engage visitors through sensory, cognitive and kinaesthetic modes, visitors co-creating their experience through prior knowledge, motivations and actions. Design products include physical and sensory environments, artworks, trails and the presentation of media, objects and text in narrative, thematic or scientific arrangements.

Although widely practiced, interpretation design is poorly represented within the literatures of design and interpretation and its practice is ill-defined. Interpretation designers can experience significant obstacles in practice due to a lack of client understanding and the late engagement of designers. The thesis addresses these limitations, arguing that design has the potential to play a strategic, integrative role in the development of interpretation projects. Using qualitative methods including practitioner interview and case study, the research examines the role of contracted interpretation designers and how project factors support or constrain their contribution. The research focuses on projects that interpret nature in museums and zoos, these bringing a specific set of concerns to the design process. Concepts of nature sit at the heart of such projects, nature being confined, refined and designed, yet clients rarely articulate their intended portrayal of nature to designers.

The thesis articulates practitioner knowledge and presents an original typology of interpretation design outcomes. Two case studies examine the role of designers in interpretation projects. As one of the first studies in the field, this original research substantiates interpretation design as a field of practice that comprises specific knowledge and expertise, establishing a basis for further academic and practical understanding of interpretation design.
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Friends and family have been supportive in my somewhat unorthodox range of pursuits including this thesis and I would particularly like to thank my three wonderful daughters Rosa, Sidney and Mardi, who provide me with constant inspiration.
Declaration

This thesis contains no material which has been accepted for award of any other degree or diploma, except where reference is made in the text of the thesis. To the best of my knowledge, this thesis contains no material previously published or written by another person except where due reference is made in the text of thesis. Where the work is based on joint research or publications, the thesis discloses the relative contributions of the respective workers or authors.

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Dated: _______________________
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Abbreviations

GBMWHA: Greater Blue Mountains World Heritage Area
MTQ: Museum of Tropical Queensland, Townsville
NPWS NSW: National Parks and Wildlife Service New South Wales
WORZ: Werribee Open Range Zoo, Melbourne

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Introduction

Interpretation in heritage sites and public institutions aims to inform, engage and inspire the visiting public. Seeking to communicate social and cultural messages, scientific concepts and information to expand visitors’ knowledge and promote specific attitudes and behaviours, interpretation may be conveyed face-to-face or through a range of designed media and exhibits. The field of interpretation draws on knowledge and practice from education, psychology, the creative arts, science, design and tourism. This research focuses on the interpretation of nature through designed exhibits and environments in institutions such as museums, zoos, visitor centres and botanic gardens.

Strategies for the presentation and interpretation of nature may include the display of live animals and plants, the preservation and display of dead specimens, replicas, staged environments and the incorporation of art elements that reference the natural environment. Design forms in these contexts may include sound, colour, images, multimedia, signage, play trails, architectural elements, exhibition furniture and electronic or mechanical interactive displays. Content may be organized around geographical, narrative, taxonomic or other thematic frameworks. The combination of text, image, objects and environmental elements communicates complex, layered messages to an increasingly diverse and demanding public. Taken together, this combination of presentation, communication and interaction strategies with a defined intent comprises interpretation design. To date, interpretation design has not been defined and characterised as a practice that makes a distinctive contribution to the visitor experience, an omission this research addresses. A field of practice at the intersection of design and interpretation, interpretation design employs knowledge and approaches from a range of fields. It overlaps with the practice of exhibition design yet is distinct in being driven by interpretive aims and not necessarily giving rise to an exhibition outcome.

This introduction outlines the historical, theoretical and practical context for the research within the fields of interpretation and design, establishing the research questions and briefly presenting the methods and theoretical frameworks used.

Interpretation design: origins and application

Interpretation has its origins in practice. From around the turn of the 20th century, guides working in the United States National Parks Service conducted face-to-face interpretation on walks with small groups of park visitors. These guides or interpreters blended the roles
of storyteller and field scientist, seeking to communicate the significance of a site, its history, geology, plants, animals and people to engender a deep connection between visitors and the natural environment. Foundational texts aimed at providing guidance for interpreters include Enos Mills’ *Adventures of a Nature Guide*, 1932, and Freeman Tilden’s *Interpreting Our Heritage*, 1957. Mills and Tilden write about the intent and practice of guiding, Tilden developing key principles to support park guides in their practice.

Writers including Beck and Cable, Lewis and Ham developed Tilden’s interpretation principles, incorporating ideas and knowledge from other fields. Aimed at supporting the development of interpretive guides, these works provide the theoretical underpinnings for other forms of interpretive media. As park visitation grew, many United States national parks created interpretive visitor centres to help visitors better understand and connect to a site. A combination of tourist information centre and local museum, such centres typically tell stories about the flora, fauna, cultural history and geography of the site, visitor education often aiming to reduce the damage done by visitors in exploring parks.

Throughout the 20th century, the scope and application of interpretation expanded beyond personal guiding in natural environments. Today, the practice of interpretation spans a diversity of exhibits and activities in visitor centres, museums, heritage sites, eco-tourism ventures, botanic gardens and zoos. Figure 1 illustrates the range of contexts in which interpretation design is undertaken, this research focusing on quadrant Four.

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Preceding and paralleling the practice of interpretation in national parks were the activities of museums in collecting and displaying natural objects. Historically, museums concerned themselves with the preparation, preservation and presentation of authentic natural specimens. These were collected for scientific examination, contributing to the development of classification systems for the natural world and to showcase rare and exotic species. During the 20th century, museums shifted their focus from collecting specimens for examination by the educated few to informing the general public about the objects on display. Museums’ new educational role created a need to supplement artefacts with written explanation, models and storytelling. Similarly, zoos moved from a focus on collecting specimens to educating the public through thematic displays. In this, the interests of museums, zoos and the field of interpretation converged, each seeking ways to connect visitors to objects or resources on display.

In the 21st century, increasing societal concern about environmental issues sees zoos, museums and visitor centres sharing a commitment to conservation and environmental

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education. Many institutions are now active agents for promoting conservation messages. New, hybrid organisations combine live animals and plants, preserved specimens and models, artworks, reconstructed habitats, theatrical performances and shops, all focused on promoting conservation messages and behaviour. Convergence in the methods of audience engagement used by museums, zoos, aquariums and nature-based tourism venues has increased the application and significance of interpretation design as a field of practice.

Certain key differences are evident between the practice of interpretation in authentic sites such as national parks and in artificial environments such as zoos and museums. In a national park, the process of meaning-making for visitors involves the connection between the visitor, the place and its stories. The site is of primary importance, the natural environment providing a holistic sensorial experience and wealth of information accessible through observation. A museum or zoo is merely a context for interpretation, not its subject, increasing the reliance on design to create the sensory aspects that a natural environment would provide. These include the vista, smells, atmosphere, textures and sounds. The constructed nature setting is designed and intentional, communicating specific ideas to visitors. Design contributes significantly to the character of visitor experience, potentially doing much more than supporting curatorial and interpretation messages or providing attractive displays and way finding. In such contexts the design of the physical environment, visitor journey and interpretive displays positions visitors in relation to nature and frames their view of the exhibits, both physically and conceptually.

In addition to creating the setting for interpretation, the presentation of objects from nature relies heavily on design. In a museum or zoo setting, it is rarely possible to present authentic natural objects within a meaningful context. Natural objects are often unsuitable for permanent display due to their size, impermanence, fragility or difficulty of preservation. Museums and zoos use a range of methods to overcome this problem, including copy or simulation through scale models, dioramas and virtual displays, capture of nature in still and moving images, re-creation of natural environments through landscapes and gardens and response to nature through creative products such as art, music, architecture and poetry.

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Epistemological perspectives frame the meaning of all natural objects on display, artefacts being employed with a particular intent that renders them no longer entirely natural. The arrangement, placement and treatment of objects and other designed aspects of the interpretive environment influence visitors’ perceptions of nature and their relationship to it. Natural objects and live specimens may serve as examples of their species, group or type, an illustration of a process, a historical record, an element of a habitat, part of a complex system of naturally occurring interrelationships, or a symbol of the environment under threat.

In public institutions such as zoos, museums and botanic gardens, staff resources for interpretation design may range from untrained enthusiasts to a well-resourced design department. Some institutions have the means to design their own exhibits on an ongoing basis. Many lack such resources and exhibition development is commonly project-based, engaging contractors within a fixed budget and timeline. A project commonly involves multiple contracts spanning the development of curatorial concepts, exhibition master-planning, architecture and landscape design, object preparation, design of exhibition furniture, art elements and theatrical environments, writing of labels and signage text, graphic design, graphic production, multimedia production, interactive software production and the fabrication and installation of three dimensional works. Depending on the project’s scale, scope and the timing of designer engagement, interpretation design can encompass a few or many of these areas of practice. Designers are rarely included in the foundation phases of exhibition development, limiting their contribution to the project’s broad vision.

**Research gap and questions**

The field of interpretation design is immature and lacks a developed body of published knowledge, being neglected within the fields of design, interpretation and museum studies. Nature interpretation is a growing field of activity in zoos, museums, national parks, botanic gardens and other venues, but the role of design in its practice has not been examined. Emerging fields of design research such as experience design examine computer-based media that may be used within such environments, but the same degree of examination is not applied to physical interpretive media. Design literature in the fields of communication, landscape, industrial and interior design touch on aspects of relevance, but none examine the intentional combination of these design practices to create interpretive physical environments.
The interpretation literature spans diverse fields including museum studies, cultural theory, education, tourism, environmental science, visitor psychology and sociology. To date, the interpretation of cultural heritage has received most attention from researchers and policy makers by comparison to natural heritage attractions, despite the much greater number of natural history objects that museums hold and the high numbers of visitors they attract. In seeking to better meet the needs of visitors to museum environments, researchers have explored visitor characteristics, motivations, movement and learning outcomes. New areas of research relevant to interpretation design have emerged within museum studies and fields such as education, environmental studies and psychology. For all the research being undertaken in relation to visitors’ experiences, their learning and psychological responses, writers barely make the link between these outcomes and exhibition design. This gap suggests that design is not recognised as an important contributor to the practice of interpretation and that design practitioners have been slow to undertake research into their field of practice.

Most interpretation design knowledge emerges from practice, practitioners holding significant expertise not represented within the limited literature. The thesis draws on knowledge from practice by employing multiple methods of data gathering. These methods include interviews with professionals engaged in interpretation design practice, development of models based on my own professional practice, site observations and two case studies that examine the role of design in specific interpretation projects. The research examines four primary questions: 1) What is the role of the designer in interpretation projects? 2) How do attitudes to the role of design by institutions and other project factors support or constrain the contribution of designers? 3) How do such project factors affect the expression of ideas of nature through design? and 4) What are the distinguishing characteristics that define interpretation design practice?

The research questions are examined within the context of contemporary nature interpretation in zoos, museums and botanic gardens as distinct from heritage sites, national parks and private tourism ventures. Question 1, ‘What is the role of the designer in interpretation projects?’ incorporates two sub-questions: What do designers seek to achieve through interpretation design in relation to the audience experience in constructed nature contexts? and How is the designer’s role in a project conceived and shaped in practical terms by clients and stakeholders? These questions are examined first from the perspective of designers and related professionals, second through the proposition of conceptual frameworks informed by the literature of interpretation, practitioner interviews and my professional experience and third by examination in two case studies.

Question 2, ‘How do attitudes to the role of design by institutions and other project factors support or constrain the contribution of designers?’ focuses on the specific ways in which the structure and management of design projects affect the designer’s role and activities. Identifying and examining such influential factors is a central area of investigation within the interviews and case studies.

To investigate Question 3, ‘How do such project factors affect the expression of ideas of nature through design?’ the research first examines how changes in the social construction of nature have affected its representation within zoos and museums in Western countries over the last three centuries. This provides an important historical context for discussion of how ideas of nature are expressed in contemporary interpretation design practice. Second, the research proposes a model of practice that accounts for the nature of design approaches and the driving forces behind design decisions. Third, the research presents a typology of design outcomes based on site observations and my professional practice which provides a framework and vocabulary that are applied in the examination of this question in the two case studies.

Investigation of the first three questions contributes to answering Question 4, ‘What are the distinguishing characteristics that define interpretation design practice?’ Synthesising knowledge gained from practitioner interviews, case studies, observation, the literature and my professional practice, the thesis culminates in a definition and characterisation of interpretation design. The definition of the field of practice and theorisation about its aims, methods and outcomes presented in this thesis are essential to improving understanding of its contribution to visitor experience, supporting the design process within project structures and developing methods for critique of practice.
Research Design
To better understand the role and effectiveness of design in interpretation practice and its multiple aspects, a holistic, flexible, multi-dimensional research design based in case study was chosen. A case study approach enables the collection and dissemination of evidence with regard to practices within the relevant institutions and projects.

The case studies are complemented by interviews with practitioners that give an indication of designers’ tacit knowledge of practice, the literature review and analysis of the interviews combining to provide an overview of the field. Interview findings identify key issues in current practice, culminating in a set of propositions that are examined within the case study analysis.

The case studies examine the development and design of two interpretation projects, considering three main aspects: project context and the organisation’s aims for the project; process, including the structure of the development team, timing of designer engagement and key issues that support or hinder the realisation of the project’s aims through design; and design outcomes, including analysis of the realised exhibits. The case studies incorporate interviews with stakeholders and designers, review of the projects’ design briefs, interpretation plans and design documentation, first hand analysis of completed exhibition environments and review of visitor feedback gathered by organisations. Discussion extends beyond each project’s aims as stated in the design brief to consider underlying aims that emerge during the development process. The two case studies apply the models of the foundations of practice and typology of design outcomes developed in the research. They examine the composition of the exhibition development team and the role of exhibition designers, case analysis identifying possibilities for improvement in this process.

World Heritage Exhibition Centre Case
Jointly commissioned by the Royal Botanic Gardens (Mount Tomah) and the National Parks and Wildlife Service of New South Wales, the World Heritage Exhibition Centre at Mount Tomah Botanic Garden aims to communicate natural heritage values relating to eight national parks in the Greater Blue Mountains Area. Specific themes include the diversity of eucalypt species in the dry sclerophyll forest, the unique geography of the karst limestone landscape and the history of conservation activity in the area.

Located within a botanic garden, the exhibition targets a broad, primarily older adult audience. Rather than following the common approach to interpretation planning involving a sequence of contracts, commissioning an interpretive plan, master-plan,
design concept and division of contracts for graphics, lighting and built form, the project coordinator opted to engage a single organisation with a multidisciplinary team to undertake research, consultation, design, content development, project management, fabrication and installation.

The case is of high relevance to the research question, being set in an interior environment, remote from the sites it interprets. That I played a key role in the project, particularly in the early stages of preparing the tender proposal, research, consultation and concept design, puts me in a unique position to investigate the place of the designer in the interpretation process. Key aspects of the project include the vast geographical area to be interpreted within a small indoor environment, a strong focus on plants rather than animals, the unsuitable building architecture for housing an exhibition, differing agendas of project stakeholders and project delays. The research examines the impact of these issues on the interpretation design process and its outcomes.

**Auckland Zoo’s Te Wao Nui Case**

Te Wao Nui showcases New Zealand’s rich diversity of indigenous wildlife, much of it specific to New Zealand and facing multiple threats to survival. The precinct presents six distinctive habitats, with a total of six aviaries, numerous waterways and six indoor environments including a large night forest viewing area.

The Te Wao Nui case draws benefit from my professional involvement in the project. I was one of a three-person interpretation design team engaged to design, document and prepare tender packages for fabrication and installation of sculptural works, Maori artworks, multimedia, theming, models, signage and graphic design. I contributed to most aspects of design, managing the allocation of content communicated across different media and methods. I drafted the text for all signage, working with zoo and Maori contributors, graphic designers and signage fabricators. Aspects relevant to the research questions include the timing of the engagement of interpretation designers for a project of significant scale, the extent of content and range of species to be interpreted, the inexperience of the commissioning organisation in comparable projects and the significant Maori cultural component of the precinct.

The two case studies exemplify differing project contexts and constraints and some of the variety of approaches taken by institutions to the development of interpretive projects. They illustrate a range of design roles and strategies and offer insights into the process and outcomes of interpretation design. Supported by findings from the practitioner
interviews, analysis of the two cases results in statements and recommendations of relevance to the broader practice of interpretation design.

**Contribution of the research**
The research is an important early study into the role and position of interpretation design. It contributes to the embryonic interpretation design literature by documenting tacit knowledge held by practitioners. Through examining the development of two nature-based projects, the research investigates how practical aspects of working in the field such as sequencing of contracts can influence the framing of concepts of nature in project outcomes. The case studies develop conclusions regarding the contribution designers can make throughout the development of interpretation projects, offering recommendations to support strategic use of design.

Drawing together research and practical knowledge, the thesis supports practice in three key ways: 1) providing greater understanding of the context for design and the factors that hinder or support its optimal use, 2) contributing theoretical and practical frameworks for planning and critique and 3) examining the underlying philosophical and conceptual approaches to nature interpretation and contributing to the development of a shared vocabulary for their articulation.

**Thesis structure**
The thesis comprises seven chapters. Chapter One, ‘Literature review’, examines the literature of interpretation and the relevant sections of the museum studies literature to establish what is known and understood about the role of design in the practice of interpretation, establishing its virtual neglect. The chapter examines relevant published discussion from the field of design including the modest contributions from interpretation design practitioners and researchers.

Chapter Two, ‘Research design and methods’, argues for the suitability of the research design in relation to the research aims. The chapter details the multiple research elements and defends the qualitative case study method.

Chapter Three, ‘The evolution of nature displays’, provides a historical overview of shifting approaches to the public presentation and interpretation of nature in museums, zoos and related institutions in the western world since the 17th century, linking these to changing ideas of nature. This historical context is essential to the analysis of contemporary interpretation design techniques. In particular, the chapter identifies an
increasing reliance by public institutions on interpretation to communicate ideas, engage visitor emotions and encourage specific visitor behaviour, coupled with a lack of discussion of conceptions of nature as articulated in interpretive environments.

Chapter Four, ‘Interpretation design practice’, presents an original model for understanding interpretation design practice including designer expertise, design approaches and techniques. Based on a synthesis of my professional experience, findings from the practitioner interviews and the relevant literature, the chapter provides a typology of design outcomes within nature interpretation sites organised according to the modes of visitor engagement they aim to elicit: cognitive, affective and kinaesthetic. The chapter presents the findings of interviews with interpretation practitioners to reveal the tacit knowledge held within the field. The interview findings support the significance of the research questions and identify key issues in interpretation design practice. These are formulated as propositions about project aspects that impact on design as a basis for discussion within the case studies.

Chapter Five, ‘World Heritage Exhibition Centre Case’, presents the World Heritage Exhibition Centre case. The chapter outlines the background to the project including stakeholder groups, project aims, team structure and methodology. To examine the role of design and designers, the chapter details the exhibition development process, discussing key aspects of the project that constrained or supported the design process and outcomes.

Chapter Six, ‘Te Wao Nui Case’, presents the case of the Te Wao Nui precinct at Auckland Zoo. Interviews with relevant stakeholders provide information on project methodology and the conceptual approach taken. Analysis of the design process examines key design constraints and opportunities, revealing their impact on design outcomes and resulting visitor experience.

Chapter Seven, ‘Case analysis and research findings,’ provides analysis of the two cases, making recommendations for optimal deployment of design in interpretation projects. The chapter culminates in a characterisation of interpretation design practice and proposes a definition of the field.

The Conclusion to the thesis summarises the current challenges in the emerging field of interpretation design to which the thesis contributes and proposes potential areas for further research.
Chapter 1
Literature Review

The literatures in interpretation and museum studies reveal an almost total neglect of the role of design in creating visitor experiences and communicating interpretive messages. Very few texts in the design literature discuss interpretation design, although published knowledge and understanding on user experience has some relevance to designers’ understanding of visitor experience. The review examines the modest literature of interpretation design and includes a brief discussion of the findings from practitioner interviews undertaken as part of this research. The review establishes that interpretation design is an emerging field in need of research that examines the designer’s role within the practice of interpretation and the barriers to its successful implementation.

A growing interpretation literature

Early interpretation texts aimed to improve the practice of United States National Parks Service guides. Enos Mills’ *Adventures of a Nature Guide*, 1920, is a foundational text for the field, as is Freeman Tilden’s *Interpreting our Heritage*, 1957, which aims to support guides in their practice by identifying principles and methods to assist in creating connections for visitors with heritage sites. Tilden remains a significant influence on contemporary interpretation practice, being the first to name and define the field of interpretation as, ‘an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information.’ Tilden’s work underpins contemporary definitions of interpretation used by professional organisations throughout the world, including Interpretation Australia and the US National Association for Interpretation. Definitions of interpretation indicate how the field overlaps with education and relates to museum studies, tourism and environmental studies. Interpretation Canada, for example, defines interpretation as, ‘any communication process designed to reveal meanings and relationships of cultural and natural heritage to the public, through first-hand involvement with an object, artifact, landscape or site.’

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10 Ibid., 33.
11 Interpretation Canada, “Our Work Defined.”
interpretation is, ‘an educational activity that aims to reveal meanings about our cultural and natural resources.’

Tilden’s work continues to have a major influence in the field, being cited by contemporary theorists, practitioners and researchers such as Knapp (2007) and Brochu and Merriman’s *Certified Interpretation Guide Training* (2006). Ballantyne and Uzzell note the pervasiveness of Tilden’s principles, particularly up until the 1980s, when interpretation theory began to broaden. The well-known phrase cited by Tilden, ‘Through interpretation, understanding; through understanding, appreciation; through appreciation, protection,’ summarises the goals of interpretation to affect visitors on cognitive, emotional and behavioural levels. Tilden contributed to the professionalisation of interpretation through the promotion of six principles for interpreters within the National Parks Service. In 2002 Beck and Cable expanded the list to fifteen:

1. To spark an interest, interpreters must relate the subject to the lives of the people in their audience.
2. The purpose of interpretation goes beyond providing information to reveal deeper meaning and truth.
3. The interpretative presentation – as a work of art – should be designed as a story that informs, entertains and enlightens.
4. The purpose of the interpretive story is to inspire and provoke people to broaden their horizons.
5. Interpretation should present a complete theme or thesis and address the whole person.
6. Interpretation for children, teenagers and seniors – when these comprise uniform groups – should follow fundamentally different approaches.
7. Every place has a history. Interpreters can bring the past alive to make the present more enjoyable and the future more meaningful.
8. Technology can reveal the world in new ways. However, incorporating this technology into the interpretive program must be done with foresight and thoughtful care.
9. Interpreters must concern themselves with the quantity and quality (selection and accuracy) of information presented.

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12 Knudson, Cable, and Beck, 2003, *Interpretation of Cultural and Natural Resources*, xi.
10. Before applying the arts in interpretation, the interpreter must be familiar with basic communication techniques. Quality interpretation depends on the interpreters' knowledge and skills, which must be continually developed over time.

11. Interpretive writing should address what readers would like to know, with the authority of wisdom and its accompanying humility and care.

12. The overall interpretive program must be capable of attracting support – financial, volunteer, political, administrative – whatever support is needed for the program to flourish.

13. Interpretation should instil in people the ability, and the desire, to sense the beauty in their surroundings – to provide the spiritual uplift and to encourage resource preservation.

14. Interpreters can promote optimal experiences through intentional and thoughtful program and facility design.

15. Passion is the essential ingredient for powerful and effective interpretation – passion for the resource sand for this people who come to be inspired by it.16

These principles convey the multiple aims of interpretation, including encouraging people to value nature and make personal meaning from experiences of a place. They illustrate the aim of designing interpretation to meet the needs of different types of visitors and to affect visitors on several levels: cognitive, emotional, spiritual and behavioural.

Beck and Cable provide three conceptions of interpretation: as a revelation, as art and as a gift.17 Benton identifies four conceptions of interpretation within the literature, emerging roughly chronologically.18 Conception One, connecting visitors to resources, arose in the early 1900s. It is grounded in program content and techniques for guides, based on the primary goal that interpreters combine their knowledge of nature, culture and history with communication and artistic skills to reveal what is not readily apparent to people’s emotion, intellect and spirit. Conception Two, conveying mission and influencing visitor behaviour, emerged in the 1950s. It is based on sociological and psychological contributions to recreation and resource management. Its goals are to carry a positive image of the agency to the public and influence visitors’ behaviour towards the resource to protect it. Conception Three, encouraging environmental literacy, appeared in the late 1960s. It seeks to introduce people to ecological relationships and move them through levels of awareness, appreciation, understanding, ownership and motivation to take

18 Benton, 2009, “From Principle to Practice: Four Conceptions of Interpretation.”
responsible action to reduce human impacts on the environment. Conception Four, promoting tourism outcomes, developed in the 1980s. It appeals to visitors’ interest in travel and leisure to promote spending as a means of improving the economic benefits of natural and cultural tourism.\textsuperscript{19}

Benton claims that today all four varying goals exist concurrently. His classification characterises interpretation as a complex field incorporating aspects of tourism, environmental education, psychology and marketing. Table 1 lists significant interpretation texts, outlining their primary contribution to the field and Benton’s categorisation.

\textsuperscript{19} Ibid.
Table 1. Contribution of key interpretation texts.

<table>
<thead>
<tr>
<th>Author</th>
<th>Text</th>
<th>Benton’s categorisation</th>
<th>Contribution/ Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tilden</td>
<td>Interpreting Our Heritage (1957)</td>
<td>Connecting visitors to resources</td>
<td>Guiding practice in US national parks. Six principles to support park guides in their practice.</td>
</tr>
<tr>
<td>Sharpe</td>
<td>Interpreting the environment (1976)</td>
<td>Encouraging environmental literacy</td>
<td>Textbook of methods with examples, from planning to training.</td>
</tr>
<tr>
<td>Larsen</td>
<td>Meaningful Interpretation (2003)</td>
<td>Encouraging environmental literacy</td>
<td>Exercises for interpreters to help them connect visitors with resources and their meanings.</td>
</tr>
</tbody>
</table>

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25 Knudson, Cable, and Beck, 2003, *Interpretation of Cultural and Natural Resources*.  

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Woodward and Weiler state that professional bodies, conferences and workshops initiate much of the discussion on interpretation and that knowledge is practice-led. Public discussion focuses on practical issues such as interpretation planning, management and interpreting ‘hot’ or difficult topics. Weiler argues that such research traditionally suffers from a lack of academic rigour and theory. She claims that in Australia research funding through partnerships between government and the tourism industry has limited the type of research output, papers often not being published in refereed journals and not reaching international audiences. According to Weiler, the lack of emphasis on research within the interpretation field is due in part to there being few university-level programs that include interpretation research training and a paucity of academics who can supervise higher degree research students in interpretation.

Those interested in research into interpretation tend to integrate theory and knowledge from other disciplines. The multidisciplinary nature of the interpretation literature demonstrated this, Ballantyne and Uzzell citing influences from fields including place identity, gender issues, visitor motivation, social theory, learning theory and visitor behaviour. For example, Moscardo, Pearce and Ham contribute to the field from communication theory and psychology, Fallon and Kriwoken from the fields of geography and environmental studies and Weiler, Smith, Knapp, Benton and others from tourism and leisure studies. Woodward is the first and one of the few to contribute from the field of design. This thesis, being unconstrained by funding agendas and through its

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31 Ibid., 42.
32 Weiler, 2005, “Interpretation Research in Australia.”
conscientious rigour, contributes to the gap identified by Weiler and builds on the foundational work of Woodward.

**Interpretation for visitor learning and meaning-making**

Broadly speaking, the museums literature sees visitor learning as the main purpose of interpretation. Learning is viewed within a constructivist paradigm of open-ended, free-choice interaction with the offerings of the museum environment. Interpretation is conceived as largely text-based media in combination with graphics. Where spatial and environmental design is considered, it is primarily in relation to visitor comfort and ease of navigation rather than its impact on meaning-making.

The field of interpretation has largely rejected the traditional model of education through information transfer for more complex accounts of the learning process that consider visitors’ active role in their own construction of meanings from objects and experiences. A constructivist approach accepts individual differences in meaning making and attempts to cater to such diversity. Research by Falk and Dierking, Bitgood, Moussouri, Packer and Ansbacher examines visitor learning in interpretive environments, seeing individuals as constructing their own understanding by integrating current experience with previously developed concepts, experiences and motivations. Some writers, however, such as Henriksen, question this constructivist model of learning as a theoretical framework for developing an exhibition, arguing, ‘It is hard to build an exhibition on the prior conceptions of museum visitors and create a common experience (or a common learning outcome) for visitors with widely differing prior experiences, interests, and educational levels.’ Stoinski, Allen, Bloomsmith, Forthman and Maple claim that, ‘In the end, no matter how skilful the exhibition makers, no matter how calculated or inspired their choices, the ultimate act of meaning making is idiosyncratic and belongs to the viewer,’

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indicating that the aim of a common learning outcome cited by Henriksen may be misguided.\textsuperscript{38}

Falk and Dierking explore the impact of context on visitor learning, taking a constructivist approach based on evolutionary adaptation.\textsuperscript{39} Notable aspects affecting visitor learning include people’s reasons for visiting gardens and museums, what they hope to gain from their visit, who they are visiting with, what predisposes them to certain types of activities, their previous experience of zoo and museum environments and the choices they make about what to look at and where to go within an interpretive setting. Falk and Dierking present a framework for understanding learning in museum environments called the Contextual Model of Learning, Figure 2.

\includegraphics[width=\textwidth]{figure2.png}

Figure 2. Falk and Dierking’s Contextual Model of Learning.\textsuperscript{40}

This holistic view of learning in interpretive contexts considers the impact and importance of the physical environment, personal and social contexts experienced over time. The model holds that visitors continue to learn from their museum experience long after it is over, through memory and association with observations in new experiences. The model is relevant to designers and exhibition producers in moving beyond the common concern for what visitors learn in an exhibition, to considering what experience

\textsuperscript{38} Stoinski et al., 2002, “Educating Zoo Visitors About Complex Environmental Issues: Should We Do It and How?,” 89.
\textsuperscript{40} Falk and Dierking, 2000, \textit{Learning From Museums: Visitor Experiences and the Making of Meaning}, 12.
at the site might increase visitor learning over time, or may predispose them to further learning in other situations.  

Physical context is one of the three key elements of the Contextual Model of Learning, Falk and Dierking claiming that it is the most remembered aspect of a visit. They state, ‘When people are asked to recall their museum experiences, whether a day or two later or after 20 or 30 years, the most frequently recalled and persistent aspects relate to physical context – memories of what they saw, what they did, and how they felt about those experiences.’

This recognition of the significance of the physical experience in relation to memory has not been matched with research into how such environments are created or how different types of designed environments, activities and experiences impact on visitor learning, indicating a gap in the literature informing design.

Research into spatial design of exhibitions examines how physical layout affords particular visitor responses such as choosing where to go and what to look at. Bitgood subscribes to the general value principle which holds that people make choices based on the relationship between benefits and rewards, perceived or actual. For example, people have a general tendency to walk in a straight line and exert minimal effort unless encouraged to deviate by higher rewards. Bitgood’s research into visitor movement and spatial layout suggests that designers may play a role in shaping visitors’ experiences by making certain choices more or less appealing. He recommends that exhibition designers minimise competing views and lure visitors towards certain exhibits by offering significant reward for effort. Wineman and Peponis note that informal education is uniquely structured through movement in space, arguing that how visitors are encouraged to move through an exhibition, whether along a clearly defined path or a more freely self-directed course, will structure the overall impression of the exhibition. Patterns of accessibility, connections or separations among spaces, sequencing and grouping of elements form visitor perceptions and shape visitor understanding. Their research

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41 Ibid., 9.
42 Ibid., 53.
identifies space as a medium that, if well understood, can serve to support curatorial intentions.

The attention given to physical and sensory experience by these researchers accords with the work of the philosopher and educationalist John Dewey in the 1930s, which considered learning to be wholly derived from experience. Ansbacher claims that the museum community has largely ignored Dewey’s theory that education is derived from experience, despite its relevance to the design of interpretive environments. He supports Dewey’s argument that, ‘What people do (or see, touch, hear, taste, or smell) in an exhibition is a necessary precursor to whatever they feel and learn.’ Dewey’s work suggests that learning amounts to far more than information transfer and includes the influence of pre- and post-visit experiences in a cumulative learning experience over time, as reflected in Falk and Dierking’s model. This leads to a definition of learning that encompasses cognitive, affective and psychomotor aspects. Learning is the result of the experience of an exhibit and any understanding that the individual visitor makes of it, suggesting the importance of the order and quality of experience rather than merely content. For Ansbacher, the design of exhibitions affects the extent to which visitors engage with the material offered and learn from it. He proposes two goals for exhibitions: the immediate visitor interactions with the exhibit and the learning outcomes that may follow the visit. He considers that knowledge is gained through experience and that understanding moves from the specific to the general, such pedagogical questions having potential bearing on the design of exhibits, although Ansbacher does not examine this.

Falk and Dierking’s explanation of motivation to learn in museums draws on other aspects of Dewey’s work, specifically the idea of intrinsic and extrinsic motivations. These are not mutually exclusive or one better or worse than the other, although Falk and Dierking argue that intrinsic motivators are very powerful and lead to an enjoyment of learning that produces very effective learning. In their words, ‘Learning is not just about facts and concepts; learning, particularly intrinsically motivated learning is a rich, emotion laden experience, encompassing much, if not most, of what we consider to be fundamentally human. At its most basic level, learning is about affirming self.’ Falk and Dierking see free choice as an important aspect of learning in museum environments, one

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45 Dewey, 1938, *Experience and Education.*
47 Ibid., 39.
48 Ibid., 27.
50 Ibid., 21.
that distinguishes it from school-based learning. Free choice learning, they argue, tends to be non-linear and personally motivated, involving choice on the part of the learner as to when, where and how to learn. No examination is made however, of design’s role in enhancing intrinsic motivation, creating effective learning environments, contributing to learning outcomes, or its relationship with the physical, personal and social aspects of museum experiences identified in Falk and Dierking’s Contextual Model of Learning.

**Design for thinking, doing and feeling**

Museum professionals debate the relative value of entertainment in comparison to education. Writers including Falk, Moussouri and Coulson and Packer argue that these variables are not mutually exclusive and may support each other to improve visitor interest, motivation and learning.\(^{51}\) Research by Moscardo finds a positive relationship between visitor enjoyment and active information processing, suggesting that when enjoyment increases, learning is also likely to increase.\(^{52}\) Packer highlights the intrinsic rewards of learning which make it fun. She proposes that entertainment and education are not in conflict; learning can *be* entertainment. Design appears only obliquely in these discussions, being seen as providing immersive and interactive elements that contribute to visitor play. Adams, Luke and Moussouri examine the value of play in museums in providing richer, deeper understanding while suggesting that many museum professionals remain wary of visitors appearing to have too much fun.\(^{53}\) Design’s contribution to ‘edutainment’ through design of the visitor space and facilitation of learning, are not directly investigated.

Interactive exhibits combine learning with action that often constitutes edutainment, examples of which are provided in Chapter Four. Birney is one of few researchers to evaluate the design of such exhibits. She identifies several criteria that should guide the development of an interactive exhibit: it meets educational and aesthetic needs, users find it affectively satisfying and enjoyable and it meets the goals of both the institution and the visitor. Birney promotes the use of formative evaluation with real visitors to ensure that they gain the intended understandings from the exhibit, the exhibit has attracting and holding power and visitors use it in the manner intended.\(^{54}\) This significant paper

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52 Moscardo and Pearce, June 1986, “Visitor Centres and Environmental Interpretation: An Exploration of the Relationships Among Visitor Enjoyment, Understanding and Mindfulness.”
establishes important design criteria, but further research in this field has not followed and many issues raised remain unexamined.

Learning is not the only aim of interpretation. Veverka proposes multiple objectives for interpretive exhibits: learning objectives, that is, what visitors will know; behavioural objectives, that is, what visitors will do with that knowledge; and emotional objectives, that is, what will have the most long term impact on the visitor’s memory and help accomplish the behavioural objectives of the exhibit.55 He makes some association between these objectives and design, stating that emotional objectives help the designers to decide on aspects such as graphic selection and colours, but goes no further in his examination of design’s contribution. Bitgood identifies the following general approaches to interpretation design: the subject matter approach, in which the focus is on presenting complete and accurate information rather than on how this message is received by the visitor or the aesthetics of the display; the aesthetic approach, in which the aesthetic appeal takes precedence over content; the hedonistic approach, in which the main aim is that the audience has an enjoyable experience; the realistic approach, in which a simulated, realistic experience is created such as a natural habitat; the hands-on approach, which assumes that hands-on activities are more effective than passive exhibits; the social facilitation approach, in which designers try to create exhibits which encourage social interaction among visitors; and the individual difference approach, which aims to meet the needs of different audience types, based on age, learning style, cognitive ability or other factors.56 Bitgood claims that although each approach has its merits, an over-emphasis on one or a few approaches in any given exhibition may be counter-effective.

Hughes identifies certain characteristics and intentions of exhibition design including: layering for different audience types such as the expert, frequent traveller, scout and orienteer; considering different learning styles such as visual, auditory and kinaesthetic; interaction design to create visitor experiences; and immersive environments using still and moving images and sound.57 Dernie identifies approaches including narrative space, simulated experience and performative spaces, these being interactive environments in which the visitor actively shapes their experience by altering the environment and outcomes.58

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58 Dernie, 2006, Exhibition Design.
Packer examines the outcomes for visitors aside from learning, arguing that to understand what visitors gain from museum experiences involves going beyond the experience itself to the benefits it provides. Drawing on the museum studies, psychology and leisure literatures to examine visitor benefits in terms of learning and personal meaning making, Packer and others argue that cognitive experiences are not the most prominent type of experience and that visitor benefits may also result from object experiences, introspective and social experiences.

Packer nominates positive psychology’s idea of psychological well-being and the environmental psychology’s concept of mental restoration as useful approaches to understanding beneficial visitor outcomes. Positive psychology seeks to understand and build quality of life to enable individuals and communities to thrive, not just survive. It provides two relevant definitions of well-being: pleasure or happiness and self-realisation or personal growth. Csikszentmihalyi’s research into optimal experience identifies the elements of enjoyment as a challenging activity that requires skill, the merging of action and awareness, clear goals and feedback, concentration on the task at hand, a sense of exercising control, the loss of self-consciousness and the transformation of time. Under certain conditions, such elements can combine to create a sense of ‘flow’ in an individual. Bell, Harvey, Loomis and Marino argue that a harmonious balance between stimulating exhibitry and soothing ambiance may provide the most fertile soil for psychological flow and sense of immersion. Their research found that theming and theatrical elements such as lighting are likely to influence visitors to become highly involved. Too much complexity and activity, information and design detail can overwhelm visitors, leading to reduced attention. Too little stimulation can lead to visitor withdrawal from the

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environment as they turn to their own internal thought processes. The study’s findings indicate that a moderate number and range of theming and interactive elements supports visitor enjoyment, engagement and learning, potentially leading to a state of flow.

Mental restoration is the process of recovery from a state of mental fatigue and can be enhanced by certain types of environments and activities such as immersion in nature. For Packer, these psychological perspectives offer insights into what museum experiences can offer visitors, but she makes no link between design of the interpretive environment and visitor well-being and mental restoration. The research by Bell et al. provides a significant first step towards understanding this relationship.

Design’s contribution to the museum visitor’s experience

The quality of visitor experience is recognised as an important factor in institutions gaining public interest and attendance, although design’s contribution to this is largely unexamined in any literature. Hennes claims that although museums are attempting to become more visitor focused, there is little evidence that the purposes of visitors and museums are now more closely aligned. He explores the possibility of narrowing this gap by re-evaluating factors such as the criteria of experience, content organization and methods of inquiry, which could result in exhibitions being modelled on visitors' methods of self-motivated activity. Hennes proposes that by shifting the focus from knowledge taxonomies to problem-solving situations, museums could make exhibitions more engaging educational experiences for visitors, but he offers no discussion of how such problem solving activities ought to be designed. Goulding argues that the visitor experience is affected by three interrelated sets of factors: socio-cultural, cognitive, psychological and environmental. Socio-cultural factors include cultural identification, continuity of theme and story, story-building, variation of stimulus and social interaction. Cognitive factors include the creation of mindful activity, involvement and engagement, reflection and imagination, variations of stimulus to create a meaningful whole and

63 Bell et al., 1998, “The Influence of Museum Exhibit Design on Immersion and Psychological Flow.”


66 Bell et al., 1998, “The Influence of Museum Exhibit Design on Immersion and Psychological Flow.”

perceived authenticity. Psychological factors include scene setting through coherent orientation, routeing and mapping. Environmental factors include crowding, seats and noise. Goulding considers interpretation, spatial layout and the physical environmental in relation to the museum visitor’s experience but does not examine design’s contribution to such factors.

In *The Experience Economy*, a much cited text in the museum literature, Pine and Gilmore propose that all transactions between consumers and businesses are a type of theatre, with the most valuable type of transaction being the transformative experience. They see museums as akin to other service providers that offer a transformative experience as a service, arguing that experiences represent an existing, but previously unarticulated, genre of economic output. Hennes recognises that experience sits at the core of a visit to a museum, zoo, garden, heritage site or national park, but argues that the reduction of experience to a saleable commodity is problematic. He criticises Pine and Gilmore’s promotion of the commodification of experience, questioning their definition of the nature of the experience provided. Pine and Gilmore’s representation of the consumers of service experiences as comparatively passive contrasts with the model of free-choice constructivist learning integral to the museums and interpretation literatures. To Pine and Gilmore, experience is designed and the participant’s role is shaped by those who design it. Pine and Gilmore’s definition of experience suggests a form of manipulation of visitors antithetical to the ideal museum experience, Hennes arguing that, ‘Pre-defining the outcome of experience is the goal of marketing; it is not the open-ended enrichment and pleasure that museums, at their best, can provide.’

Like others, Hennes turns to Dewey for a different perspective on experience claiming that, although the museum studies literature discusses Dewey, his ideas lack application in museums. Dewey judges the value of an experience on whether it arouses curiosity, strengthens initiative and establishes desires and aims that lead to future exploration and understanding. Hennes argues that, ‘By this criterion, an educative experience is valuable to the extent that it prepares one for broader, richer experiences in the future; it expands possibility…Growth itself is both the means and the end.’ Hennes and Ansbacher argue that the nature and quality of museum experiences is central to the issues of learning and other benefits gained by visitors. The contribution of design to the

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formation of visitor experience, however, is largely overlooked in the literature of museums and experience.\textsuperscript{72}

Roppola’s recent research identifies a similar gap in the literature with regard to the relationship between design and the visitor experience.\textsuperscript{73} Combining the perspective of a designer with data from visitor interviews and semiotic analysis, she conceives of the museum visitor experience as being co-produced through relationship with the exhibition environment across four processes: framing, resonating, channelling and broadening. Framing consists of how visitors read the environment, their expectations, participation and whether they feel satisfied by the experience. Framing is influenced by the visitor’s prior experience, the museum’s public image and architecture, promotional materials and conventions used within the exhibition. Framing is a type of preparation for experience, similar to the concept of orientation. Visitors’ conceptual frames of a museum visit include displayer-of-artefacts, learning, enjoyment, pilgrimage, explanation and interpretation.\textsuperscript{74} The process of resonating is the complementary match between visitors and exhibition spaces across perception and cognition, resulting in a positive state of body and mind, with increased energy and meaning. Resonance is similar to the interpretation literature’s concept of ‘connection’, achieved through attractors that draw a visitor’s attention. It can be experienced as coalescence, similar to the sense of flow described by Csikszentmihalyi.\textsuperscript{75} The third process, channelling, comprises a combination of navigation and meaning-making; the action of visitors conceptually, perceptually and physically moving through an interpretive exhibition experience.\textsuperscript{76} Roppola describes the process of broadening as the effect of the experience on the visitor in terms of meaning-making across experiential, conceptual, affective and discursive planes, leading to a broader appreciation of ideas, perspectives and feelings.\textsuperscript{77} Such categorisation of processes of interaction synthesises a range of concepts within the museums literature, providing a useful analysis of how visitors interact with the designed environment but does not examine the role and process of design in creating such environments, which is the focus of this research.


\textsuperscript{74} Ibid., 76–123.

\textsuperscript{75} Ibid., 174–215; Seligman and Csikszentmihalyi, 2000, “Positive Psychology: An Introduction.”


\textsuperscript{77} Ibid., 216–262.
Serrell is one of the few authors to acknowledge the central role of design in shaping visitor experience, having collaborated with designers to develop a framework for assessing excellence in exhibitions from a visitor centred perspective. She identifies four key criteria for excellence: comfort, engagement, reinforcement of ideas and information and personally relevant meaning for visitors. The framework does not include design features in its checklist, but its focus on visitor experience embraces designed elements such as ease of interaction, variety of media and physical environment, suggesting that these are significant to visitors. Its conception of meaning-making as an interpretive aim supports the significance of non-text based media. Martin and Toon suggest the importance of design in the interpretive context where education is the aim, arguing that creative interpretive design can make museums more educationally effective through the arrangement of space, exhibits, visitor experiences and educational messages.

**Engaging visitors through emotion and the senses**

Interpretation aims to provoke visitors by creating personal connection, emotional or affective aspects of experience. Myers, Saunders and Birjulin explore the emotional aspect of visitors looking at animals in a zoo environment. They argue that people’s emotional response to animals is an important consideration in educational efforts to foster positive attitudes toward animals and that the emotional ‘flavour’ of learning may affect a visitor’s desire to remember or reflect on an experience. Researchers have examined the effects of immersive enclosure design on visitor perceptions of animals, with mixed results. Coe proposes that viewing distance, relative position of visitor to animal and landscape immersion may influence visitor perceptions. Maple asserts that poor design might promote attitudes of human superiority, where naturalistic exhibits inculcate positive attitudes and promote respect and appreciation of animals. Shettel-Neuber identifies a major issue in zoo design in how to portray the animal’s natural

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79 Martin and Toon, 2005, “Narratives in a Science Center: Interpretation and Identity.”
habitat to the visitor and to elicit naturally occurring behaviour.83 Bitgood, Benefield, Patterson, Lewis and Landers find that exhibit size and type of physical barriers significantly influence visitor viewing time.84 Finlay, James and Maple found that the animal’s environment affects the characteristics visitors attribute to the animal, proposing that exhibit designers need to lessen the perceptual cues that remind people they are in a zoo in which animals are constrained. Bitgood, Patterson and Benefield’s research found a correlation between the characteristics of animals, characteristics of the visitor, architectural characteristics of the exhibit and visitor behaviour. The scope of such research extends to examination of the impact of enclosure design on visitor perceptions and interest, without considering the impact of interpretation design. The framing of zoo experiences through interpretive media is not examined, no link being made between the visitors’ responses and their sensorial and cognitive experiences of the designed interpretive environment. Nevertheless, such research demonstrates that visitor perceptions of animals are influenced by environment and contextual factors, supporting the need for research into the effects of interpretation design and visitor environment on perception of animals and attitudes towards nature.

Like Falk and Dierking, Kellert and Wilson take an evolutionary adaptive perspective, stating that, ‘emotion is eminently an adaptive phenomenon, mediating encounters with other animals as a strategy for enhancement and survival.’85 Myers, Saunders and Birjulin indicate areas of psychology that may assist in understanding affective aspects of the zoo experience, including biophilia. The biophilia hypothesis proposed by Kellert and Wilson suggests that there is an instinctive, innate, biological bond between human beings and nature which drives people to seek out nature experiences.86

As design relates directly to the sensory, affective aspects of visitor experiences and to the physical and conceptual relationships between visitors and the natural objects being observed, the attention in the literature to the design of enclosures and visitor psychology while ignoring design of the visitor environment indicates a significant gap in knowledge and understanding with regard to accounting for emotional aspects of the visitor experience.

84 Bitgood et al., 1985, “Zoo Visitors: Can We Make Them Behave?”.
Designing nature
Manipulations of natural objects to suit the museum context and serve interpretive aims are forms of design, although the literature does not often identify them as such. A significant literature discusses the role and eloquence of natural history objects, their authenticity and questionable objectivity. Most museum specimens are in a significant sense natural, the term specimen being, for much of museum history, one antithetical to the term artefact, which refers to a product of human workmanship. However, specimens and artefacts may not be so antonymous. Alberti argues that nature objects are cultural, ‘collections intended to be universal were loaded with different meanings, partial and reflective of the collector and curator.’ He argues that the collection, preservation and display of natural specimens and the exhibitionary frameworks in which they are set, demonstrate the ways in which nature is purified and constructed in the museum.

A significant literature examines the history of taxidermy and the role of preserved objects as cultural and historical representations of nature. Poliquin and Daston refer to taxidermied animals as loquacious objects that speak to visitors about human manipulation and their own significance. These ‘talkative things’ are typically objects that defy classification and transgress boundaries, especially between subject and object, art and nature. Wonders outlines the emergence of dioramas to create illusions of wilderness that communicate a sense of national identity. Poliquin explores relationships between the materiality of taxidermy and its multiple readings that manipulate and transform taxidermied mounts. Hein argues that, through the selection and presentation of authentic objects, ‘museums thus turn out to be depositories of subjectivity. Far from being passive storehouses, however, they actively join in giving currency to the past and, by extension, giving legitimacy to present claims of reality.’

Alberti highlights the agency of visitors in constructing ideas about nature when engaging with natural history displays. Objects are not mute, but their meanings, according to Alberti and Knell, vary according to who is viewing them and the knowledge and

88 Ibid.
91 Wonders, 1993, “Habitat Dioramas: Illusions of Wilderness in Museums of Natural History.”
attitudes they bring to the viewing experience.\textsuperscript{94} Crowley and Eberbach’s research explores how an object’s condition, that is, whether it is living, model, or virtual, influences visitor engagement, conversation and subsequent learning in museums.\textsuperscript{95} Their findings suggest that each type of object facilitates different types of enquiry and exploration. They claim that museums are moving away from an object-based epistemology in which the display of an object is assumed to convey its inherent meaning, toward an object-based discourse, in which meaning is conveyed through the integration of object, display and visitor narrative.\textsuperscript{96} Designers’ and curators’ complex constructions of nature and its objects communicate important messages to the visitor about human relationships with the natural world, yet their interpretation through design is not thoroughly examined in the museum studies literature.

\textbf{Recognition of design in reviews and guides}

Exhibition reviews are one of the few contexts for discussion of design. For example, Pilsbury, writing about the 2003 Man and Beast exhibition at Deutsche Museum, Dresden, highlights the power of design to create an engaging, critical, complex and immersive exhibition experience through the use of a range of media and clever juxtaposition of imagery and forms.\textsuperscript{97} Hayward and Rothenberg, in measuring the success of the Wildlife Conservation Society Bronx Zoo exhibition Congo Gorilla Forest found that, ‘The exhibition’s effectiveness is attributed to understanding visitors’ expectations and interests, creating an array of exhibit formats to engage people, and communicating conservation messages visually and experientially.’\textsuperscript{98} Referring to the Eden Project’s integration of signage, art, sculpture, performance, cultural association and memory, Blewett comments that, ‘The aim is frequently to engage the visitor cognitively, emotionally and sensually, serially and simultaneously.’\textsuperscript{99} Madsen discusses Les Gilbert’s use of wild sounds and technology’s ability distil to something of nature’s essence by reconstituting and re-performing a sonic environment, arguing that, ‘sound performance offers the possibility of being touched through resonance, through vibrations of the real. These sonic experiences contribute much more to the visitor experience than quaint

\textsuperscript{95} Eberbach and Crowley, 2005, “From Living to Virtual: Learning from Museum Objects,” 318.
\textsuperscript{96} Ibid., 317.
\textsuperscript{97} Pillsbury, 2003, “Man and Beast: A Paradoxical Relationship, Deutsches Hygiene Museum, Dresden, Germany,” 249.
\textsuperscript{98} Hayward and Rothenberg, 2004, “Measuring Success in the ‘Congo Gorilla Forest’ Conservation Exhibition.”
attempts at visual naturalism of dioramas and vistas of the modernist zoo. Visitors to the exhibits employing soundscapes felt more at ease, spent longer there and learnt more, although the majority of participants were unaware that they were moving in an imported sound environment. Such acknowledgement within exhibition reviews of design’s contribution to museum and interpretation practice is not supported by research into or theorisation of this contribution.

Instructional books and web-based resources offer guidelines and techniques for designing interpretive graphic communication such as signs and brochures. Caputo and Brochu’s *Interpretation by Design*, Ham’s *Environmental Interpretation* and Moscardo, Ballantyne, and Hughes’ *Designing Interpretive Signs* introduce basic design principles for non-designer audiences, but do not examine the conceptual potential of design, spatial design, theming or use of non-visual media. Houtgraaf’s *Mastering a Museum Plan* exemplifies the broadly accepted exhibition development process in exhibition planning guides, placing designer involvement after development of storylines, prior to production, Figure 3.

The more detailed version of the diagram includes development of text, infographics and multimedia but does not include any consideration of three-dimensional design, even though spatial and thematic design are mentioned elsewhere in the book. This reflects a wider disregard for the work and contribution of design.

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100 Madsen, 1999, “The Call of the Wild.”
101 Ibid.
The interpretation and museum studies literatures largely focus on management issues of planning, resourcing and curating and visitor related topics such as education, entertainment and visitor motivation. References to design are scant and scattered, with a neglect of topics that link curatorial and management issues with visitor outcomes through examination of design development, implementation and evaluation. Some authors state that design is central to the creation of visitor experiences, but the extent of literature examining design strategies and critiquing design outcomes is not commensurate with this role. There is little examination within the literature of strategic interpretation design to assist learning, arouse emotion, provide mental restoration or support biophilic bonds with nature.

**Contributions from the literature of design**

Design research and practice encompass diverse fields and activities ranging from conceptual and aesthetic work akin to art practice to technical engineering and design for mass production. Traditionally, sub-fields within the discipline of design are identified according to the form of their product, as in architecture, landscape architecture, interior design, industrial design, product design, communication design and multimedia design. Design theory is traditionally ordered around these fields of practice, its development serving as a way of learning from and improving practice. Some newer fields fit within this paradigm, service design dealing with the design of services rather than physical products and experience design, gaming design and interaction design focusing on human interactions with computers, their products being primarily digital. Others, such as user-centred design and cooperative design are defined less by their products than by the way products and services are developed. Interpretation design transgresses traditional boundaries between design fields, using a wide range of forms to engage audiences and interpret its subject.

Definitions of design are in constant flux, shifting according to context and application. Much discussion within the literature is centred on establishing a definition that accounts for the range of types of design practice, design methods and the distinctive ways that designers think and act, if indeed this is the case. In 1969 Simon described design as converting actual situations to preferred ones. Soon after, Alexander argued that design

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106 Adams et al., 2010, “Being a Professional: Three Perspectives on Design Thinking, Acting, and Being.”
is about giving form, or organisation to physical things. Schöns, in 1983, identified that Simon’s definition resulted in a widening conception of design, with policies, institutions and even behaviour being objects of design. The tension between these two conceptions of design informs discussion about design thinking; whether design is a process of making and materiality or an activity dealing in the abstract in which designers aim to create a desired state of affairs.

Proponents of design thinking argue that designers think in a particularly empathic and creative way to produce novel solutions focused on user needs, whereas non-designers are more likely to follow thinking processes that lead to more predictable outcomes. Kimbell identifies three main conceptions of design thinking within the literature: as a cognitive style, as a generalized theory of design and as a resource for organisations seeking to innovate. The US company IDEO employs the latter conception, applying its design thinking model to business and humanitarian ends. Despite its name, their model does not centre on a particular way of thinking, but on a sequence of activities: empathise and listen to user needs, define the problem, ideate potential solutions, prototype the preferred solutions and test with users. This model has limitations in contexts where designers do not have access to their end users or where the scale and type of problems and solutions are unsuitable for prototyping and testing. Any substitution of user involvement in this model with assumptions about user needs undermines the value of this approach. Other problems with the design thinking model include potentially over-stating the designer’s capabilities to solve a diversity of problems well beyond their realms of expertise. Kimbell criticises design thinking for relying on a dualism between thought and action, ignoring the diversity of designers’ practices which are historically situated and privileging the designer as the main agent in designing. She argues that design thinking ought to be re-considered by examining the situated, embodied practices of designers. Kimbell’s brief history of key positions on design thinking illustrates some of the most significant conceptions of design, summarised in Table 2.

112 Ibid.
Table 2. Conceptions of design and design thinking (adapted from Kimbell).  

<table>
<thead>
<tr>
<th>Conception of design’s purpose</th>
<th>Problem solving</th>
<th>Taming wicked problems</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key texts</td>
<td>Cross, 1982, 2006&lt;sup&gt;114&lt;/sup&gt;</td>
<td>Buchanan, 1992&lt;sup&gt;119&lt;/sup&gt;</td>
<td>Dunne and Martin, 2006&lt;sup&gt;120&lt;/sup&gt;, Bauer and Eagan, 2006&lt;sup&gt;121&lt;/sup&gt;, Brown, 2009&lt;sup&gt;122&lt;/sup&gt;, Martin, 2009&lt;sup&gt;123&lt;/sup&gt;</td>
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<tr>
<td>Schön, 1983&lt;sup&gt;115&lt;/sup&gt;</td>
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<td>Rowe 1987&lt;sup&gt;116&lt;/sup&gt;</td>
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<td>Lawson 1997&lt;sup&gt;117&lt;/sup&gt;</td>
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</tr>
<tr>
<td>Dorst, 2006&lt;sup&gt;118&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of design problems</td>
<td>Ill-structured problems; problem and solution co-evolve</td>
<td>Wicked problems</td>
<td>Organizational problems are design problems</td>
</tr>
<tr>
<td>Research focus</td>
<td>Individual designers</td>
<td>Design as a whole discipline</td>
<td>As a resource for businesses and organisations seeking to innovate or differentiate</td>
</tr>
<tr>
<td>Key concepts</td>
<td>Design ability as a form of intelligence; reflection in action; abductive thinking</td>
<td>Design has no special subject matter of its own; four orders of design</td>
<td>Visualisation, prototyping, empathy, integrative thinking, abductive thinking; design can be applied to any context from healthcare to clean water</td>
</tr>
<tr>
<td>Conception of design thinking</td>
<td>As a cognitive style</td>
<td>As a general theory of design</td>
<td>As an organizational resource</td>
</tr>
</tbody>
</table>

Design is now commonly characterised as a type of problem solving process leading to an outcome, encompassing strategies, ideas and processes as well as artefacts. Friedman describes the process of design as including thinking, research and planning as well as problem solving and physical production.<sup>124</sup> Boyle defines design as the activity of

<sup>113</sup>Ibid., 297.
<sup>114</sup>Cross, 1982, “Designerly Ways of Knowing”; Cross, 2006, Designerly Ways of Knowing.
<sup>116</sup>Rowe, 1998, Design Thinking.
<sup>118</sup>Dorst, 2006, “Design Problems and Design Paradoxes.”
<sup>119</sup>Buchanan, 1992, “Wicked Problems in Design Thinking.”
<sup>120</sup>Dunne and Martin, 2006, “Design Thinking and How It Will Change Management Education: An Interview and Discussion.”
<sup>122</sup>Brown, 2009, Change by Design: How Design Thinking Transforms Organisations and Inspires Innovation.
<sup>123</sup>Martin, 2009, The Design of Business: Why Design Thinking Is the Next Competitive Advantage.
turning ‘need’ into a solution, a ‘concept’ into a reality, stating that design may or may not have a form, but it will have a purpose.\(^{125}\) He characterises design as a complex set of activities that require seemingly contradictory thought processes: creativity and logic, innovation and pragmatism, intuition and analysis, listening and talking, problem identification and problem solving, progress and control, technical and strategic thought, to which I would add leadership and service provision.\(^{126}\) Among the varied conceptions of design, synthesis and iteration emerge as central pillars of any definition that seeks to encompass the wide range of practices and contexts of contemporary designers.

The design profession has moved away from the ‘lone genius’ conception of practice to embrace teamwork and collaboration for innovation. User-centred or human-centred design, co-design and participatory design promote engagement with end-users to ensure that problem formulation, process and outcomes meet user needs. Such methods are having significant effects in business and other contexts including museums.\(^{127}\) Holston argues that the new designer embraces complexity, is collaborative, designs in context and is accountable.\(^{128}\) According to Woodward, design practice is increasingly complex, cross-disciplinary and collaborative in nature.\(^{129}\) These changes demand greater skills in analysis and synthesis, planning and collaboration now being central to design practice and theory.

A successful contemporary design leader organises teams, working collaboratively to harness multiple forms of expertise as required by problems of increasing complexity.\(^{130}\) Within such connected ways of designing, design leadership demands a particular range of skills and expertise: relationship management, empathy, flexibility, vision and the ability to persuade others to commit to the vision.\(^{131}\) Miller and Moultrie provide a

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126 Boyle, 2003, Design Project Management.
framework of skills used by design leaders across cognitive, interpersonal, business and strategic skill sets. Adams et al argue that strategic design leadership in cross-disciplinary work involves being the “connector” or “communication specialist” to traverse disciplines and organizational cultures to cultivate an environment for innovation. Design managers must navigate the needs, processes and language of design, business and end-users.

Interpretation design has not been considered in discussion of the changing nature of design, although it exemplifies many of the characteristics outlined, being cross-disciplinary, collaborative and strategic. Interpretation design is in its formative stages; like other nascent design fields it is developing its own discourse within practice and is yet to make a significant impact on design education and research.

Designing for experience
The field of design and the combined field of interpretation and museum studies demonstrate a mutual neglect, neither offering a significant engagement with the other. However, they share an interest in understanding the nature and qualities of human experience. The museums literature examines the nature of experience in relation to learning. Design researchers investigate experience to understand the relationship between people and designed objects with a view to improving objects and interactions. In the literature of human-computer interaction and human-centred design, research into experience aims to make digital products easier and more pleasurable to use, providing satisfaction and positive affect to users. The focus in these fields on human-computer interaction and virtual experience does not preclude the relevance of such research to the design of physical environments and visitor experiences.

Like museum studies, design research into the nature of experience draws on the work of educators and psychologists such as Kolb, Dewey and Gardner that recognise the agency

133 Adams et al., 2010, “Being a Professional: Three Perspectives on Design Thinking, Acting, and Being,” 20.
of visitors in shaping their own experiences through prior knowledge and experience, free-choice decision-making, social interaction and learning styles. The fields of human-computer interaction, human-centred design and experience design highlight the lack of definition and clarity around the notion of experience. They seek to develop models for conceptualising human experience and its qualities as it relates to use of products and digital media. Forlizzi and Ford differentiate between three conceptions of experience: Dewey’s notion of ‘an experience’ as a defined moment in time, Carlson’s ‘experienced cognition’ or ongoing self-narration and Shank’s conception of experience as a story. Kočsis provides a useful definition of experience as comprising qualitative aspects of human thought, activity and behaviour, being a synthesis between abstract reasoning and the senses. Wright, McCarthy and Meekison identify four interacting threads of experience: emotional, sensual, compositional and spatio-temporal. The emotional and sensual elements of experience interact and influence each other. The compositional aspect relates to a person’s actions and the system’s response over numerous instances to constitute the structure of the whole experience. The spatio-temporal aspect is possibly the most relevant to interpretation design, being concerned with the ordering and pacing of events and actions in a particular time and place. The process of making sense of an experience is reflexive and recursive, involving an ongoing cycle of anticipating, connecting, interpreting, reflecting, appropriating and recounting. Hassenzahl argues that experience emerges from the dialogue of a person with their world through action, integrating perception, motivation and cognition. Overbeeke, Djajadiningrat, Hummels, Wensveen and Frens consider three levels of skill people use when engaging with products: doing, knowing and feeling, arguing that designers need to create contexts for experience that consider engagement of all of the senses.


140 Ibid.

141 Overbeeke et al., 2003, “Let’s Make Things Engaging.”
Some human-computer interactions are situated within a museum or gallery environment, interactive computer art and virtual displays being the subject of recent research. Bilda, Edmonds and Candy argue that audiences engaged with interactive art are involved in constructing the essential meaning of the work through this interaction. Thus, experience is driven by the active and constructive process of perception, constituting a creative activity on the part of audiences. They focus on the interaction of anticipation and expectation in shaping visitors’ perception and understanding of their experience. This analysis is pertinent to audience interaction with interpretive environments. Kocsis, Barnes and Kenderdine provide a welcome recognition that virtual and digital media in the museum exist within a physical space that carries meaning and that virtual environments cannot be treated as a separate category entirely unlike other museum experiences. They argue that visitors desire a coherent experience across ideas and feelings, virtual and physical space, yet theorists do not provide a suitably synthesising perspective on experience that accounts for this.

Recognising the plural threads of experience, Norman argues that affect, emotion and cognition are complementary and interact with the physical body. He identifies three levels of processing: visceral, behavioural and reflective. The visceral level relates to immediate perception and judgement of whether something is good or bad, safe or dangerous. The behavioural level manages subconscious actions such as driving a car whilst the conscious mind is engaged in conversation. A mismatch between expectations and perception of experiences produces negative effects. The reflective level is the highest level, being conscious of emotional feelings and intellectually driven. Using prior experience and personal meanings to evaluate experience, this level of processing can enhance or inhibit the lower levels of perception. Norman draws the conclusion that all activity has both an affective and cognitive component, each influencing the other.

Taken together, design research examining the qualities of human experience recognises its complex, multifaceted and multi-sensorial nature. Subjective experience, personal

143 Bilda, Edmonds, and Candy, November 2008, “Designing for Creative Engagement.”
motivations and psychological characteristics interact with the external world including other people within a particular context over a period of time. Physical sensation, emotion, cognition and interaction are considered key aspects of experience, consistent with the museums and interpretation literature, in particular Falk and Dierking’s Contextual Model of Learning and Veverka’s conception of interpretation.146

Examination of the nature and qualities of human experience prompts consideration of the extent to which designers can create experiences for users and visitors. Forlizzi and Ford highlight the designer’s lack of control over ‘wild cards’ such as cultural background, prior experience and chance coincidences that bring particular meaning to experiences, arguing that designers can only design situations that people can interact with, not neatly predicted outcomes.147 The thesis takes the position that interpretation designers work in the tangible world of designing material and digital products that aim to engage and affect visitors in intangible ways. Conceptions of the nature of human experience can inform a designer’s work, but designers do not create experiences, having no control over a person’s motivations, emotional state and subjective response. Rather, they design for experience that is co-constituted by visitors’ engagement and subjective response.

As interpretation began in spoken form, later extending to printed leaflets and fixed signage, it is often associated with communication design. Current practice indicates that this is an out-dated view of interpretation design. Woodward identifies that previously interpreters undertook the designed aspects of interpretation, whereas today design of the interpretation interface is a specialist form of practice undertaken by professional designers working in collaboration with other professionals.148 Interpretation design does not sit neatly in any one design field, it not being defined or delimited by the form of its product. The distinguishing aspect of interpretation design is its intent to create engaging visitor experiences that contribute to learning and meaning making while communicating messages to an audience. Media and methods are selected according to their suitability to convey meaning and create engaging experiences for a particular audience within a specific context.

There is no significant literature of interpretation design that examines the range of interpretive media and methods used by designers. Relevant research is scattered across a range of disciplines and journals, rarely providing extended discussion of design issues. The primary tourism journals are *Annals of Tourism Research*, with a social sciences perspective and *Tourism Management*, focusing on planning policy and management aspects. These journals contain limited reference to design of interpretation. The *Journal of Ecotourism* includes some research on interpretation, largely in the context of wilderness settings in relation to topics such as creating a sense of place and influencing tourist behaviour. This work is only partially relevant to the design of interpretation in constructed environments, distant from natural heritage sites.

*Environment and Behaviour* and *Anthrozoos* provide some relevant research on human relationships with natural environments and animals, but provide no extended examination of design in the context of interpretation. Within museum studies, the key journals *Museum and Society*, *Visitor Studies* and *Curator* have the largest number of contributions pertinent to interpretation, but few directly address interpretation design. The primary interpretation publications are the *Journal of Interpretation Research* published by the National Association of Interpretation in the United States and conference proceedings from national interpretation organisations throughout the world including Australia, United States, Scotland and Canada. A review of these publications found very limited discussion of design. A review of the key design journals *Design Issues* and *Design Studies* did not identify contributions relating to interpretation design.

The most significant contributor to the interpretation design literature to date is Margaret Woodward, who has authored several papers and a doctoral thesis that examine communication design as an interpretive tool. Broadly, Woodward’s research investigates how interpretive communication design in tourism settings shapes ideas

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about nature and Australian identity. Woodward’s interpretation design pattern language
aims to enhance the effectiveness of interpretation design by assisting in sharing
concepts, approaches and knowledge between design and interpretation. Table 3
summarises Woodward’s nine patterns and problem statements and her proposed design
strategies for each.
<table>
<thead>
<tr>
<th>Pattern</th>
<th>Problem</th>
<th>Design strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>People can feel overwhelmed by information in museum and interpretive settings.</td>
<td>Create interpretation environments that reveal structured information in a staggered way. Allow audiences to control the flow and pace of information. Use visual hierarchy and layering strategies to deliver information in a structured and staggered way.</td>
</tr>
<tr>
<td>2. Comfort</td>
<td>Visitors can experience physical and psychological discomfort such as dis-orientation, insecurity, over stimulation and fatigue in settings which lack clear orientation, familiarity and accessibility.</td>
<td>Provide clear way finding systems that allow good orientation, freedom of movement, navigation and directions towards exits, tracks and facilities. Provide 3-D models that give setting and location cues to visitors. Build up consistent and reassuring cues for reading and understanding information, such as type styles and icons that communicate the site identity. Design smaller coherent spaces where people feel comfortable, secure and not overwhelmed.</td>
</tr>
<tr>
<td>3. Personal connection</td>
<td>Unless the interpretation connects personally with the visitor, their experience will be superficial and limited in meaning.</td>
<td>Make a connection with other’s lived experience, both human and non-human. Personalise the communication through developing a character or voice for human stories. Use the first person in models, film, images and role play of characters that perform the function of a narrator. Develop visual concepts to allow the visitor to feel a sense of identification with the communication. Design opportunities for people to make connection with a place through an interpretive walk or quiet contemplation of a place. Allow for multiple voices and different perspectives to be represented and allow people to feel part of the narrative.</td>
</tr>
<tr>
<td>4. Challenge and curiosity</td>
<td>Visitors can be bored, feel preached at and have little incentive to be exposed to the messages and information in interpretive settings.</td>
<td>Allow for different learning styles by offering different content formats. Design information as separate clues or parts of a whole that accumulate to reveal a complete story. Work collaboratively with artists to create artefacts that rely less on literal perspectives and instead arouse curiosity, stimulate interest and provoke questions. Keep some objects or images hidden or concealed, which are later revealed to shock, confront or challenge perspectives.</td>
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<th>Problem</th>
<th>Design strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Participation and interaction</td>
<td>Visitors can feel distanced from and disconnected from interpretation.</td>
<td>Incorporate interactivity through the use of computer devices and multi-media displays. Encourage visitors to manipulate and touch objects and participate actively in displays and exhibits. Walks, talks, improvised performances and contributing memories engage people more deeply with the issues and topics than purely visual engagement. Use interaction in non-personal interpretation in the absence of guides or interpreters.</td>
</tr>
<tr>
<td>6. Variety/multisensory</td>
<td>Tourism activities often give priority to the sense of sight, overlooking the other senses as powerful ways to interact with and communicate about place.</td>
<td>Design experiences that engage visitor’s full sensory range to incorporate smell, taste, sound, touch as well as sight. Encourage learning about a place through its natural attributes by having access to the real objects in situ. Present a variety of visual and tactile textures, surfaces, aural environments, to hold interest rather than systems of display that cause the visitor to be separated from the sensory nature of the display.</td>
</tr>
<tr>
<td>7. Flow and quiet fascination</td>
<td>When visitors arrive at natural settings they may feel tired, distracted and overstimulated from multiple and competing visual demands on their attention.</td>
<td>Use the natural setting to allow for moments of quiet fascination and flow, free from distraction. Design quiet spaces and seating to encourage time for contemplation, reflection and restoration and distractions are removed. Orchestrate the pace and flow of the information to slow the visitor down rather than overload them. Use arts approaches, such as poetry, music and writing to communicate the impact of natural places on others.</td>
</tr>
<tr>
<td>8. Reading place</td>
<td>People perceive and value places differently and personally. Articulating and communicating place visually can be difficult.</td>
<td>Create mental maps of the place. Create a visual inventory of place. Create a design/visual paradigm.</td>
</tr>
<tr>
<td>9. Lexicon for place</td>
<td>People name places and speak about particular places differently, revealing shared and divergent attitudes and assumptions of place.</td>
<td>Gather language to create word maps. Collect or create written metaphors for place. Collect already published material about place to look for divergent perspectives.</td>
</tr>
</tbody>
</table>

Brine, also a communication designer, proposes a new geometric language for graphic designers. Unlike Euclidean geometry, it is based on natural forms and patterns to
facilitate communication about natural systems, which are non-linear and irregular.\textsuperscript{152} Her brief discussion of three dimensional design states that interpretive displays should contain a variety of elements for visitors to look at, listen to or interact with, to accommodate a range of visitor differences such as learning styles, left and right brain thinking, multiple types of intelligence (as theorised by Gardner), age, demographics and social group, but does not expand on how designers might achieve this.\textsuperscript{153} Brine and Woodward state the importance of a range of media within interpretive environments such as physical activities, theming and theatrical elements, Woodward particularly recommending design strategies that use non-visual media and methods. However, their research focuses primarily on the persuasive power of visual and graphic design.

Woodward notes the lack of discussion within the interpretation literature of the potential of design to enrich interpretation and claims that the absence of interpretation design in the design literature obscures its presence as a new field of design with an identity in design history and design discourse.\textsuperscript{154} She observes that the highly collaborative, cross-disciplinary and strategic nature of interpretation design practice positions the field at a high point in history. Woodward argues that, ‘The complexity of issues and viewpoints expressed through a myriad of available technologies to create audience interfaces sets up unprecedented potential for designers and interpreters to communicate meaningfully and memorably.’\textsuperscript{155}

Despite interpretation design having been practiced for many decades, academic research that combines interpretation and design is lacking. For this reason, practitioner interviews are used to garner knowledge from practice, towards developing a greater understanding of the field.

\textbf{Themes from practice}

Chapter Four, ‘Interpretation design practice’ examines in detail the interviews conducted with interpretation design practitioners but I summarise the key themes here to contribute to the characterisation of interpretation design and to highlight current issues in practice. Characteristics of interpretation design include that it is message-driven, audience-centred
and encourages social interaction. Interpretation designers interviewed reiterate the focus on audience connection espoused in the interpretation literature; design of exhibits aims to create connections between audiences and the subject through diverse media, materials and techniques. They represent the design process as cross-disciplinary and collaborative, drawing on multiple strands of design practice and engaging with a range of specialist contributors.\(^{156}\) The interviews show that interpretation designers are multidisciplinary, bringing skills and experience from other disciplines to inform their practice. Practitioners seek out professional development resources from architecture, interior design and art, due in part to the perceived superior quality of publications in such fields.\(^{157}\) Many practitioners develop a design philosophy that guides their use of technology, representation of other cultures, nature and conservation, designing for specific audiences and the integration of art and play elements.

Issues in interpretation practice identified by practitioners include: each project is highly individual, with a unique context, subject and designer role; the relationship between designers and architects is critical to the designer’s role and design outcomes; commissioning organisations vary greatly in their experience and understanding of interpretation design, seeing designers often take on an educative role with clients; and testing and evaluation are rarely included in the design process.

**Summary of gaps in existing research**

The literature review has identified that a substantial gap exists within the interpretation and museum studies literatures with regard to interpretation design. Some researchers recognise design as a significant link between a project’s aims and outcomes, but the paucity of discussion about this indicates a substantial deficit in knowledge and understanding. Design’s influence on visitors’ decisions in free-choice learning environments, its contribution to learning, entertainment, emotional response, play, interaction and its impact on the overall visitor experience is largely overlooked. Design’s role in shaping visitors’ perceptions of nature through the creation, manipulation and presentation of nature objects and environments is also under examined. This lack of recognition is reflected in the literature of interpretation and exhibition planning, in which design is largely relegated to the final stages of a project. The low profile of design within the field of interpretation limits its contribution to theory and practice. Robust articulation

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\(^{157}\) Cunningham, 2011, “Interview by Toni Roberts”; Freeman, 2011, “Interview by Toni Roberts.”
of practitioner knowledge and investigation of designer strategies is needed to address this.

The literature of design encompasses a wide range of theory including new fields such as collaborative design, interaction design and experience design, none of which considers interpretation design. Some authors profess that interaction design and experience design encompass physical as well as digital design, but the focus in these fields is on human-computer interaction and virtual experience. The rare examinations of interpretation design come from the field of communication design, neglecting the multidisciplinary nature of interpretation design practice. Interpretation design practice exemplifies the highly collaborative and strategic nature of contemporary design practice yet its profile as a potential shaper of design discourse is undeveloped.

Chapter One has established the significance and relevance of the research. The literature review has highlighted that the literatures of interpretation, museum studies and design do not adequately address the questions and concerns of practitioners or contribute to the development of specifically relevant theory. Given the extensive gap in published knowledge, the research aims to investigate broad, grounding issues in the field. Building on Woodward’s formative research, the thesis contributes to definition of the field, characterisation of practice and principles and techniques employed. Chapter Two presents the research design and methods used to harness knowledge from practice to better understand the role of interpretation design and the barriers and triggers to its successful implementation.
Chapter 2
Research Design and Methods

This chapter details the epistemological approach, research design and methods of inquiry. It establishes that the methods are well suited to the research aims and questions. The epistemological framework for the research design is constructivism, the research being grounded in an understanding of reality that sees subjective meanings as formed through experience over time and through interaction with others. This theoretical perspective assumes that reality and knowledge are socially constructed and open to diverse interpretation.

The research aims to build understanding of design, investigating project-specific factors that influence the role of design within the practice of interpretation in nature-based projects. It examines project context, structure and process to raise some recommendations about the optimal application of design within interpretation projects. The study takes a qualitative approach to data collection and a holistic, interpretive sense-making approach to its analysis. Qualitative research investigates how people construct their worlds and what meanings they give to their experiences.\(^{158}\) Merriam argues that, ‘One of the assumptions underlying qualitative research is that reality is holistic, multidimensional and ever-changing; it is not a single, fixed, objective phenomenon, waiting to be discovered, observed and measured as in quantitative research.’\(^ {159}\)

Given the immaturity of the literature of the interpretation design field and its principal basis in practice, theory building is inductive. With inductive theory building, researchers work towards the development of theory on the basis of in-depth examination of cases and intuitive understandings.\(^ {160}\) Data from interviews, observations and documents are combined and ordered into larger themes as the researcher works from the particular to the proposition of explanatory frameworks. Inductive data analysis aims to derive meaning from the data and build substantive theory from practice.\(^ {161}\) A substantive theory has a specificity and usefulness to practice often lacking in more global theory. This type


\(^{159}\) Ibid.


of theory building is well suited to my research, which seeks to understand practice and to offer practical benefits for the application of design to interpretation. Findings are presented as typologies, problems, themes and propositions.

The chapter presents the research design and components including instruments of data collection, literature review, practitioner interview, site observation and documentation review. It discusses the case study method, outlining its benefits and defending its application to this research. The chapter details aspects of the case study design including case selection, methods of data collection and analysis and limitations of the research.

**Research design**

Theory and practice are two types of knowledge in the fields of design and interpretation. Higher knowledge in a field of practice develops through a dynamic relationship between theory and practice. According to Friedman, this involves the ongoing development of theory out of practice, the application of theory in practice and the ongoing refinement of both.\(^{162}\) According to Crouch and Pearce, theory and practice are intertwined: practice is a body of knowledge in constant flux as it responds to new material conditions, ideas and theories. To theorise is to construct explanations about the world as a way of understanding our interactions with it, which involves thinking about practice.\(^{163}\) In interpretation design, the relationship between theory and practice is not well developed, as the field lacks a developed body of evidence-based, published knowledge. Further, interpretation design lacks a formal system of education, mentorship and other means of sharing and building knowledge. Practitioners primarily develop their knowledge through informal communities of practice: by viewing each other’s work in the public domain, through social networks with other designers and related professionals and through occasional design-related presentations at professional conferences about zoos, museums or interpretation. It is occasionally possible to view the design work of others through the tender process when a concept by one designer may be provided to another designer for development. Aside from these incidental opportunities to share knowledge, interpretation design consultants work in a fragmented and competitive environment, with few incentives or opportunities to share knowledge and develop a common pool of wisdom. The lack of published knowledge hampers the development of a dynamic relationship between theory and practice in the field.

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The research seeks out knowledge from practice through a range of data sources including interviews with select practitioners, design documents and site observations. Onwuegbuzie, Leech and Collins support this approach, arguing that four types of data are relevant as literature review sources: talk, observation, visual material and documents. They provide three reasons for expanding the concept of literature review beyond peer-reviewed research articles and books. The first is to address the time lag in the publication of research findings, interviews providing the most up-to-date information of the state of knowledge in a discipline. Secondly, they argue that contextual information is often only available by visiting a place, experiencing it and observing others’ experience of it. They thirdly argue that visual representations can provide information and understandings that text cannot. In this study, such research sources reveal some of the rich knowledge held by practitioners and identify key aspects of practice as a contribution to building a comprehensive view of the field in the future.

Research instrument for data collection

Qualitative inquiry focuses on meaning in context, requiring data collection instruments that are sensitive to underlying meaning, both for gathering and interpreting data. Interviewing, observing and analysing are activities central to qualitative research, the researcher being the primary instrument of data collection and analysis. The research design recognises that a researcher’s subjectivity can potentially lead to biases. The research process is grounded in the concurrent collection and analysis of data, with the adaption of methods as needed. Merriam argues that a constant comparative method approach to research is the preferred method in qualitative studies. Stake argues that data analysis should be continuous rather than staged, from first impressions to final compilations. Data analysis occurred in two rounds. First, I collected and analysed the case data, clarified and checked for accuracy with respondents. Through simultaneous data collection and analysis, I shaped and refined my questions, discarding tentative hypotheses and research directions that were not supported by the evidence. The emphasis of the research shifted from examining representations of nature to a greater focus on the impact of the design process on the designer role and outcomes, as more relevant data became available. Once compiled, a second round of analysis compared the two cases to identify themes and build tentative theory.

166 Ibid.
Research components

1. Literature review

The literature review identifies a very limited literature in interpretation design, comprising mainly tangential discussions in theory from other disciplines. Discussions related to interpretation rarely broach matters of design. The limited literature of interpretation design does not provide an adequate framework for analysis of the two case studies. For this reason, the research includes interviews with a range of interpretation practitioners about their experience to establish current practitioner knowledge not represented in the literature. The thesis treats these contextual interviews in a similar manner to the review of relevant published knowledge, using them to establish a broad understanding of the field of interpretation design and to identify issues in current practice.

2. Practitioner interviews

The interview sample is purposeful and small, encompassing the range of roles associated with the practice of interpretation and seeking out experienced and highly regarded practitioners. The interviewees are consultant interpretation specialists who work for Australian and international institutions or work at major organisations that commission interpretation design such as the Melbourne Museum. The sample includes interpretation practitioners from fields ranging across curating, exhibition design, art, writing, graphic design and project management, indicating the range of practices that contributes to interpretation and to elicit the broadest view of the place of design within it. Through the projects they have undertaken, interviewees represent the range of contexts in which interpretation takes place, including national park visitor centres, touring audio guides, major museums, zoos, botanic gardens and theme parks. Five dedicated interviews on interpretation design practice were undertaken. Three professionals interviewed for the case studies were also interviewed in relation to their general practice, bringing the total number of practitioner interviews to eight.

The interviews took a semi-structured approach, enabling participants to feel comfortable and me to use discretion to adapt questions as needed, to respond to subjects’ specific circumstances and knowledge. A consistent list of questions provided a framework for discussion to elicit comparable material without restricting novel input from each interviewee. According to Darke, Shanks and Broadbent, an open-ended interview should be an interesting conversation in which the researcher’s interest in the topic is combined

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with the interviewee’s views, experiences and the opportunity to reflect on events and actions to provide his or her insights into these occurrences.\textsuperscript{169}

The consistent interview format enabled me to use the same interview protocol for both the practitioner interviews and the interviews within the case studies. This provided an opportunity to make comparisons that could be more difficult if interviews were unstructured. Questions covered three aspects of practice within interpretation design projects: design context, process and outcomes, Figure 4. This is a recurring sequence of examination in the thesis, as each aspect forms the foundation for the next.

![Figure 4. Interview questions: aspects of work examined.](image)

Interview duration was approximately one hour. A longer period would have been an onerous demand to place on people with busy work schedules; any less would not have allowed me to explore areas of interest. I conducted interviews at a time and place of the interviewees’ choice, to make it more likely that they would wish to participate and to help participants to feel comfortable and able to speak freely. All interviews were conducted in person, digitally recorded and transcribed. I took hand-written notes during the interviews to record contextual information such as interruptions, body language and emphasis.\textsuperscript{170} As the research involved human subjects, ethics clearance was sought from the Swinburne University Human Research Ethics Committee, approval being granted on 13/12/2010, evidence attached at Appendix A.


\textsuperscript{170} Bernard, 2006, \textit{Research Methods in Anthropology: Qualitative and Quantitative Approaches}, 232.
Each transcription was edited and organised under headings that emerged from the discussion. The interviews served to assist in understanding practice and to guide analysis of the case studies; holistic, descriptive analysis best encompasses the range of experiences and perspectives evident in the data and accounts for significant topics raised by individuals that were not necessarily expressed by many participants. Summaries were collated according to common topics across the interviews. Topics were ordered according to the number of respondents who commented on the topic and the extent of concern expressed. This approach was not intended to provide a rigorous statistical analysis of the relative importance of each topic, but rather identify common themes and issues arising from experience of practice. Issues expressed by single respondents were retained until the final stages of analysis.

The collated summaries of responses ordered by topic and respondent type were then reduced and further summarised, this being the most effective means of retaining the meaning and degree of emphasis in the original text. Other methods of content analysis reporting such as word clouds and statistical reporting lack the capacity for sufficiently holistic, descriptive analysis, particularly with a small sample size. Some topics included responses from only one or two respondents, such topics being retained, discarded or absorbed into other topics according to their relevance to the key research questions. For example, discussion of the role of multimedia within interpretive environments was incorporated into the discussion of presenting nature. From the interview analysis I developed a set of propositions for examination in the case studies.

3. Site observation and documentation of professional practice

Interpretation design has a body of common design techniques and practices in the public domain. Physical things such as objects in the environment are not as commonly used for research as the other types of documents, but they are a valid source of data for the qualitative researcher. Based in the literature and drawing on practitioner interviews, numerous site observations and my professional experience, the thesis develops models of practice and contributes a typology of interpretation design outcomes drawn from a range of sites, institutions and designers, exemplified by annotated photographs. This phase of the research sought to gather and build knowledge from practice to inform the case studies.

4. Case Studies

Case study is a central component of the research and aims to integrate investigation of practice and theory to develop explanatory frameworks and recommendations. The case studies examine a range of data from multiple sources to contribute a deep and holistic understanding of interpretation design practice from the perspectives of stakeholders including designers. Methods of data gathering include conducting interviews, analysing project documents and design work and first hand observation of the completed projects.

**Case study method**

Case study searches for meaning and understanding, using the researcher as primary data gatherer and analyst. It aims to produce results that are holistic and richly descriptive.\(^\text{172}\) Yin defines case study as, ‘an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.’\(^\text{173}\) For Cresswell a case study involves ‘in depth data collection including multiple sources of information and reports a case description and case based themes.’\(^\text{174}\) Miles and Hubermann see the defining aspect of a case study as confining the object of study to the case, which is a bounded system, rather than a topic.\(^\text{175}\) In this research, all of these definitions apply.

The case study design uses qualitative methods in preference to experimental methods such as randomised control trials (RCTs). Frequently upheld as the ideal method, RCTs are commonly used for program evaluation in education and science. Vogt, Gardner, Haefele and Baker argue that the presumed superiority of randomised control trials is problematic as research design should be driven by the research topic, context and aims, there being no single standard of excellence.\(^\text{176}\) RCT is not always feasible or preferable, the authors nominating RCTs as unsuitable in five circumstances: when randomised assignment is impossible, when manipulating variables is infeasible, when they are not cost effective, when RCTs would distort the object of study and when they have limited external validity. All of these conditions apply to this research. Experimental methods are unsuitable for this topic and context as the nature of the work under examination is not of a generalised type; subjects cannot be randomly assigned to the study so external validity

\(^{172}\) Ibid.


\(^{175}\) Miles and Hubermann, 1994, *Qualitative Data Analysis: An Expanded Sourcebook*.

\(^{176}\) Vogt et al., 2011, “Innovations in Program Evaluation: Comparative Case Studies as an Alternative to RCTs.”
would be compromised. Manipulation of variables is infeasible as the experiences, approaches and events under examination are not clearly delineable, measurable or independent, RCTs being more suited to topics of study with identifiable independent variables. The research aims of understanding multiple facets of projects through several phases of development mean that RCTs would not be cost effective in this context. Experimental methods are not suited to this type and stage of knowledge building within interpretation design as the variables under examination are highly context-specific and inter-related, the work taking place over an extended period.

Types of case study relate to differing epistemological perspectives and research aims, which in turn influence methods of data collection and analysis. There is no firm separation of quantitative, qualitative or other approaches to case study research. Welch, Piekkari, Plakoyiannaki and Paavilainen-Mantymaki and Onwuegbuzie, Leech and Collins argue that quantitative methods may be used in conjunction with qualitative methods to achieve a particular research aim. In this research, qualitative methods were best suited to developing greater understanding of practice in the context of project work with a wide array of variables. Merriam identifies four main types of qualitative case study: intrinsic, in which cases are selected for their inherent interest, rather than aiming to aid understating of an abstract concept or generic phenomenon; instrumental, in which the case plays a secondary role of facilitating understanding of something else or to draw a generalisation; evaluation, for which case study is used to illuminate meanings and communicate tacit knowledge; and multi-studies or multi-case study in which cases share a common characteristic or condition. The two cases have been selected primarily for their evaluative significance.

Case study is widely used for research in the social sciences, education, information systems and business. These disciplines share a commonality with design; they are applied disciplines, so that research and theory development should have an orientation directed at improving practice. Barnes and Melles argue that the interdisciplinarity and applied nature of design demands research methods suited to reflexive, situated

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178 Merriam, 2009, Qualitative Research: A Guide to Design and Implementation. See also: Lincoln and Gruba, 1985, Naturalistic Inquiry; Stake, 2006, Multiple Case Study Analysis.

knowledge production, a proposition consistent with my research design. Case study is a well-established form of research, valued by those who use it for its ability to capture complex action, perception and interpretation. However, its acceptance is not general. Concerns centre on the capacity for case study to produce generalisable, theoretical knowledge through valid, unbiased methods.

The question of the capacity of case study to contribute to theory centres on two key questions: whether generalisability is an essential aspect of theory and whether theory developed through case study can be generalised. For Freidman, theory provides generalizable answers that can be put to use by people in other times and places. By contrast, Welch et al. define theory as a formal explanation offering coherent, examined conceptualisation of a phenomenon; they do not specify generalizability as a requirement. Crouch and Pearce state that a theory is a set of ideas developed to explain facts. These definitions reflect differing theoretical perspectives. Friedman upholds the importance of generalizability as the foundation for theory; Welch et al. and Crouch and Pearce focus on explanation. This research takes the position that theory depends on explanation rather than generalizability.

Case study has been criticised for its focus on specifics, this being equated with a limitation in producing generalizable forms of knowledge that can be uniformly applied. Supporters of case study such as Erickson refute this criticism, arguing that as the general lies in the particular, understanding produced from case study method can transfer learning from one case to another. Although not uniformly applicable, vivid, thick description of a specific case can help the reader to draw links between case studies and their own practice. Cronbach claims that, by concentrating on a single phenomenon the researcher aims to uncover the interaction of significant factors characteristic of the phenomenon, which is a weak form of generalisation. Simons argues that the apparent polarity of particularity and generalizability of case studies stems from a particular view of research. Looked at from a holistic perspective, there is no disjunction, but a paradox

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185 Erickson, 1986, “Qualitative Methods in Research on Teaching.”
that a case study can yield both unique and universal understanding. It is through the study of the uniqueness of the particular that we come to understand the universal.\textsuperscript{186} Similarly, Welch et al. contend that the case study can both generate causal explanations and incorporate context, two features often regarded as incompatible. They call this ‘contextualised explanation’. Proponents of contextualised explanation question the neat separation between the particular or historical and the general or theoretical. Case studies typically incorporate both.

Flyvberg contends that the criticism regarding generalizability from case studies stems from the misunderstanding that: one cannot generalise on the basis of an individual case so a case cannot contribute to scientific development.\textsuperscript{187} However, he argues that formal generalisation is only one of many ways in which people gain and accumulate knowledge. It is overvalued as the main source of scientific progress, whereas the force of example is undervalued. That knowledge cannot be formally generalised does not mean that it cannot enter the collective process of knowledge accumulation in a given field or society. A single experiment that identifies a single phenomenon can contribute significant knowledge. Flyvberg cites Karl Popper’s theory of falsification by example of the black swan: if a theory proposes that all swans are white, then a single instance of observing a black swan is significant and falsifies the proposition. Such identification does not need to be generalised or statistically significant, Flyvberg arguing that universals are not relevant to the study of human affairs. The detail and real-life complexity of cases provide a nuanced view of reality, thus, concrete, context-dependent knowledge is more valuable than the vain search for predictive theories and universals.\textsuperscript{188}

Flyvberg argues that analytical rationality and knowledge based on context-independent theory and rules is inadequate for exercise of a profession and that to make rule based knowledge the highest goal of learning is regressive.\textsuperscript{189} There is a need for both generalised and context-specific knowledge. Welch et al. concur, citing Bamberger’s claim that dominant positivist beliefs may force researchers to overemphasise generalisability compared with contextual sensitivity.\textsuperscript{190} According to Vogt et al., all research methods are assessed in relation to their resemblance to RCTs, based on a


\textsuperscript{188} Ibid., 224.

\textsuperscript{189} Ibid., 222–223.

presumption of the superiority of RCTs with regard to validity and generalizability.\(^{191}\)

There is an expectation that case study methods must be justified on these grounds, undermining the value of other methods. Welch et al. claim that a positivist rationale underlies much qualitative research and that a focus on generalisation and decontextualisation of theory resulting from case studies has prevailed; generalisability should not be the main priority for theory generated from cases.\(^{192}\) Simons contends that the characteristics of case study have weakened as a result of a tendency to revert to positivistic justifications such as generalisability.\(^{193}\) Stake questions the ideals of generalisability, causality and objectivity upheld by positivist case traditions, claiming that particularisation is the goal of case studies.\(^{194}\) Crouch and Pearce argue that the focus on experiential knowledge in case study research assists our understanding of the social, political and cultural contexts of individual and collective experience, or the real life of the case.\(^{195}\) According to Martin and O’Reilly, ‘The necessity to develop a body of generalizable research results applicable across settings and facilities must be balanced against the equally valid necessity to recognise the importance of contextual specificity of settings.’\(^{196}\) Otherwise, research results from one setting may be inappropriately applied to another.

Simons claims that the positivist search for certainty, comparison and conclusiveness tends to drive out alternative forms of investigation that may potentially provide world-changing insights.\(^{197}\) Eisner also challenges researchers to live with more uncertainty and ambiguity, to seek other modes of thought than rationality.\(^{198}\) Flyvbjerg contests the idea that general theoretical, context independent knowledge is more valuable than concrete, practical, context-dependent knowledge, arguing that context-dependent knowledge and experience are at the very heart of expert activity.\(^{199}\) Expert knowledge is based on a large number of concrete cases within their field, which creates in the practitioner a nuanced view of reality in contrast to the lower level of knowledge produced through rule based learning. Flyvbjerg’s argument is highly relevant to the field of study given the paucity of

\(^{191}\) Vogt et al., 2011, “Innovations in Program Evaluation: Comparative Case Studies as an Alterantive to RCTs.”
\(^{193}\) Simons, June 1996, “The Paradox of Case Study.”
\(^{194}\) Stake, 1995, The Art of Case Study Research.
\(^{195}\) Crouch and Pearce, 2012, Doing Research in Design, 141.
\(^{196}\) Martin and O’Reilly, 1988, “Editors’ Introduction.”
\(^{197}\) Simons, June 1996, “The Paradox of Case Study.”
\(^{199}\) Flyvbjerg, April 01, 2006, “Five Misunderstandings About Case-Study Research,” 222.
published knowledge available to practitioners to build their expertise; the research thus provides two cases that convey a detailed, nuanced understanding of contextual factors.

With regard to the contribution of case study to theory, Walsham identifies four possible types: development of concepts, generation of theory, drawing of specific implications and contribution of rich insight. Stake identifies two ways that researchers reach new meanings about cases, through direct interpretation of the individual instances and through aggregation of instances until something can be said about them as a class. This research aims to provide rich insight and contribute to theory building through interpretation of individual instances.

Welch et al. claim that broadening the possibilities for theorising from case studies requires an appreciation of how the underlying paradigmatic assumptions that stem from epistemological and philosophical perspectives both enable and constrain empirical research. They identify four methods of theorising from case studies, Figure 5. Each axis of the matrix represents a spectrum, so that methods may be situated in locations within a quadrant or overlap quadrants.

![Figure 5. Welch et al: Four methods of theorising from case studies.](image)

The combination of explanation and context conceptualised by Welch et al. presents case study as an invaluable method for applied fields that can benefit from both contextual knowledge and theory. My research is situated primarily within quadrant three.

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overlapping quadrant four. That is, the research aims broadly to understand the field of interpretation design practice, but also to consider potential changes that could improve processes and outcomes. The research contributes substantive theory which has a firm basis within a defined context and is not abstracted and broadly generalised. It may, however, have relevance beyond its substantive field and contribute to limited general explanation.  

Table 4 compares Welch et al.’s four methods of theorising from case study, including their philosophical foundations and attitude to generalisation. Welch et al. maintain a defence of context as being an essential component of, rather than hindrance to, explanation.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Inductive theory building</th>
<th>Natural experiment</th>
<th>Interpretive sense-making</th>
<th>Contextualised explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of context</td>
<td>Contextual description a first step only.</td>
<td>Causal relationships are isolated from the context of the case.</td>
<td>Contextual description necessary for understanding.</td>
<td>Context integrated into explanation.</td>
</tr>
<tr>
<td>Main advocate</td>
<td>Eisenhardt</td>
<td>Yin</td>
<td>Stake</td>
<td>Ragin/Bhaskar</td>
</tr>
</tbody>
</table>

In arguing for the case study as contextualised explanation, Welch et al. cite Stake’s insistence on the difference between case studies that seek to identify cause-and-effect relationships and those seeking to understand human relationships. Welch et al. argue that causation is not about the search for event regularities, but searching beyond the realm of the observable to understand the capability of humans and objects within the case. Their stance, based in the theoretical perspective of critical realism, ascribes power to

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human agency and recognises that humans operate within existing social structures. Explanatory accounts need to encompass the articulated reasons of social actors and consider an actor’s position in the social structure; generalisations are not universalities, being always limited in scope.

Welch et al. make a strong argument for the ability of case study to identify causes. My research makes limited claims to causality, being set primarily within the interpretive sense-making quadrant of their diagram, with some overlap with quadrant four. It has a strong focus on contextualisation and a moderate emphasis on causation. Interpretive sense making seeks to understand the particular rather than generate law-like explanations or definitive causal relationships, emphasising that subjects ascribe meaning to their own behaviour and experiences and that researchers are part of the world they study. This approach values thick description and narrative accounts, aiming to capture subjects’ interpretations of their own experience. The result is richly descriptive, with a critical approach to methods, structures and power relations within the practice of interpretation design.

With regard to criticism about rigour, bias and validity in case study, Breslin and Buchannan argue that, ‘Many purported case studies within design publications are simply promotional or anecdotal writing about a particular project and lack the discipline and rigour of case study methods.’ Lack of rigour is not a problem of the case study method, but a problem of its application. Yin identifies potential bias as a weakness of case study. Bias may be due to poorly constructed interview questions, inaccuracies due to poor recall or social effects such as the interviewee giving the interviewer what they want to hear, or presenting themselves as they would like to be seen. Use of multiple sources, known as data triangulation, helps to counteract researcher bias and strengthens findings through the convergence of information from a variety of sources. Orlikowski and Baroudi state that the interpretive researcher acknowledges their implication in the phenomena being studied, either weakly by attempting to describe, understand and interpret the situations from the participants’ perspectives, or more strongly by creating and enacting the reality being studied through the constructs they use

to view the world. Merriam states that rather than trying to eliminate potential bias due to subjectivity, it is better to identify and acknowledge these subjectivities and monitor how they may shape data. In cases where the researcher is also a participant in the study, subjectivity can constitute a distinctive contribution to understanding.

Stake, Yin, Merriam and Flyvbjerg argue that the question of subjectivism and bias toward verification applies to all methods, not just to case study and other qualitative methods. That is, the choice of categories and variables in a quantitative investigation also demonstrates subjectivity. Stake and Merriam argue that the analysis and interpretation of findings always reflect the constructs, concepts and theories that structured the study in the first place. Yin argues that qualitative research is more likely than quantitative research to correct bias as the quantitative researcher does not get as close to those under study as does a case study researcher. In quantitative research it is likely that this subjectivism is not corrected by the participants ‘talking back’ and survives to affect results. By contrast, within case study, the researcher’s closeness to the subject often leads them to discard preconceived notions in response to data such as participant feedback. Case study contains no greater bias toward verification of the researcher’s preconceived notions than any other methods of inquiry.

With regard to questions of validity, Yin applies four tests: 1) construct validity, that is, establishing correct operational measures for the concepts being studied; 2) internal validity, or establishing a causal relationship; 3) external validity, that is, establishing the domain to which a study’s findings can be generalised; and 4) reliability, demonstrating that the operations can be repeated with the same results. Welch et al. see Yin’s analysis as limited by his positivist aims. What is under investigation in case study is people’s constructions of reality, which may not be repeatable or generalisable. Darke, Shanks and Broadbent state that interpretivist research rejects the notion of value-free research and is not concerned with the repeatability of an explanation. The interpretivist researcher attempts to gain a deeper understanding of the phenomena being investigated and acknowledges their own subjectivity as part of this process. The value of an explanation is judged on the extent to which it allows others to understand the phenomena

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and makes sense to those being studied. Janesick claims that the term validity is confusing because it has a different meaning in qualitative and quantitative arenas. In qualitative research, it has to do with whether a given explanation fits a given description, that is, whether it is credible.\textsuperscript{214}

In consideration of concerns regarding validity and potential bias, I acknowledge my position within the cases as a practitioner and as a researcher, both of which add richness to the data but may limit objectivity. An advantage of case study where the researcher is the primary instrument of data collection is that the researcher can process information immediately, clarify, summarise and check for accuracy with respondents and explore unusual or unanticipated responses.\textsuperscript{215} In this research, all interviewees were sent transcripts and, where requested, digital audio recordings of their interviews to verify the accuracy of reporting. Research activities were recorded in a log to provide an audit trail. The combination of data sources spanning interviews, observation and documents strengthens the validity of my research through triangulation.

**Relationship between theory and practice**

According to Breslin and Buchannan there is confusion and scepticism within the discipline of design regarding the role of theory since successful design is often attributed to the genius or talent of an individual. The role of case studies is to develop theory and practice in close relationship for the benefit of design researchers and practitioners. Designers, by the nature of what they do, must become skilled at moving between the world of theory and the experience of practice. Design case studies have a two-part job of establishing theory and creating a bridge back to the practical.\textsuperscript{216} According to Crouch and Pearce, the focus on experiential knowledge in case study research assists understanding of the social, political and cultural contexts of experience, case study having considerable potential for those working and researching in the field of design.\textsuperscript{217}

In discussing the significance of findings from case studies, Patton states that in place of statistical significance, qualitative findings are judged by their substantive significance. He identifies the following four criteria: 1) coherence and consistency of the evidence in

\begin{flushleft}
\textsuperscript{216} Breslin and Buchanan, 2008, “On the Case Study Method of Research and Teaching in Design.”
\textsuperscript{217} Crouch and Pearce, 2012, *Doing Research in Design*, 141.
\end{flushleft}
support of findings; 2) depth of understanding of the phenomenon provided by the findings; 3) usefulness for the intended purpose; and 4) the extent to which findings are consistent with other knowledge. If findings are consistent with or supportive of other work it has confirmatory significance, whereas a finding that breaks new ground has discovery or innovative significance.

**Case study: summary of benefits**

Proponents of case study identify the following benefits of case study as a research method, Table 5:
Table 5. Benefits of case study as a research method.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contextual - suited to situations where context is significant or impossible to separate from the subject of study.</td>
<td>Yin218</td>
</tr>
<tr>
<td>Particularistic – targets a particular situation or phenomenon. The case is important for what it reveals about the phenomenon and what it might represent.</td>
<td>Yin Merriam219 Bromley220</td>
</tr>
<tr>
<td>Closeness - enables the researcher to get close to the subject, gaining access to subjective factors through a wide range of sources.</td>
<td>Stake221</td>
</tr>
<tr>
<td>Complex - able to capture complex action, perception and interpretation. Includes differences of all kinds and acknowledge that solutions are rarely simple.</td>
<td>Flyvberg221 Merriam</td>
</tr>
<tr>
<td>Applied - Particularly useful for applied fields such as education, examining processes and problems, evaluating programs, informing policy and improving practice.</td>
<td>Merriam</td>
</tr>
<tr>
<td>Insightful – provides perceived causal inferences.</td>
<td>Yin</td>
</tr>
<tr>
<td>Heuristic - increases understanding of the phenomenon by extending experience, bringing new meaning or confirming what is known. Build expertise in a discipline by providing contextualised exemplars, contributing to improving practice.</td>
<td>Stake Flyvberg Merriam</td>
</tr>
<tr>
<td>Open-ended - previously unidentified relationships and variables can emerge, leading to a rethinking of the phenomenon.</td>
<td>Stake221</td>
</tr>
<tr>
<td>Understanding – focus on understanding complex issues in context rather than separating, measuring or comparing variables.</td>
<td>Flyvberg220 Vogt et al.222</td>
</tr>
<tr>
<td>Contribution - knowledge gained is concrete, vivid and sensory, contextual rather than formal and abstract. The product is descriptive, providing complete, literal description of many variables and their interaction over time. Holistic, grounded and exploratory. May be confirmatory or innovative.</td>
<td>Stake Merriam Patton223</td>
</tr>
<tr>
<td>Theory development - particularly useful in fields where research and theory are at their early stages. Insights gained can be construed as tentative hypotheses that help structure future research, helping to develop a field’s knowledge base.</td>
<td>Merriam Erickson224</td>
</tr>
</tbody>
</table>

218 Yin, 2003, *Case Study Research: Design and Methods.*
222 Vogt et al., 2011, “Innovations in Program Evaluation: Comparative Case Studies as an Alterantive to RCTs.”
224 Erickson, 1986, “Qualitative Methods in Research on Teaching.”
Each of the benefits listed in Table 5 supports case study as being well-suited to my research questions and context, specifically that case study focuses on particular situations and events that reveal important information of relevance beyond the specific cases.

**Case study design**

Case study is holistic, examining processes and projects in a lifelike manner. It is descriptive, including many variables and their interaction. It is concrete, vivid and sensory. It is naturalistic and heuristic, providing understanding of experience through a process of interpretive sense-making. Multiple sources of information are examined to develop in-depth understanding, the resulting theory being grounded and exploratory. The research design for the two cases under examination is informed by the aim of the research, being to improve understanding of practice and the recognition that contextual, holistic knowledge of interpretation design is a valuable contribution to this stage of the field’s development. Case study is the only method capable of handling holistic content necessary to capture the complexity of interpretation design practice.

**Case selection**

Purposeful, information-oriented case selection seeks to maximize the usefulness of information provided through small samples and single cases. My perception of the relevance of the cases derives from my professional involvement in them prior to undertaking research. Patton writes in support of purposeful sampling, claiming that by selecting information-rich cases for in-depth study provides insight into issues of central impact to the purpose of the inquiry. Each case is an instance of a nature-based interpretation project with defined timelines, budget and scope of work. My professional involvement in the projects provided me with access to background information and documents, affording unique insight into the underlying intentions, requirements and outcomes in respect of design. It has enabled me to contact key players within the project, where this may not have been otherwise possible. Each case presents multiple perspectives on the design aims, processes and outcomes, providing insight into the role of design in the practice of interpretation.

**Data collection and analysis**

The two case studies draw on multiple methods and data sources. These include:

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225 Flyvbjerg, April 01, 2006, “Five Misunderstandings About Case-Study Research.”

1. Review of background documents: the project brief, master-planning, background papers, text and contextual documents. From analysis of these documents I summarised the relevant issues, intended interpretive messages and content relevant to the design process and the structure of the project team.

2. Interviews with key personnel on the project, these being essential to understanding events that cannot be observed and to gain the perspectives of a range of participants. Interviews are a primary data source for interpretive case study research in enabling researchers to access case participants’ views and interpretations of actions and events.\textsuperscript{227} The case study interviews discussed the way projects were structured, the role and standing of designers within projects and the conceptual approaches they bring to interpretation design. They sought to reveal the dynamics and structures that shape interpretation design projects such as design process management, team composition and roles, limitations of the project and stakeholder expectations and experience. Selection of interview subjects reflects the significance and nature of their role within the project, it being an aim to represent the range of roles and expertise in an interpretation project. Interviewees agreed to their identity being known through the research. All those approached for interview in the case studies agreed to participate. Interviews were digitally recorded, accompanied by hand-written notes.\textsuperscript{228} In the World Heritage Exhibition Centre case, four people were interviewed; in the Te Wao Nui case, six.

3. Review of design process documents: I collated all briefing documents provided to the design team, design documentation prepared and presented by the designers and communication and feedback provided by stakeholders. Meeting minutes, emails and informal written communications were reviewed and collated. Taken as a whole, such project documents are an essential source of data for the case studies and informing their analysis.

4. Site observation and analysis: Some time elapsed between the design of the work and re-visiting the site for observation. This enabled me to observe with relatively fresh eyes and senses. I walked through the site as a visitor might, with the intention of gaining as much from the experience as possible, looking, touching, reading and experiencing the exhibits within the normal time spent by a visitor to the site. Observations were noted.


\textsuperscript{228} Bernard, 2006, \textit{Research Methods in Anthropology: Qualitative and Quantitative Approaches}, 232.
using a voice recorder. This method produced a rich description of the experience as close as possible to a visitor’s viewpoint. The site was revisited with a more critical eye, seeking out evidence of the issues raised in interviews and background documents to analyse the extent to which design outcomes met the requirements of the brief and fulfilled the designer’s intent. A secondary question was to identify views of nature expressed in the finished work. Contributions and feedback were also invited from the client.

5. Presentation of cases: The resulting case studies are richly descriptive, using photographs, diagrams, descriptions and excerpts from interviews and documents to systematically portray a detailed picture of the projects and their key issues.

6. Cross-case analysis and theory building. The two case studies involved different design requirements, producing distinctive outcomes, but provide some salient points of comparison. Analysis draws on the interpretation design knowledge in the literature, site observations, documents and communications and propositions arising from practitioner interviews. Comparisons between the two cases treat variables as context-sensitive rather than context-independent.

Limitations

As an early study in the field, the research establishes broad based foundations for future research. The research aims to substantiate knowledge of practice, the two cases providing evidence of what happens in reality, from the perspective of designers, clients and stakeholders. The research makes no claim to statistical significance, the frequency and extent of the impact of project specific factors on practice not being measured.

The research does not include visitor evaluation of design outcomes. Given the conception of interpretation as aiming to influence visitor understanding, learning and meaning-making over time, visitor evaluation would require longitudinal studies, beyond the scope of this research. Further, visitor studies are limited to the examination of responses to the designed product and cannot explore alternative designs proposed or examination of the design process.

Chapter Two has explained that the research design is based in a constructivist epistemology and takes a qualitative, interpretive sense-making approach to theory building. It has set out the mixed methods of data collection and analysis used in the two case studies. Chapter Two established that the thesis does not seek to present generalised

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theory from the cases for application in the rest of the field, but rather to develop a
deep, richer understanding of the processes, forces and issues at play within each
project. Through their specificities, the two cases raise issues of potential relevance to
other projects and the interpretation design, museum and exhibition industry. The cases
are among the first to be undertaken in the field of interpretation design. As such, they
examine overarching aspects of each project and develop some preliminary explanatory
frameworks as a foundation for further research into the role of design in interpretation
practice.
Chapter 3
The Evolution of Nature Displays

The thesis considers the practice of interpretation design using nature-themed exhibits in public institutions as a focused context for investigation. Changing ideas about nature, especially as influenced by developments in the natural sciences and in perceptions of the role of zoos and museums as social institutions, have had a significant influence on the design of nature displays. Equally, interpretation design contributes to the production of knowledge and ideas about nature through public interaction with zoos and museum exhibits. Chapter Three considers how evolving concepts of nature have influenced the character and practices of zoos and museums, including the comparatively recent development of interpretation design practice. Setting contemporary practice in a historical context demonstrates the increasing use of interpretation design by institutions to create visitor experiences that surpass mere information transfer or entertainment and communicate values, ideas and encourage specific behaviours beyond the exhibit. The cultural and social shaping of nature is an overarching, yet rarely acknowledged influence on nature-themed interpretation projects and the actions of project contributors. Understandings developed in this chapter are integral to the framework of the foundations of interpretation design practice presented in Chapter Four and the case studies in Chapters Five and Six.

Ideas about nature reflect how society views itself. For example, the idea that competition for survival is good for the species and society and that the laws of survival will eliminate the weak reflects a very different vision of society than if nature is seen as compassionate and cooperative. Evernden, 1992, *The Social Creation of Nature*, 27. Nature is a powerful part of the vocabulary of persuasion. Natural science is upheld as showing humans how to behave, as though ethical principles are inherent in nature. Simmons, 1993, *Interpreting Nature: Cultural Constructions of the Environment*, 6. Appeals to nature are widely used to support concepts of goodness, normalcy and health. Evernden argues that, ‘To be associated with nature is to be placed beyond caprice or preference, beyond choice or debate.’ Attributing a connection with nature confers legitimacy on an idea or practice. Nature can be seen as an external absolute providing laws as to what should be. Paradoxically, this view sits alongside a modern western desire to
separate what is human from what is natural. In this view, nature is bestial, lascivious and brutal, a state that humans have struggled to overcome through civilisation. Nature is seen as something to be subjugated rather than preserved. Luther Standing Bear identifies such views as culturally bound, arguing that, ‘Only to the white man was nature a ‘wilderness’ and only to him was it ‘infested’ with ‘wild’ animals and ‘savage’ people. To us it was tame. Earth was bountiful and we were surrounded with the blessings of the Great Mystery.’

For Alberti, museums ‘are not simply channels for the dissemination of elite knowledge, but rather active sites for the construction of ideas about nature.’ He argues that it is not possible to detach representation from knowledge production in the consideration of display practices. Since their origin, museum displays have indicated as much about the collector or institution as the natural history artefacts and subjects on display. This brief history of nature presentation shows that nature concepts are neither singular nor static. It considers dominant views of nature in key periods within western culture, which have helped to shape aspects of contemporary nature displays. The review pays particular attention to natural history museums in the Victorian era and the recent rise of landscape immersion exhibits within zoos for their significant influence on the interpretation of nature in zoos and museums today.

**Menageries: exotic animals as symbols of power**

Collecting and exhibiting wild animals has been practiced around the world for thousands of years. In the fourth century BC, most Greek states had extensive zoos for the education of young scholars, providing the basis for Aristotle’s first zoological encyclopaedia. The royalty of ancient Egypt, Rome and China displayed exotic animals in cages for entertainment and to impress their guests. In the 16th century, Indian mogul emperor Akbar the Great established several zoos in Indian cities, which were seen to confer power and prestige on their owners. Menageries were common among European royalty in the 16th to 18th centuries. Visiting travellers and explorers often brought back unknown species as gifts to royalty in the hope of securing finance for future travels.

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238 Hanson, “Why Zoos? Musings on Their Past, Present and Possible Future...,” 1.
animals were held in cages, often lavishly decorated to match the architecture of the royal mansion. In the early 1700s, the menagerie at Versailles housed animals in individual villas; some cages mimicked the architectural style of the animal’s native country or their decoration related to folklore about the animal. Keepers would sometimes dress in a costume of the animal’s homeland to create a theatrical spectacle for the entertainment of royalty and their guests.

From the late 1600s, live animals were displayed for study purposes at the menagerie of the Jardin des Plantes, Paris, and early zoos opened in Vienna in 1765 and Madrid in 1775. Wild animals were housed in cages, with larger animals displayed in concrete enclosures. In serving as symbols of prestige and objects of entertainment, live animal collections did not require interpretation of the animals’ origin, behaviour or habitat; their value lay in the mystique of being exotic and fearsome.

As Europe expanded its influence and territories in the 17th, 18th and 19th centuries, the collection, preservation and cataloguing of exotic species increased, emphasising the Enlightenment values of rational organisation and the notion of European superiority. Even at this time, however, many visitors did not enjoy the captivity and constraint of animals.

Curiosity cabinets: noblemen collecting God’s handiwork

Histories of museums generally trace their origins to the curiosity cabinets, or Wunderkammer, of Renaissance princes and scholars. Such ‘cabins’ ranged from individual pieces of furniture to rooms containing collections of objects of natural history, artworks, books and artefacts, reflecting a broader fascination with collecting that emerged in the fifteenth century. Macdonald argues that collecting developed as a way of suggesting some degree of control over the natural world. The popularity of curiosity cabinets among noblemen indicates that collecting specimens was an attribute of high social status. Such cabinets were encyclopaedic in intention, aiming to represent the world in microcosm by gathering as many specimens of different species as possible. Shared among nobles as a symbol of power, the curiosity cabinets were not made

240 Ibid.
accessible to the general public who were considered too ignorant to make sense of such collections.\textsuperscript{247}

From the fifteenth to 18th centuries, the period when cabinets of curiosity were most popular, there was no concept of science as we know it today. Curators ordered the contents of cabinets on similitude, resemblance and interpretation of God’s signs, a cabinet’s variety and scale illustrating the omnipotence of God.\textsuperscript{248} These collections often contained fanciful artefacts such as unicorns’ horns and the remains of dragons, even though collections aimed to represent and comprehend nature.\textsuperscript{249} Early modern scientific collections such as the Repository of the Royal Society, established in London in the 1660s, sought to provide a complete visual grammar of nature, an ambitious, unfeasible objective for the time since many collections were formed primarily by donations.\textsuperscript{250}

By the 17th century, natural philosophers were developing new criteria for authentication and validation of scientific findings. Where previously this relied on the gentlemanly status and standing of the ‘scientist’, now laboratory-based methods of observation were founded on ideas of objectivity, visibility, mathematisation and the ambitions of a science of order. This major change enabled any properly trained and equipped person to enter the previously rarefied world of scientific knowledge.\textsuperscript{251}

\textbf{18th century museums: empire and order}

In the 18th century, the systematic classification of the natural world became a fundamental activity of science. As Great Britain continued to expand its empire through colonisation, British naturalists claimed the right to classify plants and animals across its territories.\textsuperscript{252} This taxonomy was acquisitive in nature, Goodall commenting:

\begin{quote}
If the commitment to comprehensiveness, integral to the enterprise of taxonomy, meant going global in the search for specimens, it also meant bringing them home to a single collection, the extent of which was a visible
\end{quote}


and material expression of the owner nation’s knowledge … New specimens appearing in the major natural history museums of Europe were the visible and tangible signs of remote possessions, now installed within a knowledge system that reached throughout the world.253

Well into the 18th century, an appreciation of nature was seen to bring a person closer to God. This spiritual association helped make natural history a common pastime and hundreds of field clubs sprung up throughout Britain. Such clubs provided a seemingly wholesome basis for fraternizing, drinking and roaming the countryside. The British enthusiasm for bird-watching began in this period, as did the movement to protect animals against cruelty. Religion, science and socialising went hand in hand.254

Natural history emerged as a discipline at the end of the 18th century based on the work of naturalists such as Buffon and Linnaeus. With its focus on the classification of objects, natural history was the branch of science most easily presented in museums. During this period, many previously private collections were claimed for the public, with numerous local and national museums being established. Yanni states, ‘Piled high with bones and stuffed animals, natural history museums were the primary places of interaction between natural science and its diverse publics.’255 Opening museums to broader audiences reflected changing conceptions of scientific authority and knowledge in which the museum played an important formative role. In the late 18th and early 19th centuries, pioneering natural history curators John Hunter in London and Georges Cuvier in Paris sought to convey the rationality and orderliness that they believed lay beneath the diversity of life forms, many newly discovered.256

19th century zoos: entertainment for the middle-class

By the 19th century, for scientists captive animals had become subjects for serious biological study. In 1826, Sir Thomas Stanford Raffles established the Zoological Society of London, based on the Jardin des Plantes, Paris. He sought to advance zoological science by forming a collection of living animals, a museum of preserved animals and a library. Soon after the Zoological Gardens opened in Regent’s Park in 1828, however, they were made accessible to the public and quickly became a place of outdoor

255 Ibid., 1–2.
entertainment and leisure more than scientific endeavour. Blending the character of an urban nature park and an amusement park, the Gardens offered concerts, promenades and afternoon teas. Rather than attempting to replicate natural environments, major zoological gardens in Europe and the United States presented animals in predominantly human contexts. Many animal houses had spectacular architecture, sometimes resembling churches or mosques, such as Berlin’s huge elephant house that imitated a Hindu temple. Smaller animals such as birds and monkeys were housed in delicately wrought cages. A zoo’s status was measured by the number of species in its collection and enclosure design exalted the achievements of civilized man rather than offering opportunities for interpretation of the animals.  

Victorian museums: the emergence of science

With no attempt at any educational message in exhibition design, the animals were often misinterpreted and misunderstood. In the Victorian era, exotic animals were considered so entertaining that displays of wild animals were even brought into English department stores for shoppers’ enjoyment.

Victorian museums: the emergence of science

The fascination with collecting natural specimens continued into the 19th century, although with a changing purpose. Invigorated by new ideas about science and taxonomy, 19th-century naturalists aimed to distinguish themselves from the idiosyncratic, private collectors of the previous centuries by bringing order to their collections. Using observation as the primary scientific method, Victorian collectors aimed to identify and classify specimens to give meaning to their collections of butterflies, marine animals, ferns and rocks, recording observations in accompanying notebooks. This shift, from displays of curiosities to displays of typical or representative objects occurred slowly from the 17th to 19th centuries.

The opposition of science and theology, often taken for granted in the 20th century, is a social and intellectual construction, not a fact of history. During the 19th century, nature specimens were still largely considered to demonstrate the work of God, as natural theology continued to dominate scientific thought in Britain, especially at Oxford and Cambridge Universities. When Richard Owen became Superintendent of Natural History at the British Museum in 1856, he saw the purpose of a natural history museum as showing the greatness of God in the variety of nature. He divided the collection into God-

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258 Ibid., 20.

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made and man-made objects. British naturalists’ work of classifying the world’s plants and animals continued apace, seeing them name over 1000 new genera of each during the last decades of the 19th century. Specimens were displayed in museums according to ever expanding and changing categories and sub-categories as taxonomic classification systems were revised.260

Amid optimism about the powers and achievements of scientific inquiry, museums came to be conceived as symbols of national identity and progress. In publicly funded museums, nature became a medium through which to represent the state. Located at the centre of the British Empire, London’s museums were material evidence of the empire’s breadth, wealth and knowledge. Exhibiting moved beyond the confines of museums with the flourishing of international exhibitions, the first of which was the Great International Exposition held at Crystal Palace, London, 1851. More specialised public museums emerged during this period, including those focused on natural history. Britain’s Museum of Natural History emerged out of the British Museum collections and the Museum of the History of Science in Oxford emerged from the Ashmolean collection.261

By the early decades of the 20th century, most developed nation-states had national museums of natural history, science and technology, art and other subjects. The flourishing of museums was entwined with new ways of seeing the modern world. Concepts of nature were in flux in the Victorian era, when Charles Darwin’s theory of evolution brought a transformation in the understanding of the span of history and the pace of natural change. Museums presented this new reality as ordered, organised and essentially knowable, natural history knowledge being presented through discrete specimens, each preserved, categorized and fixed in orderly display cases. Victorian science was based on observation rather than experiment, continuing to prioritise sight over the other senses as a means to understanding reality. This representation of the world as visible and ordered was part of a wider sense of scientific and political certainty. Museums and exhibitions served not just as reflections of this sense of order and objective truth, but also contributed to its production. 262

The 19th century museum had to communicate to the general public rather than just an educated few. With a mass audience came new needs for interpretation of objects, exhibitions being augmented with catalogues, guidebooks, plans and educational talks. Such exhibitions were conceptualised not just as containers of facts, but as integral to the scientific message. Museums were expected to compensate for the inherent deficiencies of working-class people, who had previously been excluded from the world of culture and knowledge. To become effective instruments of public education, museums used rational spatial layout, clear classification and descriptive labelling to convey scientific concepts such as evolution or chemical principles. Most museums displayed their entire collection, in contrast to the current practice of keeping a large portion of the collection in storage. Specimens were arranged to illustrate a point and each display sought to teach visitors a lesson. This didactic approach, now fundamental to museological practice, took hold in the 1890s. Nature became a vehicle for those who wished to put forward biases or particular visions of society. The new role for museums in public education was bound up with ideas about public transformation and producing model citizens who would take on the task of self-education. Such ideas of education, self-improvement and transformation through the museum experience persist in interpretation theory today.

No singular vision of nature dominated the Victorian period, with politicians, naturalists and architects in Britain, for example, debating how best to present natural science within museums. The question of the need for labels was repeatedly debated at the annual conferences of the Museums Association in Britain. In 1898, Sir William Henry Flowers, Director of the British Museum, advocated for labels and pristine clarity in museum displays. Similar arguments were found in the US, where both George Brown Goode in Washington and Baron Osten Sacken in New York promoted an ordered and well-planned display of specimens with appropriate instructive labels.

The reconception of the museum as an institution of public education was not just a matter of producing labels. This new role changed the status of the museum object and demanded new skills in exhibition design, curatorship and interpretation. By the late 19th century, science had shifted from a vocation practiced by wealthy men to a paid profession conducted in universities and state funded institutions. The new secular scientists initiated ideas of nature and its representation that still hold today. Many issues


in contemporary museum debate and practice were present in the 19th century; questions of whether museums were primarily for entertainment or education and whether to employ theatrical illusion in displays or keep to traditional specimens in jars of formaldehyde.265

**20th century zoos: illusions of freedom**

The 20th century saw a dramatic change in the presentation of animal species in zoos, with concrete enclosures and wire cages being progressively replaced by landscaped environments. Pioneering this approach was Carl Hagenbeck. Working with architect Urs Eggenschwiller, Hagenbeck created a new kind of zoo in Stellingen, Germany. Opening in 1907, the Animal Park was the first zoo to use immersion exhibits on a large scale, doing away with the conventional barriers between visitors and animals. Iron bars, mesh and concrete walls were replaced with moats, theatrical design techniques creating an illusion of freedom and openness while separating animals from visitors and other species. Plants, rocks and logs were used as stage props to create long panoramas, with mixed species housed in a seemingly natural habitat. The former animal houses became the off-display holding areas, camouflaged to contribute to the illusion of wildness and visitors’ deception; the structure of the zoo disappeared.266

At Hagenbeck’s Animal Park, visitors could observe exotic animals and even foreign peoples in simulated native habitats such as the African jungle, Russian steppes, American plains and the Arctic, without leaving the comfort of their urban environment. This utopian illusion of freedom for the animals was so popular that Hagenbeck later designed zoos across Europe and the United States and his designs were emulated internationally. Hagenbeck was the first to arrange animals in groups according to their continent of origin. These exhibits, however, made no attempt to replicate the actual natural habitat of the species, merely the continent in general, with animal groupings often not consistent with what would be found in the wild.267

Rothfels argues that the shift from the presentation of animals in human contexts to apparently natural environments changed the underlying narrative of the zoo from a captive collection to a utopian place of freedom and peace among the animals. The animals were not only uncaged, they were apparently safe, happy and long-lived. Promotion of the Animal Park shifted from the original concept of a re-creation of Eden

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to what would become the dominant metaphor for zoos in the 20th century: the Ark. Hagenbeck’s park became a sanctuary from a violent, brutal natural world and the evolutionary fight for survival. The metaphor of the Ark earned the Animal Park and other zoos to follow a resonant justification for their continued existence in the face of their critics. A narrative of the benevolent zoo was made possible by idyllic visions of animals in natural environments.268

Hagenbeck’s design approach was the birth of landscape immersion enclosure design, which continued to develop throughout the 20th century and remains the dominant design approach to animal enclosures.269 According to Maple and Mallavarapu, ‘By the end of the century, landscape immersion techniques had transformed the better zoos and aquariums into complex, naturalistic simulations of nature, providing spacious, functional, imaginative and appropriate living conditions for even the most challenging species.’270 Polakowski argues that the development of landscape immersion exhibits aimed to improve the recreational experience of the zoo visitor and to communicate some message about the animal and habitat in which it evolved. The role of zoos had extended beyond public entertainment, to include conservation and public education. From the 1960s, zoos began to change their focus from recreation to conservation, increasingly participating in the challenge of ensuring the survival of a growing list of endangered species. No longer was the number of species the primary measure for a zoo’s world standing. It was now based on its research, conservation programs, quality of exhibits and educational offerings.271

20th century museums: theatrical illusion for public education
The 20th century brought a change in scientific enquiry, from a focus on form and classification to the study of animal behaviour. Around the turn of the century, the biological sciences expanded and diversified, with experimental science in laboratories assuming greater authority. As a result, the significance of museums as sites of scientific endeavour faded, leading to a degree of separation of the education and research roles within museums and seeing many research activities move off site. Public education and entertainment assumed a more prominent role, consolidating the importance of museums as a public resource. This shift implied a greater responsibility on the part of museums to

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269 Ibid.
meet the needs and interests of the public visitor, to attract them in greater numbers and hold their interest.272

To attract and engage visitors, theatrical elements were brought into specimen displays. Taxidermy, used for preservation of hunting trophies in the 18th century, was now applied in the museum dioramas of the late 19th and early 20th centuries. At the very end of the 19th century, William Hornaday, chief taxidermist at the National Museum of Natural History in Washington DC, championed staged groupings of animals in front of painted backdrops. Between 1900 and 1935, full scale dioramas became the most prominent form of display in natural history museums. Bridging art and science, these dioramas employed precise perspective, detailed illusion and skilled taxidermy to create three-dimensional still-life scenes of nature. Often featuring fierce animals in action poses or predator and prey in battle, dioramas were carefully designed to provide a hyper-realistic vision of nature not otherwise so closely observable for the majority of people.273

The introduction of dioramas brought a new sense of aliveness to museum displays. Habitat dioramas sought to immerse the visitor, being employed to create a sense of space and distance. Paradoxically, this scene of aliveness is predicated on killing, taxidermy requiring an animal’s death, complete dismemberment and rearticulation of the remains. Commonly, the majority of the animal is disposed of, with only skin, feathers and other durable external features being retained. Soft tissue such as eyes, nostrils and tongue can be glass, wax, or plastic, but the skin is real to provide a sense of authenticity. The demonstration of the taxidermist’s skill is in rendering their handiwork invisible, with the ultimate aim of making the diorama appear credible, impartial and natural.274

Taxidermy has been extensively researched and analysed, its fascination lying in two paradoxes: the illusion of aliveness created by the products of death and the use of the diorama in the service of conservation messages, while many specimens originate from a culture of trophy hunting and killing as sport. The vision of nature created by many such


specimens is directly relevant to the historical roots of hunting and taxidermy. The hunt was seen as a demonstration of manliness, skill and sportsmanship, with the killing of larger and more intelligent animals being more greatly admired and ranking higher in accomplishment. Generally, hunters sought out the largest, dominant, most perfect adult male as the ideal example to represent the essential concept of ‘the gorilla’, or ‘the elephant’.275 One of the most famous hunters and taxidermists was Carl Akeley, who specialised in African animals. The American Museum of Natural History in New York contracted Akeley to provide taxidermied specimens of large mammals for the African Hall exhibit. Haraway describes the group of gorillas on display:

The animal is frozen in a moment of supreme life, and man is transfixed. No merely living organism could accomplish this act ... The animals ... have transcended mortal life, and hold their pose forever, with muscles tensed, noses aquiver, veins in the face and delicate ankles and folds in the supple skin all prominent. No visitor to a merely physical Africa could see these animals. This is a spiritual vision made possible only by their death and literal re-presentation.276

Wonders claims that dioramas became popular in Sweden and the United States because wildness still existed in the extreme north of Scandinavia and Alaska and national identity was symbolically connected to frontier locales. Dioramas chosen to represent America in United States museums were often dramatic landscapes that provided a stage for large and dangerous animals, which conveyed a nationalist sense of ‘manifest destiny’.277

Ash argues that dioramas were intended to promote an ethic for the preservation of the species and their habitats in the wild, claiming that dioramas represent a natural reality and encourage a personal experience with nature.278 Detailed observation of complex arrangements of objects in realistic dioramas demands specialized skills. Visitors watch, point, seek more information and ask questions. Ash compares such detailed observation to the way a naturalist observes an ecosystem, claiming that through observation, visitors may link their own experiences with the artefacts in the dioramas and even personalize concepts such as habitat and species conservation. This is a strong claim for a static display of stuffed animals in an illustrated environment, many of which were not designed with such a clear educative intent. Poliquin argues to the contrary that:

276 Ibid., 166.
277 Wonders, 1993, “Habitat Dioramas: Illusions of Wilderness in Museums of Natural History.”
Unlike models and artworks which refer to nature, the thingness of taxidermy resides in the recognition that this animal-object was once a sentient creature … at once lifelike yet dead, both a human-made *representation* of a species and a *presentation* of a particular animal’s skin … This uncanny animalthingness of taxidermy has the power to provoke, to edify, and even to undermine the validity its own existence.\textsuperscript{279}

In the mid-20th century, animatronics took over from taxidermy, harnessing technological innovation but retaining the interest in theatrical illusion. Drawing on the fictions of aliveness that underpin taxidermy, constant improvements in robotics produced animatronic displays seeking to replicate the fluidity of animal movement. Unconstrained by the need to employ any part of a real animal, animatronics sought to bring to life animals from prehistoric times, giving an increasing, although superficial, semblance of naturalness.\textsuperscript{280}

Developments in science and technology in the 1960s, including the discovery of the structure of DNA and space travel photography, shaped a generation’s concept of nature. Science was deciphering great mysteries and rendering them knowable. Nature came to be recognised as a complex, vulnerable system of forces and balances which humans had the capacity to influence. This kind of nature could not be apprehended by observing a series of labelled specimens, requiring more complex forms of storytelling. Science museums shifted from simply presenting scientific principles through a library of objects to mediating and interpreting scientific concepts for the public. Exhibits using storylines to convey an educational message through media other than object labels emerged. To make science more accessible and interesting, science was interpreted through themes such as ‘shopping’ or ‘your body’.\textsuperscript{281} Multi-sensory media and participatory or interactive exhibits such as those at the Exploratorium in San Francisco were developed to inspire visitor interest and engagement. Some museums developed relationships with schools, offering tours for students and classes for teachers. By the latter half of the 20th century, interpretation was provided as an adjunct to the object on display and even as a central organising principle, a driver of design and arrangement.\textsuperscript{282}

\textsuperscript{280} Desmond, 2002, “Displaying Death, Animating Life: Changing Fictions of ‘liveness’ from Taxidermy to Animatronics.”
21st century zoos: bettering nature

The nature immersion exhibits created in the early 1900s continue to dominate zoos around the world.\(^{283}\) Ongoing development of this technique has seen nature further augmented and idealised to enhance the visitor experience. Designers use soundscapes, lighting, landscaping, running water, mist and other simulated nature effects to increase the realism of the nature experience. To simulate wild environments vegetation is often densely planted so that visitors may only catch a glimpse of the animals on display. Animals have enrichment activities to stave off boredom and retreat areas to escape the public gaze. Some zoos even make the veterinary clinic visible to the public so visitors can see how well the animals are cared for. Zoo animals are portrayed as better off than in the wild, with longer, healthier lives free of conflict and predation.\(^{284}\) However, Robinson argues that, ‘Naturalistic exhibits might only be naturalistic to an upright primate of our height with good colour vision… If I were a dog, I would be much more interested in the smells than whether there were leaves on the trees for instance.’\(^{285}\) Zoos perpetuate the peaceful kingdom myth through mixed species exhibits and group exhibits, but in fact species and sex mixes are carefully managed to ensure there is no conflict. Nature is thus reconfigured and redesigned for human appreciation.

Compressed into small spaces, the improved nature of the zoo makes real nature seem dull by comparison.\(^{286}\) Discussing the Congo exhibit at the Bronx Zoo, Rothfels comments, ‘But this isn’t “the wild,” and it isn’t even a replica of “the wild.” It’s a fantasy of “the wild” … Unlike the actual Congo, where one can walk for days without seeing anything larger than an insect, in the new, better world of the immersion “Congo” life teems.’\(^{287}\) Naturalistic exhibits are used to counter public concerns about animal welfare and justify the value of zoos. Zoos argue that animal displays of “natural” habitats with real trees and plants communicate the concept of a pure nature worthy of preservation.\(^{288}\)


\(^{286}\) Rothfels, 2002, “Immersed With Animals.”

\(^{287}\) Ibid., 220.

The international zoo community has gradually progressively adopted conservation education as its mantra. Promoting themselves as important centres for conservation, zoos offer conservation activities as a form of worthy entertainment. For McGill, this ‘evolution of zoos away from living natural history cabinets towards a meaningful role in conservation implies a shift in dominant theme, from that of casual recreation to that of purposeful education.’ Interpretation is used to support this rebranding of zoos by interpreting the institution’s conservation activities and promoting their high levels of animal care. The new focus on conservation education has driven interest in innovative interpretation design in zoos, many borrowing exhibit design techniques from museums to sustain visitor attention and increase their learning opportunities.

The purpose and value of zoos in regard to their contribution to public conceptions of nature and promotion of conservation attitudes are highly contested. Debate continues over whether zoos provide valuable nature experiences for visitors or whether they support cultural stereotypes about nature. Hanson describes zoos as a symbolic comparison of our attitudes to and relationship with nature, suggesting that the keeping of animals in zoos may represent ‘the cultural dominion of humans over a savage, irrational, and destructive natural force.’ Acampora claims that ‘zoos are pornographic in that they make the nature of their subjects disappear precisely by overexposing them’, resulting in a dominance narrative that is counterproductive to valuing animals. He suggests that zoos in their current form be phased out in favour of richer and less oppressive modes of encountering other forms of life. Hanson, however, raises the dilemma for zoos as they seek to remake themselves as parks for family recreation, as institutions for learning and research and as bioparks for understanding integrated ecologies, asking how humans can express curiosity and reverence towards nature without appearing to dominate or destroy it. McGill claims that zoos play an important role in helping visitors sustain a relationship with animals and the natural world when, globally, human populations are becoming increasingly urbanised.

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294 Hanson, “Why Zoos? Musings on Their Past, Present and Possible Future....”
zoos’ potential for changing public attitudes to conservation by providing a glimpse, although somewhat distorted, of nature’s wonder, beauty and mystery.296 Fraser and Wharton argue for an activist role for zoos, proposing a role in restoration of species to the wild and in assisting visitors to explore the relationship and responsibility people have to other sentient animals, thereby ‘crafting a new vision for how society can live in a productive relationship with the world’s remaining biodiversity.’297 These debates are important in the context of interpretation design, having direct impact on interpretive themes, promotional aims of institutions and public reception of interpretive messages.

Questions regarding the degree of wildness and tameness of captive zoo animals are relevant to public perceptions of nature within zoo environments. Zoos are no longer the primary source of images of wild animals as people have easy access to film and video that provides increasingly detailed and intimate footage of wild animal behaviour. Yet the popularity of zoos indicates that people continue to seek out direct connections with non-domesticated animals. Landscape immersion exhibits support this sense of connection with animals by limiting visible barriers. In a study of how zoo environments influence human perceptions of animals, Finlay, James and Maple found that animals in traditional zoo environments were seen as ‘restricted, tame, and passive’, whereas wild animals were characterized as ‘free, wild, and active’.298 Animals in a naturalistic zoo setting were rated more similar to wild animals when no confinement barrier was visible, illustrating that visitors accept the illusion of wildness even when in a zoo setting. Hanson argues that zoo animals should not be confused with wild animals as most have been bred in captivity rather than captured from the wild.299 However, it is in the zoo’s interest to promote such visions of ‘wildness’ to attract visitors. The potential exists for zoos to use visitors’ fascination with animals to help visitors gain a better understanding of the dynamic systems of nature that created these animals and offer the visceral connection that comes from witnessing the spontaneous movement or meeting the eye of another living creature. Visitors want to see animals displaying wild behaviour yet they know animals are neither wild nor tame but a special kind of zoo nature.300 Madsen describes this tension, ‘We see

298 Finlay, James, and Maple, 1988, “People’s Perceptions of Animals: The Influence of Zoo Environment.”
299 Hanson, “Why Zoos? Musings on Their Past, Present and Possible Future....”
the animals in the flesh, partially fulfilling our desire to experience nature, and yet they are captive, no longer wild.\textsuperscript{301}

The literature identifies four generations of zoo enclosure design.\textsuperscript{302} First generation exhibits were barred cages in which animals had restricted freedom of movement. Second generation exhibits consisted of larger cement enclosures surrounded by moats. Third generation enclosures provided natural surroundings for animals, sometimes including species from their natural habitat. In fourth generation exhibits, the animals and visitors share the same landscape, designed to represent the animals’ natural environment.\textsuperscript{303} The evolution of landscape immersion exhibits has blurred the boundaries between visitors and animals. The visitor is transported to another place, one where they are surrounded by nature. Hanson describes this as ‘nature taking over’.\textsuperscript{304} Based on extensive site observations of zoos I propose a fifth generation of exhibit, cultural immersion, building on Polakowski’s concept of ‘cultural infusion’ exhibits.\textsuperscript{305} In this type of exhibit, the visitor is situated in an immersive cultural environment that creates a context from which to view the animals. Such environments may include theatrical settings such as a traditional village, ecotourism venture or wildlife research camp and may be primarily decorative and scene-setting, or highly interpretive, communicating ideas and information to visitors within a contextualised setting. Animals may be in a naturalistic landscape similar to third and fourth generation exhibits though in many cases cultural elements extend into the animal enclosure. This has a historical precedent in the menagerie at Versailles in the 1700s, where animal cages were decorated with designs from the animal’s country of origin, however contemporary designers would argue that the current approach is significantly more sophisticated and authentic, Figure 6.

\textsuperscript{301} Madsen, 1999, “The Call of the Wild,” 39.
\textsuperscript{304} Hanson, 2011, “Interview by Toni Roberts.”
\textsuperscript{305} Polakowski, 1987, Zoo Design: The Reality of Wild Illusions.
Institutions use such cultural contexts to integrate visitor amenities and structures such as shelters, viewing areas, walkways, railings, bridges and play equipment. They help to present interpretive media into a semi-realistic context and to highlight specific problems in places where humans and animals compete for natural resources. According to Hanson, immersive environments emerged as an interpretive technique in the 1970s, but the creation of a cultural context and use of human artefacts has only become widespread since the 1990s. Proponents of this interpretive strategy believe that a cultural aspect can make visitors more receptive to information about animals. The combination of

306 Hanson, 2011, “Interview by Toni Roberts.”
307 Wilcken, 2011, “Interview by Toni Roberts.”
immersive cultural and natural environments can inform about the interface between species in their native habitats and human civilisation and related conservation, protection, political and economic issues.

Drawbacks to this approach include a tendency to make cultural generalisations and to conflate cultures creating false realities, such as presenting Africa and Asia as singular cultures. The design intent is to make these cultures seem alive, but they often appear as ghost towns, being generally unstaffed. They risk sharing the superficiality and falseness of theme parks as a form of faux tourism, as though a culture can be replicated without the people that created it. In focusing on human objects, such environments may not transport visitors to the natural world. Elements related to cultural context may provide interest for visitors, but may also distract them from animal observation, placing visitors at a greater distance from nature. Human culture may overshadow the animal’s importance or inspire anthropomorphic visions of an animal’s identity. Such exhibits often present nature as threatened, weak and in need of rescue, nature being a site of conflict and crisis due to human activity.308

21st century museums: old specimens tell new stories
As with zoos, museums have embraced the conservation mission, although taking a more restrained approach. Museums have moved from static taxonomic displays to interpreting collections through entertaining, informative exhibitions with an environmental message. Producing interpretation that aims to change public perceptions and behaviour has effectively re-shaped museum nature. Yanni argues that the new focus on endangered nature might also save the endangered natural history museum, as it seeks to remedy dwindling visitation.309

The conservationist message that nature is under threat is implicitly founded on a contemporary definition of nature to the exclusion of human culture and activity and the perception of its fragility. This narrative of nature under threat is evidenced by the reinterpretation of taxidermied displays in many natural history museums as being associated with historical practices of domination and destruction of nature.310 Once a suitable recreation for young ladies, taxidermy is now largely out of favour within museums. Many museums with 19th century roots have had their collections branded as

imperialistic archives, their taxidermied specimens being dumped or burnt.\footnote{Poliquin, 2008, “The Matter and Meaning of Museum Taxidermy.”} New methods of displaying old specimens attempt to re-work the problematic relationship between contemporary concerns with conservation and historic practices of collection and taxidermy.\footnote{Museums Association, 2000, “Ethics Q and A.”} Deeper narratives and thematic displays have replaced ordered, taxonomic arrangements. For example, the dioramas at the Field Museum in Chicago have been reinterpreted through signage that describes the killing, skinning and mounting of specimens and the inherently constructed view afforded by such displays.\footnote{Poliquin, 2008, “The Matter and Meaning of Museum Taxidermy,” 126.} Rather than attempting to present an illusion of realism, such interpretation recognises that contemporary audiences, exposed to video footage of living, fighting, mating animals, displaying natural behaviours in natural habitats, require a new narrative. Kean argues, however, that while it has become a lost art, the diorama ‘has maintained its grip on the public imagination, coming to represent an imprecise and nostalgic longing for the ‘old museum’.\footnote{Kean, 2012, “The Day the Diorama Died,” 2.} In the Melbourne Museum, taxidermied collections and dioramas are used to interpret museum practices of collecting, preparing and storing specimens. Dilapidated specimens illustrate the damage insects can cause and the inevitable degradation of natural specimens over time, Figure 7. In these contexts, the objects cease to act as natural specimens and become historic artefacts of human creation.

Figure 7. Moth Eats Kangaroo!, Melbourne Museum. Photograph by Toni Roberts, 2011.
Another approach to reinterpreting animal specimens is the postmodern, ‘reflexive showcase’, as I have called it. This is a mass display of taxidermied specimens, as seen at the Grand Galerie de L’Evolution at the Jardin des Plantes in Paris and Melbourne Museum’s ‘Wild’, Figure 8.

![Mass display of taxidermied specimens](image)

Figure 8. Wild, Melbourne Museum. Photograph by Melbourne Museum, 2011.

Criticised by some as a type of storage on display, this arrangement of stuffed animals presents a contemporary narrative of, in one case, evolution, and in the other, dwindling biodiversity. Poliquin argues that ‘the sheer magnetism of the animals impels viewers to look at nature and implicitly encourages them to appreciate the creatures on display and simultaneously to recognize the problematic of looking at them within a museum context.’315 This postmodern approach references the museum’s imperfect history of collecting, preserving and displaying animals in glass cases and dioramas, yet its meaning is unclear. Freed from encased isolation, the mass display of diverse objects is open to many interpretations, relying heavily on interpretive media to communicate the exhibit’s intent.

A hallmark of the 21st century museum is its interaction with the public through public programs, social media and interactive displays. The public is no longer seen as a mass audience of the uninformed, but rather as individuals with diverse needs, interests and abilities. Visitor motivations and pre-existing knowledge are recognised and valued by

museums, with exhibits designed so that each visitor can make choices and shape their own experience. One of the most notable responses to visitor needs is the exponential increase in interactive displays: mechanical, digital, auditory, sensory and kinetic. These aim to hold visitor interest and add another dimension to the museum experience.

21st century hybrids
The distinction between museum displays as inert material objects and the living, natural exhibits of zoos is fading, with many museums integrating displays of insects, plants and other living organisms. This integrated approach is more fully demonstrated in recent hybrid institutions. Combining elements of the zoo, museum and botanic garden and employing interpretive techniques from theatre, nature guiding, art and science museums, such institutions are re-shaping the territory of nature interpretation. Four notable examples are the EcoTarium, the Eden Project, the Sonora Desert Museum and the Ark of the World Museum. The EcoTarium in Worcester explores local and global environments. Combining characteristics of a museum, nature sanctuary, planetarium, wildlife center, and educational institution, it enables visitors to explore the natural environment from many perspectives. The Eden Project in Cornwall aims to communicate and educate about the political and economic aspects of human relations with the land, agriculture and the wild environment. Eden strives to connect people with the natural world through theatrical performance, art, public lectures, demonstrations and landscape immersion. The Arizona Sonora Desert Museum in Tucson uses living and non-living exhibits together with outdoor education techniques to communicate biological, ecological and conservation stories of the Great Sonora Desert. The Ark of the World Museum in Costa Rica mixes natural history museum, eco-tourism visitor centre and contemporary art museum, representing the ecological diversity and cultural heritage of Costa Rica, its architecture inspired by local plants and animals. Hancocks argues in support of such hybrid organisations, ‘Each type of public institution, such as botanic gardens, aquariums, marine parks, zoos and specialist natural history museums each

317 Simkin, 2011, “Interview by Toni Roberts.”
deal(s) with separate parts of nature. I believe we need a new type of institution: one that reveals a holistic and integrated story of nature, not just isolated chapters.\textsuperscript{320}

For Hancocks, zoos are ideally placed to take on this new role, arguing that, with a new focus and wider skill base, zoos could introduce greater awareness and comprehension of nature and reveal its complex interdependencies and interconnected systems.\textsuperscript{321} The hybrid organisation, combining zoo, museum and theme park may have greater resonance with contemporary audiences than the compartmentalised institutions that define categories of knowledge such as natural history, technology and zoology. There is some resistance to these hybrids from within the museum community, which sees such organisations as compromising the cultural significance of museums and their collections, but some also recognise the benefits of aspects of the experiences offered by such institutions, in particular their power to attract high visitor numbers.\textsuperscript{322}

Each era aims to demonstrate its advancement in knowledge and understanding through the way natural objects are organised, displayed and interpreted to the general public. The same objects can serve a new purpose through re-interpretation, from which new audiences will make their own, new meanings. As zoos and museums have become more concerned with educating audiences, they have adopted presentation methods that aim to facilitate visitor interest, learning and reflect prevailing views on nature. Concurrently, where visitors were once awestruck by exotic and unfamiliar specimens, they are now likely to be well informed through nature documentaries and other information sources, raising expectations for the quality of experience and depth of information provided through displays and their interpretation.

**Contemporary constructions of nature and the conservation agenda**

This historical overview of nature presentation demonstrates that concepts of nature are subject to frequent change. Designers and curators communicate to the visitor ideas about nature and people’s place in it through the creation of interpretive environments, helping to construct as well as reflect current conceptions of nature. It is not possible to separate knowledge production and representation, museums actively contributing to social constructions of nature. Messages about human relationships with nature are communicated through methods of animal display, including the perspective from which

\textsuperscript{321} Ibid., 24.
\textsuperscript{322} Bergdoll, 2007, Nature Design: From Inspiration to Innovation.
the visitor views the animals and types of enclosures. This relationship extends to the role of interpretation design in shaping visitor perspectives and experiences. Nature interpretation has a broad aim of engaging the public in concern for nature; articulation of various cultural constructions of nature is thus fundamental to the development of design strategy in interpretation design practice. A deep examination of such perspectives is beyond the scope of this research, but the following examples indicate the breadth of ideas relevant to interpretation.

Human relationships with nature continue to be debated across disciplines, differences in perspectives being highlighted in the current focus on conservation and sustainability. Berger claims that the separation of human culture from animals and nature has had a profound influence on ideas about nature. Prior to the 19th century, animals and humans lived in close proximity, animals being simultaneously considered magical, sacrificial, tameable and edible, with no apparent conflict between these roles. Berger argues that, ‘They were subjected and worshipped, bred and sacrificed.’ Contemporary society excludes animals from daily life, except as pets or food, but never both. Wild animals are foreign, exotic and a spectacle to be viewed in safely constructed tourism settings. Visiting captive animals has become the main context for observing and interacting with wildlife. Together with this marginalisation of animals, nature has become idealised, both in an environmental sense and as an element of human nature. Haraway argues that the idea that humans are separate from nature is culturally derived, stating, ‘There is no border where evolution ends and history begins, where genes stop and environment takes up, where culture rules and nature submits, or vice versa.’ Driven both by conservation and cultural concerns, Haraway contends that the human relationship to nature must be re-thought, proposing that attitudes of reification, possession, appropriation and nostalgia are insufficient.

The theory of biophilia proposes a genetic basis for the human predilection towards the natural world; driven by evolutionary forces, humans have an inherent desire for

connection with nature and seek out opportunities to commune with it. The biophilia hypothesis sees nature as a necessary element of human life, but one that has been separated through culture, leaving a sense of loss that people seek to remedy. Rabb suggests that people seek out nature experiences and contact with animals, yet they often find it difficult to articulate why they do so. Rabb’s research shows that visitors state a number of reasons for visiting zoos, including seeing and learning about animals, spending time with family and relaxing. He argues, however, that these purported reasons may obscure deeper, unstated reasons based on biophilic connections. The interdisciplinary field of conservation psychology seeks greater understanding of such motivations and connections between people and the natural world. Research in this field may provide a more accurate vocabulary for human-nature relationships with value for nature interpretation.

Research by Schultz et al. into people’s attitudes about environmental issues examines the extent to which a person’s implicit belief that they are part of nature affects their explicit concerns with environmental issues. The research finds that those with an implicit association with nature demonstrated greater explicit biospheric concerns over egoistic concerns. This suggests that interpretation with conservationist aims should have as a central principle the promotion of visitor connection with and inclusion in nature.

An extended examination of constructions of nature and the environment by Simmons presents various attempts at defining nature, from the dualist view that nature is all that which is not human, to the view that the environment exists only in the human mind. Simmons contrasts reductionist constructions that examine the constituent parts of the environment to understand the whole, to holistic approaches that consider nature to be an indivisible entity comprised of complex, balanced inter-relating systems such as described by Lovelock’s Gaia hypothesis. Drawing attention to the diversity of perspectives offered by different disciplines, Simmons outlines scientific, political, economic, eco-feminist, humanist and post-structuralist perspectives together with constructions of nature presented through artistic endeavour. He does not prescribe one model above another, but argues for an interpretation of nature that accommodates a

range of perspectives, proposing that humans are both created by and help to create nature.\footnote{Simmons, 1993, Interpreting Nature: Cultural Constructions of the Environment; Lovelock, 1979, Gaia: A New Look at Life on Earth.}

The diversity of contemporary perspectives on nature as relevant to interpretation can be summarised as:

- Indigenous: home, immediate source of all things, connected, inseparable, spiritual
- Scientific: objective, ordered, provable, known
- Colonial: to be controlled, tamed, owned, source of resources to be used, property
- Romantic: ideal, naive, sanctuary, utopian, untouched
- Conservationist: fragile, emotional, political, complex, at risk from humans
- Holistic: robust, driving force of which we are a part, sustainable, humans as animals
- Systemic: based on systems and inter-relationships
- Aesthetic: beauty inspires artistic endeavour, calming, regenerative

Interpretation employs a mix of these perspectives, for example, by presenting indigenous perspectives in a romantic or conservationist manner, or by presenting conservationist messages through scientific, systemic or holistic approaches. Presentation of scientific content may imply that it is objective and factual, when in fact much scientific knowledge is theory that undergoes continual revision. Further, scientific theory and its interpretation are underpinned by social values, frequently incorporating anthropomorphic attitudes. For
example, portraying evolution as inherently progressive and striving for improvement corresponds with a broad social value of progress. Imbuing evolution with such a character may create a compelling story, but it is no more scientifically accurate or factual than a presentation of evolution as the effect of random acts of chance.  

Similarly, an emphasis on the struggle for survival in the wild promotes social values of competition over cooperation, when scientists argue that mutual aid and symbiosis are equally potent forces in nature systems. A predominant focus on individual animals and nuclear family units reflects human values and interests. A more comprehensive, holistic perspective that examines natural systems and colonies, recognising the variety and mutability of roles within cooperative groups, would paint a very different picture of nature and science. Thus, each perspective on nature exists not in isolation, but in combination and co-relation.

Analysis of such approaches is important in meeting visitor needs as, for example, a conservationist perspective of crisis and catastrophe may be at odds with visitors’ primary aims of relaxation and entertainment. Analysis is important in relation to the construction of knowledge and promotion of values through interpretation, a lack of awareness of underlying attitudes potentially leading to interpretation that promotes inappropriate or regressive ideas about the subject. For example, Woodward highlights the predominance of colonialist attitude to nature in wilderness interpretation in the Australian context, arguing:

The separation between nature and culture has origins in European settler assumptions of place and ignores the fact that Australia’s cultural landscape has been managed and modified, for many thousands of years by indigenous people. The concept of nature is a cultural construct that depends on the presence of its opposition – culture. These distinctions are problematic and prevalent in communication, language and ideas about place.

Shani and Pizam argue that animal-based exhibits are geared towards appealing to visitors’ values. Displays may feature more than one value although typically one is

dominant, the naturalistic value being widespread in contemporary presentation of captive animals. The ecologistic-scientific value stresses the interdependence of species and natural habitats, referring to a deeper understanding of the physiological, biological and behavioural attributes of the animals. Animals on display are seen as representatives of their wild counterparts, enabling visitors to connect with the natural world and better understand it. This value implies that, through systematic exploration living diversity can be comprehended and sometimes controlled. This value is mainly expressed in highlighting endangered species and promoting conservation actions, such as in The Trail of the Elephants at Melbourne Zoo. The humanistic value relates to the emotional identification people experience in the presence of animals, which may include bonding, attachment and intimacy. This can lead to anthropomorphism of animals, such as giving them names and ascribing human characteristics to them. Dominionistic exhibits demonstrate human prowess, mastery and dominance over animals such as in rodeo and crocodile wrestling. Utilitarian exhibits are relatively uncommon, but may include rural shows and farm tours. In moralistic exhibits, the central focus is the right and wrong conduct towards the non-human world, such values generally leading to a reduction in the display of animals, with exceptions such as educational sanctuaries. Negativistic exhibits aim to provoke feelings such as fear and disgust in visitors through the display of animals such as sharks, snakes and spiders.
Table 6 sets out Shani and Pizam’s typology of animal exhibits based on basic wildlife values, which builds on the work of Kellert.\textsuperscript{339}

Table 6. Shani and Pizam’s types of exhibit in animal-based attractions.

<table>
<thead>
<tr>
<th>Exhibit Types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalistic</td>
<td>Exhibits in which the animals are presented in natural and semi-natural surroundings, with the incorporation of elements and techniques to enhance the impression and experience of a natural setting.</td>
</tr>
<tr>
<td>Ecologistic-scientific</td>
<td>Exhibits in which the emphasis is on delivering environmental and conservational messages and encouraging activism on behalf of visitors, as well as fulfilling visitors’ intellectual curiosity with regard to the physical, biological and behavioural characteristics of the animals.</td>
</tr>
<tr>
<td>Humanistic</td>
<td>Exhibits in which animals are displayed in a way that allows visitors to express affection for them and/or displays which present animals performing human-like behaviours.</td>
</tr>
<tr>
<td>Moralistic</td>
<td>Exhibits that stress and promote various animal-rights messages – principally, an opposition to cruelty towards and exploitation of animals.</td>
</tr>
<tr>
<td>Utilitarian</td>
<td>Exhibits wherein the practical and material value of the animals to humans is emphasised through demonstrations and/or hands on activities.</td>
</tr>
<tr>
<td>Dominionistic</td>
<td>Exhibits that, in most cases, involve shows aimed at displaying mastery and power over animals.</td>
</tr>
<tr>
<td>Negativistic</td>
<td>Exhibits that include shows and displays that focus on presenting animals with a negative, scary or repulsive image.</td>
</tr>
</tbody>
</table>

The roles that animals play in communicating these values can be further categorised. Zoos Victoria has recently developed guidelines for delivering its ‘connect, understand, act’ visitor journey. These identify five key roles animals play:

1. Recovery species: if the species is part of a threatened species recovery program
2. Ark species: if there is a real threat of extinction in the wild and the captive population managed through regional and international breeding programs can prevent a species from becoming extinct.
3. Ambassador species: if the animals are ambassador species that support important conservation messages and have the capacity to harness visitor and community action behind our conservation effort.
4. Enabling species: if species enable visitors to make connections with animals and create emotional bonds that stimulate learning and positive actions.
5. Research species: if animals enable the achievement of research outcomes and knowledge acquisition that support our conservation efforts or improvements in the care and wellbeing of wildlife.  

These diverse approaches lead to very different interpretation design approaches through the use of sound, lighting and other elements to create a particular mood and context for view. Attitudes towards nature provide the philosophical underpinnings of interpretive...
exhibitions, yet they are rarely openly discussed in a design context, nor are they generally detailed within a design brief. Even when curators and designers have no specific view they wish to present of the relationship between humans and nature, practical decisions about location, views of animals, props and theming, selection of stories, images and objects all serve to present and promote perspectives on the subject.

The chapter has established that nature displays both reflect and shape society’s ideas about nature. Interpretation methods are connected with, but not dictated by, the type of exhibit; old exhibits can be re-interpreted for new audiences. The chapter has argued the increasing reliance on interpretation in zoos and museums as they have sought to expand their educational mission and broaden their public appeal. Such institutions now aim to cater to the complex and varying needs and interests of differing visitor types. The chapter has proposed a fifth generation of zoo exhibit, the cultural immersion approach, often used in combination with naturalistic landscape immersion, arguing that immersive environments have blurred the distinction between exhibits and the visitor environment, expanding opportunities for interpretation. Chapter Three presented a range of values and perspectives on nature that underlie interpretation, proposing that their articulation aids coherent, strategic design. Chapter Four presents a model of the foundations of interpretation design that accounts for such conceptual approaches together with design techniques and types. The cases in Chapters Five and Six aim to examine the means by which these effects arise in the practice of interpretation.
Chapter 4
Interpretation Design Practice

Chapter Four synthesises data from interviews, observation and the author’s professional experience. Building on the literature review, the chapter situates interpretation design in relation to other domains of knowledge and practice. It proposes a model of the foundations of interpretation design that demonstrates the relationship between the designer’s principles and expertise, design approaches, techniques and outcome types, project aims and target audience and the project parameters. The chapter presents a typology of design outcomes in interpretive settings in line with the interpretive aims of affecting visitors on cognitive, affective and behavioural levels. This original work makes a significant contribution to understanding and theory of interpretation design practice by drawing on the views and knowledge of practitioners and observation of designed objects to provide conceptual models and vocabulary that are applied in two case studies in Chapters Five and Six. The second part of the chapter presents findings from practitioner interviews. It builds understanding of interpretation design practice by giving voice to practitioners’ knowledge and investigating consultant designers’ perceptions of their role, the context in which they operate and ways that it could be improved. Analysis of practitioner interviews generates propositions for investigation within the two cases in Chapters Five and Six.

Foundations of interpretation design
Building on the designers’ perspective, together with observation of completed work and informal knowledge gained through professional practice, this section proposes an overarching model of the building blocks of design practice, what constitutes designer expertise, what shapes design directions and how these are manifest. Physical evidence of the product of design work is analysed and categorised according to a framework based on modes of visitor engagement. Visitor studies and detailed feedback from institutions is required to establish the success or otherwise of the designer’s efforts, evaluation of completed work being essential to creating a holistic understanding of practice by providing evidence of the effects of such design products. Such research is beyond the scope of this thesis. This original research contributes to consolidation of knowledge about practice, providing an essential foundation for the development of evaluative frameworks and criteria in future research.
Situating interpretation design practice

It is important to establish the professional context of interpretation design to understand the field’s characteristics. Woodward places interpretation design practice at the intersection of interpretation, design and tourism, as shown in Figure 9.

![Figure 9. Woodward’s professional context of interpretation design.](image)

The focus of Woodward’s thesis on interpretation design within ecotourism settings supports the significance of tourism within the professional context. This research recognises that interpretation design takes place within a range of contexts such as suburban parks, botanic gardens, city streets and other non-tourism settings. It therefore positions interpretation design practice at the intersection of interpretation and design, Figure 10.

![Figure 10. Situating interpretation design practice.](image)

Interpretation design is informed by domains of knowledge and practice that contribute to interpretation theory and principles such as: museum studies, education, tourism and environmental studies as shown in Figure 11.

Figure 11. Fields of knowledge that contribute to interpretation.

Knowledge and practical skills from diverse design fields contribute to the practice of interpretation design including exhibition design, communication, landscape, architecture and theatre design and art, as shown in Figure 12.

Figure 12. Design fields that contribute to interpretation.
Interpretation design is informed by interpretation and design, harnessing the principles and philosophy of heritage interpretation and a range of design fields and applying them through the diverse media and methods of multidisciplinary design practice, Figure 13.

![Figure 13. Interpretation design: a multidisciplinary field.](image)

**Foundations of interpretation design practice**

Ideally, a practitioner’s work is founded on principles and knowledge shared among a community of practitioners. In fields such as architecture, industrial and graphic design, courses and resources provide essential theory and examples of their application in practice. Within interpretation design, no such set of principles and knowledge has been consolidated, this research providing a first step towards a mapping of designer expertise.

As demonstrated by the literature review and described in the practitioner interviews in the following section, this multidisciplinary practice draws on research and practice from a broad range of fields. Designers may be trained in any one of many design fields and may or may not have further training in interpretation, education or museum studies. Individual designers may be multi-skilled and may form teams combining complementary skill sets. The degree of interaction and sharing of perspectives will vary among teams, in some cases transcending disciplinary boundaries to develop shared understanding and methods. Such multidisciplinary and transdisciplinary teams are consistent with current practice in other design disciplines, enabling the pooling of diverse skills and insights to process and solve problems. Many designers have learned about interpretation design through practice, the development of skills and knowledge being dependent on the types of opportunities and contexts of such work. Thus, a

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designer’s expertise is a somewhat ad-hoc agglomeration of knowledge, skills, principles and personal philosophy. This forms the foundation for a designer’s practice.

The primary driver for a consultant designer’s work is the project brief, including the institution’s aims for the project and its intended audience, shaped by the institutional and wider social context. The project is bounded by practical constraints of time, budget and physical environment, together with the personnel allocated to its management, Figure 14.

From the basis of their expertise, driven by the brief and constrained by the project’s parameters, a designer sets about developing an approach to the interpretive environment, generally in consultation with the client and other stakeholders. Based on the chosen approach, techniques are applied and design outcomes proposed. This model is broadly applicable, although within any project there will be variation in the scope of the designer’s role, such that they may not be involved in determining the overall approach, or certain types of outcomes and techniques may be predetermined. Generally, the following hierarchy of design decisions applies, whether made by the contracted designers or by others. Each level of design decision-making is ideally guided by the project aims, context and audience and influenced by a designer’s creativity and skill. The following sections examine the central aspects of this model, from theory to types.

**Theory, principles and expertise**

It is beyond the scope of this research to exhaustively examine the underlying theory, principles and expertise of the profession, as practice is very diverse. The research recognises that such expertise exists, that it is valuable and that it is currently idiosyncratic rather than a solid, shared skill base among the practitioner community. Theory in this context includes informal theory developed through experience,
professional development or collaboration. Theory includes knowledge gained through formal training in other design fields and interpretation, museum studies, education, science and psychology. Principles applied within practice include those from interpretation, general design principles such as universal access, affordance, intuitive way finding and aesthetic principles in combination with museum design principles such as thematic markers, spatial layout and physical and conceptual orientation.

Designer expertise consists of a combination of theory and practice, developed through experience of previous projects, case studies and experience as a visitor. Areas of expertise include understanding of visitor behaviour and movement, knowledge of materials and fabrication methods, understanding of project management and ability to effectively collaborate with other professionals. The combination of theory, principles and expertise form the foundation for a designer’s practice. Designers may have varying degrees of competence in each of these in relation to different aspects of their work. This is the basis from which all design decisions are made.

**Approach**

The approach sets the parameters for the design components of an interpretation project by establishing the overarching organisation and style of the visitor journey. Such decisions may be part of a designer’s role or may be set by the client or architect, but there is generally a period early in a project in which the designer and stakeholders establish key aspects of the approach. The general design approach includes the conceptual arrangement of content such as thematic, chronological, taxonomic or zoogeographic.\(^{343}\) These are well covered in the general literature of interpretation, museum studies and zoos. Included within this level of design decisions is the style of the exhibit, whether naturalistic, stylised, futuristic, cultural, traditional and so forth. An overarching aesthetic style may be decided at this level or may develop through later stages of the design process. Perspectives on nature and its representation ideally inform this level of design thinking and decision-making. Where such perspectives are clearly articulated and understood, designers and clients are more likely to be aligned in their thinking and more effective in their decision-making.\(^{344}\)

The approach includes the overarching physical layout of the space and visitor path, for example, radial, linear, web, circular or other spatial layouts. Wineman and Peponis, Bonn et al. and Bitgood argue that design has a significant effect on visitor experience,\(^{343}\) Hall, 1987, *On Display: A Design Grammar for Museum Exhibitions*.\(^{344}\) Boyle, 2003, *Design Project Management*. 
but little work has been done to characterise design methods in the field of interpretation. This chapter posits a typology of techniques and types to begin this vital work.

**Techniques**

Interpretation designers employ a number of commonly recognised yet little researched techniques. Designers select and adapt techniques to meet a project’s aims, context and audience needs, reflecting the project’s underlying principles and general approach.

**Immersion**

Immersion is a widely used technique that designers use to increase visitor engagement, enjoyment and learning. There is variance in the literature in the way the term is used, some referring to the design technique of creating three-dimensional surround environments and others referring to the pleasurable psychological state induced by engaging experiences. I use it here in the sense of a technique for designing environments that seeks to create a new reality to enfold the visitor. The design of immersive environments aims to create an experience of a particular time and place, whether real or fictional. According to Bitgood, visitors may be more likely to attend to exhibits and thereby learn more when the environment offers an opportunity for immersion. Bell et al. report a significant range of research indicating that the opportunity for immersion may enhance learning and pleasure as visitors become fully absorbed in their environment and distracted from their everyday concerns. Falk and Dierking support the proliferation of immersive and experience-based exhibitions in interpretive environments, arguing:

> The immediacy of real things, set in well-designed, appropriate contexts, provides tangible and accessible images that enrich and extend meaning. Increasingly, museums maximise the use of design through immersion experiences. Few museum experiences are more compelling to visitors than

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347 Bitgood, 1990, *The Role of Simulated Immersion in Exhibition*.
348 Bell et al., 1998, “The Influence of Museum Exhibit Design on Immersion and Psychological Flow.”
such experiences, which envelop the visitor in the sounds, smells, sights, textures and even tastes of a place or event.  

A key aspect of immersive environments is that the visitor feels they are experiencing a phenomenon from the inside, rather than as an outsider looking in. As in theatre, visitors need to suspend their disbelief and accept this new reality to derive the most benefit and enjoyment from the experience. Immersive environments make use of lighting, sound and theming to support and enrich the illusion. Immersion may be done by degrees, ranging from a lightly themed environment that provides visual cues to communicate a sense of place to an environment in which the visitor loses all sense of relationship to the outside world. Museum designers use various methods to create immersive environments. These include themed three dimensional space-surround environments, role playing and interactive components in which a visitor’s response produces changes in the environment. Dynamic displays using sound and lighting help to set the atmosphere of the exhibit.

Nature immersion

The premise of nature immersion is that nature becomes the dominant reality for visitors. Commonly, these are outdoor environments, where the landscape provides a naturalistic walkthrough environment. Nature immersion has been shown to provide benefits such as restoration and relaxation, similar to being in any other natural place. Nature immersion is not restricted to outdoor landscapes, however. The Enchanted Rainforest at the Museum of Tropical Queensland, Townsville is an example of a non-naturalistic nature immersive environment that combines real and replicated nature with stylised elements, lighting effects and large-scale graphics. This exhibition is a theatrical portrayal

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Footnotes:

of the Paluma rainforest, a setting within which visitors explore a range of informative and interactive exhibition components. Although set within a small space, through theatrical techniques, the visitor is in a sense transported from the museum to the rainforest, Figure 15.

![Figure 15. The Enchanted Rainforest, MTQ. Photograph courtesy of Mothers Art archives. Used with permission.](image)

Immersive environments are not necessarily realistic or naturalistic; they simply need to be coherent and create a consistent environment with a distinctive sense of place. Themes for immersive environments include natural landscapes, cultural contexts such as a domestic home or foreign environment, a science laboratory, fantasy world or submarine.

Cultural immersion
In cultural immersion, designers create a specific cultural context. Most commonly used in interpreting historical sites and cultural heritage, the technique of cultural immersion is also widely used for presenting nature exhibits. The African village, the Thai hill tribe hut or the Antarctic submarine environment within a zoo serves to quickly communicate features of the culture and context of the area from which the species originates. Cultural immersion environments can communicate layers of information about real-world human relationship with nature rather than an idealised pristine ‘wild’ view. This can highlight specific issues in the relationship between humans and animals within a particular cultural context, such as poaching, bush meat or over-fishing. Text is integrated into cultural immersion environments through everyday objects such as books, signs and tins.
of food. Designers sometimes use humour to add a playful, fun element to the experience, including the potential for role play and imaginative engagement that help to hold the visitor’s attention. Lions on the Edge exhibit at Werribee Open Range Zoo is an example of a cultural immersion environment, set within the context of a Ranger camp and African village. This immersive environment encourages role playing, as children climb in the jeep and explore the equipment used by rangers in the camp, Figure 16.

Virtual immersion
Designers use surround screens, headsets, PCs and virtual games to create virtual immersive environments, sometimes in combination with other techniques such as theming and soundscapes to enrich the visitor experience.

Interactivity
Educational theory and psychology research indicate that people learn and remember most effectively when they have taken an active role in the learning process through enquiry, investigation and especially when they engage on a physical level.\textsuperscript{352} Derwin and Piper’s research found that interactive elements in exhibit design significantly aided

\textsuperscript{352} Kolb, 1984, \textit{Experiential Learning: Experience as the Source of Learning and Development}; Dewey, 1938, \textit{Experience and Education}.
cognitive recall when compared to information presented without interaction. Interactive exhibits and components are known within the profession as ‘interactives’.

Some interactives require minimal visitor action and simply focus the visitor’s attention, for example, by looking through a viewer or opening a lid. Others require the visitor to run or jump or find ten things or draw a picture, solve a problem or build something. Yanni critiques this obsession with interactivity, claiming that it stems from a view that scientific knowledge is inherently boring so must be couched in entertainment to engage visitors. However, Bell, Harvey, Loomis and Marino report from visitor research that interactive components made the greatest contribution to visitor engagement, followed by multisensory stimulation. Designers often provide a reward to motivate visitors to engage with interactive exhibits and feel satisfied that the result was worth the effort.

Interactive exhibits vary from set results to open-ended outcomes. They support a range of educational and affective aspects of visitor engagement desired by institutions, including: active learning through personal connection, multisensory engagement, social interaction and potentially inducing an optimal experience or state of ‘flow’. However, the proliferation of interactive exhibits indicates that the educational benefits of interactivity may have been eclipsed by its entertainment value.

The simple interactive shown in Figure 17 aims to educate visitors about selecting sustainable fish species as food. Referencing the form of a barbecue, the visitor turns the fish on a skewer to read about whether it is a suitable fish to choose for eating and why.

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355 Bell et al., 1998, “The Influence of Museum Exhibit Design on Immersion and Psychological Flow.”
A range of types of interactive exhibits are described in the Typology section.

**Embedding content**

Not all content is presented to visitors through text. Designers convey messages, orientation and other interpretive content to visitors through subtle means set within a specific context. This is known as embedding and is the dominant technique for communicating content within immersive environments, reducing the need for standard signage and explication. Embedded content is seamlessly integrated into the visitor environment and is not limited to naturalistic settings. Designers use embedded content in an immersive context to communicate multiple messages at one time, contributing to contextual and cultural understanding as well as scientific concepts, field observation techniques, political issues, messages about sustainability and conservation actions. Designers use graphics, art and objects to provide sensory and cognitive information about nature and human interactions with it through items such as footprints, pest traps and model animals. Where text is used, it may consist of contextual items such as road signs, wildlife service signs, replica books and blackboards.

Werribee Open Range Zoo’s ranger camp in Lions on the Edge includes numerous examples of embedded content within a cultural immersion environment. Visitors can learn about the lions and the activities of the ranger by exploring objects in the ranger
camp. Figure 18 shows, for example, a replica ranger’s journal detailing information about the animals.

Figure 18. Lions on the Edge, WORZ. Photograph courtesy of Mothers Art archives. Used with permission.

Television and radio within the Pula African village huts provide stories about lions and other animals within a culturally themed context, Figure 19.
As a form of interpretation, embedding has benefits in comparison with explication through signage. Embedding content can help to reduce visitor fatigue and information overload. Visitors may tire of reading signs, whereas information that is visual or incidental and integrated into a meaningful context can be easier to absorb.

**Information organisation**

Designers use a range of techniques to cater to individual differences in audiences by presenting different types of content in distinctive ways. Graphic design and writing techniques such as layering, chunking, highlighting and progressive disclosure can be applied to accommodate particular visitor needs. A hierarchy of text styles assists the visitor to choose whether to skim through the headings and larger text to gain a general understanding or to access more detailed information by studying the smaller, lengthier paragraphs. Alternatively, or in combination, designers use distinct fonts and colours to indicate different types of content such as geology, history, indigenous culture and native

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animals. The visitor is then able to follow a particular thread of content, accessing as much or as little information on a given topic as they wish. Museums use content hierarchies in computer-based interactives to provide deep levels of content, allowing visitors to explore a topic to their preferred level using menus and links. Designers use colours or markers to identify a particular thread of content or type of experience, targeting a particular audience segment. Different modes of display can be used to communicate with different audience types and interests. For example, computer-based interactive exhibits provide for those interested in topic A, graphic panels for those interested in topic B and reading cards for those who wish to learn more about topic C. Figure 20 shows a flipbook at Melbourne Museum that provides content suitable for children in an alternative thread of content to the signage directed at adult readers.

Figure 20. Flipbook for children, Melbourne Museum. Photograph by Toni Roberts, 2011.

Figure 21 shows lift out cards and flipbooks used at the Australian Museum to provide more detailed content for interested visitors without cluttering an exhibition space with text that most visitors do not require.
Types
The types of design outcomes that visitors experience are the end result of the design process. The development of such outcomes within a project is based on the foundations of the project aims and context, designer expertise and knowledge of interpretive principles, the development of conceptual, physical and stylistic approaches and the application of design techniques as appropriate. Although the designed outcomes for each project are often unique, designers generally share the aim of engaging visitors through a combination of modes that contribute to the whole visitor experience. Audience engagement and response completes the meaning of these outcomes, demonstrating the success or otherwise of chosen approaches and design resolution. The following section presents a typology of such design outcomes to serve as a tool in design planning and evaluation.

Typology
The conceptual framework for the typology of design outcomes synthesises knowledge gained from observation and practice in the field, research on visitor types, motivations and learning styles, theory of interpretation, education and interaction design outlined in earlier chapters. In particular, it draws on Veverka’s proposed multiple objectives for interpretive exhibits based on cognitive, affective and behavioural outcomes, Falk and
Dierking’s Contextual Model of Learning, Packer’s conception of the relationship between education and entertainment, conceptions of experience by Edmonds, Kocsis, Barnes and Kenderdine, Overbeeke et al., Hassenzahl, Forlizzi and Ford, Gardner’s theory of multiple intelligences and the work of Dewey, Ansbacher and others with regard to learning through experience.\textsuperscript{359} It is based in an understanding that overall goals of interpretation are visitor learning, enjoyment, understanding and behaviour change, these being achieved through engaging in experiences and their effects over time. The model recognises that designers do not have complete control over the shaping of a visitor’s experience, as this is co-constituted through visitor engagement. Designers, although considering experiential aims, must therefore focus on creating tangible catalysts of experience by engaging visitors on cognitive, affective and kinaesthetic levels, that is, thinking, feeling and doing. Figure 22.

\bibliography{references}

Significant aspects of experience identified in the literature such as imagination, reflection, self-narration and Roppola’s processes of framing, resonating, channelling and broadening are not included in the model as they constitute the visitor’s subjective responses to the modes of engagement, these being beyond the control of designers, Figure 23.

The conceptual framework forms the basis of the typology of design techniques. Modes are not firmly delineated, the model representing a continuum and combinations of
modes. I have noted from observation that most design outcomes are situated in the overlapping areas: thinking/feeling, feeling/doing, doing/thinking and thinking/feeling/doing, reflecting the aim of interpretation design to affect visitors in multiple ways at the same time. In other cases, this balance is achieved through a combination of design elements emphasising or affording particular modes of engagement in an area or over the site as a whole. The model recognises that each experience is comprised of multiple smaller experiences and can be applied at any scale. The section outlines types of design outcomes within the framework categories, providing examples and photographs, summarised in Table 7.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Character of experience</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking</td>
<td>Cognitive, conceptual, scientific, informative, rational, factual.</td>
<td>informative signage, instructional and way finding signage, scientific diagrams.</td>
</tr>
<tr>
<td>Thinking/Feeling</td>
<td>Learning through observation, reflection, provocation, appreciation, humour.</td>
<td>models, mixed media displays, large-scale graphics, video.</td>
</tr>
<tr>
<td>Feeling</td>
<td>Affective, aesthetic, sensory, narrative, emotive, creative, inspiring, sense of place.</td>
<td>sculptures, theming and scenery, poetry, soundscapes.</td>
</tr>
<tr>
<td>Feeling/Doing</td>
<td>Exploration and sensation, play.</td>
<td>Role play, responsive environments, performative spaces, constructive tasks, sense trails, musical instruments, play sculptures.</td>
</tr>
<tr>
<td>Doing</td>
<td>Kinaesthetic, interactive, active, fun, social, playful, navigating.</td>
<td>Playgrounds, parallel play, seating, paths.</td>
</tr>
<tr>
<td>Doing/Thinking</td>
<td>Learning by doing, seek and reveal, learning through social interaction.</td>
<td>Q and A, viewers, comparing, matching, computer-based interactives, inquiry trails.</td>
</tr>
</tbody>
</table>

**Thinking**

**Informative signage**

Object labels provide scientific, background or historical data to support display of a collection such as these egg specimens at the Natural History Museum, London, Figure 24.
Topics that are conceptual or theoretical rather than physically demonstrable, such as evolution, genetic modification and fire management may be more dependent on graphic display and text than object display. Figure 25 from the Gondwana exhibition at Melbourne Museum illustrates the use of diagrams to explain the concept of the geological timescale.
Information-based displays that use labels, signage or large-scale graphics aims to communicate on a cognitive rather than an emotive or aesthetic level. However, in practice, very little signage is purely informative, as it is generally designed to create a particular feel, sense of place or provoke a response.

Figure 26 shows interpretive signage at Melbourne Zoo that makes use of photographs of baboon behaviours to explain aspects of social life and communication within the family group. Although primarily informative, the photographs of family groups may elicit feelings of empathy and care in visitors.

The two examples of species signage at Melbourne Zoo in Figure 27 and Figure 28 demonstrate the effect of design. The purely informative, authoritative style of the standard species identification signs at Melbourne Zoo in Figure 27 contrast with the more colourful hand painted examples style in Figure 28. Both are informative in content, but the painted signs provide a more personal connection with the animals through colour and a naïve style.
Instructional and way finding signage

Instructional signage is not inherently interpretive, its intent being simply to indicate how to use a piece of equipment, how to behave, such as, ‘Do not feed the animals’, how to open a gate and so forth. However, as with the species signage, these can be presented in a uniform, formal manner or they can adopt an interpretive role, communicating with visitors through the use of illustrations and humour, as shown in Figure 29 and Figure 30.
Instructional signage carries messages about the institution, its character, attitude to visitors and whether it is a fun place or a serious institution. Signage at Wellington Zoo clearly communicates that they are a fun organisation and that they like to challenge the rules of convention, Figure 30.

Although primarily informative, way finding markers and signage can be designed to support interpretation and immersive environments. For example, at Melbourne Zoo’s elephant exhibit, signage and rubbish bins are designed to match the Thai village context, maintaining the theatrical illusion and contributing to the sense of place, Figure 31 and Figure 32.
Figure 31. Trail of the Elephants signage, Melbourne Zoo. Photograph by Rosa Roberts, 2011.

Figure 32. Trail of the Elephants map, Melbourne Zoo. Photograph by Toni Roberts, 2010.
Thinking/Feeling

Models

Replicas

Realistic replicas enable representation of the natural environment in otherwise unsuitable locations or contexts. Replicas provide more comprehensive information than graphic representations as they demonstrate scale, texture and context. Realistic exhibits provide visual information on habitats, scale, plant and animal relationships without the need for explanatory text. Replica natural objects can be durable enough for long-term public display without the need for an enclosure or case, such as those at Melbourne Zoo’s Australian Bush precinct. Figure 33 shows a red-bellied black snake sunbaking on an old tree, which might surprise the unsuspecting visitor, but poses no threat. The model demonstrates the snake’s size, habitat, form and sun-seeking habit.

Figure 33. Red-bellied black snake replica, Melbourne Zoo.
Photograph courtesy of Mothers Art archives, used with permission.

At the Natural History Museum, London, a replica dinosaur skeleton enables the original skeleton to be kept in safe conditions. Figure 34 shows how visitors get a close-up view of the specimen to powerful effect. Where skeletal remains are incomplete, designers use replicas to recreate the whole structure.
Artistic/scientific models
Accurate scale models isolate and focus on key features, produced at a suitable scale for viewing. They include small scale models of large objects such as trees or dinosaurs; environmental features such as river systems and volcanoes; and large-scale models of small insects or microorganisms to illustrate features not visible to the naked eye. Such models are accurate in scale and form to convey scientific information, but may be manipulated to focus the visitor’s attention on key features. Familiar items can be seen in a new way through a change in scale and visible detail. Designers may use repetition to great visual effect, creating attractive, artistic displays that are scientifically accurate.

The insect scale models in Figure 35 to Figure 37 have each been designed to highlight different features. The cross-section of a fly at Melbourne Museum illustrates the internal organs, using vivid colour to delineate key features, Figure 35.
In the case of the scale models of insect heads in Figure 36, designers draw the visitors’ attention to the feeding apparatus of various insects through the use of colour.

In the highly theatrical display of fangs, barbs and stings designers use isolation, colour and lighting to emphasising their danger, Figure 37.
The relief model of Hawai’i Island at the Hawai’i Volcanoes National Park visitor centre illustrates the submarine land formations on and around the island, Figure 38. The scale model enables visitors to quickly comprehend a lot of information. In time, the model will need to be updated as volcanic activity extends the island’s land mass to the South.
**Scenic treatment**

Although the traditional nature diorama comprising taxidermied animals set within a theatrical replication of a natural environment is now somewhat out of favour, these types of displays are still used to show animals in the context of their habitat, to illustrate biodiversity and highlight relationships between plants, animals and their environment. Through observation, visitors can absorb a significant amount of information, reducing the need for interpretive text or other media. Figure 39 shows the scenic treatment in a Diamondback python display at Taronga Zoo to illustrate the snake’s habitat.

![Figure 39. Eastern diamondback python, Taronga Zoo. Photograph by Toni Roberts, 2011.](image)

**Non-realistic mixed media displays**

Designers use the visual appeal of displays that integrate text, image and form to attract visitors to explore the interpretive message. Some displays are akin to art, offering impressionistic reference points rather than literal or didactic explication. Displays in the Surviving Australia exhibition at the Australian Museum combine glass cases with small semi-diorama scenes. Backlighting, translucent graphic prints and masks heighten the impact of the displays. In the example at Figure 40, graphics convey information on identification and range of the species together with interpretive text about its behaviour. The combination of two- and three-dimensional elements in an artistic arrangement balances visual effect and informative content.
Figure 41 shows a design that references the natural environment without attempting to replicate it. The soft tones and organic lines of the acrylic burrow complement the realism of the wombat’s rear end.
In Figure 42, the designers have used an arrangement of thongs on a jetty pylon to evoke thoughts of the beach in summer and draw visitor attention to text that highlights the importance of leaving the beach the way you would like to find it.

![Jetty pylons, Melbourne Zoo.](image)

**Figure 42. Jetty pylons, Melbourne Zoo.**
Photograph by Toni Roberts, 2010

**Aesthetic graphic displays**

Where subject matter such as landscapes, planets, geomorphology and microbiology cannot be easily presented in physical or realistic form, designers may communicate topics primarily through large-scale environmental graphics. Photographs and graphics set the scene, their aesthetic impact attracting visitors to points of interest. Figure 43 exemplifies the technique of layering materials and integrating small specimen cases to create visual interest in otherwise flat graphic panels.
The sombre aesthetic of the memorial to extinct species at the Australian Museum mimics a war memorial, Figure 44. The subdued lighting creates a solemn atmosphere, encouraging audience reflection. Detailed information is provided in smaller back lit graphic displays.

**Humour**

Interpretive and informative signage establishes a particular type of relationship between an organisation and its visitors through tone and style. Figure 45 illustrates the use of
humour to engage and entertain visitors, adding an affective aspect to the informative content.

Figure 45. Meerkat exhibit, Wellington Zoo. Photograph by Toni Roberts, 2011.

**Feeling**

**Art in the environment**

Interpretive artworks connect directly with visitors’ emotions, crossing barriers of language, education and culture. Art may bring a sense of surprise, humour and playfulness to exhibits. Whether referencing nature through forms, use of materials and motifs, or communicating about human relationships with nature through indigenous, religious or contemporary art forms, art can be a powerful medium for creating a sense of place, communicating key messages and engaging visitors.

Sculpted wooden snails at Mount Annan Botanic Garden in Figure 46 attract visitors’ attention by their scale, standing at about 500mm high. They are also in a surprising location along a road in a large open area away from other displays. The sculptures are a hook to engage visitors and encourage them to read the accompanying signage about the plight of the Cumberland land snail.
The use of recycled timber in sculptures of a mob of kangaroos at Melbourne Zoo echoes key themes of the exhibit such as Australian ingenuity and resourcefulness, using old materials for new purposes in a rough, ‘agricultural’ style, Figure 47. The bounding mob is evocative of wild kangaroos rather than the passive, lounging kangaroos likely to be observed in captivity.
The degree of authenticity of theming elements varies, depending on an organisation’s aims and budget. Materials and finishes relate to the context of the exhibit. Figure 48 shows recycled oil drums and natural sticks employed to create the appearance of a handmade African bridge. In reality, the bridge is structurally robust and engineered to meet public safety standards.

![Figure 48. Themed bridge, WORZ. Photo courtesy of Mothers Art archive, with permission.](image)

The barge in Figure 49 appears to be an old boat floating on the river, but is actually on the ground and is constructed from new materials, aged to fit the context. The barge creates a strong sense of place, providing interest for visitors while serving as a viewing platform to watch hippopotamus in the water. An underwater protective barrier surrounds the boat, keeping the animals at a safe distance from visitors.
Wild Sea at Melbourne Zoo is an example of a non-naturalistic themed environment that uses architectural design to create a strong sense of place. Highly stylised, Wild Sea embraces the designed nature of interpretive environments and can be seen as a reaction against the contrived naturalism of the diorama in favour of a more contemporary aesthetic. In Figure 50, a touch pool is set within an architectural interpretation of a coastal landscape.
In contrast to many naturalistic underwater exhibits, such as at Taronga Zoo, where seals swim among replica seaweed, concrete rocks and plastic shells, the seal pool at Melbourne Zoo references Australia’s wild southern coastline without attempting to replicate it, Figure 51.
Feeling/Doing

Role-play

Some exhibitions incorporate dress-ups, props and other supports for role play. Staff may perform in character to establish role-play environments and support visitors’ deeper exploration of ideas and information. This technique is commonly used in interpretation of historical sites and events, but less often within nature interpretation. Generally requiring staff supervision, role play and dressing up are more common within public programs than permanent exhibits.

Responsive environments

Responsive environments include those that change due to visitor movement or action. These changes may be activated by sensors, such as in the sound walkway at Werribee Open Range Zoo, Figure 52. The visitor’s movement along a boardwalk triggers animal sounds such as a lion’s roar in the bushes, potentially inducing fear and surprise in visitors.
Performative Spaces

A performative space is highly interactive and responsive, visitors shaping their environment through intentional actions and movement. For example, visitor movements are tracked by sensors that activate sounds, projections and lighting effects. Visitors may speak into a recording device that remixes their voice and plays it back with added effects. This type of technology-based performative environment is more often seen within commercial displays and art exhibitions than in nature interpretation displays. Generally, performative spaces are more open ended than physical interactives, being less predictable and providing a greater range of outcomes. They afford returning visitors rewards by offering them the potential to build on past experiences.

Constructive tasks

Activities that involve some form of making, such as planting seeds, constructing cardboard models, making puppets, or building a city incorporate thinking and action to create something new. Such activities generally require some level of staffing to monitor and manage the activities and materials, so are most common in public programs. Engagement may be primarily active, but can also include reflection, artistic creation and cognitive engagement.

360 Dernie, 2006, Exhibition Design.
Doing

Play

Most interpretive elements are intended to provoke some thought or feeling, rather than mere action, but there is also a role for free play in interpretive environments. In some cases designers provide some play-focused elements to serve particular purposes. Play offers the opportunity for visitors to be active, energetic, curious and tactile. On an interpretive level, this sense of fun and reward can make visitors more receptive to other content and encourages further exploration of exhibits and repeat visitation. On a practical level, play areas can provide a useful break in the visitor journey, where adults can relax and children can expend some energy in between more demanding aspects of their visit. Institutions use play areas to retain visitors in the institution for longer, to encourage purchase of food and retail items. Designers and artists often combine art and play, as in Figure 53, to offer children a surprising and unique experience that relates to the site.

Figure 53. Hippo water play, WORZ.
Photograph courtesy of Mothers Art archives, used with permission.

Parallel play

In parallel play, the visitor plays in a similar way to the species on display, such as climbing or swinging on ropes near the orang-utan enclosure, or tunnelling like a wombat as in Figure 54. This encourages visitors, either consciously or subconsciously, to recognise the similarities between themselves and another species. The intention is to encourage appreciation, concern and ultimately care for conservation of the species.
Doing/Thinking

Many types of interactive exhibit combine thinking and action to extend visitor attention and maximise learning. Key differences among them are the target audience age group and the degree to which the interaction is open-ended and exploratory.

Question and answer

In simple question and answer activities the visitor responds to a simple question or image and lifts the flap to see the answer. This is a basic form of interactive display with a fixed outcome, limited visitor reward and minimal holding power. The activity may provoke initial surprise or interest, but will yield the same results every time. This series of ‘Who am I?’ questions shown in Figure 55 offers short descriptions and asks the visitor to guess who it is, revealing the answer by lifting the flap.
Viewers

The effect of focusing the visitor’s gaze earns viewers’ inclusion in this category. Viewers range from a simple cone, which focuses the view on a nest in a tree, Figure 56, to windows into beehives, microscopes and magnifiers.
Sliding magnifiers assist visitors in examining real or replica specimens in detail, Figure 57.

![Figure 57. Butterfly magnifier, MTQ. Photograph courtesy of Mothers Art archives, used with permission.](image)

Viewers may include a simple push button interactive element with a single output, for example, ‘What sound does a cuckoo make?’ (push the button to hear it), or, ‘What does a fly’s eye look like?’ (push the button to see an image appear). The interactive at Figure 58 shows what can be seen at night under torchlight.
As new designs combine computer-based CGI effects, sensor mits and views of real objects, viewers are becoming more dynamic and open-ended in the experience they offer visitors. At Melbourne Museum, viewers focused on a diprotodon skeleton show the skeleton coming to life and starting to move.

Comparing and measuring

Designers use comparisons between people and the species on display to inspire visitors’ engagement with exhibits and provide a hook for learning and remembering the information. Interactive comparisons of weight, height, skill, strength, food consumption, area, activity and physical features such as hands range from sliders and mechanical scales to mirrors and sideshow style games. Such comparisons encourage empathy and excitement, developing in visitors an appreciation of an animal’s abilities and interests, directly serving conservation goals of appreciation and understanding.

In the series of interactives at the former exhibition ‘A Dugong called Pig’ at Underwater World in Queensland, the visitor can compare their own height, weight, food consumption and age-related characteristics with those of the dugong. These interactives are more open-ended than simple question-and-answer, with different participants achieving different results. A feature of the interactives shown here is their large-scale and bold graphics, enabling social interaction through shared activity, Figure 59 and Figure 60.
Matching

Activities such as matching animals with their homes, matching numbers and objects and simple words with images are used primarily with younger audiences. Matching activities
may take the form of joining blocks together to form a picture, sets of abacus style spinning blocks, jigsaw activities and putting shapes into the right holes. Some matching activities combine more than one outcome, for example, cube blocks with an image on each face. In general, however, matching activities have a fixed outcome or correct answer, limiting their interest value for repeat visitors. Figure 61 shows a simple exercise for younger children, where the visitor can choose to create words or images. Figure 62 shows the same type of activity designed for an older age group. The action remains simple, but the illustrations communicate complex information, interactivity serving to attract and hold the visitor’s attention so they engage with this content.

Figure 61. Matching activity, Seaworld. Photograph courtesy of Mothers Art archives, used with permission.
Computer-based interactive exhibits

Computer-based interactives range from those with a simple user interface with limited inputs and defined outcomes to open-ended, exploratory or complex game-based activities. The capacity for computer-based interactives to measure and respond to input is key to their interest value. Games may also set targets and goals, providing visitors with a sense of motivation and achievement. An interactive about energy use at London Science Museum shown in Figure 63 combines a game-based screen display and sensors that measure the visitor’s activity. Participants engage in highly energetic combinations of actions to achieve goals and progress through the game.
An interactive table at the Australian Museum shown in Figure 64 encourages social interaction through exploration and play. The table combines touch-screen interactivity with sensors and projection to create a non-linear, open-ended large-scale interactive table.

Inquiry trails

Inquiry-based learning motivates visitors to solve a problem or seek out specific information. Investigation and inquiry trails may be integral to an exhibit or add-ons
created by an institution’s education team. They engage visitors by raising questions that people seek to answer along their journey. Investigation and inquiry-based programs help to prevent information overload and fatigue in visitors as they scan for content relevant to their quest rather than trying to read everything. Inquiry based programs are generally developed to cater for specific audience types, ages and interests, with suitable levels of complexity and detail. Trails may be self-directed or supported by guides and educators. Examples range from simple passports for which visitors collect stamps at key points in the exhibit, through to complex team-based activities involving researching problems such as how best to conserve and protect a species within a threatened habitat.

Cues and clues in the form of symbols, colour and other markers signal particular types of content and experiences. The visitor seeks out these markers for content as they move through the environment, collecting information or undertaking a series of actions that build a body of experience in addition to the main exhibits. This type of exhibit element establishes a mode of investigation, encouraging visitors to touch, explore and question. Cues and clues can create a sense of anticipation and motivation, giving visitors something to look for at each exhibit. The Survival Secrets trail at the Australian Bush exhibit, Melbourne Zoo, provides a series of flip panels in a consistent style. The large signpost marks the beginning of the trail and visually indicates what visitors should look for along the way, Figure 65.
Each panel is in the shape of an animal, with the Survival Secrets brand etched into one side as a reminder of the name of the trail and the context of the information, Figure 66. As the visitor turns the panel over, they read information and questions about environmental systems in nature that help species to survive.

![Survival Secrets, Melbourne Zoo.](image)

**Thinking/Feeling/Doing**

**Visitor performance**

Designers use a balance of thinking, feeling and doing modes of visitor engagement across a precinct or site to suit the needs and interests of the target audience. Some individual exhibits combine a balance of these aspects. The temporary exhibition Birds of Paradise at the Australian Museum, demonstrates how humans mimic animals in both adornment and dance, making comparisons between humans and birds through examples of Papua New Guinean ceremonies, as shown in Figure 67.
Graphics carry the main concepts and narrative throughout the visitor journey, with different sections of the exhibition devoted to film and object display. At the end of the exhibition, a mixed media interactive combines graphics, music and video. Visitors are shown a video of a dance performance inspired by the dances of tropical birds and are invited to do their own dance, which is videoed and replayed.

**Sensory interactives**

A smell interactive at the Australian Museum invites visitors to turn the handle to smell the Late Cretaceous period, Figure 68. The visitor can make comparisons between different periods to build on their understanding gained from other parts of the exhibition. Through olfactory engagement, the display contributes a strong sensory aspect to the simple interactive.
Similarly, the frozen map of Antarctica at the Melbourne Aquarium offers tactile as well as visual means to communicate the message that Antarctica is the coldest place on earth, Figure 69.

Figure 69. Ice map, Melbourne Aquarium. Photograph courtesy of Mothers Art archives, used with permission.
**Typology significance**

Through its focus on modes of visitor engagement (thinking, feeling and doing) the typology conceptual framework emphasises the significance of the qualities of the visitor experience above other competing aspects of a project such as the multitude of stories and content a client wants to convey, site constraints and aesthetic concerns. Content-based models predominate over visitor experience focused models within the interpretation planning literature, together with a division of work into media types. Project documentation is generally separated into works packages such as signage, multimedia, sound, exhibition furniture and printed materials, which also do not focus on the whole visitor experience.

The framework’s simplicity aids its practical purpose. It can be applied in combination with other measures for planning and evaluating interpretation design projects, for example, being cross-referenced with a project’s aims, visitor characteristics, story threads or fabrication works packages such as graphics, sculpture and architecture. It can be used to map the range of offerings in a planned project to create the appropriate mix for a given audience and intent.

The typology contributes to the understanding and practice of interpretation design by providing a simple, visitor-centred model for planning, evaluation and critique of interpretation design projects and elements.

**Practitioner knowledge**

Institutions rely increasingly on interpretation design to communicate meanings and messages to visitors and to promote specific behaviours. Interpretation design has emerged as a field of practice to meet this need, through a synthesis of other design fields informed by theory from interpretation, education and museum studies. Research in the field of interpretation does not adequately account for the role and process of design, the quantity and range of research not being commensurate with design activity in the field. Practice and theory are not well integrated to support critical analysis of completed work and provide firm foundations for development of the field. The field of interpretation design lacks documented exemplars and other forms of collective knowledge from practice needed to build shared expertise among practitioners. Any field of knowledge is built on hundreds of exemplars, practitioners building expertise through experience of many of examples including case studies.361 Research by Woodward identifies that

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361 Flyvbjerg, April 01, 2006, "Five Misunderstandings About Case-Study Research."
designers experience this lack of shared information about interpretation projects as a sense that each project is started from ‘scratch’, with designers reinventing solutions to design problems as knowledge and experience gained from one project is not effectively applied to the next.\textsuperscript{362} It is necessary to engage directly with designers and their work to reveal knowledge of the field and generate theory.

As a first step in consolidating such knowledge, the research gives voice to practitioner experience and opinions about their practice together with two case studies. I interviewed eight professionals working in the field. Four interviewees are consultant designers with extensive experience on major and smaller projects in Australia and internationally. Bryon Cunningham is a Director of Cunningham Martyn Design, a Melbourne-based exhibition design company specialising in major exhibitions for museums such as the Australian War Memorial, National Museum Australia and other tourism destinations. Susan Freeman is a Director of Freeman Ryan Design, a Sydney based consultancy working primarily in the museums and heritage sector, designing for major museums such as the Australian Museum and National Museum of Australia and smaller interpretive centres. Both companies are multidisciplinary practices offering a range of services including master-planning, interpretive exhibition concept design, documentation and production management. Ian Bracegirdle is the Director of Motherworks, a small consultancy in Melbourne and former Director of Mothers Art, a design and fabrication company based in Melbourne. Bracegirdle’s practice spans zoos, public art and museums. Becca Hanson is a partner in Studio Hanson/Roberts, a planning and design consultancy based in Washington that specialises in zoos, aquaria, botanic gardens and interpretive centres in the United States and internationally, including a number of Australian zoos.

To gain perspectives complementary to those of consultant designers, I interviewed professionals from two major museums. Luke Simpkin, Manager of Exhibitions Operations at Museums Victoria has experience working with internal designers and external designers across all aspects of exhibition development. Peter Wilson, previously employed by a consultant design company, is now Senior Designer at Museums Victoria. Neridah Wyatt-Spratt, Public Programs Manager at the National Maritime Museum of Australia, has worked in a range of roles in the museums sector including exhibition development at the Australian War Memorial, where she worked closely with consultant designers on several major projects. Kirsty Hawkes, a consultant interpretive writer, was

interviewed for her perspective on the relationship between writers and designers on interpretive projects. Table 8 lists interview participants.

Table 8. Practitioner interviewees.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Field of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bryon Cunningham</td>
<td>Director, Cunningham Martyn Design.</td>
<td>Exhibition for museums, corporate clients.</td>
</tr>
<tr>
<td>Susan Freeman</td>
<td>Director, Freeman Ryan Design.</td>
<td>Interpretive exhibits for museums, heritage sites, art galleries.</td>
</tr>
<tr>
<td>Ian Bracegirdle</td>
<td>Director, Motherworks.</td>
<td>Art, design and interpretation for zoos, museums, public environments.</td>
</tr>
<tr>
<td>Becca Hanson</td>
<td>Director, Studio Hanson-Roberts (USA).</td>
<td>Strategic planning, master-planning, design for zoos.</td>
</tr>
<tr>
<td>Peter Wilson</td>
<td>Senior Designer, Museums Victoria (Melbourne Museum).</td>
<td>Exhibition design.</td>
</tr>
<tr>
<td>Kirsty Hawkes</td>
<td>Interpretation writer, Kirsty Hawkes Interpretive Services.</td>
<td>Interpretive writing, specialising in audio guides for national parks, botanic gardens and local governments.</td>
</tr>
</tbody>
</table>

As an early study in the field, the scope of discussion in interviews was broad, aiming to contribute to understanding of the nature of project development teams, the role of designers, possibilities for improvement in the design process and post-evaluation of exhibits. The semi-structured interviews were guided by the following questions:

Professional role and background

1. What organisation do you work for?
2. What is your position and role in the organisation?
3. What is your typical role in interpretation projects?
4. Have you worked in other organisations within this field? What role did you have there?

General

1. How are interpretation projects generally initiated? (contracts / tenders / internal?)
2. Which professionals and roles are involved at each stage?
3. At what stage do designers become involved?
4. How would you ideally structure interpretation projects?

5. How do you perceive the role of designers in developing interpretive exhibitions and environments?

6. What are some of the most effective design approaches you have experienced in interpretive settings?

Specific Project (where relevant)

1. Why was this project undertaken?

2. What were the key interpretive messages, educational aims and visitor experience goals? How were designers involved in developing these aims?

3. How did project development and design progress? Could this have been improved?

4. Was formal or informal evaluation of the project included? eg. visitor studies.

5. Was the project successful in meeting the stated aims and objectives, prompting the expected visitor response and fulfilling other benchmarks?

Initial analysis of the interviews revealed marked differences between responses from practitioners in large organisations such as Melbourne Museum and the National Maritime Museum and those of consultants. As the research focuses on consultant designers, this distinction is directly relevant to the research; as such responses from these two groups are separated in the analysis summaries. Table 9 lists the key issues raised by participants, these being discussed in the following section.

Table 9. Summary of issues from interviews.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Consultant comment (5)</th>
<th>Others (3)</th>
<th>Total (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing of designer engagement</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Client experience and attitude</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Project structure and process</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Designer role</td>
<td>4</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Interpreting nature</td>
<td>4</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Understanding audiences, evaluation</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

**Interview findings**

This section presents discussion of each topic and response summaries. Based on the findings, the interview analysis generates propositions for discussion in analysis of the case studies in Chapter Seven. The propositions are not intended as rigorously testable hypotheses but as a counterpoint to the case studies. As they arise from discussion of
general aspects of design practice they provide a valuable comparison to the case studies which examine specific situated examples of practice by particular designers.

Timing of designer engagement

The most significant finding from the interviews is that, outside of major institutions with in-house design teams such as Museum Victoria, designers are generally engaged too late in the process to be optimally effective. This view was articulated not only by designers, but by all interview participants. Interviewees were unanimous in arguing that designers ought to be involved in projects from their inception to contribute to the conceptual development, architecture and landscape design.

Architects are generally engaged as the leaders on a project with interpretation designers being secondary in terms of both seniority and timing of engagement, yet interviewees concurred that architects and clients are often not aware of the infrastructure needs of exhibitions and interpretive environments. This results in unsuitable buildings and environments that designers must remedy or attempt to accommodate to progress a project.

Bracegirdle recommends wide consultation during the early project development phases to ensure that the building is well suited to the needs of interpretation and display. Freeman identifies early engagement of designers as a key aspect of successful projects, so that designer expertise can contribute to the built environment, visitor orientation and sequence of movement through the exhibition space. Freeman notes that in some projects her team has worked closely with the architect to develop a space, using architectural elements to support communication of interpretive meanings. She cites the example of the Pinnacles Visitor Centre in Western Australia, where the building contributes to interpretive intent of visitors feeling as though they are in a cave. This sort of relationship with an architect develops through collaboration, such a partnership identifying ways that the architecture can contribute to the interpretation. However, Freeman states that this requires a very willing and open architect, which is rare. Table 10 summarises interviewee responses regarding the timing of engagement of designers on interpretation projects.

<table>
<thead>
<tr>
<th>Consultants</th>
<th>Staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most architects and clients don’t know what’s needed in an interpretive exhibition environment. (BC)</td>
<td>As a lead designer I’m involved from the start. (PW)</td>
</tr>
<tr>
<td>Designers are generally engaged after architectural or landscape design is well developed. (BC, IB, SF, BH)</td>
<td>It is a luxury having a strong in-house design team so there’s more room for design to contribute to the early stages. (PW)</td>
</tr>
<tr>
<td>Ideally a designer should be involved in developing the architect’s brief to ensure the space has the right infrastructure. (BC)</td>
<td>It’s about getting the balance right between having content resolved but not too prescriptive so we have creative input. (PW)</td>
</tr>
<tr>
<td>Few architects are willing to collaborate by altering the building design to support interpretation. (SF)</td>
<td></td>
</tr>
<tr>
<td>We have such a good understanding of visitor needs for arrival, physical and intellectual orientation that could inform the architecture. (SF)</td>
<td></td>
</tr>
<tr>
<td>It is best to build a team around the project’s needs that works together for the duration of the project. (IB)</td>
<td></td>
</tr>
<tr>
<td>Ideally the interpretation team is involved early enough to shape the visitor experience rather to affect how visitors feel when then move through the space. (IB)</td>
<td></td>
</tr>
<tr>
<td>Ideally designers are involved from the beginning so everybody goes on the journey together. (KH)</td>
<td></td>
</tr>
</tbody>
</table>

Proposition for examination within case studies:
Late engagement of designers limits their contribution to functional, spatial and conceptual aspects of the building, often leading to environments unsuitable for interpretive works. This limits the designer’s creative contribution and hinders the potential use of architecture as an interpretive element.
Client inexperience and attitude

Many interpretation projects are undertaken as a one-off for an institution or site that does not have the infrastructure for developing interpretive exhibits. Such organisations are unlikely to have curatorial staff, designers or design managers, interpretation planners or writers on staff. These may include state or national parks management, local government bodies, botanic gardens, zoos, visitor centres and smaller museums with funding for a single project or may only rarely undertake such projects. Inexperienced commissioning organisations have a limited understanding of the process, roles, technical requirements and design possibilities in interpretation design, potentially leading to unsuitable project structures, unrealistic timelines and a poorly defined project brief.

Major organisations such as state and federal museums that undertake large-scale exhibitions are likely to have established processes for developing a design brief. According to Wyatt-Spratt, such a brief may be developed over one or two years and may provide sample labels, images and objects, storylines, thematic areas, a detailed schedule, consultation and sign off requirements and the scope of work, comprising a document of over 100 pages. In contrast, many smaller or less experienced organisations may present a design brief that is not clearly articulated or thorough, leaving designer roles, project aims and philosophical approaches undefined. In this case, designer time is required at the outset and throughout the project to manage these roles and expectations. Some designers prefer to prepare a ‘return brief’ that sets out the parameters, assumptions and process for the client to reduce the time spent in ongoing negotiation.

In cases where the client is inexperienced, the role of guiding and educating the client falls to the design team, this educative role taking significant time and resources away from design. Each time a project concludes, designers lose the work invested in educating a client, having to start again with the next project. Freeman claims that people in commissioning institutions are less informed than people in similar positions a few years ago. Staff with little background or experience are now making decisions and preparing design briefs that are unclear and poorly written. Hanson’s ongoing consultation with a number of the same organisations over many years puts her in a different situation in this regard, where it is possible to educate and collaborate with staff over several projects, building skills within the organisation beyond relationships with specific individuals.

The role of client educator is not recognised within fee structures and measurable design outputs, despite it being a demanding role. Inexperienced clients may make decisions prior to designer engagement which constrain the contribution of designers, such as the
project timetable and sequencing of contracts. The designer must then expend considerable effort trying to redress or conform to unrealistic project parameters including timelines, budgets and built environments. Table 11 summarises interviewee responses regarding client experience and attitude toward designers.

Table 11. Client experience and attitude: summary of responses.

<table>
<thead>
<tr>
<th>Consultants</th>
<th>Staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are designing exhibitions all the time, but we are often working with people who are doing it for the first time and may only ever do it once in their career. (BC)</td>
<td>In major institutions it may take two years to develop a thorough project brief of 100-200 pages. (NWS)</td>
</tr>
<tr>
<td>People in commissioning institutions are less informed than people in similar positions a few years ago. (SF)</td>
<td>Designers work within a broad team, spread throughout the whole museum, including curators, conservators, programs officers, researcher, scientists – it’s enormous. (PW)</td>
</tr>
<tr>
<td>We do a lot of workshops to build skills within organisations. (BH)</td>
<td></td>
</tr>
<tr>
<td>We try to get in early to prevent organisations from going in the wrong direction. (BH)</td>
<td></td>
</tr>
<tr>
<td>Each time a project is completed we lose all the work we have done educating the client. (BC)</td>
<td></td>
</tr>
<tr>
<td>Client experience and expertise affects whether designers are used to shape the stories or just display them. (SF)</td>
<td></td>
</tr>
<tr>
<td>Sometimes a brief is so badly written it is unclear what work is required. (SF)</td>
<td></td>
</tr>
<tr>
<td>We always like to prepare a return brief to clarify clients’ objectives and refine the scope of work. (BC)</td>
<td></td>
</tr>
</tbody>
</table>

Proposition for examination in the case studies:

A client’s lack of experience and understanding about managing interpretation design projects places a burden on the designer to educate the client about project management and the design process.

Project structure and process

Participants propose no single structure or method for development of projects and management of design. However, there are some common traits that distinguish project-based consultancy work from in-house design within larger institutions. Several designers spoke of the uniqueness of each project as a significant aspect of interpretation design practice. The individual nature of the site, the client organisation, its context, stories and
audiences require a tailored design process. Research and consultation may involve liaison with content specialists such as scientists, historians, community members and indigenous groups, in some cases the designers having to seek out knowledgeable contributors. A project’s scope may demand highly original design work or may limit the design to creative application of existing media. Interpretation projects may consist of a number of separate stages including interpretation planning, scoping, master-planning, curating, scripting, design, multimedia, graphic design and production. Project participants and contracts vary depending on the type of client organisation, its internal resources and ongoing external consultants. The timing of contracts and the relationship between consultants is largely driven by the client and expectations they establish during the tender process. Where a project requires building work, the architect is generally given the lead contract, either engaging an interpretive team directly or the client engaging them subsequently. Frequently, a staged process is employed, whereby the architectural component is completed or well under way before interpretation designers are engaged, limiting potential collaboration.

Bracegirdle argues that architects are seen as more reliable and worthy than practitioners in other design disciplines, so that clients are more likely to trust them with financial resources. He states that the capacity of artists and interpretation designers depends to some extent on their access to other professionals on the project such as landscape designers and architects so that all the design forms can be harnessed to create interpretive visitor experiences. Such access to other consultants requires overlapping or concurrent contracts. With regard to content, Hawkes questions the value of the often fragmented process of undertaking staged contracts, each with their own research and outputs, claiming that engaging consultants in separate contracts is inefficient, resulting in numerous planning documents rather than focusing on outcomes for visitors. Often the work done in each stage is not used in the following one, as each new contractor undertakes research and inevitably finds new interpretations of the content. All interviewees argued that collaboration is the most productive approach, harnessing the skills of researchers, writers, architects and designers to a common goal. However, project structures often work against this.

The interview analysis focuses on what was said by participants, but it is worth noting that the consultants interviewed did not mention curators, this reflecting the situation that in many projects there is no curator and the client or interpretation designer absorbs this into their role. By contrast, museum employees mentioned collaboration with curators.
Table 12 summarises interviewee responses regarding the structure and process of interpretation design projects.

**Table 12. Project structure: summary of responses.**

<table>
<thead>
<tr>
<th>Project structure and process</th>
<th>Summary of responses from consultants</th>
<th>Summary of responses from staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each project structure and process is unique, demanding a tailored approach. (SF, IB)</td>
<td>Designers work as a team, reporting to a senior manager. (PW)</td>
<td></td>
</tr>
<tr>
<td>It is standard practice that architects, landscape architects and engineers drive the design. (IB, BH)</td>
<td>In-house designer involvement is probably more fluid than if it was contracted out. (PW)</td>
<td></td>
</tr>
<tr>
<td>There is often discontinuity between separate contracts for feasibility studies, planning, thematic development, writing, design and project management, which involves time and money better spent on collaboration. (KH)</td>
<td>You get more consistency of message working with the same team throughout a project. (PW)</td>
<td></td>
</tr>
<tr>
<td>If the architect is willing, the building can be used as an interpretive element, but this is rare. (SF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working with creative people can be non-linear, uncomfortable and different for stakeholders, but the results can be outstanding. (IB)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through the tender process contracts are created with no consideration for the specialist work we do. (BC)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proposition for investigation in the case studies:
Ideally, consultant contracts overlap to enable opportunities for collaboration in developing interpretive environments and content.

**Designer role**

For consultant designers, client experience and expertise varies greatly and affects whether designers are involved in shaping the stories and messages or whether their work is restricted to exhibition layout. The designer role is also affected by the extent of work undertaken by other professionals such as the curator and master-planners if any, prior to their engagement. In such cases, designers are associated with technical production rather than conceptual and creative aspects of the project, the designer’s role being to realise the curator’s vision. As Cunningham states, ‘The least satisfactory project that I have worked on, in that it used none of the skills that I could really bring to bear, just used me as a decorator of showcases – visual merchandising.’

Hanson’s conception of the designer’s role is one of expanding the view, opening up the range of possibilities, challenging assumptions and getting to the heart of the story. Such
a role involves a global vision, facilitative role and critical perspective. It involves gaining the trust of stakeholders and demonstrating passion for their collection, their work and site. Bracegirdle states that his role is to question everything provided in the brief, to make the design ‘work harder’ and become more meaningful rather than just a series of props. A practicing artist, Bracegirdle sees the interpretive role as an extension of his art practice. In relation to zoo projects, Bracegirdle states that, rather than seeing the interpretive component as something that can be tacked on, if it is well based in the content and objects, it can actually drive the visitor experience ‘from the inside out.’ The interviews demonstrate that designers have philosophies that drive their practice such as object-centred storytelling, audience provocation and collaborative development.

There are notable differences between the roles of designers within Melbourne Museum compared to the consultants interviewed. Some larger institutions such as state museums have well developed systems that utilise and support designer expertise, whereas smaller or less experienced organisations may lack understanding of design processes and roles, design opportunities and methods. Inexperienced project leaders may unintentionally create a range of obstacles for designers in terms of the physical environment, project structure and process, in particular through late engagement that constrains their contribution. By contrast, Wilson states that for designers on staff within Museum Victoria, their roles are clearly defined. Curators develop the initial messages and senior designers are involved with a wide group of key contributors from the project’s inception. The design team plays a significant role in shaping the project physically and conceptually. Designers must justify their rationale for design directions and choices and gain the support of the wider team to progress through design stages.

The interviews revealed that practitioners focus on the aim of connecting audiences with objects and topics, consistent with the interpretation literature. The designers see their practice as aiming to spark visitor curiosity so that visitors would seek out further information and experiences. Interviewees spoke of seeking to engage diverse audiences in terms of age, interest and learning modes. They do this by making topics relevant to visitors through analogy with everyday experiences, seeking out unusual and unexpected stories and by creating experiences that are surprising and sometimes challenging for audiences. Cunningham states that an exhibition should take a point of view, presenting an opinion about the subject rather than presenting apparently objective truths. Bracegirdle argues that the challenge for designers is to not only shape cognitive understanding, but also deeper, emotional aspects that are potentially life-changing. Table
13 summarises interviewee responses regarding the role of designers in interpretation projects.

Table 13. Designer role: summary of responses.

<table>
<thead>
<tr>
<th>Designer role</th>
<th>Staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>A designer’s role within the broader project team is pretty clear, guided by a detailed brief. (PW, NWS)</td>
</tr>
<tr>
<td>Our role varies so much from project to project, depending on the content, site, client experience and intent. (SF)</td>
<td>The design team plays a significant role in shaping the project physically and conceptually. (PW)</td>
</tr>
<tr>
<td>A designer puts together the way in which the public interacts with not only the objects, but the experience of being amongst those objects, in a live sense. (IB)</td>
<td></td>
</tr>
<tr>
<td>My role is to question the intent of the proposed exhibits and to make them work harder and become more meaningful. (IB)</td>
<td>We’ve got to embed meaning in everything we do rather than using design for design’s sake. (PW)</td>
</tr>
<tr>
<td>Our role starts with creating an environment where people feel safe to express their opinions and research to collaboratively develop an approach that everyone owns, that is achievable and clear. (BH)</td>
<td>You may have to design for an audience very different from yourself and your peers; the designer has to represent the audience, acting as their advocate in the development process. (PW)</td>
</tr>
<tr>
<td>Some designers are aesthetically driven; some design for the appreciation of their peers; some focus on telling stories through objects, which may over-ride aesthetic principles. (IB)</td>
<td>A designer’s role is to consider the most effective ways to engage all of the audience’s senses to connect them with the subject. (PW)</td>
</tr>
<tr>
<td>A designer has to prove to the institution that they care about their collection, share their passion and aspirations. (BH)</td>
<td></td>
</tr>
<tr>
<td>Ideally, designers have an ongoing conversation with curators, specialists and writers to shape stories and create focal points. (KH, NWS)</td>
<td></td>
</tr>
<tr>
<td>Designers shape cognitive understanding, but also deeper, emotional aspects that are potentially life-changing (IB)</td>
<td></td>
</tr>
</tbody>
</table>

Propositions for investigation in the case studies:
Project factors such as sequence of contracts serve to constrain or expand the creative and practical influence of the designer.

Designers act as audience advocates, representing their needs and interests in the design process.
Communicating ideas about nature

A common idea expressed in the interviews is that designers seek out ways of distilling aspects of a natural environment without aiming to replicate or mimic it. Wilson gave the example of a single piece of granite used as a seat for viewing a video of snow covered alps in Melbourne Museum’s Wild exhibition: ‘It’s little hints or keys or beautiful things, like imagining sitting on top of that mountain and looking out at that view. Without recreating it you’ve tried to get the essence of it.’ Consultants state that philosophical issues of presentation and representation of nature are not generally discussed within the design process although Freeman states that it does occasionally occur. Museums Victoria employees state that there is some discussion of this within the design process, although the museum’s philosophical position is well established, this being a focus on scientific knowledge in parallel with indigenous perspectives.

Interviewees concurred that technology can be useful for providing extensive content without cluttering a space with signs and for burrowing beneath the visible to convey content that cannot be understood by observing the object. Designers use technology to do this in engaging ways that traditional media does not allow, such as the diprotodon viewer at Melbourne Museum that brings a dinosaur skeleton to life. Wilson reports that multimedia needs to involve all of the visitor’s senses, the designer aiming to help the visitor to connect with the subject. Freeman similarly describes her ongoing interest in developing soundscapes as a powerful interpretive device. All agreed that use of multimedia must be driven by the content rather than presented as an attraction in itself, Cunningham stating that ‘nothing beats the real thing’ and the experience of seeing real objects still lies at the heart of the museum.

Interviewees noted that zoos and museums are employing more similar methods for engaging audiences, both relying more heavily on interpretation to convey messages to audiences. However, according to Simpkin, the two types of institution remain different in their aims and in their appeal to audiences, stating that zoos often take a stronger conservationist position in their interpretation, whereas the Museum allows visitors to create their own understandings. Simpkin claims that the incorporation of live exhibits within the museum does not make it more like a zoo or botanic garden, describing the Living Forest Gallery as a contemporary view of a traditional museum practice; a modern walk-through diorama.

Discussing the Pinnacles project in Western Australia, Freeman expressed the intention of interpreting that which the visitor cannot experience. Visitors come to the interpretive
centre from Perth on day trips only, so miss the beautiful dawn and dusk at the site so imagery of these times of day aimed to fill out the experience of place. Similarly, certain sites are too environmentally fragile to allow visitor access, so the interpretation serves to give visitors a feel for the place and educate them about why they cannot go there. Table 14 summarises interviewee responses regarding interpreting ideas about nature.


<table>
<thead>
<tr>
<th>Interpreting nature</th>
<th>Consultants</th>
<th>Staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideally, interpretation is deeply embedded in the environment. (BH)</td>
<td>Designers aim to distil the essence of a place, resource or concept. (PW)</td>
<td></td>
</tr>
<tr>
<td>There is generally little discussion generated by clients about philosophical aspects of nature presentation. (SF)</td>
<td>There is some discussion about philosophical aspects of nature interpretation within the museum. (PW, LS)</td>
<td></td>
</tr>
<tr>
<td>Designers use multimedia to communicate that which is not visible to the naked eye, such as the microscopic, the vast, the prehistoric or the forbidden aspects of nature. (several)</td>
<td>The museum presents scientific knowledge in parallel with indigenous culture. (LS)</td>
<td></td>
</tr>
<tr>
<td>Real objects are a significant aspect of the visitor experience. (BC)</td>
<td>Live exhibits are part of contemporary museum practice and help to connect with audiences. (LS)</td>
<td></td>
</tr>
<tr>
<td>Designers aim to convey that which the visitor cannot observe directly, to provide a holistic view of a place or resource. (SF)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Propositions for investigation in the case studies:
Interpretation designers aim to distil the essence of a subject, creating a sense of place and providing affective experiences of nature that communicate ideas and arouse feelings in visitors.

There is little discussion about philosophical aspects of nature presentation in consultancy projects.

Interpretation design can assist in communicating a more holistic view of nature and human relationships with the natural world.

**Understanding audiences: evaluation, feedback and ongoing development**

Designers expressed frustration at the lack of investigation into audience interests by institutions and the lack of visitor feedback from institutions once projects are complete. Discussions with visitors before, during and after design is complete would assist designers in tailoring their work to audience needs. Cunningham is critical of many
institutions in this regard, stating that apart from a few major museums, organisations do not speak to their audiences to learn what interests them, relying instead on assumptions about what might engage them. In his design practice, Cunningham seeks out conversations with target audiences to identify their areas of interest to guide his design approach, although this can be costly and time consuming. Hawkes concurs, emphasising the need to understand the audience to avoid disengagement.

Designers spoke of the very limited amount of feedback from clients after a project is complete. Many organisations do not gather summative evaluation. Of those that do, few include any consideration of design, focusing instead on general visitor satisfaction. All the consultant designers stated that most institutions don’t attempt to measure how design contributes to the visitor experience. Designers develop their own means of assessing their work and that of other designers, mainly through visitor observation. Freeman states that people don’t necessarily do what a designer thinks they will do or find interest in the thing that the designer finds most interesting and it’s really important to understand that difference. Museums Victoria is a notable exception, given its sophisticated identification of audience types. The Museum tracks visitor pathways and time spent at different exhibits, using studies on visitor demographics, motivation and satisfaction to inform the design of exhibits and interpretation. With regard to evaluation, Wilson states that visitors are often overwhelmed by the experience of visiting a museum or zoo and may be better able to articulate their response to an exhibit after leaving, as memories and experiences spark connections and understandings. Such long-term responses can be difficult to capture.

Participants offered no examples of formative evaluation during the design phase, all interviewees stating that experimentation and prototyping are generally impossible within the timeframe and budget constraints of projects. Freeman noted that her company has developed certain technologies and modular exhibition furniture over a number of projects, revising and improving with each one. Wilson stated that within Melbourne Museum there are some instances on larger projects where new products can be developed and tested.

Discussion of whether projects are revised and augmented after opening day demonstrated an understanding that interpretive messages keep changing as ideas about knowledge and conservation change and audiences change. Cunningham often tries to convince clients to make exhibitions temporary so they can be developed, adjusted or reinterpreted over time in line with social change. Hanson stated that in zoos, the
messages around animals are constantly changing, so that interpretation should combine elements that are deeply embedded within the environment with temporary, changeable interpretive items. Table 15 summarises interviewee responses regarding client understanding of audiences and visitor feedback in the design process.

Table 15. Understanding audiences, evaluation: summary of responses.

<table>
<thead>
<tr>
<th>Understanding audiences, evaluation</th>
<th>Staff in major institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>Staff in major institutions</td>
</tr>
<tr>
<td>Audience understanding is critical to visitor engagement and interest. (BC, KH)</td>
<td>Museums Victoria has sophisticated methods of tracking and learning about their audiences. (LS)</td>
</tr>
<tr>
<td>Assumptions about audiences are often inaccurate. Organisations need to research and talk to their audiences. (BC)</td>
<td>Visitors rate various parts of the exhibition, what they enjoyed and found most interesting. It is critical that designers get this feedback. (LS)</td>
</tr>
<tr>
<td>Methods of audience understanding such as focus groups and informal conversation are rarely used by client organisations. (BC, SF)</td>
<td>Visitors may be best able to reflect on the value of their visit after leaving so organisations need ways to maintain contact with them. (PW)</td>
</tr>
<tr>
<td>I have never worked on a project where evaluation is built into the project. (BC)</td>
<td></td>
</tr>
<tr>
<td>We conduct our own evaluation, gathering data from the internet, visiting our exhibitions as audiences and looking at other people’s exhibitions to see how they work. (BC)</td>
<td></td>
</tr>
<tr>
<td>There are benefit in considering interpretive exhibitions as temporary, with the potential for ongoing development and change in response to audience feedback. (BH, SF, BC)</td>
<td></td>
</tr>
</tbody>
</table>

Propositions for investigation in the case studies:

An institution’s lack of knowledge about audience interest and needs can create unstable foundations for design.

Formative and summative evaluation is under-utilised by client organisations and designers, particularly in relation to design outcomes.

Professional background

Many designers enter exhibition and interpretation design from other fields of practice, meaning the skill set of any individual interpretation designer can vary widely. Interpretation design projects can be highly complex, with many factors contributing to their development. Where theoretical knowledge and expertise are lacking within a
project team, the foundations for such design decisions may be flawed. All interviewees were asked about their professional background and formal training. The five interviewees practicing as interpretation and exhibition designers have each been trained in different fields: architecture, landscape architecture, industrial design, furniture design and sculpture. As a result, each undoubtedly brings a different skill set to their practice. Prior training and background may influence a designer’s philosophy and perceptions of their role. Professional background is likely to affect sources of professional development and professional alliances.

Interviewees indicated the lack of suitable professional development resources within the interpretation design field, many seeking out journals and opportunities in other disciplines such as architecture. This partly reflects the multidisciplinary nature of the work, with relevant content found in interior design, art and product design publications. It is also partly due to the perceived superior quality of publications in other fields, particularly architecture. One suggested reason for the lack of a solid body of research is that the field is relatively undefined.

Interviewees highlighted collegial networks and conferences as an important means of fostering collaboration and extending skills through alliances with related practitioners. Cunningham states the importance of relationships with competitors for professional development, through organisation such as the Design Institute of Australia, stating that he is willing to share information freely as each designer will interpret it in different ways. Cunningham also follows the work of artists and sculptors, international retail design, architecture and science. Freeman cites art galleries, interior design and architecture as fields of reference, particularly for learning about new products and materials. Freeman has also participated in interpretation-related conferences. Wilson cites online sources such as design publications, blogs and practice journals as providing professional development and inspiration, highlighting the currency of online materials compared to print resources. Table 16 lists the professional backgrounds of the designers interviewed.
There are no specific propositions arising from this topic for investigation in the case studies, it being included here primarily as evidence of the trans-disciplinary nature of practice and evidence that the field has not effectively consolidated knowledge from design and interpretation to provide training and ongoing professional development for practitioners.

The practitioner interviews provide insight into the field from a small sample of designers and related professionals, the data contributing to characterisation of practice and guiding case analysis. Interview data demonstrates that, although many designers have no formal training in interpretation, they espouse many of the principles expressed in the interpretation literature, specifically, that interpretation design aims to meet the needs of diverse audiences, engage visitors on multiple levels and create meaningful experiences for visitors rather than support simple information transfer.
Chapter Four presented a model of the foundation of interpretation design extrapolated from a synthesis of theory, professional practice and interviews with practitioners. It illustrates that project context, aims and audience drive design decisions and influence all aspects of design development. The typology of design outcomes is organised around the interpretive aims of engaging visitors through cognitive, affective and active means, as expressed in the interpretation literature and practitioner interviews. The framework is a practical tool that can be employed in planning and evaluation to ensure a suitable mix of types of experience appropriate to the target audience and project aims. The chapter highlighted issues in the practice of interpretation as identified by practitioners in relation to the impact of project specific factors on the designer’s role, the design development process and outcomes, such issues being examined in relation to two cases in the following chapters.
Chapter 5
World Heritage Exhibition Centre Case
Mount Tomah Botanic Garden

The World Heritage Exhibition Centre (WHEC) case study examines the roles undertaken by the interpretation design team through investigation of the project context, structure, process and outcomes. The chapter seeks to develop a deep, rich understanding of the processes and issues at play within the project that may have relevance to other interpretation design projects. It provides background to the project including the World Heritage values, stakeholders and project aims. The chapter outlines the structure of the exhibition development team and the development process, including the relationship between the interpretation design consultants and other contractors. I describe the exhibition in some detail, following the intended or typical visitor path from the building entry through the interior and exiting into the garden. Themes, content, exhibition furniture forms and other design elements are outlined as a visitor might experience them. Following the description, I discuss design constraints and opportunities and other issues related to the development of this interior interpretive exhibition environment. Topics that emerged from the case data are examined in a sequence of design context, process and outcomes. This analysis draws on a wide range of data sources including project documents, communications, stakeholder interview, observation and my professional experience.

This case and that presented in Chapter Six are among the first to be undertaken in the field of interpretation design. As such, they examine overarching aspects of each project. Chapter Seven analyses the two cases, addressing the central questions of the thesis and the propositions raised in Chapter Four.

The World Heritage Exhibition Centre is an interior exhibition environment that aims to communicate the significance of the Greater Blue Mountains World Heritage Area. A thematic display combines sculptural exhibition furniture, large format photographs, graphics, sound and film. The project was selected for study because the interpretation of nature is at its core. Aiming to interpret eight national parks within an interior exhibition space, it presents numerous design challenges that are deserving of analysis. I was closely involved in the project for the research and concept design stages. My direct experience and knowledge of the project adds a further level of understanding to the research.
The case does not present the World Heritage Exhibition Centre project as representative of the interpretation design field, there being no usual practice in terms of project structures and design approaches or processes in the field beyond a broad sequence of design stages: concept, design development and documentation. The WHEC project reflects how, in small institutions and projects, project models and methods are often informal and varied. In such projects, designers may need to adopt a more diverse and mediatory role than in other contexts, with fewer professional boundaries. Many such commissioning organisations have never undertaken an interpretive exhibition design project before and may never do so again. They receive funding for one project, often managing it with limited resources and expertise. The World Heritage Exhibition Centre is one such example, with some features common to other projects of this scale and some aspects that are unique. Through its specificities, this case raises issues of relevance to a range of interpretation projects.

Background
Mount Tomah Botanic Garden is located on the Bells Line of Road, approximately two hours’ drive North-West of Sydney. It is on the northern side of the Blue Mountains National Park, some distance from Katoomba and the most famous Blue Mountains tourist sites such as the Three Sisters. There is no public transport to the garden, so most visitors arrive by bus or private car. It is a destination in itself rather than a stop-over on the way to another major tourist attraction. Visitors are primarily Australian, including tour groups of mature aged visitors. It is a popular destination for residents in the area for functions, weddings and picnics. Children are not a target market.

Purpose - World Heritage listing
The WHEC was developed to communicate the values for which the Greater Blue Mountains World Heritage Area (GBMWHA) gained World Heritage listing and to inspire visitors to conserve and protect the area. To understand the context of the project, it is necessary to understand the scale of the World Heritage Area, the listing criteria and the values for which the area has gained recognition. A great deal has been written about these values, much of which is dense and complex, the salient points being summarised below.

The GBMWHA covers an area of approximately 1,026,044 hectares and comprises eight protected areas: Blue Mountains, Kanangra-Boyd, Gardens of Stone, Wollemi, Nattai, Yengo and Thirlmere Lakes National Parks and the Jenolan Caves Karst Conservation
Reserve.\textsuperscript{363} Extending 220km in the north-south direction and up to 80km in the east-west direction, the World Heritage Area extends across 14 local government areas and at least six indigenous language groups, Figure 70.\textsuperscript{364}

![Figure 70. Map of the Greater Blue Mountains World Heritage Area.\textsuperscript{365}]

World Heritage listing acknowledges an area’s outstanding universal values and constitutes the highest level of international recognition. In summary, the area gained listing in 2000 for being of universal value to humanity as:

- an outstanding example of Australia’s characteristic sclerophyll ecosystems dominated by eucalypts,
- a significant representation of Australia’s biodiversity, and
- the habitat of a number of globally important threatened species.\textsuperscript{366}

\textsuperscript{363} Department of the Environment and Heritage, 2005, \textit{GBMWHA Draft Strategic Plan}, 3.
\textsuperscript{365} Department of the Environment and Heritage, 2005, \textit{GBMWHA Draft Strategic Plan}, 45.
The World Heritage Committee recognised two additional and connected values of the Greater Blue Mountains as being of national importance, but declined to recognise them as globally significant. These are the beauty of the landscape as perceived by humans and changing human attachments to the landscape in its natural condition over at least 12,000 years. The Aboriginal connection is of particular significance due to its longevity and continuity. Past Aboriginal management may also have influenced the area’s biology.367

The GBMWHA is acknowledged for numerous other important values, including geodiversity (Karst landscape walls, canyons, caves and pagodas) and biodiversity, water catchment, indigenous, historic, recreation and tourism, wilderness, economic, research and education, scenic and aesthetic values, which complement and interact with its World Heritage values. According to the GBMWHA Interpretation and Visitor Orientation Plan, it is important that interpretation of the area recognise the interrelationship of all major values of the GBMWHA. For instance, the story of Aboriginal occupation and land use is connected to existing levels of biodiversity and recreational values have supported artistic production and the conservation story.368

It is these specific and yet interrelated values that the World Heritage Exhibition Centre sought to communicate, with the aim of encouraging its conservation and ongoing protection through public appreciation, advocacy and support. The interpretation design team was asked to focus on the primary values for which the area gained listing and to include some of the other values, specifically karst landforms, scenic beauty, Aboriginal rock art and significant conservation history events such as those that occurred in the Grose Valley. Even within the GBMWHA Interpretation and Visitor Orientation Plan, the difficulty of articulating World Heritage values in plain language is noted. In an attempt to clarify these concepts, the plan provides a draft ‘standardised, stand-alone “values statement”. The result is a page long so is not reproduced here.369 During the project, the interpretation design team was provided with an additional attempt at summary of the World Heritage values in the form of the Greater Blue Mountains National Landscape Position Statement:

The Greater Blue Mountains is a place of extraordinary wild beauty, where the blue haze of World Heritage listed eucalypts is splashed across golden sandstone. It is an ancient land of 350 million year old cave systems.

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367 Ibid., 20.
368 Ibid., 20–21.
369 Ibid., 19–20.
serpentine slot canyons and the prehistoric Wollemi pine. Traditional Country of six Aboriginal language groups and Australia’s cradle of conservation and bushwalking, this accessible wilderness is on Sydney’s doorstep, but feels a world away.370

As a guide for designers the statement does not adequately identify the key topics and themes and does not articulate any conservation threats or actions, or identify community and governmental roles and responsibilities to care for and protect this area.

**Responsibilities for World Heritage**

As a signatory to the World Heritage Convention, Australia is obliged to identify, protect and maintain natural and cultural heritage of international significance. Two state government agencies have management responsibility for the GBMWHA reserves: the National Parks and Wildlife Service NSW and the Jenolan Caves Reserve Trust.371 World Heritage listing is not permanent and can be revoked if the area is not effectively protected and its values promoted.372 The World Heritage Exhibition Centre is one of a number of projects within the GBMWHA and its sub-sectors aimed at increasing protection of the area through public promotion and education via interpretation.373

The World Heritage Exhibition Centre exhibition was a joint project of the Royal Botanic Gardens Mount Tomah and National Parks and Wildlife Service NSW. Rob Smith, then Assistant Director of the Royal Botanic Garden, Mount Tomah was the project sponsor. Jacqueline Reid, Executive Officer for World Heritage, represented National Parks and Wildlife Service NSW and the Federal Government in relation to its World Heritage obligations.

**Community and political background**

Over the last century, the local and wider community of the Greater Blue Mountains area have undertaken significant conservation actions and political lobbying to gain National Park status and, more recently, World Heritage nomination. These people appreciate and use the Greater Blue Mountains area for recreation, work and leisure, being active advocates for its protection.374 Many passionate locals helped to gain support for the exhibition. Shifts in power and influence occurred within this group over time, together with changes in local, state and federal politics, each impacting on the project. The World

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372 Ibid., 13.
374 Reid, 2011, “Interview by Toni Roberts.”
Heritage Exhibition Centre was at one time planned as a stand-alone centre in national park bushland near the small town of Bilpin, but local political influences and budgetary concerns resulted in the location changing to Mount Tomah Botanic Garden. Stakeholders acknowledged that the available budget was insufficient to build on a greenfield site that would require all amenities such as toilets and electrical supply as well as creating a quality exhibition.

The nearby Mount Tomah Botanic Garden was selected as a more suitable site given that its visitor centre has a large car park, café/restaurant, toilets, education centre, shop and volunteer guides. The new space for the World Heritage exhibition was proposed as an extension of the main visitor centre.

The location was finalised through arrangements with local and federal government. Rather than being managed by National Parks and Wildlife Service as it would have been if located in Bilpin, Smith, Assistant Director of the Royal Botanic Garden at Mount Tomah, became the project sponsor, charged with managing and acquitting funds. This reduced the National Parks and Wildlife Service’s control of the project, although they remained in the Project Control Group.

Although this change was generally understood as a necessary outcome to provide a quality building and interpretive exhibition, it was seen by some stakeholders as a compromise that affected the project outcomes.

Commissioning organisations’ staff roles

The primary client roles are listed in Table 17.
Table 17. Commissioning organisations’ staff roles.

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation / Position</th>
<th>Role</th>
<th>Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rob Smith</td>
<td>Assistant Director, Royal Botanic Garden Mount Tomah (now Director, Blue Mountains Botanic Garden, Mount Tomah).</td>
<td>Executive Sponsor of World Heritage Exhibition Centre. Assisted research with National Park site visits and botanical knowledge.</td>
<td>379</td>
</tr>
<tr>
<td>Jacqueline Reid</td>
<td>Executive Officer of Greater Blue Mountains World Heritage Area. National Parks and Wildlife Service, NSW.</td>
<td>Project Control Group member, National Parks and Wildlife Service representative. Provided guides for consultants to visit National Park sites.</td>
<td>380</td>
</tr>
<tr>
<td>Janelle Hatherley</td>
<td>Manager of Public Programs, Royal Botanic Gardens Trust.</td>
<td>Project Control Group member, Education and interpretation specialist, Royal Botanic Gardens. Text review. Evaluation of completed exhibition.</td>
<td>381</td>
</tr>
</tbody>
</table>

A project control group (PCG) comprising marketing personnel, representatives from tourism bodies, Jenolan Caves and those listed above oversaw the project. Wider community consultation was undertaken through workshops and discussions led by the interpretation design team and informal consultation by members of the PCG with the groups they represented.

**Overview of the design process**

**Engaging the interpretation designers**

Mount Tomah Botanic Garden and National Parks and Wildlife Service NSW issued a public Expression of Interest (EOI) from which a shortlist of contractors was selected. A formal Request for Tender was then issued and all interested parties submitted a written submission, budget, project schedule and initial concept drawings. Shortlisted applicants attended an interview with the project control group at the Mount Tomah Botanic Garden. After undertaking substantial research and conceptual design work, Mothers Art was awarded the tender for the project.382

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379 Smith, 2011, “Interview by Toni Roberts.”
380 Reid, 2011, “Interview by Toni Roberts.”
381 Hatherly, 2011, “Interview by Toni Roberts.”
382 Mothers Art, 2008, “GBMWHA Exhibition Tender Proposal.”
The area of the exhibition space is approximately 125m². The architectural plan by Eales Trelise, Figure 71, indicates the area of the proposed extension.

![Architects’ plan of proposed exhibition space](image)

Figure 71. Architects’ plan of proposed exhibition space.

An architectural model by Mothers Art provides a three-dimensional view of the exhibition space as a lower ground floor extension on the sloping site, Figure 72. The ramps into the garden were later deleted from the design for budgetary reasons.

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384 Eales Trelease, 2009, “Preliminary Drawings, Mount Tomah Botanic Garden Exhibition Centre.”
An extract from the Mothers Art tender proposal shows a cross section of the proposed exhibition space with skylights and main windows, Figure 73.

**Objectives and Scope**

As outlined in the EOI documentation provided to prospective tenderers, the objective of the World Heritage Exhibition Centre was to provide:

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385 Mothers Art, 2008, “GBMWHA Exhibition Tender Proposal.”
• A gateway to the Greater Blue Mountains World Heritage Area, promoting other areas within the Greater Blue Mountains World Heritage Area;
• A means of identifying and presenting the values of the Greater Blue Mountains World Heritage Area;
• Educational resources and experience for diverse community groups and individuals;
• Information and resources for current and potential eco-tourism and mainstream recreational opportunities; and
• A range of visitor services including saleable items, information and products which bear a relationship to the Greater Blue Mountains World Heritage Area and the communities throughout the Greater Blue Mountains World Heritage Area.  

The scope of work outlined in the brief was as follows:

The successful tenderer will be required to develop, supply and install unique state of the art displays in both static and interactive modes, and associated printed / handout materials for the World Heritage Exhibition Centre. The displays can use a variety of two-dimensional, three-dimensional and audio visual delivery modes for engaging and educating the visitor.

The successful tenderer will be required to:

• Develop a concept plan for the interpretive elements of the World Heritage Exhibition Centre
• Produce a detailed interpretation plan (including exhibitory and graphic design components) for the display area of the World Heritage Exhibition Centre;
• Produce a design and manufacturing specification document aligned to the allocated budget for implementing the Interpretation Plan; and
• Produce and install the approved interpretative elements in the display areas of the World Heritage Exhibition Centre.

Within the EOI document, text development is not highlighted as an important task, not being listed within the scope of work. The lack of specific mention downplayed the task’s significance. The document stated that the shortlisted applicants would receive a detailed

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387 Ibid.
tender package including draft interpretive themes and messages however no such material was provided. Instead, the team received an extract from the GBMWHA Interpretation and Visitor Orientation Plan that outlined the World Heritage values and other significant values.388

**Interpretation Design Consultancy**

Mothers Art was a design and construction company specialising in art, interpretation, exhibition and sculptural works. The company was based in Melbourne from its founding in 1982 until it closure in 2010. This was among the last projects undertaken by the company. Table 18 lists the primary staff involved in design, management and fabrication.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Role</th>
<th>Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ian Bracegirdle</td>
<td>Director</td>
<td>Tender response, initial concepts, stakeholder consultation workshop, project overview.</td>
<td></td>
</tr>
<tr>
<td>Toni Roberts</td>
<td>Development Manager</td>
<td>Tender response, initial concepts, stakeholder consultation workshop, research and site visits, thematic framework, early design elements.</td>
<td></td>
</tr>
<tr>
<td>Neridah Wyatt-Spratt</td>
<td>Project Manager</td>
<td>Joined the project soon after the stakeholder consultation workshops. Research and site visits. Project manager during the design and content development phases. Text development.</td>
<td></td>
</tr>
<tr>
<td>Design team</td>
<td>Various industrial designers</td>
<td>Concept illustration, design documentation.</td>
<td></td>
</tr>
<tr>
<td>Biggi Spiro</td>
<td>Graphic design</td>
<td>Design of graphic style, design development presentation, exhibition graphics.</td>
<td></td>
</tr>
<tr>
<td>Fabrication team</td>
<td>Various fabrication staff and contractors</td>
<td>Fabrication of exhibition components.</td>
<td></td>
</tr>
<tr>
<td>Christopher Mether</td>
<td>Installation / project manager</td>
<td>Project management of final stages of fabrication and installation.</td>
<td></td>
</tr>
</tbody>
</table>

The Mothers Art team engaged on the project changed during the life of the project. In the early stages, the Director and I played key roles, reducing our involvement as the

389 Bracegirdle, 2011, “Interview by Toni Roberts.”
390 Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
project progressed and particularly after project manager Neridah Wyatt-Spratt was engaged. Wyatt-Spratt and I undertook extensive research including visits to key sites within the World Heritage Area.

Following usual practice within Mothers Art, a project manager supervised the project, with some creative and managerial input from the company director. Unusually for the company, there was no lead industrial designer assigned to the project, several designers sharing design components.\textsuperscript{391} Due to the predominance of graphics in the exhibition, the Senior Graphic Designer took a leading role, particularly in decisions regarding style and textural detail. The design process followed common practice in proceeding through the stages of concept design, design development, documentation, fabrication and installation. However, the 12-month delay between the presentation of design development and final documentation caused by client problems with the building tender affected aspects of the project including budget and design team staffing.

Relationship with other contractors
The client selected architects Eales Trelease to design the exhibition building as the company had previously designed the garden’s visitor centre. Garden Director Smith comments that, ‘We didn’t want to see a new architect coming in and wanting to leave their mark on someone else’s work.’ Smith states that he would have liked to engage the interpretation design team prior to the architects so that their needs and creative direction could inform the design of the building, but this was not possible due to the structuring of finances. This intent on the part of the client, even though it was not followed through, indicates that he saw the value in collaboration between the interpretation designers and the architects. Smith explains that, ‘If I were doing it again and I was able to manage those (processes) more effectively I would have liked the interpretation people to be selected before the architect started designing.’

Mothers Art had some communication with the architects regarding potential variations to specific building elements such as the skylights, theatre and side windows but this was not successful; no significant changes were made to the building during the interpretation design contract.

The researchers and text developer from Mothers Art consulted with a range of content specialists including botanists, National Parks and Wildlife Service staff, Jenolan Caves staff, conservation experts and local community members. Both Mount Tomah Botanic Garden and the National Parks and Wildlife Service NSW supported and assisted these

\textsuperscript{391} Ibid.
relationships. They were keen for the team to experience the sites first-hand to understand their qualities and differences. Photographer Jaime Plaza was a significant asset to the project, provided through the Royal Botanic Gardens. Plaza provided access to his vast catalogue of high quality photographs of the Greater Blue Mountains area and took new photographs and video including aerial photography. The National Parks and Wildlife Service image database provided free use of work by other photographers such as Ian Brown. These photographic resources were of great value to the researchers and the project as a whole and sat outside of the project budget. It would not otherwise have been possible for the designers to experience and understand the great diversity of landscapes, plants and scenery across such a range of environments that change over time and with the seasons within the timeframe demanded by the project. Nor would it have been possible to purchase the necessary quantity and quality of images within the project budget.

Film-maker Peter Borland was engaged to develop a short film from a selection of still images with a musical score. Mothers Art provided a storyboard of the film and collaborated closely with him to develop the final product. The exhibition fabrication and installation was largely undertaken within Mothers Art. Work such as the printing and electrical fit-out was completed by contractors.

**Project stakeholder experience and aims for the project**

Participants in the project had specific areas of responsibility and distinct approaches to the project. At times, these were misaligned. Smith, the Executive Sponsor for the project, had held the position of Director of Mount Tomah Botanic Garden for 19 years. His experience in interpretation was limited to small-scale interpretive initiatives such as the development of thematic garden beds with layback interpretive signage, an audio tour about the evolution of the Australian flora and large maps to assist visitors in way finding. According to Smith, ‘It’s the largest interpretation budget our organisation had ever put into a project. In the past we’ve done smaller projects with a lot of in house skills … but never anything of that size, so it’s set a benchmark for taking interpretation ahead in the gardens when we’ve got funding for it.’

Reid, the Executive Officer of World Heritage had a specific role to represent the government’s World Heritage responsibilities:

> I look after the World Heritage area. I don’t manage the land, but I try to manage the projects in terms of fulfilling the Australian government’s role as signatory to the World Heritage Convention. My role is partly funded by the
NSW government through the National Parks and Wildlife Service and partly by the commonwealth government, so I act for both agencies.

Reid also had no previous experience in interpretation projects. The member of the client team with the most experience in such projects was Hatherly, with a history in large public institutions such as the Australian Museum and managing smaller interpretation projects within the Royal Botanic Gardens Sydney.392 As Manager of Public Programs at the Royal Botanic Gardens, Hatherly was responsible for education, interpretation and volunteerism at a strategic level across the three sites.393 Interestingly, Hatherly did not take a leading role in the development of the content, which was included in the interpretation design consultancy’s role. Hatherly’s input to the text comprised a review of the content framework and text panel revision.

Arising from their differing roles in the project, these key players also had diverging aims and hopes for what it could achieve. Smith states:

I didn’t have a vision of what it was going to look like, but I had an emotional feeling of what I wanted people to walk away with. That was from my bushwalking in the Blue Mountains and the feelings I get from walking in the canyons and walking along the ridgelines … It’s like an ocean of land with vegetation on it and I wanted people … to be inspired to continue to convince governments to look after those areas and not have them degraded.

As the World Heritage Officer, Reid hoped the World Heritage Exhibition Centre would be a hub for dissemination of information about the World Heritage property. It would be connected with other visitor centres in the area:

The original concept was about creating a world class visitor facility that interpreted the values of the World Heritage property and help people to understand what was important and how they could engage … smaller centres might have a panel about that location in the World Heritage Area, but could link back to the exhibition.

Reid’s further aims for the project were that it would explain the significance of the World Heritage area and how it connected into the bigger scheme of World Heritage around the globe, and ‘feel connected somehow, and, depending on the individual, whether they’d feel inspired to go out and explore further.’

392 Hatherly, 2011, "Interview by Toni Roberts."
393 Ibid.
Hatherly describes her hopes for the project as, ‘The World Heritage Exhibition Centre was the opportunity to show people that humans sit in a natural environment in an unnatural way. How can we enjoy it and yet sustain it?’

These varied roles and intentions within the client group had some positive effects in that they represented a range of community interests and hopes for the project. However, they also affected what was achievable by the designers, who were answerable to all key stakeholders. The written brief to the designers represents the interests of both major parties, but in practice, Smith, the project’s sponsor, had greater control over the project. As such, the exhibition did not focus on information dissemination and connecting with other visitor centres or provide a global perspective on World Heritage as Reid had hoped.

**Early Consultation**

The World Heritage values were the starting point for developing an engaging exhibition, but they were very abstract and in need of interpretation and elucidation. At the start of the contract, Mothers Art conducted a community consultation workshop to harness the ideas of community members who had contributed to the World Heritage nomination and lobbying for its support. The group included professionals from tourism, marketing, education, science and some visitors. Mother’s Art focused the workshop around the themes of ‘story’ and ‘place’. The workshop influenced much of the design and content of the exhibition, especially in respect of a focus on the idea that people are part of the natural environment, nested within it, not sitting outside it. An Aboriginal participant said that even though the area spanned six different Aboriginal language groups, there was a commonly held idea that the trees hold the stories and are the keepers of the culture.394 This idea inspired the design of tree-like forms as the main vehicle for interpretation within the exhibition; visitors step within the embracing trunk to learn the stories of land, place and people.

The research and consultation phase of the interpretation project culminated in the GBMWHA Exhibition Interpretive Design Concept Framework, which sets out the key themes, topics, objects and stories for inclusion in the exhibition. This thematic framework was the basis for text development and the design of the exhibition furniture.

394 Mothers Art, 2008, “MTBGWHA Stakeholder Workshop Notes.”
and graphics; a summary is shown at Figure 74. At the conclusion of the concept design phase, Mother’s Art presented the framework, Thematic Overlay floor plan, Figure 75, and design illustrations to the Project Control Group for review. In this chapter and Chapter Six, plans and drawings are provided to indicate the scale and type of work undertaken and are not intended for detailed examination.

Figure 74. GBMWHA Exhibition Interpretive Design Concept Framework.

395 Mothers Art, 2008, “GBMWHA Exhibition Interpretive Design Concept Framework.”
396 Ibid., 1.
Design strategies

The Mothers Art design team came to the project with a predisposition to immersive, theatrical approaches to exhibition design and an object-centred philosophy of interpretation. The team aimed to create an experiential environment for visitors. Figure 76 is a diagram that Mothers Art included in their tender proposal to illustrate the multifaceted approach taken to exhibition design. The diagram shows the integration of physical, cognitive, emotional, aesthetic and social aspects that the designers aimed to address in developing the visitor experience.

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397 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”

The intention of the interpretation design team in this respect is further illustrated further by Figure 77, also from the Mothers Art tender submission. It shows the designers’ thematic approach to exhibition development, highlighting the interconnection between themes. These themes changed and developed with further research and consultation.

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399 Ibid.
Design Challenges

Designing an exhibition about nature that is not situated within the environment it references and is not based around a collection of natural objects presented some challenges to the design team’s immersion approach. The design brief focused on World Heritage values rather than storylines or themes. These values are the scientific and cultural reasons for World Heritage listing and are open to broad interpretation in terms of developing an exhibition. This latitude in relation to content, combined with the multiple constraints in terms of the physical exhibition environment created by the building design, posed significant opportunities and challenges for the design team. The interpretation designers’ role encompassed content research and development, while having limited control over key aspects of the exhibition environment's design.

Early in the process, the design team explored how to convey the World Heritage values and associated concepts through physical form to create an immersive environment and embed content within the space. Some of these initial ideas formed a foundation for the exhibition, with much of the development during the design process focusing on materials and methods for achieving these within the space and budget.

Figure 78 shows the proposed exhibition built form overlaid on the thematic plan at concept presentation stage, comprising tree forms, a walk-through slot canyon, a hands-on investigation area, a floor map and interactive multimedia experience in the theatre.

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Figure 78. Concept floor plan, built form.  

Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
The design development stage saw these concepts move into more detailed documentation of materials and form. Some exhibition components were further developed primarily through graphics, using layering of materials, cut-outs and textures. The early concepts were retained, but the look and feel of the exhibition changed significantly through this process, becoming more decorative and less stylised. Some elements related to the concept intent were discarded or forgotten as different design staff developed the design.

**Walk-through description of WHEC**

The visitor enters the Botanic Garden visitor centre from the car park, passing the small shop selling plants, books and gifts associated with the Blue Mountains. The humble entry offers no glimpse of the panoramic view ahead, Figure 79.

![Figure 79. Garden visitor centre entry and shop. Photograph by Rob Smith, 2009.](image)

Visitors enter a large foyer space from which they can go down to the café, or out onto the balcony, with a magnificent view out across the gardens to the mountain range beyond, Figure 80.
The deck connects with the roof of the new exhibition extension, which visitors can also walk on to look at the view. The garden is bounded partly by natural bushland and has views to national parks beyond. Smith says the garden uses hedges, walls and meandering paths as part of a ‘hide and reveal’ strategy to maximise the impact of these views.

To the left of the foyer is a wall with a large photographic image of a site within the GBMWHA and the title of the exhibition: World Heritage Exhibition Centre. This signals the exhibition entry via the stairs, but is not directly adjacent to it. The visitor must connect this welcome wall panel with the narrow stairway edged by a concrete balustrade, Figure 81. To remedy visitor confusion, garden staff have attached a laminated sign to indicate entry to the exhibition via the stairs.
As the visitor descends the narrow stairway to the exhibition, a small panel mounted on the bulkhead welcomes them to the exhibition, although it is easily missed, competing with the view outside, Figure 82.
At the bottom of the stairs, an entry panel explains the purpose of the exhibition and what World Heritage recognition means. The exhibition is also accessible via the lift located on the roof that extends from the balcony. Visitors entering from the lift arrive facing away from the orientation panel, so may easily miss it.\footnote{Smith, 2011, “Interview by Toni Roberts.”} Once within the space, visitors may freely explore the different exhibits in a non-linear sequence. Stylised natural features form the physical structure of the exhibition, primarily a number of abstracted tree forms covered with distinctive bark prints, Figure 83.
Each section within the exhibition has a colour scheme, vertical title panel and large-scale photographic images to identify the overarching theme. The four exhibition themes are:

1. World Heritage Place - orientation, theatre and exit
2. Lives of Trees - eucalypt diversity
3. Nature’s Stars - rare and threatened species
4. Work of Aeons - rivers lakes, caves and canyons

Theme titles are not essential to understanding the exhibition. Smaller text panels, images and objects detail particular stories or topics, each functioning as a stand-alone exhibit. Together, they communicate an overall picture of the GBMWHA and its human connections, including stories of conservationist bushwalkers, explorers, botanists and Aboriginal cultural stories.

Theme 1. Orientation - World Heritage Place
Theme 1 is about what the World Heritage listing means for the Greater Blue Mountains and its people and primarily comprises large-scale graphic panels with panoramic views of parts of the World Heritage Area combined with text about the importance of these areas within a global context.
Theme 2. Lives of Trees

The Lives of Trees theme focuses on eucalypt diversity and the character of native forests in the GBMWHA. Different species of eucalypt are represented through distinctive bark patterns in the form of a large-format photographic print on the outside (see Figure 83 for example). Visitors can stand within stylised tree forms to learn about some aspect of the forest and eucalypt biodiversity. Some real bark samples are installed as touch panels so that visitors can experience the feel and smell of the real thing, Figure 84.

One large tree form is a ‘fire tree’, in the typical tripod form of burnt out hollow trees, Figure 85. The form is made from burnt plywood, sealed to prevent the charcoal from rubbing off.
Visitors can enter the fire tree to view a short film about fire and its effects within the GBMWHA. A partially hidden image of a possum inside the fire tree illustrates that animals rely on burnt out trees as homes, reinforcing the importance of fire within a natural habitat. Making the fire tree wheelchair accessible required a two metre diameter, which detracts from the cosy tree-hollow feel and creates a rather imposing black form within the exhibition.

Theme 3. Nature’s Stars - rare and threatened species

Rare and threatened species is a complex topic. Many species in the GBMWHA are naturally rare, having evolved within specific microclimates that may exist in only one small location. Others are rare due to naturally occurring climate change and evolutionary forces. The majority are rare or threatened due to human impact or through activities such as farming and the introduction of foreign species. The interpretive elements within this section aim to succinctly cover a broad range of content about naturally rare species and those endangered as a result of human impact, through selected stories and representative species. Stories of human endeavours to protect rare and threatened species are included, from major actions to individuals making a small difference.
The most prominent element of this section is a vertical structure with a clear glass panel on each side, Figure 86. Samples of plants have been collected, dried and set into resin discs fixed into the glass. Other rare species are represented in graphics, creating a central feature that can be viewed from either side.

Figure 86. Nature’s Stars, Rare and threatened species. Photography by Toni Roberts, 2011.

A sliding magnifier is a design feature within this section that allows visitors to see fossils of now extinct plants such as the Glossopteris seed fern from the Gondwana period, Figure 87.
The Wollemi pine was famously rediscovered in 1994 within what is now the GBMWHA. Being one of the world’s oldest and rarest trees and highly sensitive to human impact, visitors are prohibited from the remote Wollemi forest area. The Mount Tomah Botanic Garden has a long history of association with the rediscovery and propagation of the Wollemi pine and has some of the most advanced propagated species found anywhere. The Wollemi is therefore an important story for the centre. The cast replica Wollemi bark touch panel shown in Figure 88 that enables visitors to experience the distinctive texture of a mature Wollemi.
Theme 4. Work of Aeons – Rivers, lakes, caves and canyons
Rivers and lakes are presented through large-scale graphics using cut-outs and set-backs to accentuate the feel of moving water, Figure 89.

![Image](image_url)

Figure 89. Rivers and lakes, Work of Aeons. Photograph by Toni Roberts, 2011.

The karst limestone geology that supports the biodiversity and eucalypt forest in the GBMWHHA is presented primarily through a stylised slot canyon and its accompanying video, Figure 90.
The stylised slot canyon offers the sense of enclosure and coldness of a canyon, with slivers of light from above and the sound of water trickling down through rock crevices. Around the outside of the slot canyon, other aspects of karst geological landforms are presented through large-scale photographs including Jenolan Caves, the Kanangra Walls and Gardens of Stone National Park pagodas. Aboriginal rock art from approved sites also features here. Rock samples, shown in Figure 91, are displayed for visitors to touch, illustrating the difference between the hard ironstone that forms the caps of the pagodas and the soft limestone that erodes more easily to create canyons and caves.

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*403 Ibid.; Hatherly, 2011, “Interview by Toni Roberts.”*
Theme 1 revisited. World Heritage Place - Theatre and exit message
The theatre features a short film that cover a broad spectrum of content from seasonal changes within the area to fire and its effects, close-ups of specific endemic species and broad sweeping vistas. As with the rest of the exhibition, images represent all eight national parks within the GBMWAH.

As visitors turn to leave the theatre, an exit message and large graphic encourages them to support and maintain this important area, Figure 92.
Visitors then leave the exhibition via the stairs, lift or directly into the garden.

The garden and beyond
The exhibition forms a backdrop to the visitor’s journey through the garden, with threads of content and plant species making connections with the content experienced within the World Heritage Exhibition Centre, rather than a focused World Heritage Area species garden experience. According to Smith, volunteer guides will encourage visitors to explore the garden to continue to learn about the World Heritage Area and its treasures. Layback signs will interpret the species and their relevance for visitors. Smith is keen to maintain unity within the garden, the graphic style for the garden panels therefore following the general garden signage rather than the World Heritage Exhibition Centre graphics, so visitors may not make the connection between the two.

From the rooftop of the exhibition space, as from the balcony of the main building, visitors can see across the garden to views of the mountains and national parks beyond. There is no interpretation on the roof, although this was considered during the project. A bronze plaque on the main visitor centre balcony identifies specific peaks in view but

404 Mothers Art, 2010, “GBMWHA Exhibition Design Documentation.”
does not refer to World Heritage as it predates the area’s listing. The rooftop features three large skylights clad in copper, Figure 93. These are a dramatic visual feature, yet have no significance either functionally or in terms of interpreting the environment.

Figure 93. Roof top skylights and view to national parks. Photograph by Toni Roberts, 2011.

Summary of design approaches, techniques and outcome types

Overall, the visitor experience emphasises the aesthetic value of the Greater Blue Mountains World Heritage area, through large-scale photography. Sculptural components referencing natural forms provide a distinctive feel. The exhibition focuses on sensory aspects of experience, more active experiences being provided in the garden. Table 19 summarises the design elements using the frameworks presented in Chapter Four.
Table 19. WHEC interpretation design summary.

<table>
<thead>
<tr>
<th>APPROACH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual arrangement</td>
<td>Thematic.</td>
</tr>
<tr>
<td>Physical layout</td>
<td>Free choice movement, optional loop (exit through entry).</td>
</tr>
<tr>
<td>Style</td>
<td>Stylised sculptural space referencing nature with some real elements.</td>
</tr>
<tr>
<td>Nature perspectives</td>
<td>Aesthetic, restorative, romantic, conservationist, indigenous.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TECHNIQUES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Immersion</td>
<td>Moderately nature immersive – tree forms, canyon.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>Interactive components – touch objects, magnifying viewer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTCOME TYPES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Think</td>
<td>World Heritage theme text.</td>
</tr>
<tr>
<td>Think/feel</td>
<td>Thematic text panels with indigenous, conservationist and historical content; film.</td>
</tr>
<tr>
<td>Feel</td>
<td>Tree forms, large-scale photographic imagery.</td>
</tr>
<tr>
<td>Feel/do</td>
<td>Rock forms, large-scale photographic imagery.</td>
</tr>
<tr>
<td>Do</td>
<td>Rock samples, bark touch panels.</td>
</tr>
<tr>
<td>Think/do</td>
<td>Fossil magnifier.</td>
</tr>
<tr>
<td>Think/feel/do</td>
<td>Slot canyon and fire tree interiors combine physical, audio visual, experiential aspects.</td>
</tr>
</tbody>
</table>

The description and summary demonstrate that thinking and feeling are more dominant modes of visitor engagement than physical activity. There are few interactive and no exploratory exhibits, although the designers sought to create a range of sensory experiences within the space.

**Factors that affected design**

All design outcomes represent a compromise between aims, differing stakeholder interests and the limitations of skill, budget and other practical factors. The following analysis is not intended to characterise the project as unsuccessful, as the exhibition has received excellent visitor feedback. Rather, the section explores specific aspects of the project to gain further insights into their impact on the role of the designer and design outcomes with a view to identifying criteria for optimal use of design in interpretive environments. Factors are examined in a sequence of context, process and outcomes. Topics focus on issues of relevance to the research questions rather than aiming to quantify the magnitude of impact. To maintain the flow of discussion, the many data sources are not referred to individually except where the individual author is significant such as in stakeholder interviews.
1. Project context

Location

The siting of the exhibition within a botanic garden is significant in relation to its meaning. Although the exhibition is about the wilderness, it is set within a manicured botanic garden. The issue of siting is identified as a problem for the NSW Parks and Wildlife project partner Reid, ‘Because of the chasm between National Parks ideology and Botanic Gardens ideology … it became a botanic garden project and … it lost that sense of a national parks-based World Heritage property.’ This was not considered problematic by Smith who argues:

The botanic garden is quite relevant to the national parks surrounding us and we have as one of our core values ‘conserving natural areas’ within our interpretation. One of the drivers is to encourage people to support the protection of large natural areas so that they don’t get developed…So it was a nice fit – fitted our values, fitted theirs (National Parks and Wildlife Service), so then we could start the project.

Hatherly has a different perspective on the relationship between the botanic garden site and the national parks the exhibition interprets, commenting:

If you were in the (national) park it wouldn’t have felt any different I don’t think…. It loses its value if it isn’t linked to the place you are visiting. They know they are in a botanic garden. That was my role, to make sure that linked.

The mismatch between the exhibition content about national parks and World Heritage Areas and the context of the botanic garden puts the exhibition design strategies at a disadvantage. Ideas are communicated not just through intentional interpretation but also through the site, the architecture and its affordances and the relationship with the World Heritage Area. For the interpretation design team, the location of the exhibition is conceptually and practically problematic for several reasons.405

Within a botanic garden, the primary view is a taxonomic one, often with a focus on aesthetic beauty and appealing to the home gardener. The organisation of the Mount Tomah Botanic Garden is largely based on themes and continents, all sharing a broadly cool climate habitat. It is not primarily about wilderness or wild places, although it espouses appreciation and protection of such places.406 The wilderness is visible in the

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405 Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
406 Smith, 2011, “Interview by Toni Roberts.”
distance but is not directly connected with the centre. This confuses the message about the reasons for World Heritage listing and does not support a coherent sense of place and context. However, this was beyond the control of the interpretation designers.

**Botanic garden audience**

Changing the exhibition centre location from a national park to a botanic garden brought with it a change of audience, with differing expectations and needs. Mount Tomah Botanic Garden has an established identity and appeals particularly to older visitors, many arriving on bus tours. It is a popular location for romantic picnics and weddings. Families visit for school holiday events but children are not a target market. It is not frequented by many bushwalkers and conservationists. Having originally been conceived for a different site, the project aims were not fully aligned with the needs of the botanic gardens audience. The project brief was not fully embedded in the vision and aspirations of the host organisation, an aspect that Fox considers a necessary condition for a project’s success.  

In a location such as a national park or other bush setting, a visitor experience could have been created that would have more effectively represented the aims set out in the project brief. A different audience could have been targeted and cultivated, such as younger audiences and tourists wanting to explore the World Heritage Area through bushwalking. The project’s final location largely dictated its audience, requiring some adjustment by stakeholders in their aims for the project. This occurred largely through the design process rather than prior to it, consuming significant design time.

The museum studies and interpretation literature generally associates extended visitor attention with positive aspects such as increased learning and engagement. In contrast, the client did not want to hold people in the area for too long. Smith wanted to give people a taste of the bush, some pertinent information, a compelling and emotive film experience and then get them to move into the garden or the café. Here, the client argued that firstly, tours groups are on a tight schedule, secondly, young children engaging in activities may distract other visitors and thirdly, the space does not comfortably hold more than 30 people. To address these concerns, the timed film with automatic curtain closing is used by the designers to encourage people to leave the space and continue their journey.

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Architecture

The most significant challenge for the interpretation designers was the building itself. The building had been purpose-designed by architects with little understanding of the requirements of an exhibition environment. They did not seek advice on these requirements during the design process. As a result the building was not well suited to an interpretive exhibition.

Smith sought to make the building secondary to the exhibition, stating:

I was really rude to the architects – I said I don’t care if you give me a black box. What people are coming to see is the exhibition, not the building. If we can put the two together and have a beautiful building and a beautiful exhibition that’s fantastic, but it’s the product inside that drives the visitors, not the monument to the designers of the building.

In reality, however, the building design proved to be a major constraint for the exhibition designers. Wyatt-Spratt argues that the architects did not understand fundamental requirements of an exhibition environment or consider of how people would use the space. Despite the Director’s desire to engage the interpretation designers early and have them inform the building design, this did not happen. The building design was approved before the interpretation design team were contracted. Further, the client was attached to specific design elements without a full understanding of the implications of these and their impact on the exhibition environment and visitor experience. Possible alterations to create a more suitable exhibition environment were proposed by the interpretation team, but were not approved. A number of key issues in relation to the architecture were at odds with the aims of the exhibition and the designers’ philosophy, not all of these being effectively overcome through the design process.

1. Entry to the exhibition

The exhibition entry is in the visitor centre foyer but is not welcoming or obvious. Visitors must descend a narrow staircase or go out onto the roof and enter a lift to access the exhibition, neither option being visually prominent from the entrance:

I think the design challenge was how to work with that space. It was very difficult – it wasn’t just even rectangular or just square. It was very narrow … it was downstairs. People had to choose to go down a stairway where they couldn’t actually see a great deal.409

409 Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
Smith explains the difficulty of getting people into the exhibition space:

People need more direction than we thought. It’s the orientation – go here, do this. The arrival in the exhibition space, because the welcome is upstairs, some people think that’s it and then walk out into the garden. Or (they) are daunted by the massive flight of stairs and miss the fact that there’s a lift there … People here obviously need more direction … So that type of direction is something we need to do more work on.

For the interpretation designers, such reliance on directional signage is avoided in preference for intuitive navigation. In a well-designed environment, architectural features and affordances can guide visitors rather than explicitly directing them. To ameliorate the counter-intuitive entry to the exhibition, the designers proposed several options for a more obvious and appealing entry, all of which were rejected. Figure 94 shows one entry concept in which the exhibition themes and furniture design from the exhibit is extended into the entry foyer area. This creates anticipation about what might be found in the exhibition and orients visitors before they enter the exhibition proper. Other options explored included vertical banners, printed graphics fixed to the balustrade and wall graphics within the stairway. However, the client did not approve these for development.

Figure 94. Entry concept.410

The completed wall graphic introduces the concept of World Heritage, but does not link with the stairs or effectively introduce the exhibition themes and style. This direction was

410 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
taken at the client’s request to minimise impact on the foyer and the view onto the balcony. Thus, several directions given by the client contributed to difficulties with visitor way finding and orientation at the entry to the exhibition space.

Further, the design of building elements prevented the inclusion of interpretive or orientation materials at the entry. The wall of the stairway was designed to the minimum allowable width; the addition of graphic displays would have breached building codes. Such simple impediments to interpretation design could have been rectified during the building design phase had exhibition designers been consulted. The result is that the entry signage is disconnected from the physical entry via the stairs and visitors get confused and lost.

In terms of conceptual orientation and connection with the exhibition, the stairway and lift down to the exhibition space do not provide a conceptual link with the idea of entering a wild forest, which is the primary focus of the exhibition. If reconsidered, the narrow descent could have represented entry into a cave or slot canyon, leading into a darkened theatrette. This would have been a logical context to create around the stairway. However, the building had been designed so that the theatre was located at the end with the most light and the best view.

The ceiling height of 2.4m is low and limits design options within the exhibition. A higher ceiling within the exhibition space would have provided more flexibility and could have been used to accentuate the feeling of being in a tall eucalypt forest. The designers’ capacity to create a welcoming entry and coherent physical and conceptual orientation was compromised by the building design and client preferences. For their part, the designers may have lacked persuasive power in such discussions due to ineffective articulation of the importance of orientation and intuitive way finding.

2. Skylights
The skylights are another example of the architects designing a building whose features create a very difficult space in which to situate an exhibition. The combination of the skylights and the vertical slit windows along both sides of the exhibition space create difficult lighting conditions for display of objects, text, graphics and video screens. Wyatt-Spratt comments that, ‘if that was an exhibition that required object conservation, it could not have happened. So that’s another reason why graphics were preferable as a main form of interpretation.’
Smith had hoped that the view from the skylights into the exhibition space would be tantalising and inspire visitors to go down to the exhibition. However, due to the narrow building and universal access requirements, this proved very difficult. Early designs took into account the location of the skylights and attempted to create items of interest below. Figure 95 shows one skylight (black lines) over an activity table in Area 2 and the other two over the canyon and exit in Area 4. The concept design for a children’s activity table, shown in Figure 98, would have offered an interesting view from the skylight above. However this concept was rejected by the Project Control Group, as were floor-based graphics in the area.

Figure 95. Floor plan showing location of skylights.411

With each stage of design development and review, the structures became more vertical and therefore of less interest when viewed from above; see Figure 98 to Figure 102 for the changes in design of the rare and threatened display. Suggestions by the exhibition designers for blinds, cut-out textural panels and other treatments for the windows and skylights were not approved by the client. Smith still hopes to resolve the view from the

411 Concept presentation, Mothers Art, 2008
skylights over time. Smith acknowledges, ‘One part I think we really missed out of the design … if we had placed one or two of the exhibits more for intrigue rather than for flow downstairs that would have worked. Although then people probably wouldn’t have been able to move through the exhibition downstairs (laughing), which is the architects’ fault.’

3. Theatre
Feedback from visitors, stakeholders and the design team shows that the short film is very successful. However, the designers have concerns about the placement of the theatre within the building. This location was largely informed by an experience Smith had enjoyed at another site.\textsuperscript{412} It also ties in with the ‘hide and reveal’ approach used within the Mount Tomah Botanic Garden to alternate screening and revealing of the views. According to Wyatt-Spratt:

Rob had a vision … and he wanted to relive that vision and I still don’t believe that was the best way. This was the whole thing of a vista that’s hidden from the public at the very end and then a curtain is revealed … Coming to a thing with only one part of the picture is very difficult and it also makes it much harder for the designers to work with.

The theatre was a contentious issue as Smith had briefed the architects on where to locate it. However, for the interpretation team, situating the large theatre space at the end of the room with the best view was counter-intuitive and expensive.\textsuperscript{413} It would have been better situated within the dark interior of the building so the curtains were not needed. The film experience is dependent on the reliability of automated curtain systems to close off the view every 20 minutes, any malfunctions in this technology making it impossible to show the film as the theatre is in full sunlight. This is a potential problem as the garden is prone to power outages from lightning strikes. This issue was discussed in some depth during the design process, with Smith claiming that the timed curtains provided a cue for people to leave the centre and move out into the garden. However, from an exhibition design perspective, the location of the theatre was problematic. When the curtains are open, the visitor is drawn towards the view only to have it taken away as the curtains close around them.

As with the skylights, this element of the building design is a result of the architect’s lack of understanding of the needs of exhibition spaces and the Director’s commitment to a

\textsuperscript{412} Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
\textsuperscript{413} Ibid.; Bracegirdle, 2011, “Interview by Toni Roberts.”
particular element without understanding the ramifications of its placement within the building and its effect on the exhibition as a whole. This ‘shopping list’ approach taken by the client, rather than a holistic informed approach to building design indicates the need for exhibition and interpretation designers to be involved during the building design phase. This is especially true for projects in which the architects and client are not experienced in interpretive exhibition design.

**Commissioning organisation’s understanding and valuing of design**

Despite the client’s inexperience and lack of understanding of some aspects of design as demonstrated through the architectural design, Smith and the Project Control Group demonstrated a strong valuing of design through the engagement of a single multidisciplinary team to undertake all content planning, design, text development and fabrication. This gave the designers significant creative freedom and enabled the coordinated design of text, object displays, exhibition furniture, graphics and multimedia.

The Director was committed to safeguarding the interpretation design budget and kept it separate to the building budget to ensure that it would not be whittled away during construction, this being a common problem within exhibition and interpretation.414 When the building costing exceeded the budget, additional funds were sought and the construction was retendered rather than consuming the interpretation budget.

2. **Project structure and process**

The project structure and process for design management shapes the context within which interpretation designers operate. According to Boyle, design project management is the holistic and proactive planning, coordination and management of all multidisciplinary ideas and processes involved in a project’s development.415 Best provides a range of definitions of design management, including that a design manager anticipates how design can contribute to an organisation’s strategic goals and develops the means for achieving this.416 Boyle argues that the key to successful design lies with clients rather than designers, clarity of intent being essential to managing progress and optimising creative opportunity.417 Kamien proffers five models of exhibition development teams for in-house museum projects as summarised in Table 20.418

414 ibid.; Hatherly, 2011, “Interview by Toni Roberts.”
Table 20. Summary of Kamien’s exhibition development models.

<table>
<thead>
<tr>
<th>Model</th>
<th>Features</th>
<th>Findings from experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curatorial</td>
<td>Most traditional model. Curator holds primary authority over the creative outcome. Similar to architecture model.</td>
<td>Product might not be in tune with visitor interests and concerns. Can limit the contribution of other staff members’ expertise, especially in relation to understanding visitors.</td>
</tr>
<tr>
<td>Team</td>
<td>Curator, designer and educator/interpreter share authority and responsibility equally and report directly to the client. Wider team members each report to one of these.</td>
<td>Effective in moving away from purely content-driven paradigm. Inefficient as there is no single authority to adjudicate differences and communicate with client. Lack of resolution of team issues can be evident in the completed work, e.g: fragmentation.</td>
</tr>
<tr>
<td>Developer</td>
<td>Senior content interpreter drives the vision, supported by large group of specialists. Senior developer takes authority and responsibility for the project as a whole and reports directly to the client. Similar to theatre model.</td>
<td>Reassigning authority from content specialists to interpreters shifted the emphasis from information presentation to interpretation. Challenges were made to central authority of the lead developer from several team members. Such a central role is very taxing on the developer, especially on larger projects over long time periods, leading to a turnover of developers. As team became more experienced with this model, they offered more support to developers, allowing greater delegation.</td>
</tr>
<tr>
<td>Broker / Project Manager</td>
<td>Creative equality between a designer and a developer, with a broker or project manager who reports directly to the client and takes responsibility for keeping the project on track.</td>
<td>Clear division of roles between creative team members and the broker, who attends only to issues of budget and schedule. Requires broker to understand and support the roles of other players including the client, so can be a hard role to fill.</td>
</tr>
<tr>
<td>Designer</td>
<td>Designer holds primary authority over the creative outcome. Similar to architecture model.</td>
<td>A focus on design concerns can result in beautiful exhibitions that do not hang together conceptually. Can limit the accumulated knowledge of other staff members, especially in relation to content. When a client cannot offer a clear vision for the project, the designer will invent one, but it may not satisfy organisational aspirations.</td>
</tr>
</tbody>
</table>

For Kamien, the success of each model depends on practice, clarity of role, authority and expertise of role. Each model may be more suited to particular organisations and projects and reflects an organisation’s emphasis on particular exhibition elements and types of visitor experience. For example, pressure to increase visitation for economic survival has
seen museums engage developers or interpreters to produce exhibitions with wider audience appeal. Placing the interests of the visitor at the centre of the exhibition development process downplays the more traditional focus on content.

Kamien argues that the choice of model is not of primary concern, but it is essential that a model be chosen and rigorously implemented, with all contributors understanding where responsibilities and authority lie. She promotes the value of the theatrical or developer model in integrating the various specialties into a coherent whole. This model gives priority to the visitor experience while equally respecting content, presentation and interpretation.

The Director of the garden had a genuine commitment to working with a multi-disciplinary team and appreciated Mothers Art’s artistic approach, his personal engagement being an asset to the project. However, his dominance was problematic in the partnership with the National Parks and Wildlife Service. Applying Kamien’s exhibition development models, the project most closely resembles the architectural model in which Smith played the lead role overall, his vision defining the parameters within which the designers worked. With respect to the consultant design team, the model most closely resembles the developer model, in which the primary focus is interpretation, although design is also very prominent. The developer was required to undertake multiple concurrent roles, including researcher, writer and project manager.

Roles

Arguing that greater consideration should be given to the effective management of exhibitions, Kamien identifies specific roles that must be fulfilled, as summarised in

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Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
Table 21. Individual contributors may undertake more than one role, providing they have the necessary skills and attributes and are given the time and resources to complete the roles simultaneously. Problems that result when one of the roles is not fulfilled include impenetrable exhibits, those lacking coherence or those that are incomplete due to financial problems.

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Table 21. Summary of Kamien’s essential exhibition development roles.

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>Provides final approvals. Their support for the project is imperative.</td>
<td>How will institution resources support exhibition effort? Are the resources sufficient? How will project support institution goals? How will this be measured?</td>
</tr>
<tr>
<td>Content specialist:</td>
<td>Provide content and ensure its accuracy.</td>
<td>What ideas are fundamental to the understanding and appreciation of the exhibit? What are the most engaging aspects of this material? Which objects and archival materials will best support the content and interests of visitors?</td>
</tr>
<tr>
<td>curator/researcher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designer</td>
<td>Provide three-dimensional frame for exhibit and drawings to enable fabrication.</td>
<td>How will the space be organised for maximum coherence and best flow through the exhibit? How will the exhibit be made visually engaging? What props, environments or devices might support content and engage visitors?</td>
</tr>
<tr>
<td></td>
<td>May be primarily logistical role or may help to define content and its interpretation.</td>
<td></td>
</tr>
<tr>
<td>Content interpreter:</td>
<td>Interpret content for visitor’s appreciation and understanding.</td>
<td>What will the visitor bring to this experience? What organisation and selection of material, ideas and experiences will make the exhibit most accessible to its audience? What should the overall visitor experience be like?</td>
</tr>
<tr>
<td>developer/interpretive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>planner/educator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project manager</td>
<td>Oversee schedule and budget.</td>
<td>How should the process of creating the exhibit be organised? What processes and milestones should be established to meet deadline and budget? How will the project communicate with contractors and institution departments?</td>
</tr>
</tbody>
</table>

Kamien’s analysis refers only to in-house museum exhibition development, but the models and roles she identifies are relevant to projects in which an organisation contracts external interpretation designers. Applying Kamien’s list of essential roles to the WHEC project post-hoc, Table 22 shows the distribution of roles within the client organisation and design consultants.
Table 22. Roles of project contributors.

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
<th>Person</th>
</tr>
</thead>
</table>
| Client                      | Manage institutional resources. Provide final approvals. Direct project to meeting institutional goals. | Rob Smith – primary client, resource manager  
Janelle Hatherly – concerned with the Botanic Gardens’ institutional goals  
Jacqueline Reid – concerned with National Parks and Wildlife Service and World Heritage institutional goals |
| Curator / content specialist| Research and provide content, ensure its accuracy. Select and objects and stories. | None assigned within client organisations  
Neridah Wyatt-Spratt – researcher, writer  
Toni Roberts – initial researcher, planner  
Botanists, National Parks and Wildlife Service staff and other specialists consulted |
| Designer                    | Provide three-dimensional frame for exhibit and drawings to enable fabrication.    | Ian Bracegirdle – initial concept and sketches  
Toni Roberts – initial concept and floorplan  
Biggi Spiro – graphic design development  
Various Mothers Art designers – illustration and design for fabrication |
| Content interpreter: developer, interpretive planner, educator | Interpret content for visitor’s appreciation and understanding. | Neridah Wyatt-Spratt  
Toni Roberts |
| Project Manager             | Oversee schedule and budget.                                                     | Rob Smith – internal Botanic Gardens manager  
Neridah Wyatt-Spratt – project development manager  
Christopher Mether – fabrication and installation manager  
Ian Bracegirdle – higher level oversight |

These shared roles and blurred distinctions do not meet Kamien’s essential conditions that all roles must be allocated to someone, the roles must be known and accepted, the person must be capable of fulfilling the role and they must be allocated sufficient time and resources to carry out the role.\textsuperscript{421} During the early stages of this project, the role of designer was not separate from other roles such as project manager, researcher and text developer. The three leading team members developed all elements in collaboration, allocating specific items to other designers to illustrate for presentation. This was effective in the concept design phase, but design development would have benefitted from an experienced designer coordinating and developing the detail of all forms.

\textsuperscript{421} ibid.
materials and interface with the building. One of the factors that prevented this was a change in staff and an inability to secure a new Senior Designer within Mothers Art. The project suffered from a lack of design leadership, changes in materials and style through the design process impacting on experiential and interpretive outcomes. The predominance of graphics as a form of communication within the exhibition meant that the Senior Graphic designer within Mothers Art took a leading role in design decisions regarding style and textural detail, but she did not have sufficient knowledge of three-dimensional and spatial design to lead the project as a whole.

The client provided no detailed articulation of content prior to engaging the interpretation design team, the brief referring mainly to interpreting the heritage values as provided within the lengthy World Heritage nomination document. This meant that the design team had responsibility for shaping the thematic framework, developing storylines and writing text. The lack of clearly identified storylines and content within the design brief offered the designers freedom to shape the whole environment, however, the lengthy process of text development and consultation was costly because of the broad range of stakeholders to be consulted, this impacting on the design budget.

**Design and review process**

The World Heritage nomination and listing was a long and involved process, requiring significant documentation, complex bureaucratic procedures and much political manoeuvring. By the time the exhibition design commenced, stakeholders were ready to embrace a shift from text to visual form. However, the Project Control Group was not comprised of highly ‘visual’ people with skills in interpreting plans and technical drawings. Understanding this, the designers produced illustrative sketches and renders to communicate design ideas in meaningful ways. Design presentations were conducted in person so that items of concern or confusion could be clarified. This travel was a cost to the project, but was invaluable in communicating designs to stakeholders.

When asked whether she felt able to engage with and contribute to the design process, Reid commented, ‘I think the designs and layout and being able to visualise it and looking at it that way and this way and the schematics and overheads (overlays) … I think were really useful … there was enough explanation and talk about what it all means.’

Although Reid felt welcomed to collaborate and respond to the designs by Mothers Art, she felt that bureaucracy and hierarchy came into play, stating, ‘Overall, I was inspired by

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422 Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
423 Reid, 2011, “Interview by Toni Roberts.”
the process, I was also annoyed, frustrated and angry about the process, but that was not about the design or the interpretation – that was about the bigger project and how that was managed and run,’ referring to the dominant role played by Smith and the Botanic Gardens organisation. Smith agrees that bureaucracy and multiple stakeholders made the process more difficult, but for different reasons:

The big challenge for us was working with National Parks (Service), because with these big juggernaut organisations, you have a lot of people with vested interests. So we weren’t just developing an exhibition for Tomah, we were developing an exhibition that satisfied the National Parks’ agenda, the World Heritage Authority’s agenda, the state government’s agenda, the tourist agenda etc., rather than just the public … it made it very hard, but I think … we succeeded despite that. … And a lot of time went into bureaucracy rather than creative ideas.

These unresolved philosophical differences between the National Parks and Wildlife Service and the Mount Tomah Botanic Garden made the process more difficult for all parties.

Processes of consultation with the World Heritage Advisory Committee and Aboriginal representatives could not fit within the constraints of the design development and review process. Reid felt the effects of this, stating:

I felt really responsible in terms of getting better cultural input, Aboriginal cultural stuff and that didn’t happen. I don’t think there was enough … time for the advisory committee for the World Heritage Area to have input. These are the scientific, technical community indigenous representatives signed off by the state and commonwealth ministers to provide advice about the World Heritage property and … it was really a challenge to make sure that that was included.

Delay
Due to financial difficulties exacerbated by the project’s 12 month delay, Mothers Art was unable to appoint a senior designer for the project, instead using several designers on different elements of the project. The break in the project had far-reaching and unforeseen effects. According to Wyatt-Spratt, ‘You lose a lot of money just by putting it on hold. You lost money, you lost momentum.’ Wyatt-Spratt would have preferred to have the same design team for the entire project and to engage the fabrication manager much earlier in the process.
The delay led to a compressed timeframe for the installation, impacting on the quality and final finish. The key aspect Smith would have liked to change was, ‘to run it on time, without the 12 month delay … I think it would have been better to have a longer time for the install and to deal with issues as they came up.’ Wyatt-Spratt agrees, commenting that her major concern was the quality of the build due to the rush at the end of the project.

**Tree form design development**

The metaphor of trees holding the stories of a place, from local Aboriginal cultures, was the rationale for using stylised tree forms as the main vehicle for presenting content. At concept stage, it was proposed that each tree would hold within it a story, object or experience relating to the theme. The exterior of each tree was to be covered in a bark print of a specific species to highlight the differences between species and encourage visitors to appreciate them as individuals in a community of biodiversity rather than a homogenous mass of ‘bush’. Each tree had its species name in both English and Latin set within the graphic, Figure 96.

During the design development stage, the curved trees developed into faceted forms for ease of fabrication and installation. This creates an attractive form, but is less obviously recognisable as a tree. The original concept of simple, plain tree forms became more

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424 Mothers Art, 2008, “MTBGWHA Stakeholder Workshop Notes.”
425 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
426 Hatherly, 2011, ”Interview by Toni Roberts.”
complex and layered, Figure 97. Leaf cut-outs soften the transition from the vertical tree to the relatively low white ceiling. The species names in English and Latin dropped out of the design through the development phase, the trees becoming more decorative rather than helping visitors to identify specific species. This emphasised an aesthetic experience over an interpretive or educative one.

However, the trees are generally considered a successful design element within the space. Physically, they create embracing spaces that partially block light from the windows. Conceptually, they provide a meaningful context for a range of story elements related to eucalypt diversity, early exploration, and conservation actions. However, their impact is reduced as the low ceiling means that they lack the height and grandeur to echo a eucalypt forest.

**Rare and threatened species section development**

The area interpreting rare and threatened species proved the most difficult for the designers to resolve, undergoing more significant changes through the design process than any other area. This was due in part to confusion about the needs of the client, assumed interpretive aims, together with the constraints of the space, complexity of the

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topic and the lack of a specific collection of objects. The design was not finalised until the project was in the build phase.

At concept stage, a hands-on activity area was proposed to engage visitors in discovery and social interaction, Figure 98. It was to focus on objects such as fossils, preserved specimens and models and to offer an interesting view from the skylight above, which looks down on the table.

This concept was rejected as the client was concerned that creating a play environment may encourage children to stay too long in the area. The second approach, shown in Figure 99, also offers discovery and engagement suited to a more adult audience however this design was not approved.

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429 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
Figure 100 shows a later design for spinning panels with information about rare animal species together with a glass panel illustrating plant species.
The spinning panels were not approved so this area lost its interactivity apart from a sliding magnifier and a large Wollemi bark touch panel shown in Figure 101 and Figure 102.

![Figure 101. Nature’s Stars wall showcase, revised.](image)

Initially, the designers assumed a general aim of gaining and maintaining visitor attention, encouraging visitors to interact with displays. However, in discussion about proposed design concepts, the client expressed the opposite: that they not want visitors to stay in the area too long and did not want to encourage children to play. As a result, despite the designers’ philosophy of encouraging learning through play, social

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432 Ibid.
433 Ibid.
engagement and sustained investigation of object displays as espoused in the interpretation literature their designs for this area became static and information-focused.

**Canyon development**

Slot canyons are a distinctive feature of the Greater Blue Mountains Area but one that most visitors will never experience as they are often hard to access and require knowledge of the location and bushwalking skills. A stylised canyon concept was in the initial concept for tender, to give visitors a sense of such an experience, Figure 103.

![Figure 103. Canyon / cave concept.](image)

The canyon design went through several iterations and was then changed again after the project delay and resulting budget issues. Figure 104 is an illustration of the proposed scale and wall treatment.

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434 Mothers Art, 2008, “GBMWHA Exhibition Tender Proposal.”
The stylised slot canyon concept was not intended by the designers to create a realistic experience but serves as a sensory walk-through environment. The stylised canyon walls simulated a slot canyon’s confined space with shafts of lights from the skylights, Figure 105.

The materiality of the structure was integral to its sensory impact, but was compromised in its implementation. The central section, designed to be lined with real rock and corten steel to provide a tactile experience, proved too costly and difficult to engineer. The

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435 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
stylised, contemporary interpretation of a canyon in corten steel and stone became a timber structure covered with vinyl, losing the coolness of materials and suffering a change in aesthetic. As a result, this feature is not entirely successful, some visitors reporting that it is an underwhelming experience.437 Reid says, ‘I was pretty gutted by the canyon effect ... that to me is a shrine to linoleum ... because it doesn’t feel like a canyon. It feels like a cupboard.’438 The sounds of water and the video of walking through a slot canyon are more successful, being evocative of a real slot canyon. As Hatherly states:

When you walk into that canyon, Jaime’s little video … you start looking at it and it’s as though you’re in a canyon! It works. So, those walls were great – if they could have had the look and feel of a canyon inside - that’s all that was needed. We just didn’t have the budget to do it properly.439

The changes to the material aspect of the design to meet budget requirements severely undermined its design intent and compromised its success. Floor lighting and a wide opening for wheelchair access reduce the sensory references to a real slot canyon. As with the fire tree, accessibility for all visitors was chosen over creating a dramatic experience that is not universally accessible.440 The designers and client held onto their vision for an immersive sensory experience rather than seeking an alternative design solution that better matched the client’s accessibility requirements and budget realities.

Maps

The design brief states that the exhibition is to connect with other tourism sites and National Parks and Wildlife Service visitor centres in the area, acting as a guide and resource centre for tourists. However, proposals for the inclusion of maps and tourist information were rejected within the design phase for a range of reasons. One proposal was to project a large-scale interactive map within the theatre space so that visitors could explore the GBMWHA from a satellite view and zoom in on key areas.441 Another proposal involved a printed map in the carpet in front of the large windows in the theatrette that identified the mountains and national parks in the view.442 The client selected neither concept for implementation. ‘Rest and Read’ bench seats were also proposed, each housing lift out sheets with a range of information including tourist

438 Hatherly, 2011, “Interview by Toni Roberts.”
439 Ibid.
440 Reid, 2011, “Interview by Toni Roberts.”
441 Mothers Art, 2008, “GBMWHA Exhibition Concept Presentation.”
442 Ibid.
brochures. This concept was approved, with garden staff planned to build the benches in house to reduce costs, but this has not eventuated.

As such, the exhibition does not serve as a tourism hub or provide links with other tourist centres and information outlets. Some printed material is available at the Botanic Garden shop similar to that available at local National Parks and Wildlife Service visitor centres, but it is not integrated into the exhibition. The lack of inclusion within the exhibition is of concern in relation to the original aim of ‘connectedness’ with other sites and services within the Greater Blue Mountains. Reid’s vision of a ‘hub’ did not eventuate:

It’s just an added attraction to go to the garden. It’s not … ‘We’re going to the Greater Blue Mountains World Heritage Area, so let’s go to the visitor centre or the exhibition to find out what it’s really all about and where we should go.’

**Development of themes and text**

In this project, the design team had the latitude to develop the thematic approach, content and text, effectively undertaking curatorial, design and production roles. The designers were also free to obtain or create objects for display rather than being constrained by a pre-existing collection. It was understood that the consultancy was a multidisciplinary team who worked in collaboration.\(^{443}\) One of the key aspects of the brief was to offer a sensory experience to connect with visitors’ emotions. The selection of stories and drafting of short text pieces was done in conjunction with the design to achieve this aim. This offered significant creative freedom, but could have been better supported by a more thoroughly developed creative brief.

No thematic plan or framework was provided to designers as a basis for the exhibition, their development being part of the interpretation design consultancy. There are arguments for and against this approach. Within large museums, there is generally clearer delineation between professional roles and a designer would not be asked to develop themes and write content, although they may interact through the design process to hone messages, reduce signage or focus on a particular object.\(^{444}\) Many issues around conservation and World Heritage are complex and politically charged. Words are laden with associations and readers, each with their own agenda, have strong responses to words such as ‘wilderness’, or ‘rare’. These contentious terms have specific connotations and political associations within the fields of conservation and botany. Drafting the text

\(^{443}\) Wyatt-Spratt, 2011, “Interview by Toni Roberts.”

\(^{444}\) Ibid.; Hatherly, 2011, “Interview by Toni Roberts.”
required wide consultation and considerable redrafting, not only for accuracy, but for politically correct terminology.\textsuperscript{445} This became a drain on resources, with budget implications.

3. Design outcomes: communicating nature concepts
The area to be interpreted was vast, comprising eight national parks with a multitude of landscape types and plant species. The design intention is that the individual character and qualities of these landscapes are communicated to visitors within the exhibition. It was necessary to select representative elements from each national park within the exhibition to promote them equally, a challenge given the small space.

In line with both the reasons for World Heritage listing and the policies of the Mount Tomah Botanic Garden, animals and their role within the environment take a lower profile than plants and geology. Animals are seen as more readily eliciting public support and interest, but the interpretation designers were discouraged from using the ‘cute’ animal factor to persuade visitors of the value of the region. Rather, they were directed to focus on the unique landscapes that support diverse plant species and create microclimates that support very small populations of endemic plants. Indeed, Smith proposed that one of the primary project aims was ‘to make plants sexy.’

A stylised approach to depiction of nature was selected to create a clean, contemporary exhibition space that links with the rest of the visitor centre and is connected with the natural environment without attempting to replicate it. The WHEC design uses photography to illustrate distinctive large-scale environments and land forms. In many cases these were set within layered sculptural panels to integrate stylised forms and realistic imagery.

The interpretive elements emphasise that the geology of the area creates particular conditions that support unique microclimates and biodiversity of the region. In this way, the interpretation presents nature as a holistic system of enduring value. Although interpreting a vast area, the intimate and aesthetic portrayal emphasises the delicate balance of forces and systems in the environment. Conservation of the environment is presented in a historic and contemporary frame, but does not dominate the interpretation. Threats are mentioned but not demonised or emphasised.

\textsuperscript{445} Wyatt-Spratt, 2011, “Interview by Toni Roberts.”
The tree forms and canyon envelop visitors, drawing them into this stylised nature environment, rather than leaving them as passive observers. This subtly indicates that humans are part of nature, not separate to it.

**Natural objects**

That there were no specific objects to be displayed within the exhibition proved to be both a constraint and an opportunity. Objects often provide a starting point for stories and design concepts.\(^4^4^6\) The lack of predetermined objects meant there were few concrete springboards for design, other than the landscape itself. The design constraints were mainly provided by the difficult building design rather than by mandated objects to be included in the exhibition. The designers sourced some objects and created others according to the storylines developed. Real objects such as rock samples, fossils and bark touch panels are displayed together with replicas such as the Wollemi Pine bark and artistic creations such as the set of 103 ceramic eucalypt nuts.

**Nature Environment**

When questioned about the aims and success of communicating messages about living nature through non-living objects within an interior environment, the key project contributors believed it was possible at the outset and felt it was effective on completion. Smith, for example, states:

> The exhibition space for me was to take people on the virtual journey into what’s out there in that Wollemi National Park. I thought that could be done internally. And that was a mixture of finding real objects that people could look at and sharing stories of how people engage with that landscape.\(^4^4^7\)

Hatherly comments that, ‘I like the constructed environment. I wouldn’t actually like to work in National Parks – because I like creating a theatre and objects are a tangible link to the real.’ She emphasises the importance of the theatrical elements and the emotion they can evoke:

> I like interpreting things out of context, so that people then get excited to get into it. One of the serendipitous, brilliant outcomes was Jaime’s video … putting together those images with the music knocks the socks off people … That’s where you can do it out of the site and make it work very, very well.

For Reid, the exhibition environment was a mixed result:

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\(^{4^4^6}\) Ibid.; Cunningham, 2011, “Interview by Toni Roberts.”

\(^{4^4^7}\) Smith, 2011, “Interview by Toni Roberts.”
It’s still a box. It’s still that whole squeezing a million hectares and a million values into a box … I just think it should be a bit more about people and values, rather than making it fit a certain space … the whole building and the way it worked out and how it enhances the visitor centre is just great, but it’s just too botanic gardensy.

One of Reid’s aims for the exhibition was that it would encourage people to get out into the bush and explore the World Heritage Area. She discussed concerns about the prevalence of the nature deficit disorder among residents of the Blue Mountains Area. These residents are fearful of nature and its dangers and do not engage with the environment at their doorstep. She poses the question of whether the exhibition helps or hinders this problem:

Does interpreting nature in a building, in a built environment, does that … enhance the nature deficit disorder, or does it reduce it because people go there and they think, ‘Oh wow, I’d like to go and see that,’ or, ‘I felt this,’ or ‘I know the name of that tree now,’ or is it saying, ‘OK – you can get everything you need from nature right here in this room?’

Summary of nature concepts
Applying the categories of nature representation presented in Chapter Three, the WHEC interpretation design outcomes demonstrate a primarily ecologistic-scientific view of nature, emphasising an aesthetic approach to its representation. Content combines indigenous, holistic and conservationist values, with a lesser focus on scientific aspects. The film uses romantic imagery to elicit emotional connections with the landscape and promote conservationist ideals.

4. Other findings
Evaluation and remediation
Hatherly conducted a review of the exhibition, identifying aspects that require remediation or improvement. These include creating a more visible entry marker inside the exhibition, fitting a larger screen and more tactile experiences such as real rock within the slot canyon, minimising reflection and increasing contrast on acrylic panels and improving way finding into the exhibition from the lift on the roof.448

Other items with which the Mount Tomah Botanic Garden client expressed some dissatisfaction include the lack of an engaging view into the space from the skylight

domes and that some visitors do not recognise the blackened tree form as communicating
fire. Smith reported that visitors do not intuitively interact with the sliding magnifier,
which might require a sign to invite visitors to use it. Smith, 2011, “Interview by Toni Roberts”; Hatherly, 2010, “WHEC Remediation List.”

This may be related to audience type and to the location of the exhibition. In a museum context, visitors expect to interact
with displays and investigate objects; in the botanic garden visitors are less sure of how to
behave as it is neither a museum nor a tourist centre. Smith, 2011, “Interview by Toni Roberts.”

No formal evaluation of the exhibition has been undertaken with regard to visitor
response, although the visitor book has received overwhelmingly positive comments. In
relation to the success of the exhibition, Hatherly states that, ‘the key objectives of the
exhibition are achieved, you know, educating people about the World Heritage Area, the
role of plants, the diversity of the eucalypts etcetera.’ Wyatt-Spratt says the key messages
communicated are:

We need to take care of this World Heritage Area for people now and people
in the future … In the Rare and Threatened area, people did gain a sense that
this diversity supports very strong plant and animal life, which is constantly
threatened by urban and human development and the environmental changes
that happen.

Reid has some reservations, claiming a lack of focus on national parks and the work of
people within the area that led to World Heritage recognition:

There could have been a little more acknowledgement that … they are
national parks and that’s about people … who work here and people who
love national parks, the community and green groups that fought hard to have
these areas protected in the first place and ongoing protection.

Hatherly, however, claims that the National Park status of the area is unimportant:

Whether people recognise an area as Wollemi National Park, Kuringai
National Park, whatever National Park, they look the same to the ignorant
eye. Why I liked it at Mount Tomah, in the botanic gardens there, is because
it was in a cultural institution and the role of cultural institutions is to mirror
society and show society what it values … the key messages were not about a
specific acreage. They were about the concept of World Heritage listing, the
importance of nature, preserving for posterity what we have available to us
today.

These varying impressions are consistent with respondents’ differing views on the World Heritage Exhibition centre being located in the botanic garden.

**Case summary**

Design cannot necessarily be isolated from other aspects of a project when analysing its success and meaning. Ideas of nature are communicated through the design of specific interpretive elements such as the exhibition furniture, graphics, text, objects and their display methods. However, other powerful aspects include the site and broader context, the building and its affordances, the immediate exterior and views from within the exhibition. The case identifies that the designers were not engaged early enough to contribute to design of the building to ensure that it was suitable for exhibition purposes. The building design was a major impediment to the creation of a suitable physical environment and coherent visitor experience. It would have been ideal to engage the interpretation designers at the beginning of the project to inform the building design and conceive a meaningful exhibition space. Despite the client and the interpretation design consultants wanting this, it did not happen.

A more developed brief to the interpretation designers could have guided the design process and may have reduced design time and cost to the project. It can be concluded from the research that a developed brief was not supplied due to inexperience on the part of the commissioning organisations and unresolved disagreements among stakeholders about the location and intent of the exhibition. Had the clients and stakeholders worked through the process of developing a more detailed brief prior to engaging designers, they may have been more prepared and more resolved in their approach. Some design companies develop a ‘return brief’ as a first step in clarifying roles and expectations for a project. This may also have made the project more efficient in its design direction and use of resources. However, certain issues only emerge through the process of designing; through the conceptualisation and visual presentation of design solutions and resulting response and ongoing dialogue between the designer, client and content specialists.

Throughout the design process, the designers’ philosophy and vision was at times at odds with that of stakeholders, who were at times also in disagreement. The designers’ desire to avoid conflict due to a tension between the role of service provider and expert led to an acceptance of some unsatisfactory resolutions. Unwillingness on the part of the designers and the client to let go of certain visions such as the slot canyon and the skylights, rather than adapting to the realities of visitor flow on the one hand and budget constraints on the other also contributed to poor resolution and integration of certain design elements.
Other factors in this project that impacted on the design process were the multiple stakeholders, the compromises made by some and the dominant roles taken by others. The 12 month delay in the middle of the project had a significant impact, but could not have been foreseen. Staff changes within the interpretation design consultant organisation were a factor in design development; a consistent interpretation design team with a lead designer could have helped to carry key content and ideas from the project’s inception through to realisation as well as saving time and money.

Chapter Six presents the second case, Te Wao Nui, through a similar method and parallel structure, the two cases demonstrating notable similarities given the marked differences in context and content. Chapter Seven analyses the two cases, providing recommendations for optimal application of design in such projects.
Chapter Six
Te Wao Nui Case
Auckland Zoo

Chapter Six examines the Auckland Zoo Te Wao Nui precinct in respect of the interrelationships within the process, intent and outcomes of the project. As with Chapter Five, this chapter aims to develop a deep and rich understanding of the context for interpretation design and the factors that influence it. The case draws on a wide range of data including multiple site visits, project documents, communications, stakeholder interviews and my professional experience. The chapter presents the project background, project structure and a description of the completed environment. Through examination of the context, process and outcomes, the project is analysed with respect to the factors that shape designer’s role and the approaches taken by the zoo and designers to representing the relationship between people and the natural world.

Te Wao Nui is a precinct that showcases New Zealand’s indigenous flora and fauna, with a strong emphasis on conservation. The precinct focuses on diverse human relationships with the environment, encompassing both Maori and European perspectives across recreation, resource use and tourism. Organised into six habitats, it is based around a large, living collection of species, set within a combination of outdoor and interior environments. The interpretation utilises a wide range of media including sculpture, sound, theming, signage, video and interactive models.

This project is unique in New Zealand in its scale and scope and is the largest project Auckland Zoo has ever undertaken, being almost a zoo within a zoo. I was closely involved with the project as a member of the interpretation design consultancy team of Hatchling Studio and Motherworks. My involvement has afforded access to relevant documents and key contributors and adds significant contextual knowledge, depth of understanding and insight. I interviewed contributors to the project while it was in progress, gaining additional feedback through a review meeting once the precinct was opened to the public. Approximately four months later, I invited individual email responses to project contributors to gain further comments. Interviews with project contributors provide information and differing perspectives on the project methodology, the conceptual approach taken and the perceived success of outcomes.
Background

More than ten years in the making, Te Wao Nui is an ambitious project. Developed as a celebration of New Zealand’s natural world and Auckland Zoo’s conservation efforts, this NZ$16 million precinct was funded by Auckland Council and the Auckland Zoo Charitable Trust. Covering a fifth of the Zoo’s 17 hectares, the Te Wao Nui precinct comprises six distinct habitats representing iconic New Zealand landscapes and environments. These are The Coast (Takutai), The Islands (Moutere Rāhui), The Wetlands (Ngā Repo), The Night (Te Pō), The Forest (Te Wao Nui a Tāne) and The High Country (Whenua Waotū). With six walk-through aviaries and five interior environments, the precinct showcase more than 100 native plant species and over 60 species of native animals, many in mixed species exhibits. The interpretation design component was neglected until the latter stages of the project. It was nevertheless allocated a significant budget of NZ$1.2 million, far greater than for any previous project at the zoo.

The environmental background is significant to understanding of the project. New Zealand has seen a dramatic decline in native species since human occupation over the last 800 years. New Zealand was one of last places on earth to be settled by humans. Due to its isolation from other land masses for millions of years, a unique flora and fauna evolved, with 80 per cent of New Zealand’s trees, ferns and flowering plants being endemic.451 In the absence of any land mammals apart from bats, animals such as birds and insects evolved adaptations to take on ecological roles usually filled by mammals such as grazers, predators and pollinators.452 New Zealand is home to the world’s heaviest insect, the giant weta, the world’s only alpine parrot, the kea, giant carnivorous land snails, the world’s heaviest parrot, the kakapo and the national icon, the flightless nocturnal kiwi. The lizard-like tuatara is the only remaining representative of the sphenodont group of reptiles that thrived during the dinosaur era. Before the arrival of Maori from Polynesia in the 13th century, New Zealand’s range of endemic species included the world’s largest eagle with a wingspan of three metres and 40 species of flightless bird.453 Within a short time after Maori settlement, only 25 of these species remained due to the effects of hunting, fire and introduced rats. Among the species lost was the moa, a huge emu-like flightless bird that reached up to 3.6m tall. This in turn led to the extinction of Haast’s eagle that relied on the moa as a food source.454

452 De Roy, 2006, New Zealand: A Natural World Revealed.
453 Ibid.
454 Ibid.
When Europeans arrived in the late 18th century, mass tree felling for building houses and production of butter boxes for export decimated large areas of native forest. European species were introduced as game for hunting and farming. Accidental stowaways to New Zealand included rats, wasps and invasive plants. The combination of human settlement and introduced species has destroyed habitats and animal populations, including 42 per cent of native bird species.\textsuperscript{455} Australian brushtail possums have had a devastating effect on New Zealand’s forest habitats and are trapped and poisoned by the Department of Conservation (DOC). Destruction of habitat and animal and plant extinctions continues despite major efforts by the DOC and other organisations.\textsuperscript{456} The DOC is active in conservation management and regeneration of habitats and animal populations throughout New Zealand and the Ministry of Fisheries manages a range of marine sanctuaries and fishing quotas. Many small organisations with a more specific focus are also active in conservation, some of which contributed to the Te Wao Nui project.

Although New Zealand is renowned for its natural beauty, only a few iconic species such as the kiwi and kea are famous, whereas many other equally environmentally significant and endangered species are little known, even within New Zealand. This backdrop of the dramatic decline in native species and habitats, together with some major conservation success stories and ongoing actions, influenced the zoo’s plan to develop native fauna exhibits with a conservation focus. Te Wao Nui seeks to promote understanding of these issues and encourage a wide range of sustainable practices and conservation actions in the community.

**Overview of the design process**

**Zoo Staff Roles**

Like many zoos, Auckland Zoo has a very flat organisational structure.\textsuperscript{457} Director Jonathon Wilcken was responsible for the project, but was not involved in every decision, allowing other staff members to take leading roles appropriate to their fields of expertise.

\textsuperscript{455} New Zealand Department of Conservation Te Papa Atawhai (DOC), “Conservation.”
\textsuperscript{456} National Heritage Collection, “Endangered Species of New Zealand.”
\textsuperscript{457} Hanson, 2011, “Interview by Toni Roberts.”
Table 23 lists the primary zoo staff involved in the project and identifies those interviewed in the research.
Table 23. Zoo project staff.

<table>
<thead>
<tr>
<th>Person and position</th>
<th>Role in project</th>
<th>Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonathon Wilcken, Director</td>
<td>Project sponsor.</td>
<td>458</td>
</tr>
<tr>
<td>Michael Batty, Capital Works Manager</td>
<td>Site manager, Te Wao Nui.</td>
<td></td>
</tr>
<tr>
<td>Ian Fraser, Curator of Native Species</td>
<td>Native species and conservation specialist.</td>
<td>459</td>
</tr>
<tr>
<td>Andrew Nelson, Team Leader, Native Species</td>
<td>Native species specialist.</td>
<td></td>
</tr>
<tr>
<td>Jamie Bell, Interpretation Coordinator</td>
<td>Coordinator of consultation for text review.</td>
<td>460</td>
</tr>
<tr>
<td>Hugo Baines, Senior Horticulturist</td>
<td>Plant species specialist.</td>
<td></td>
</tr>
<tr>
<td>Monique Zwaan, Manager Discovery and Learning</td>
<td>Manager of education and schools programs.</td>
<td>461</td>
</tr>
<tr>
<td>Natalie Hansby, Sales and Visitor Services Manager</td>
<td>Marketing liaison.</td>
<td></td>
</tr>
<tr>
<td>Bernadette Papa, Maori (Ngati Whatua) representative</td>
<td>Maori cultural content specialists.</td>
<td></td>
</tr>
</tbody>
</table>

A zoo reference group contributed to the interpretation development. Comprising all the listed personnel and others as required, this group supported the project through consultation and design feedback. Initially, meetings were scheduled on a regular basis, but as the project progressed a core group was defined for more urgent consultation and approval to reduce demands on staff time across the zoo. Architect Logan Brewer was not a member of the reference group. Jamie Bell was a relative newcomer to the project and to the zoo, having been appointed as the Interpretation Coordinator in 2010. Although his role was seemingly central to the project, his standing in the zoo made him less influential. During the final text development stage, a group of specialists was consulted to expedite the review of text, coordinated by Bell.

Due to local political issues, for the first seven months of the interpretation design contract there was no Maori representation at reference group meetings. Bernadette Papa joined the group in July 2011, having some prior involvement and knowledge of the project. The United States-based consultancy Studio Hanson-Roberts assisted in the development of the precinct through master-planning and peer review. Hanson was interviewed in relation to the project due to her long-standing relationship with the zoo and knowledge of the project.

458 Wilcken, 2011, “Interview by Toni Roberts.”
459 Fraser, 2011, “Interview by Toni Roberts.”
460 Bell, 2011, “Interview by Toni Roberts.”
461 Zwaan, 2011, “Interview by Toni Roberts.”
Objectives and scope

The fundamental intent of the project appears to have changed little over its long period of development. Wilcken describes the interpretive aims for the project:

… to elevate what are otherwise relatively uncharismatic species … in people’s minds as important, interesting and unique. So, it’s got a very strong environmental education role in that sense … in terms of building that emotional connection which I think is an important environmental education goal … The other part is that the project shopfronts a whole lot of activity …

We are out there with conservation partners doing things actively to conserve native species. Join us!

Hanson’s vision was ‘introducing New Zealanders to the richness and preciousness of the native New Zealand species that used to call the place home … but because of their being dull brown and nocturnal … everybody can kind of drive them to the edge and forget about them.’ Fraser concurs, commenting that his sense of the project’s goal was ‘to get people enthused about native wildlife and its conservation and to make them think they and their actions can make a difference and to know what those actions might be.’ Zwaan argues that by elevating native species to being worthy of a zoo exhibit, locals should feel a sense of pride in their New Zealand identity. She hopes that Te Wao Nui will help visitors to have fun and fall in love with New Zealand wildlife, so they will leave the zoo feeling empowered with hope for change.

Early interpretation development

In the 15 years between the project’s conception and completion, the zoo experienced many changes in staff including several directors. Interest in the project waxed and waned over this time, gaining momentum under the former director Glen Holland. Wilcken took over management of the project when he became Director in 2007. He quickly became a passionate supporter of the project and allocated significant resources to it. However, he and other zoo staff had never undertaken a project of this magnitude and had little experience of interpretation, focusing instead on sourcing animals and preparing secure enclosures.

Architect Logan Brewer played a key role in the development of the precinct through landscape and architectural design. From his background in designing theatrical environments for aquaria, theme parks and theatrical events, Brewer brought an excellent understanding of the infrastructure required for interpretive environments as well as interpretive principles and techniques. Brewer’s work began the interpretive design
process through the landscape design, providing concept illustrations and landscape plans that communicated the theme of each habitat. Brewer designed interior spaces suited to interpretation and theming with a strong conceptual vision.

The zoo developed a document titled ‘Technical Manual’ that details the key objectives of the project, habitats, species description, their conservation and relevant aspects of Maori culture. The manual describes personal guides as the primary means of interpretation while including occasional references to interpretation methods such as a series of etched images of ‘fire trees’ as ‘rubbings’ for children to collect, but is otherwise unclear as to proposed interpretive techniques. At almost 35,000 words, it is not clear how this lengthy document was to be used in the project. According to Wilcken, the zoo was not sure of its purpose other than to inform the next iteration of interpretation documentation. The zoo continued to pursue somewhat unfocused approaches to development of the interpretation, contracting the development of a narrative script. Completed in June 2010, the script integrates much of the content of the Technical Manual, broken down into numbered items, some with proposed methods of interpretation such as soundscapes and models. The right hand column of the document contains text for audio narration; the purpose of the left hand column is unclear even to zoo staff, possibly being intended for signage or other audio guide options, Figure 106.462

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462 Interview, Ian Fraser, 2011
### 3.9 BOATSHED
Panel shows Penguin hatchery

<table>
<thead>
<tr>
<th>3.10 SUGGESTED AUDIO NARRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand has more types of sea bird nesting along its shores than any other country. A quarter of the world’s 360 known species breed here, and many of them are endemic – they breed nowhere else.</td>
</tr>
<tr>
<td>Some of our most endangered birds nest in the sand dunes. Before humans arrived there were very few predators, so the birds were safe. Today life in the dunes is far more dangerous – the birds are threatened by dogs, cats, hedgehogs, and a host of other pests – including people.</td>
</tr>
<tr>
<td>Without your help many shoreline species could soon become extinct.</td>
</tr>
</tbody>
</table>

### 3.11 SHORE BIRD BREEDING BEACH

<table>
<thead>
<tr>
<th>Fairy tern / Tara-iti</th>
</tr>
</thead>
<tbody>
<tr>
<td>The New Zealand Fairy tern has come so close to extinction that the Department of Conservation has stood guard over its nesting sites for decades.</td>
</tr>
<tr>
<td>This bird used to be found in many parts of the North Island and on the east coast of the South Island. Today it’s confined to just three places: Waipu, Mangawhai, and the south head of the Kaipara harbour.</td>
</tr>
<tr>
<td>It nests on the beach, so the little New Zealand Fairy tern is threatened by coastal development, high tides, and predators. If people get too close they can easily scare the birds away from their nests, leaving the chicks to die.</td>
</tr>
<tr>
<td>Other chicks are crushed when 4WDs and quad bikes drive over their nests.</td>
</tr>
<tr>
<td>A DoC recovery plan for the Fairy tern aims to increase the population by a quarter before 2015.</td>
</tr>
<tr>
<td>If you’d like to help the Fairy tern, DoC is always looking for volunteers to monitor nesting sites and report any sightings of pests in the area.</td>
</tr>
<tr>
<td>Tara-iti, the New Zealand Fairy tern, is our rarest breeding bird – there are only a dozen surviving pairs. One thing that makes the tern so vulnerable is the way it builds its nest - often it’s nothing more than a hollow scraped in the sand. The Department of Conservation and community groups work hard to protect nesting sites. Some areas are fenced off, and marked with warning signs. Rangers - many of them volunteers - keep a round-the-clock watch at other sites.</td>
</tr>
</tbody>
</table>

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This highly descriptive account of the visitor journey through the precinct supports the vision for the landscape as expressed in Brewer’s conceptual illustrations. However, by the time the narrative was completed, the zoo was losing interest in using audio narration within Te Wao Nui, rendering the script obsolete.

**Engaging interpretation designers**

After Brewer completed the design of the Te Wao Nui precinct architecture, builders were engaged and the zoo began preparations for contracting interpretation design consultants. In June 2010 the zoo issues the Request for Proposal (RFP) for Interpretative Art Director Services. The title ‘Art Director Services’ is somewhat misleading, the role being far broader in scope and involving more design work than this implies. The RFP included the Interpretative Design Brief, Technical Manual, Narrative Script and selected drawings by Brewer and set out the following objectives for interpretation:

- Set benchmarks for world class interpretation in a world class attraction.
- Deliver a coherent story that leads visitors on a journey through Te Wao Nui.
- Provide sufficient flexibility to allow visitors to experience Te Wao Nui their own way.
- Use a mix of media that inspires and delights the different groups within the audience (parents, children, international visitors, domestic tourists, students, Aucklanders and so on).
- Provide moments of magic that will keep visitors coming back.
- To tell stories to visitors experiencing Te Wao Nui about New Zealand’s taonga (treasures).
- Provide an equal balance of flora, fauna and culture.
- Empower visitors with the tools to find out more.
- Allow interested visitors to learn more in depth stories.\(^{464}\)

The project brief outlines the target audience for the Te Wao Nui project in order of priority:

**Traditional Zoo audience:**

- Aucklanders
- Young Family (children under 10 years old)
- Friends of the Zoo (central Aucklanders, frequent visitors)
- Casual Visitors (greater Auckland, annual visitors)
- International Visitors\(^{465}\)

Much of the brief was informed by a desire to weave together nature, culture and conservation. In some parts of the brief, ‘culture’ referred exclusively to Maori culture, but it also contained many references to European settlement, tourism, conservation and general human activities. The zoo’s architectural plan for the precinct had a predominant landscape immersion approach with some cultural immersion areas. The brief discussed extinct fauna and species not held at the zoo with the aim of painting a fuller picture of biodiversity, extinction and conservation issues across New Zealand. Figure 107, an early plan of the whole Te Wao Nui precinct provided to the designers, gives an indication of the extent of the precinct.

ibid.
For each habitat, a landscape planting plan and landscape reference images were supplied to the interpretive design team, examples for The Southern High Country habitat provided in Figure 108 and Figure 109.

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Figure 108. Landscape planting plan, The High Country. 467

Figure 109. Reference images, The High Country. 468

Setting mixed species exhibits within a meaningful context of habitats provided a solid foundation for building coherent interpretation and meant that conservation actions could be linked to habitats rather than to specific species.

The Technical Manual was out-dated several years by the time the interpretation design team was appointed. Even though the audio script had only been completed six months prior, it was also considered to be now inconsistent with the zoo’s thinking. To compensate for this, zoo staff summarised key messages for each habitat to a few dot points. The Islands habitat, for example, is described as follows:

**From accidental sanctuaries to active sanctuaries.**

New Zealand’s offshore islands have long been a refuge for our unique native flora and fauna, isolated from the mainland they have acted like time capsules, safe from humankind and introduced pests. When pests eventually found their way onto these accidental sanctuaries – putting many species at risk of extinction – people stepped in and continue to work towards restoring these islands as active sanctuaries for our native species. Now we even make new pest-free ‘islands’ on the mainland.

**KEY THREAT STORY:** Bio-security threat; pests are the biggest threat to these sanctuaries

**KEY TAKE HOME MESSAGES:** Respect island-landing rules; check your boat for rats and other pests

**KEY CONSERVATION INNOVATION:** Pest-proof fences

These briefing notes were intended to ‘provide a background document against which to measure the script and rationalise the stories to be told.’ There was no planning or strategy document that sat in between the very brief key message statements and the lengthy manual and script documents in terms of level of detail or strategic direction for the interpretation team, such as could have been provided by a content framework.

In 2010, Mothers Art prepared a tender submission and, after short-listing and interview, won the tender. During this period, however, Mothers Art went into voluntary administration and ceased to operate. This caused a delay and it was not until January 2011 that the interpretation design team members were appointed as individual

468 Ibid.
469 Auckland City Council, 2010, “Te Wao Nui Project Interpretative Art Director Scope of Services.”
470 Ibid.
consultants. This delay meant that the contract for design, development, construction and installation of all interpretive media was reduced from nine months to seven, exacerbating time pressure on the project.

**Interpretation design consultants**

The Art Director role as set out in the project brief encompassed concept design, technical design, graphic design, writing, art production and management, preparing tender packages, overseeing contractor selection, management of contractors for fabrication and installation of all works, audio visual production, signage production and resolving quality issues and timely delivery. One of the difficulties in responding to the design brief was the lack of information on relative weighting of tasks and roles. In particular, the RFP document focused on the technical design, fabrication and subcontractor management aspects, omitting any mention of strategic content delivery and concept development. The Scope of Services document mentions writing text only once on page two, giving little clue as to the scale and significance of this task in relation to the project as a whole.471

Based in Melbourne, the designers decided that a small team would be more efficient in terms of travel, communication and collaboration given the large scope of work to be completed within an extremely short time frame. The primary consultants engaged by the zoo were Ian Bracegirdle as Director of Motherworks and me as Director of Hatchling Studio, with David Gargiulo sub-contracted to Motherworks. Bracegirdle is an artist and former director of Mothers Art who has undertaken numerous zoo and museum projects around Australia. My background in education, writing and design were brought to my role in the interpretation team. Gargiulo’s skills as an industrial designer and illustrator were utilised in communicating concepts to the zoo staff and meshing interpretive works with the architectural plans. The team engaged Janneen Love, a Maori curator at Auckland Museum, as a cultural advisor in the early stages of the project. Dianna Wells was engaged specifically to develop the graphic style for the suite of signage. Table 24 lists the design team members.

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471 TWN Interpretative Art Director Scope of Services, Auckland Zoo, 2010.
### Table 24. Interpretation design consultant team.

<table>
<thead>
<tr>
<th>Person and Position</th>
<th>Role on project</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ian Bracegirdle, Director Motherworks</td>
<td>Team leader, designer, artist. Oversee design, budget, construction, reporting. Based in Melbourne.</td>
<td>Interviewed 472</td>
</tr>
<tr>
<td>Toni Roberts, Director Hatchling Studio</td>
<td>Designer, content manager, writer. Manage graphic design, cultural liaison, signage construction and installation. Based in Melbourne.</td>
<td>Author</td>
</tr>
<tr>
<td>David Gargiulo, Industrial designer</td>
<td>Designer, illustrator, technical designer, some cultural advice as originally from Auckland. Based in Melbourne.</td>
<td></td>
</tr>
<tr>
<td>Janneen Love, Curator, Auckland Museum</td>
<td>Cultural advisor for the initial stages. Based in Auckland.</td>
<td></td>
</tr>
<tr>
<td>Dianna Wells Design, Graphic designer</td>
<td>Graphic style designer. Based in Melbourne.</td>
<td></td>
</tr>
</tbody>
</table>

### Design philosophy

The design team of Hatchling Studio and Motherworks came to the project with a strong philosophy of immersive interpretation using art, objects and play as primary means of communication, supported by text, image and sound. For this team, interpretation design is about creating engaging visitor experiences and encouraging exploration and discovery rather than mere information delivery. Within the zoo environment, the team’s philosophy was to respect the primacy of visitors’ experience of nature, however constructed that nature environment may be. The design team wanted to create works that complement rather than overwhelm or interrupt visitors’ appreciation of the environment. Where it was possible to embed interpretation within a human context the team aimed for a predominantly naturalistic feel. In other areas a more theatrical, artistic or playful approach might be taken. Where Maori cultural elements were included, the team’s philosophy was that they should be authentic, relevant and approved by cultural representatives. Bracegirdle states:

> We hope to produce a result that is close to Te Papa, where indigenous culture is … not just seen as an add-on, or just paying lip service to the indigenous components. (We hope the visitor will) come out of it with a better understanding not only of how we cohabit with these animals … and perhaps embrace some of these culturally different principles of the Maori.

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472 Bracegirdle, 2011, “Interview by Toni Roberts.”
Consultation and review process

As with the WHEC project, the design consultants conducted a workshop at the beginning of the project to gather information from all stakeholders about their vision, aims and objectives. The Auckland Zoo workshop was limited to relevant staff, as no Maori representatives chose to attend. Consultation followed a similar model of wide inclusion of ideas which were then refined through discussion. The designers summarised content from the consultation workshop to inform the design process.

A meeting schedule was set for design review between the design team and the zoo reference group. It was often difficult to get all the necessary specialists in the room at the same time as staff did not get release from their regular zoo duties to work on the project. This was a hindrance for designers as timely feedback was critical to meeting deadlines. The standard staged design process for this type of work is presentation of concept, design development, documentation and fabrication. To save time, the design team did all of these at once for different components, staggering works to fit with progress on the construction of the architecture and landscape on site. The designers created a comprehensive matrix of all content and potential display items then worked their way through a prioritised list of items. The team presented various elements at differing stages of development at any given meeting. As the last habitat on the list, The High Country was often neglected in such discussions. The completed architecture and landscape was different to the documented plans so the designers needed to be highly agile and flexible in their methods.

Maori cultural collaboration

The zoo’s brief asked the interpretation design team to weave together nature, culture and conservation. As such, the design team considered it a priority to establish how to develop authentic Maori cultural elements. The zoo had no Maori staff and the Maori representatives on the project advisory committee had ceased involvement over the previous year to focus on local government business. The designers wanted to present Maori culture as a living, continuous culture, with a strong spiritual relationship with nature and practical use of natural resources, but with no Maori actively involved in the project the process for achieving this was not clear.

The design team understood that art could be a potent vehicle for interpreting Maori culture and that it was essential to engage the artists early in the process to enable them to meet the project’s tight deadline. The interpretation team’s Maori cultural advisor

473 Ibid.
introduced the designers to a group of highly respected Maori artists, TuWao. The TuWao artists were based to the north of Auckland but had had sufficient standing in the Maori community to be welcomed by Ngati Whatua (Auckland region iwi) for the project, which was a great bonus for the project as it could otherwise have required a significant period of negotiation and approval. The team comprised artists Bernard Makoare, Lyonel Grant and Manos Nathan, supported by Hinerangi Himiona and graphic designer John Ringer. In preparing the brief for the artists, the challenges presented by the project’s long history became evident. Over the period, many partnerships had been forged with Maori groups and iwi (extended kinship group or tribe). Previous cultural advisors had recommended locations and styles for Maori art that this artist team felt were not relevant or appropriate, such as entry posts and a raupo hut. The long history of changing Maori input made it hard for the zoo and the design team to trace the origins of these plans and justify their purpose, giving the artists significant power to determine what to include or exclude.

The artists’ responses to the environment and conservation themes aligned with the overall goals for interpreting Te Wao Nui and elevated the role of Maori art within the precinct. The artists brought a sophisticated approach to presenting Maori culture within a zoo context and questioned ideas and stories that had been part of the project for some time and challenged some cultural traditions. This exemplified the approach the design team sought to take in representing Maori culture; being respectful to the past, but still evolving, learning and living. However, as with the other elements of Te Wao Nui, the Maori contributions could have benefited from more time to develop a more extensive and integrated strategy across the precinct through closer cooperation with the interpretation design team.

**Developing the signage graphic style**

The interpretation team designed all signage plinths and panels to ensure the design, scale, materials and placement supported the general approach to interpretation. One of the key requirements from the zoo was that species signage was movable and changeable as the collection of species will change over time or content may need to change. It was essential that signage within aviaries be impervious to the effects of frequent wet weather, high humidity and inquisitive parrots with strong beaks. All materials had to be non-toxic should any animals ingest them. For this reason, glass was selected as the primary signage material within the aviaries.
The team engaged Dianna Wells Design to develop a graphic style for Te Wao Nui, including the main precinct entry sign, habitat entry signs, species signs, way finding signage and poetics. An important aspect of the graphic style was the relative position and size of the Maori and English species names. Nuances of design and text communicate perceptions of relative dominance, so it was important to get the balance right. Wells’ design sets the English language above the Maori for easy recognition by the majority of visitors. To balance this, the Maori language is in a bolder font and colour. Local Maori species names were selected in preference to the ‘most common’, as this eliminated potential bias and showed respect to local traditions. Where the Maori name is also the common name, signs have only one heading. English was used for all body text except in the precinct entry and exit panels that included a Maori welcome and farewell. This approach was met with approval by the zoo and Maori representatives. The zoo decided not to include Latin species names. The designers planned to integrate Maori design motifs or tohu into the graphic style but the Tuwao artist team did not provide the tohu just prior to production, limiting creative approaches to their integration. This caused considerable disruption to the graphic design process.

Dianna Wells Design worked closely with the design team and writer to develop a graphic style that suited the number and size of signs, location types and zoo requirements for panels to be removable and interchangeable. This co-development of text, structures and graphics was efficient and effective, producing a modular suite of designs for the whole site.

Text development

The design team treated text as one of their suite of design tools, text style, content and tone being integral to the overall feel of the interpretation. Given that the design team had already undertaken significant research and accumulated a body of knowledge and given my prior experience in developing and writing educational materials, it was decided that I would draft all signage text. Text was based on information provided in the Narrative Script and Technical Manual, species lists, research and direct experiences with some of the animals at the zoo and in the wild. The aim as described by the zoo was to communicate the character of each species, threats they faced and what conservation actions visitors could take. Bell acted as the conduit for feedback on drafts from zoo specialists and Bernadette Papa, while I communicated directly with Hinerangi Himiona and the graphic production company. With a very fast turnaround for text review and proofing, this became an efficient process conducted via email. As with the main design components, work was done in batches, with some items still being drafted while others
were being produced. During this stage, it became evident that the lack of definition of 
the designer’s role was beneficial and more efficient as the designer/writer was able to 
make decisions on text, layout and image selection directly with the zoo.

There were some differences in approach to text between zoo staff, Maori advisors and 
me. In line with interpretation theory, I preferred to focus on engaging and exciting 
audiences with informative stories about the species and their interrelationships as a 
motivator to conserve and protect. The Maori contributors wanted to provide a deeper 
Maori cultural element that could serve as an educational resource for Maori people. The 
zoo was keen to promote conservation actions. As the client, the zoo held sway on most 
decisions, although all parties had a commitment to the success of the project that assisted 
compromise and collaboration.

A constraint to the text development was that the number and type of signs was not 
finalised until late in the project, due in part to the changing species list. Even very late in 
the project it was difficult to get a complete list of animal and plant species to be 
interpreted because it was in constant flux, Figure 110.
### Walk-through description of Te Wao Nui

Visitors enter Te Wao Nui from a central area of the zoo, near the café and picnic area. It is a physically complex area, with the main arterial road running through it. The beginning of the precinct is marked by a large artwork and sign rather than a gateway as used in other parts of the zoo, as the road requires truck access at all times. This creates a

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474 Auckland Zoo, 2010, “Te Wao Nui Species Interpretation Plan.”
subtly-defined entry rather than a clear threshold. The primary entry marker shown at Figure 111 is a Maori sculpture, its design responding to two existing clustered timber structures on the opposite side of the road.

Figure 111. Entry sculpture. Artwork by Tu Wao. Photograph by Toni Roberts, 2011.

Interpretive text accompanies the artwork:

Tumu Herenga Waka is a sculpture combining traditional Maori elements of welcome, invitation and discovery. It is inspired by the tuwatawata (traditional palisades) surrounding Maori pa (villages). These tuwatawata have been gathered together to form tumu herenga waka (canoe tethering posts).

Just beyond the sculpture is an entry sign that outlines the precinct in both Maori Te Reo language and in English, Figure 112. This sign sets the style for entry signage to each habitat within Te Wao Nui.
Interpretive text accompanies the entry signage, introducing the Maori concept of Kaitiakitanga, or guardianship of the environment, Figure 113. This concept is revisited throughout Te Wao Nui. The Maori tohu used in signage throughout Te Wao Nui also relate to this concept.
Unlike most other precincts within the zoo, Te Wao Nui is not a single path walk-through experience, having numerous entry and exit points that connect with other precincts and which are not always prominent. This creates a challenge for visitors to navigate. For example, immediately the visitor has entered the Te Wao Nui precinct, they must take a sharp turn to the right to enter the first habitat, The Coast, see Figure 114.

![Figure 114. Te Wao Nui Entry and Coast entry visitor pathway.](image)

To help attract visitors around the sharp bend, the designers created a huge whale skeleton that draws them into The Coast, Figure 115. Passing through the skeleton, the visitor is conceptually oriented to the coastal habitat and threats to key species.

475 Motherworks / Hatchling Studio, 2011, “Te Wao Nui Orientation Structure Plan, MW-DD-00-i.1.”
Whales are further interpreted in a sign part way up the path. The path leads up to a seal viewing area where keepers present talks and displays of seal management. The main interpretive vehicle in this area is signage, its uniform design using natural tones and photographic images of each species as shown in Figure 116.
A Maori ceramic sculpture of a stylised figure sits atop a rock within this area, shown in Figure 117.
Signage interprets the story of Te Takutai:

The figure overlooking the takutai pool is named Te Takutai and represents the nature of the coastline around Aotearoa New Zealand.

The takutai is formed and shaped by the natural elements - it is always being reshaped but is strong and ever present. Te Takutai comes out of the sandy clay-baked earth to greet all those that come to share, enjoy, and care for our beautiful coastal areas.

The visitor then enters the first of the huts within Te Wao Nui: the boatshed. This is themed as a working fishing shed with two rooms. The first room focuses on relationships between penguins and humans through coastal activities. Two crates on the floor can be opened to reveal penguin nests: one a model, shown in Figure 118 and the other an audio-visual live feed from one of the nesting boxes outside.
The second room focuses on fishing-related issues such as quotas, marine sanctuaries and limits on shellfish collection. A range of objects supports messages about sharing the coast with native species, including displays within the workbench drawers, a pin-board with photos and newspaper clippings (incomplete in this image) and timed radio and television programs about sustainable fishing. Figure 119. Simple wall graphics communicate other key information.
This room of the boatshed is open to the aviary housing little blue penguins, dotterels and shags. The overarching theme within The Coast is sharing the coast with the native animals that live there. Within the aviary, the interpretation focuses on shore birds and caring for sand dunes. Threats such as dogs, cats and four-wheel drives are communicated through props such as a tyre track over a crushed nest and animal silhouettes among the plants.

The Te Wao Nui precinct attempts a holistic representation of habitats by also interpreting species that are not held by the zoo, such as the sooty shearwater and extinct giant penguin in The Coast. The model Royal Albatross landing on a rock shown at Figure 120 has just returned from a five year journey across the Pacific, Indian and Atlantic oceans. This exhibit reinforces the connection between local habitats and the rest of the world.
The visitor exits the Coast aviary and descends the path to a viewing area where they can watch seals under water, Figure 121. Interpretation does not impinge on this aesthetic experience, being limited to model bladder kelp and signage about the seals.

Exiting The Coast, visitors pass a collection of rubbish and fishing line wrapped around pylons with interpretation about the dangers of debris to seals and other sea life, Figure 122.
A large kaitiakitanga sign summarises key actions that visitors can take to reduce their impact on coastal habitats and take action to protect coastal species, Figure 123.
The Coast sets the scene for the habitats that follow in the visitor journey. Each habitat combines landscaped environments, sculptural elements and contextualised human environments:

- Entry signage for each precinct highlights the importance of each habitat type and the effects of human activity on it;
- Signage integrates the Maori tohu relevant to that habitat;
- Species signage uses photographs to assist with identification of plants and animals, its text providing some information on their character, relationship with other species and conservation;
- Maori artworks and interpretive signage tell a cultural story relevant to each habitat;
- Two- and three-dimensional interpretive displays communicate key conservation issues; and
- Kaitiakitanga signs list specific actions that visitors can engage in to support each habitat.

The second habitat in the Te Wao Nui journey is The Islands. The island hut is themed as a disused shack that has been over-run by nature and is now part of a Department of
Conservation managed island sanctuary. It houses the tuatara and several types of gecko and skink, Figure 124.

Directly in front of the tuatara case, interpretation includes a skull that shows the unique features of the animal including its third eye, Figure 125.
Model eggs in a burrow demonstrate how the ground temperature can cause baby tuatara to be male or female, Figure 126. Signage invites visitors to touch the eggs and feel the difference in temperature.
The primary message within The Islands is that, just as islands have naturally served as sanctuaries to certain species that became extinct on the mainland, so now islands are intentionally used as sanctuaries to re-establish populations of threatened species.

Within The Islands habitat is a re-creation of a traditional Maori raupo hut with thatched roof. In this area, native plants are interpreted with respect to their uses for Maori traditions of building, weaving baskets and making fishing nets. The Islands habitat includes a small island in the middle of the river that runs through the zoo. To one side is a huge timber structure, a replica kauri log dam. The loss of New Zealand’s great kauri forests is presented here, through signage and a model slice of tree set on a saw blade, Figure 127.

From the island, the visitor is faced with several options of where to go. A sign in The Islands encourages visitors to go to The Wetlands, rather than instinctively heading toward The Forest entry ahead, Figure 128.
On the way to the wetlands, a number of plant species are interpreted through signage along the boardwalk.

The Wetlands entry signage maintains the Te Wao Nui style, Figure 129. Text here introduces the importance of wetlands as nurseries for many bird and fish species and as water filters for other habitats.
Within the wetland aviary, signage describes the character and habits of the numerous bird species held here. The brown teal is a focus in this area as conservation efforts to save this species have had a huge impact on wild populations. The lush environment includes waterfalls and occasional mist effect, Figure 130.
A separate pool within the aviary houses long-finned eels, interpretive signage explaining their complex life cycle and migratory habits, Figure 131. This scientific information is complemented with a panel about the importance of eels in Maori culture.

A kaitiakitanga sign at the exit from The Wetlands reminds visitors of what they can do to help save wetlands and the species they support.
Visitors enter The Night from a cave within The Wetlands aviary. It is a dark and uninviting cave with gates as a necessary aviary lock, Figure 132.

Within the cave, a ceramic Maori sculpture is subtly visible, as are lizard paintings on the wall. Glow worms dot the ceiling. The Night is the most theatrical of all the habitats within Te Wao Nui. This very dark interior environment is themed as a beech forest at night. Stars twinkle above, a moon is projected into one of the display cases and tree trunks are set within both the cases and the visitor environment, Figure 133. The area is entirely lined with fake rock, aiming to create a sense of landscape immersion.
Signage is backlit, each panel individually adjustable so that it can be made legible without being too bright and imposing on the space. Two large cases house kiwi, one also with a morepork owl and the other with tiny bats. Extensive kiwi interpretive signage includes video footage of adaptations, breeding and threats.

A Trapper’s tent within this space houses a range of paraphernalia used by conservationist trappers who kill wild stoats and other pests. Objects include barrels of poison, skins of stoats and rats, bags containing kiwi remains, tracking equipment and a laptop with gruesome imagery of kiwi that have been mauled by dogs and other introduced species. The scary factor of this display aims to appeal to children, within a safe environment and with an important message: trappers are doing important work to protect this vulnerable native species by killing introduced predators such as dogs and stoats. This is the ugly side of conservation work, Figure 134.
A knot in a tree trunk provides a viewing hole into a fake bat’s home where a looped video shows a family of bats clustered together. Smaller cases house weta, giant snails and river species, Figure 135.

A huge sculpture of a giant weta hangs from the ceiling in the semi darkness near The Night exit, Figure 136.
Leaving The Night, visitors enter a DOC hut. The space is a hybrid between a laboratory and a field hut, interpreting the conservation work that helps to protect kiwi and another endangered species, the kakapo. This area focuses on the technological innovation inspired by conservation activities such as nest minding and captive breeding. From crates along the wall emanate sounds of birds inside awaiting release. A bookshelf, wood stove and tin mugs indicate human presence and show the basic living conditions in field huts. The kiwi section covers the main stages in the conservation program Operation Nest Egg. This area integrates real equipment and documents with more direct interpretive signage. It aims for a friendly scientific feel, with a strong interactive aspect, Figure 137.
The Kakapo Recovery Program section displays the nest minders’ kit, tracking methods and equipment. Play aspects include a kakapo-shaped beanbag in front of a green screen where children can see themselves on a television looking like a kakapo chick in a nest. An interactive computer game is based around tracking and finding kakapo in the forest, Figure 138.
As visitors leave the DOC Hut, navigation is again unclear, signage being needed to guide visitors to the next habitat in Te Wao Nui: The Forest. On the way, visitors pass sculptural signage known as the ‘Walk of Shame’. These three panels list New Zealand’s extinct species, reinforcing the fact that they are ‘Gone Forever’, Figure 139.
The Forest entry is marked by a carved wooden lintel over the aviary gate, Figure 140. The entry sign continues the Te Wao Nui style, with a distinctive forest green colour scheme and Maori tohu line art, Figure 140.

Situated inside the aviary, the largest Maori sculpture in the precinct is a figure of Tane, carved from a single slab of recycled timber approximately five metres high, Figure 141.
The interpretive signage reads:

This is Tāne nui a Rangi who obtained the three kete (baskets) of knowledge. His journey to get these kete was filled with many challenges. The challenges he faced remind us that knowledge is not always easily obtained and challenges are a part of learning and earning knowledge.

The artworks help to communicate Maori perspectives on the environment, combining traditional carving practices with contemporary cultural views. The Forest is a beautiful, contemplative natural space, containing a range of native ferns and canopy trees. Signage interprets nine bird species and some of the key plants on display. Content focuses on inter-relationships between birds and plants such as through seed dispersal and pollination. Distinctive wrought iron fencing has a different design in each habitat. Within The Forest it represents the distinctive unfurling frond of New Zealand’s Silver Fern, Figure 142.
A key conservation action within the native forests of New Zealand is to clean all boots and equipment to prevent the spread of dieback. This disease is carried in the soil and is affecting the remaining kauri forests. A real dieback station, consisting of a tank with sprayer and instructional signage is installed just outside the aviary gates, Figure 143. It is hoped that visitors will recognise the importance of using these stations when they next visit a natural forest.
Interpretation along the path from the aviary includes signage about canopy trees and forest insects. Colourful, oversized wire sculptures of the puriri moth, huku grub and velvet worm are nestled within the bush, Figure 144.

Figure 143. Dieback station, The Forest. Photograph Toni Roberts, 2011.

Figure 144. Insect sculptures, The Forest. Photographs by Auckland Zoo, 2012.
The interpretation design team proposed a series of poetic elements that aim to connect with visitors on an emotional level about appreciation of the natural environment and to illustrate that nature is an ongoing source of inspiration for writers and artists. Together with zoo staff, designers identified potential locations for text set into paths, logs and other landscape elements, including within The Forest. As project resources did not allow for their completion, it is intended that the poetic elements will be developed for the precinct over time.

The last habitat in the Te Wao Nui journey is The High Country, its key species being the kea, weka and blue duck. The kea is a clever and curious parrot with a strong beak, renowned for its destructive abilities. It can destroy the rubber mouldings on a car, shred a backpack or ruin a motorbike in search of food. No displays or artwork are possible within this aviary unless made from concrete, metal, glass or stone. Elsewhere in Te Wao Nui, the signage panels are removable so that content can be updated or swapped over as species change. However, in the kea aviary, within minutes of installing the glass panels with strong magnetic tape set into sturdy aluminium frames, the kea had popped one out of its frame. Signage within the kea aviary is now securely fixed with silicone, Figure 145.

![Figure 145. Kea signage, The High Country. Photographs by Ponch Hawkes, 2011.](image)

The High Country has two aviaries with an open area in between that will be the site for an adventure play trail, themed in keeping with the High Country landscape of a braided river bed. Incorporating a moa nest, uprooted trees and logs, a cave and sandpit with
bones of the extinct moa and Haast eagle, the adventure trail will be developed as a separate project once funds are acquired. Figure 146 shows a concept illustration for the adventure trail.

![Concept illustration for the adventure trail.](image)

Figure 146. Proposed adventure trail, The High Country. 476

The zoo requested that the story of introduced wasps be included within the High Country due to stakeholder interest. Introduced wasps multiply rapidly in beech forests, robbing native birds and insects of an important food source. The wasp story is interpreted through signage and a replica wasp nest suspended from the walkway canopy. Otago skinks are housed under the walkway that leads to the High Country Hut. This stone hut is themed as a trampers’ hut also used by Department of Conservation staff, Figure 147.

Within this hut, theming is sparse, consisting of historic photographs, old backpacks, a wood stove and small kitchen area with cupboards and tins of food. Interpretation includes a notice board with photographs of the high country, maps and information on wasps, release of birds, didymo (dangerous algae that affects inland waterways) and the changing snow line due to climate change. A notice about basic housekeeping rules reinforces the need to develop responsible habits to minimise impact on the environment. Inside the kitchen cupboards models depict threats to the high country such as introduced species and climate change.

The long bench shown in Figure 147 houses a sliding magnifier, displaying a range of freshwater aquatic insects, the primary food source of the blue duck. A walkie talkie gives updates on the release of some captive bred weka into the wild. A boot cleaning station within the hut illustrates the importance and simplicity of taking action against didymo, Figure 148. A wall poster accompanies the station to detail the dangers of didymo and how to avoid spreading it.
Hanging from a clothesline strung through the middle of the hut, T-shirts display humorous conservation messages about relevant threats such as wasps and cats, Figure 149.
The hut leads onto a balcony inside the second High Country aviary, housing the blue duck and kakariki, Figure 150.

As visitors leave The High Country a kaitiakitanga sign reinforces key messages encouraging sustainable practices in the High Country. Visitors cross a bridge to exit the Te Wao Nui precinct. To the left is a Maori sculpture, a huge, stylized version of the stone anchor at the entry, Figure 151.
Directly opposite the exit is a final kaitiakitanga sign that summarises the key conservation actions for the whole Te Wao Nui precinct in Te Reo Maori and English, Figure 152.
To the right an exit sign provides messages in Te Reo Maori and English that complete the visitor’s journey.

**Summary of design approaches, techniques and outcome types**

One of the most inviting and effective aspects of Te Wao Nui is that it is a beautiful environment to be in. This was an explicit aim identified by Wilcken, who believes that the more time people spend in a place the more likely they are to come to appreciate and understand it. In this way, the landscape supports and underpins the interpretation.

Through a mix of theming, interpretive displays, signage and art, storylines are carried through each habitat and in some cases across the whole of Te Wao Nui. Table 25 summarises the key topics and media used to interpret them.
Table 25. Key topics and interpretive media.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Primary Interpretation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat significance</td>
<td>Habitat entry signs, general signage.</td>
</tr>
<tr>
<td>Fauna species information</td>
<td>Species signage, sculpture, audio visual such as TV and radio.</td>
</tr>
<tr>
<td>Flora species information</td>
<td>Species signage (focus on Maori use), some grouped signage such as ‘Canopy trees’.</td>
</tr>
<tr>
<td>Introduced species and threats</td>
<td>Themed exhibits such as trapper’s tent, rubbish poles in The Coast, specific signage and sculptures such as wasps.</td>
</tr>
<tr>
<td>Human relationships with the land</td>
<td>Hut theming and props, audio visual such as TV show in boatshed, examples of impact such as tyre tracks over shorebird nest.</td>
</tr>
<tr>
<td>Maori traditional stories</td>
<td>Artworks and signage, kaitiakitanga signs, main entry and exit signs.</td>
</tr>
<tr>
<td>Maori cultural practices</td>
<td>Species signage such as flax, kaitiakitanga signs.</td>
</tr>
<tr>
<td>Significant species not held at the zoo</td>
<td>Sculptural works such as the wire insects, albatross and whale skeleton.</td>
</tr>
<tr>
<td>Extinctions</td>
<td>Walk of shame, sculptural works such as giant penguin. Playground: Moa and Haast Eagle.</td>
</tr>
<tr>
<td>Conservation success stories</td>
<td>Species signage such as Brown teal. DOC hut focus on kiwi and kakapo. High Country hut weka release.</td>
</tr>
<tr>
<td>Conservation actions for visitors</td>
<td>Kaitiakitanga signage, audio visual such as radio and TV in boatshed.</td>
</tr>
<tr>
<td>Appreciation of nature as source of inspiration</td>
<td>Poetics, artworks.</td>
</tr>
<tr>
<td>Augmented sense of place</td>
<td>Landscaping, soundscapes, theming effects such as bladder kelp.</td>
</tr>
</tbody>
</table>

In the outdoor environments, the main interpretation vehicles are signage and sculpture. Consistent graphic style creates a recognisable Te Wao Nui ‘brand.’ Kaitiakitanga signage offers a continuous thread of conservation action messages throughout the precinct. The thread of Maori culture runs through the precinct, presented through text and sculpture as a living culture with a deep connection with nature.

The interior spaces are used as interpretation hubs, with contextualised content ranging from a TV program about sustainable fishing in The Coast to interactive equipment such as the kiwi egg incubator in the DOC hut and gory displays of dead stoats, rats and 1080 poison in The Night. These environments are themed and somewhat theatrical, providing a distinctive sense of place and purpose in each. This contributes to the overall understanding of ways in which people interact with the land.
Interpretation in the precinct focuses on engaging visitors through feeling and reflective thinking in a highly immersive environment. Table 26 summarises the design elements using the frameworks presented in Chapter Four.

<table>
<thead>
<tr>
<th>Te Wao Nui – Interpretation Design Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPROACH</strong></td>
</tr>
<tr>
<td>Conceptual arrangement</td>
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<tr>
<td>Physical layout</td>
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<tr>
<td>Style</td>
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<tr>
<td>Nature perspective</td>
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<tr>
<td><strong>TECHNIQUES</strong></td>
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<tr>
<td>Immersion</td>
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<tr>
<td>Embedding</td>
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<tr>
<td>Interactivity</td>
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<tr>
<td><strong>OUTCOME TYPES</strong></td>
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<tr>
<td>Think</td>
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<td>Think/feel</td>
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<td>Feel</td>
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<td>Feel/do</td>
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<td>Do</td>
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<td>Think/do</td>
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<td>Think/feel/do</td>
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</tbody>
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**Factors that affected design**

Project factors that impacted on design are examined in order of context, process and outcomes, with a focus on issues generated by the data that relate to the research questions. The many data sources are generally not referred to individually except where authorship is significant such as in the stakeholder interviews.

1. **Project context:**

The zoo spent 13 years discussing possibilities for the project, the focus being largely on species and the overarching aspirations and aims of the project, without developing clear
messages, interpretation methods and what role each species and exhibit plays in telling
the story. According to Wilcken there tended to be a slight ‘collecting’ mentality through
this process, which he made attempts to redress. Staff changes during this time meant that
some legacy content and ideas remained, without clear justification or current support,
while others were continually re-worked as each new person became engaged on the
project. Further, Bell cites the long process as a reason for new people not being fully
assimilated into the project. Bell states that the ideas and opinions of newcomers were not
attended to as the project progressed, as others had already staked their claim.

**Zoo inexperience**

The zoo’s lack of experience in developing interpretation contributed to setting the short
timeline for design and the roles assigned to the interpretation design consultants.477
Wilcken speaks of the zoo’s general lack of experience, knowledge and strategies for
developing an exhibition of the scale of Te Wao Nui:

> There was a work stream that was working on the interpretive program and I
> think up until you guys (design consultants) took over it, relatively little of
> that work was valuable. And yet it took up an enormous amount of time ... if
> we started you guys six months earlier, we could have started with a blank
> sheet of paper and we could have a) saved a lot of money and b) saved a lot
> of time and we’d have probably got at least as good if not better results than
> we’re going to get ... to be frank, I don’t think anyone knew what to do with
> the interpretives at all.

This led to an imperfect, inefficient and expensive sequence of events, trying out various
approaches before inviting interpretation designers to join the project late in the process.
Wilcken comments that although they did not know how to engage with interpretation
design, he had a sense of the preconditions required for effective interpretation design, in
particular, the creation of inviting environments with a strong sense of place that people
want to spend time in:

> It comes down to quality of design and a philosophy of design that is around
> landscapes rather than buildings, which we’ve not completely realised in this
> project, but we’ve gone a long way to it so that you’re creating places that
> people love to be in.

477 Wilcken, 2011, “Interview by Toni Roberts.”
Zoo understanding of the importance of interpretation design

The zoo recognised that interpretation was essential for this precinct due to the nature of the animals on display, typically being small, brown and shy. Wilcken summarises the greater need for interpretation within the Te Wao Nui precinct compared to some other precincts:

So, if you were trying to communicate to people the wonder of an elephant, you just need to sit them in front of an elephant. You can do a lot more, but you can go a long way to your goals just by getting them close to an elephant. But if you’re trying to communicate the intricate wonder of the New Zealand environments and species, you need them to love being in the place that you’re talking to them about so that they spend enough time there to really get some glimpses of species that otherwise they wouldn’t pay much attention to.

Despite this recognition, the zoo did not engage interpretation specialists on the project early enough to make a significant impact on its overall design. Wilcken states that the zoo had not considered engaging interpretation designers or art directors until the need became evident. When developing the RFP, they began to understand that specific interpretation design expertise was required. Wilcken especially regrets the late engagement of interpretation designers in respect to the lost opportunity to gain their input into the architecture of the Te Wao Nui precinct. He argues that earlier engagement may have resulted in the creation of areas for people to gather together at particular points, offering more quiet reflective spaces, better infrastructure for signage, sculpture and other interpretive elements and more effective integration of the architecture and landscape, stating:

I would change it (the process) by bringing the interpretive plan forward to the beginning of the program, so that the … physical landscape design was informed, and vice versa, by the interpretive program … there are almost certainly interpretive opportunities and design opportunities that we’ve missed because we’ve done it in sequence rather than in parallel.

Bell supports this, commenting that:

Te Wao Nui was a very complex project due, largely, to the length of time it was developed under. This also meant that the two major designers on the project, architects and interpretive designers, completed most of their work independent or (or retrospective to) each other.
Bell notes that this is a problem common to other projects undertaken within the zoo, stating that, in general, the asset management team will commence a project and only seek to involve him after decisions about design and finishes have been made. He comments, ‘Then I come in at the end and it’s almost too late. There’s nothing I can do but put up a sign and that’s about it.’ Bell argues that it is more financially efficient to work with designers in the early stages to integrate theming and immersion elements rather than adding them afterwards. The zoo’s lack of integration of interpretation into projects across the board indicates that the zoo’s internal structures and processes have not adapted to the changing role of the zoo and the increasing significance of interpretation.

Once designers were engaged on the project, the Director moved quickly from having little understanding of interpretation to becoming a champion of its value. Interpretation design was no longer seen as a final stage in implementation, but rather as a creative process to be worked through. Wilcken states:

I think we started from the wrong end. Instead of starting with thinking about the language of interpretation, we started with all our ideas that we wanted to communicate. And that’s what ended up going into all of those various technical manuals and narratives and stuff like that ... as you guys (interpretation design consultancy) know about interpretation and what you can do and what you can’t do and what works ... That develops a language of its own which informs the sort of stories that will work and which won’t work. Whereas we started from the other end.

This is a much more sophisticated understanding than where the zoo began with the project, but it came too late to apply to Te Wao Nui. A more nuanced approach to interpretation may have been possible had this been the zoo’s starting point, enabling interpretation designers to contribute to shaping interpretive messages and focusing content, developing more thorough approaches to inter-weaving nature, culture and conservation and exploring a broader range of interpretation media and strategies within Te Wao Nui. The compressed timeframe limited the development of a shared language of interpretation design including its tools, strategies and options, with initial concepts frequently moving straight to production.

**Budget**

Te Wao Nui had the largest budget for interpretation of any project in the zoo’s history although it did not start out that way. Wilcken comments:
We didn’t even go into this project with ten per cent of the project fees available for interpretives … one thing that I would absolutely change in any future budget is that ten per cent is a minimum and ideally you’d go in with a greater percentage of the project cost directed to the interpretives because that’s what people are going to do. I would at least have doubled the (final) interpretive budget.

Through the course of the project, Wilcken came to understand the value of expenditure on interpretation:

So it’s only now, seeing the reality on the ground – in terms of the impact that it can have on the visitor, it’s relatively small expenditure of funds for a massive impact. And much more so, quite frankly, than quite a lot of the infrastructure, which costs a fortune ... and largely doesn’t make a lot of impact on the visitor.

Bell comments that the zoo is beginning to realise that the budget allocations to interpretation are generally inadequate. This may benefit future projects but is unlikely to lead to further development of Te Wao Nui.

2. Project structure and process

Applying Kamien’s exhibition development models to the zoo’s project structure, the project most closely resembles the team model, containing all the inherent inefficiencies described by Kamien. Approvals required whole team meetings, often with up to 12 participants, although staff were not released from other duties to work on the project.

With respect to the consultant design team, the model most closely resembles the developer model, in which the leading driver is interpretation, although design is also very prominent.

Roles

The lack of clarity around the interpretation design team’s role and the broad scope of work were significant factors in the project that proved both a benefit and a burden within the time constraints.

The small design team needed to cover diverse roles and tasks with maximum efficiency, so quickly adopted complementary roles based on skills, abilities and workload. In many organisations, these roles would have been covered by a much larger group. Some tasks

could have been outsourced, but time constraints made briefing and managing additional team members prohibitive. All members of the team contributed to design through creative activity and liaison with the zoo, each member taking on specific roles as follows:

Ian Bracegirdle  
Research art, artefacts and materials, concept sketches, manage overall budget, brief and manage audio visual contractors, liaise with site manager and architect.

Toni Roberts  
Coordinate content, research key messages, liaise with Maori artists, manage graphics and signage contractors, update content matrix, write text in consultation with zoo staff and Maori consultants.

David Gargiulo  
Research visual references of species and locations, concept illustrations, design development and technical drawings.

Applying Kamien’s list of essential roles to the project post-hoc, Table 27 shows the distribution of roles within the client organisation and design consultants.
### Table 27. Roles of project contributors.

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>Manage institutional resources. Provide final approvals. Direct project to meeting institutional goals.</td>
<td>Jonathon Wilcken – internal zoo resource management.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zoo reference group – concerned with meeting institutional goals and external stakeholder interests.</td>
</tr>
<tr>
<td>Curator / content specialist</td>
<td>Research and provide content, ensure its accuracy. Select and objects and stories.</td>
<td>No single person assigned by client organisation Pre-existing documents provided some content guidance. Design team – research and propose content. Ian Fraser – approvals to content and accuracy. Hinerangi Himiona – Maori consultant. Bernadette Papa – Maori consultant. Other zoo staff consulted in reference group meetings and via Jamie Bell.</td>
</tr>
<tr>
<td>Designer</td>
<td>Provide three-dimensional frame for exhibit and drawings to enable fabrication.</td>
<td>Logan Brewer Design – architecture, landscape design.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ian Bracegirdle – lead designer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>David Gargiulo – designer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toni Roberts – designer, content focus.</td>
</tr>
<tr>
<td>Content interpreter: developer, interpretive planner, educator</td>
<td>Interpret content for visitor’s appreciation and understanding.</td>
<td>Toni Roberts – content planner, researcher, writer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Design team – integrating content and interpretation across whole site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jamie Bell – text editing.</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Oversee schedule and budget.</td>
<td>Ian Bracegirdle – manage resources within interpretation budget.</td>
</tr>
</tbody>
</table>

This division of roles was not articulated clearly enough to meet Kamien’s essential condition that the roles must be known and accepted. However, team members adapted to ensure that all roles were fulfilled and there were no issues regarding capability, by default meeting two more of Kamien’s criteria. The project failed to meet the criterion that people undertaking these roles must be allocated sufficient time and resources to carry out the role, this issue applying to both internal staff and consultant designers / interpreters.479

**Role and activities of designers – design process**

The large volume of content across science, culture and conservation topics impacted on the designers’ methods. Together with the very tight timeline for a project of this scale,  

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479 ibid.
the volume of content meant that the designers had to start everything at once: research, concept, design development, sourcing artists and other contractors. This time pressure meant that some opportunities were not explored and consultation was not always thorough. At any given time, the design group could be working on concept design for one area and detail design for another while some items would already be under construction. To save time and resources, not all items were fully documented prior to fabrication.

The scale and complexity of the project required specialised tools for tracking and managing design components and content to enable communication and feedback from the zoo. Visual design tools were insufficient to map and manage the wide range of design elements within Te Wao Nui. The designers developed methods for communicating their vision of a holistic, multidimensional, sensory visitor experience to the client.

Among the first tasks for the design team was to amalgamate the information provided by the zoo and the architect in suitable forms to gain a picture of the whole precinct, its messages and possible methods of interpretation. The team developed a matrix in the form of a spreadsheet to analyse the significant amount of content proposed for the precinct. The matrix cross-references the physical location, exhibit number, type of object (whether graphic, Maori art, theming or multimedia), the species it relates to, exhibit intent, specific content to be included, physical description, sources of information and images, visitor experience aims, drawing numbers and description from the narrative script. This useful reference helped the team to see the big picture, but the size of the document soon became unworkable, covering 12 square metres of wall space when printed.

The team created a summarised version of the matrix to guide everyday work on the project, Figure 153. Separate versions of the matrix were developed to track specific project components such as audio visual, sculptural works, Maori art, signage and text. Each of these linked to further documents including drawings and location plans.
Other design tools overlaid information from the matrix onto site plans. This helped the designers to envision the whole project and to discuss with zoo staff areas of weakness or overly dense interpretation and activity. The stringline narrative layouts sought to map content items onto the visitor journey in the order they are likely to be experienced by visitors to assist in the pacing of interpretive elements in the visitor experience, reflecting the dimension of time as well as physical space, Figure 154.
The colour coding in the content matrix shown at Figure 153 corresponds with the coloured markers on the landscape plan at Figure 155, indicating the form of design product. The matrix was later divided into these categories to form works packages for contractors. Item numbers cross reference with all drawings and plans.

Figure 154. Sample stringline narrative layout, The Islands.481

481 Motherworks / Hatchling Studio, 2011, “TWN Stringline Narrative.”
Specific items and interiors and were then illustrated in sketches, plans and elevations as shown in Figure 156 and Figure 157.

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482 TWN Interpretation Plan, Hatchling Studio, Motherworks, 2011
Figure 156. Sample item illustration, High Country Hut.  

Figure 157. Sample interior concept illustration, Island Hut.

In some cases, due to time constraints, items were fabricated based on sketches. Most individual items were documented in more detail, Figure 158.

As the site was complex, with many items to be installed onto rocks or into a landscape, photographs were used in place of plans to accurately plot location and orientation of signage, Figure 159.

Figure 158. Sample detail design, Tuatara skull case layout.485

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485 Ibid.
The quantity and range of documentation was extensive to capture the intended outcome and resulting visitor experience and communicate this to the zoo and fabrication contractors. Development of this comprehensive set of design documents enabled effective communication between the design team, client stakeholders and fabrication contractors about a large number of items within complex outdoor and interior environments. These design tools supported ongoing revision and approval of designs, concurrently progressing multiple strands of work across the site, Table 28. Flexibility with regard to the design process and ingenuity and creativity in design management were thus an essential aspect of the design team’s role.

Motherworks / Hatchling Studio, 2011, “TWN Signage Locations.”
The extensive range of documentation produced for Te Wao Nui is an example of the issue noted by Cunningham, that interpretation projects frequently require more detailed documentation than the architectural design of a building, yet are not valued equally.487

3. Design outcomes: communicating nature concepts

Nature concepts

The zoo did not articulate within the design brief a particular philosophy in relation to nature interpretation for the project apart from a general landscape immersion approach and a focus on conservation. This lack of an articulated philosophy at the outset of the project reflects the zoo’s focus on animal management over public display and education and a general lack of investigation into interpretation. Bell is the first staff member to have a primary responsibility for interpretation within the zoo. Prior to his engagement, interpretation had been done in an ad hoc manner by a zoo staff and occasional

487 Cunningham, 2011, “Interview by Toni Roberts.”
consultants. Bell faces significant challenge he faced within his role, including educating the zoo about interpretation and securing resources to support it.

According to Zoo Director Wilcken, when interviewed prior to the project’s completion:

> I’m not sure if we particularly espouse a philosophy behind our exhibits. But I think there is one, actually, I just don’t know that we’re particularly conscious of it. I think that philosophy would be ‘wildlife in context.’ So it wouldn’t be conservation. It’s kind of complicated because the reason why we’re doing the whole zoo is conservation. But you couldn’t say that we’re building an alligator exhibit for conservation. We’re building an alligator exhibit to help us build that interest in and empathy for wildlife in wild places ... And that gives us the necessary precursor to build in some of the messaging hooks and all that kind of stuff.

This sophisticated rationale was not stated within the project brief or subsequent briefings and only emerged in the interview, late in the project. This perspective is supported by Bell, who made the following comments when interviewed near completion of the project:

> There's an element of me that has to toe the zoo line and talk about conservation … but I'm firmly in favour of us not necessarily being completely overt and telling people that, ‘you must go home and do this to save this animal,’ but more to say, ‘you know this is an animal you've probably heard about, but you might not have seen. It's got amazing adaptations for its environment, it's been sort of screwed over a little bit by what's happened that it wasn't expecting to happen, but in terms of New Zealand and the world it's a very unique amazing animal’ and create an environment where people can engage with that animal, start to care about it and go home and still care about it. So in terms of how we make people take positive action for the environment I see Te Wao Nui as being a thing where we can make New Zealanders care about New Zealand and start building it that way.

Such a nuanced perspective may have been a result of Bell’s role on the project, rather than a pre-existing position going into the project. It would have been of great value to the interpretation design team for key staff within the zoo to articulate such ideas early in the project.

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Nature imagery

In selecting images for species and other interpretation signage, given my philosophy that design should focus on nature as a holistic system, I proposed that photographs should illustrate the species within a natural habitat, demonstrating the natural groupings and behaviours typical of the species, such as in a large flock on a lake, or in a pair eating berries in the treetops. However, the zoo prioritised species identification, requiring a close-up image of individual animals. This limitation affected the capacity for signage to communicate a holistic vision of nature. Images of the natural environment can show relationships between animals and plants and the importance of habitat, expanding the visitor’s reference beyond the constructed nature of the zoo to connect with wild nature. The zoo agreed to use large scale images of each habitat in the kaitiakitanga signage to help visitors relate the six zoo habitats to places they have been or might go to in the future. This connects visitors with the world beyond the zoo.

Weaving together nature, culture and conservation

The zoo requested that the threads of nature, culture and conservation needed to be entwined throughout the interpretation in Te Wao Nui, but the design team had to create the right balance between them. In addition to engaging the Maori artists, the interpretation design team needed to determine with whom to consult about developing Maori cultural content for signage, what content to cover, what languages to use and how much text to include. Hinerangi Himiona, a researcher and writer closely involved with the Maori artist team TuWao, was engaged to develop and review Maori content, liaising with Bernadette Papa, the Maori reference group member. It was important to have two people who could discuss and resolve often complex cultural issues rather than have one person carrying the burden alone. The mutual respect between the two women was essential to the smooth running of the text development process.

Te Wao Nui is not primarily a Maori cultural experience and the majority of the zoo’s visitors are non-Maori local New Zealanders. The Zoo Director clearly stated a desire to focus on animals in context over a social agenda. As a result, Maori content is relatively sparse and does not attempt to provide a comprehensive introduction to Maori culture. Nature is presented as the subject of spiritual stories, a source of food and materials for practical and cultural objects and as a force that must be respected and protected. Attempts were made by the design team to avoid idealising indigenous culture although Maori contributors sought to edit out mention of negative effects of Maori settlement on the environment.
The Maori system of kaitaikitanga, or guardianship of the environment, includes practices such as limiting catch and collection (rahui), to enable stocks to regenerate, consideration of seasonal effects and sustainable harvesting of plants such as the flax. For the interpretation design team, it provided an important link between Maori content and the call to conservation action. The Maori artists identified with the term as it aligned with the traditions of their culture and the understanding that, although the people come and go, the land remains forever. For the zoo, the concept signified one of the key goals of Te Wao Nui, to inspire people to take action for wildlife. From the outset, the design team sought ways to use the concept of kaitaikitanga as a means of drawing all the threads of content in Te Wao Nui together, as the central theme that set all contributors on the same path. However, the cultural sensitivity of using symbols, sculptures or animals to represent the concept would have required lengthy discussion and consultation to resolve. Nearing the end of the project, the primary means available for communicating the kaitaikitanga concept to visitors was through signage. Given more time, strategic planning could have resulted in more diverse, embedded, powerful and culturally significant methods of inviting visitors to engage with kaitaikitanga.

As a result of various deletions and design decisions through the process, an artificial division of cultures emerged, Maori cultural elements being mainly set within the landscape and western culture in interior environments. This was not an explicit intention expressed by the zoo or the designers and runs somewhat counter to the intention of presenting Maori culture as contemporary. The boatshed is the only interior environment that combines Maori and western elements. This was resisted by some members of the reference group, but such discussion was truncated due to time pressures. A few non-Maori sculptural elements within the landscape balance this division but they are primarily communicating scientific rather than cultural aspects of nature, such as specific species. The development of poetic text elements in the landscape will help to further redress this division. Visitor studies in relation to the perception of cultures and their relationships to nature would shed light on the impact of this artificial division on visitor understanding.

**Use of cultural objects as interpretive tools**

The question of the place of human cultural objects within nature interpretation arose through the course of the project. The zoo held no particular philosophy on this, although

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Wilcken believes that the use of human culture and artefacts helps to transport people to another world, ‘I do agree that people react well to people and therefore they react well to people things and it is a way of people beginning to see ... not necessarily their place in things, but those connections.’

Fraser comments that, ‘The amount of man-made material, including the artwork, props in huts et cetera, probably reinforces the close relationship between people and animals.’ Hanson argues that the use of cultural contexts in zoos is recent but not problematic, reflecting that humans and their effects are part of the animals’ habitat. Thus, the zoo encouraged the designers to use a combination of landscape and cultural immersion, artefacts and art to interpret human-nature relationships. This was in line with the designers’ general philosophy of creating a theatre of objects, rather than a text-driven narrative. I was the most concerned member of the design team in relation to an emphasis on human objects over natural ones, seeking ways to bring the focus back to the natural environment.

**Summary of nature concepts**

The interpretation in Te Wao Nui offers a range of conceptions of nature: as a resource, as a source of beauty and wonder, as a spiritual force and as the focus of many conservation activities. It emphasises the uniqueness of New Zealand’s fauna as an aspect of its value. The focus on threats and the fragility of the natural environment in the interpretation is to some extent counter-balanced by the lush abundance of the landscaped environment. The precinct retains a zoological focus on individual specimens as representatives of each species rather than portraying natural social grouping of animals, although mixed species exhibits demonstrate cohabitation of species within a habitat. Text, particularly in The Forest habitat, emphasises symbiotic relationships between species and adaptations to the environment, demonstrating a more holistic, systemic understanding of nature but this is not supported by imagery or other design forms.

The interpretation portrays human culture as both a threat to nature and a means of protection and restoration of the natural order. Nature is presented as a source of artistic inspiration, primarily in relation to Maori culture.

Applying the categories of nature representation presented in Chapter Three, the Te Wao Nui interpretation design outcomes demonstrate a primarily naturalistic representation of nature, with a strong emphasis on ecologistic-scientific values. Content combines indigenous, systemic and conservationist values within a landscape that aims to connect visitors with nature through aesthetic impact.
4. Other findings

Design evaluation

Evaluation was not built into the Te Wao Nui project, Wilcken and Fraser both expressing a general scepticism about the worth of formal evaluation, its design and value for money. Wilcken is confident that general responses to the exhibit will be communicated to the zoo via volunteer guides, education staff and occasional letters from visitors.

Two months after the public opening of the main phase of the project, I organised a meeting between the interpretation team and key zoo staff to review project outcomes and the process. Zoo staff are broadly happy with the project results. Bell states:

The interpretation has assisted in constructing a diverse, multi-faceted visitor experience. The range of interpretive techniques utilised has helped visitors from broad demographic backgrounds engage with Te Wao Nui and its messages ... In particular, feedback through our social media channels has emphasised the impact that the broad interpretive approach has had in reaching visitors across the board.

Fraser comments that, ‘The theming work (props, set dressing, soundscape) certainly makes it a more immersive experience and probably goes some way toward compensating for when animals are not visible.’ Concerns include that certain conservation activities could have been more effectively brought to life and that certain elements have not yet been completed due to timing and funding issues.\textsuperscript{490}

Education staff were not involved in the review so I met separately with Zwaan to gain her feedback from the large number of teachers and students who use the zoo as a learning resource. Zwaan reported that the response from visitors, teachers and peers has been overwhelmingly positive. She noted that the education team had limited involvement in the project, the most significant result of this being the lack of spaces within the precinct for school groups to gather. This means that classes must return to the main building for all group teaching, which is not ideal for contextual learning. However, Zwaan was generally happy with the range of modes of content presentation, particularly the experiential, embedded elements.

\textsuperscript{490} Bell, 2011, “Interview by Toni Roberts.”
Ongoing development

In other contexts, design objects are evaluated and refined through models, prototypes, research with users and trialling with focus groups. By contrast, in this type of project the trialling starts on opening day. Although the major work is complete and Te Wao Nui is now open to the public, its ongoing success will depend in part on further development over time, such change encouraging repeat visitation. However, Wilcken doubts that this will occur, as it is difficult to source funding for ongoing development. Hanson concurs, stating that exhibits are generally only developed further if the original implementation was unsatisfactory. The project review meeting highlighted the following areas for possible further development:

**Way finding:** Way finding in Te Wao Nui is problematic as the meandering route can be disorienting. There are also a number of entry points to the precinct that are not signposted, such as from the major roads. No maps are provided in signage as the zoo opted for printed maps. Way finding signage was within the scope of the interpretation designers’ work but was not considered a high priority. Pathway layout had already been finalised prior to designer engagement. Ideally, rather than littering the environment with way finding signage, more intuitive way finding and way showing strategies integrate landscape and interpretation, providing an invitation rather than direction. One such example is the whale skeleton in the Coast, which is discussed in Chapter Seven.

**Naming of huts:** Giving each hut a clear identity has the potential to clarify the purpose of each interior and to mark visitor areas as distinct from staff service areas. Names could also potentially assist with way finding as visitors can name their location.

**Poetic elements:** The proposed poetic elements within the landscape will add an emotional aspect to the cultural component of the precinct that is currently lacking. Two staff members are keen to pursue this over time, but it may be difficult to maintain momentum given other demands on time and resources within the zoo.

**Whole zoo approach:** The power of the Te Wao Nui experience and brand is undermined by haphazard approaches to branding and marketing. Currently, the Te Wao Nui entry banners, marketing materials and education materials are in a different graphic style to the signage within Te Wao Nui. This diminishes visitor recognition and sense of place. Historically, the education team operates independently of interpretation projects, the zoo missing an opportunity for greater contribution of educators’ expertise.

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and coordination of content. More coordination is needed between the interpretation reference group, marketing and education departments to unify the visual ‘brand’ and to build on messages and stories within the precinct.

**Case summary**

The key constraint in this project was late appointment of interpretation designers which created a distinct disadvantage with widespread implications in relation to the design process and outcomes. Although very successful overall, there is room for improvement in the interpretive elements developed and the process followed. The zoo staff recognise that lack of experience in such projects and lack of understanding of interpretation design prior to the project’s commencement was the primary cause for engaging the designers so late in the project’s development. Through the course of the project, the Director came to recognise that interpretation is deserving of a more significant budgetary allocation and development period, given its direct impact on the visitor experience.

The project would have benefited from at least one member of staff being released from daily duties to oversee the interpretive aspects of the project. A more developed brief that articulated the relative weighting of content and topics would have provided greater guidance to the interpretation design team. The project was aided by the zoo and designers having a closely aligned philosophy in terms of landscape immersion and a commitment to the primacy of the visitor experience over information delivery. This could have formed the basis for development of a highly sophisticated, strategic approach to interpretation through designers educating the client about interpretation and the client educating designers about species and conservation topics, resulting in a shared language of interpretation design and understanding of its potential. The shift in client understanding demonstrated in the interviews indicates that this was partially achieved but that time constrained such activities.

The short timeline, in combination with the scale and scope of the work, led the designers to develop unique design systems and methods to progress work rapidly and in parallel. Designers were forced to innovate in response to the diverse range of roles, speed of output demanded by the project and the need to communicate a holistic vision to the client and stakeholders.

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492 Fraser, 2011, “Interview by Toni Roberts.”
As a result of the compressed timeline, in several locations there was insufficient time to explore contextualised, embedded forms of content delivery, printed signage being used in its place, resulting in over 200 signs throughout the precinct. The need for concurrent development of design elements across the precinct limited strategic integration of conservation messages, species information and storytelling across design forms. This also resulted in an over-reliance on signage, particularly for the kaitiakitanga element. The timeline impacted on the graphic design, in particular due to the inability of the Maori artists to provide tohu artwork in time for integration into the signage style. As a result, the tohu were placed into the design rather than used as a basis for developing further design motifs.

In general, there was little conflict between the designers and stakeholders in relation to philosophies about design, conservation or representation of nature; the challenge was for project contributors to effectively articulate their ideas in ways that others could quickly grasp. The design team was in a constant point of tension between providing leadership through design expertise and providing a service to the zoo to realise a vision for the precinct as held in the minds of its architect and staff. By the end of the project, some zoo staff were able to articulate a much clearer philosophy in relation to interpretation design than at the start of the project. Given more time, such learning could have made a greater contribution to the coherence of the precinct through all forms of design.

Chapter Six detailed the Te Wao Nui case, investigating the role of interpretation designers through the project context, design process and outcomes. It examined the representation of nature, conservation and the relationship between human cultures and the natural world in this zoo-based interpretive environment. The following chapter analyses the two cases with regard to design constraints and opportunities and draws conclusions about the role and potential of design within projects of this type.
Chapter 7
Case Analysis and Research Findings

The thesis has established that despite a growing reliance on interpretation by zoos and museums, interpretation design practice is not well supported by published knowledge or public recognition of the field. The research therefore seeks to understand and build knowledge from practice by capturing designer knowledge and experience. Practitioner interviews in Chapter Four proposed project factors that impact on the designer role, the most significant being that, a) engagement of designers late in a project limits their contribution and b) lack of client understanding and experience in interpretation design leads to designers adopting an educative role with clients. The two cases presented in Chapters Five and Six describe practice in two nature-based projects, illustrating the impact of project specific factors on designer role, design processes and outcomes. Chapter Seven examines the extent to which the two cases support the propositions from Chapter Four and the ways these are manifest. The chapter analyses the two cases in relation to three primary research questions:

1. What is the role of the designer in interpretation projects?
2. How do attitudes to the role of design by institutions and other project factors support or constrain the contribution of designers?
3. How do such project factors affect the expression of ideas of nature through design?

Drawing on knowledge gained from the two cases, practitioner interviews and the literature, the chapter makes recommendations for optimising use of interpretation design within projects. Understanding gained through the research culminates in a characterisation of interpretation design practice and a working definition of the field in response to the fourth research question:

4. What are the characteristics of interpretation design practice?

Case analysis
The two projects selected for examination are set in contrasting environments, the first being in a relatively small interior space, the second extending over a large expanse of land, incorporating outdoor and interior environments. Organisational and project aims,
collections and visitor types are distinct between the two projects. In this way, the cases provide a small sample of the diversity of interpretation design work and share a number of common aspects worthy of investigation. Both are strongly conservation focused and, according to client feedback and the limited visitor data available, both are successful in creating experiential visitor environments that engage their audiences and communicate intended messages. That being said, in any project, certain factors hinder or support effective design development and resulting outcomes. The analysis proposes causal relationships between project specific factors and the designer role, design process and outcomes. The combination of factors that affects the design process in each project provides useful insights with relevance to interpretation design and potentially to other fields of design practice.

Research Question 1: What is the role of the designer in interpretation projects?
As demonstrated in the practitioner interviews and case studies, the role of the interpretation designer or design team is shaped by the specific requirements of each project, its aims, stage of development, type of site and institution, stakeholders, audience and types of media involved. It is also shaped by the client’s understanding and experience in relation to interpretation design. In the WHEC case, the client specified a diverse role, encompassing research of primary and secondary sources, development of content, design of all elements, fabrication and installation, thus requiring a highly multi-disciplinary team. The brief recognised the technical, conceptual, artistic and communication aspects of the role. However, the client’s vision in relation to specific items and the completed architectural design constrained the designers’ capacity to fully execute their role. Designers informed the architects of technical building requirements such as electrical cabling but could not advise on experiential requirements such as visitor orientation and way finding as the building design was largely complete. Staffing issues within the design organisation affected design leadership, shifting the burden of this role onto staff less experienced in design of this type.

In the Te Wao Nui case, the lack of clarity around the interpretation design team’s role and the wide scope of work were consequences of the zoo’s lack of experience in such projects. The full scope of work became apparent once the project was under way, this including researching species and conservation programs that could be referenced within the precinct, managing development of Maori art and content, audio visual production, graphics, play elements, interactive exhibits, models, text, props and theming. The role
required collating and mapping a huge amount of content from out-dated documents, compiled by people no longer engaged on the project. Seeking and engaging Maori artists was a high priority given the scope of work required by them, the demands of cultural negotiation and the fabrication time required. The broad scope and role had a number of benefits for the designers together with the challenges it posed, giving the design team significant control or influence over a range of elements. Had the client chosen to separate the project into multiple design contracts, it would have been more difficult to create cohesion across media and to develop threads through the precinct as a whole.

In both cases, client understanding of design’s contribution to the project developed through the course of the project as a result of advice from the designers and experience gained through the design process. Case analysis is consistent with the following proposition from the practitioner interviews:

- A client’s lack of experience and understanding about managing interpretation design projects places a burden on the designer to educate the client about project management and the design process.

In addition, designers needed to educate the client about audience needs and behaviour, particularly in relation to attention and information overload, non-text based means of communicating content, way finding and coherence.

The two cases demonstrate that the designer role is diverse and often poorly defined. Within a design brief, the role may include project management, exhibition design, research, writing, technical design, art and contractor management. Designers may be expected to promote the organisation’s activities as well as interpreting their resource, especially as zoos are keen to promote their conservation credentials. This adds a marketing dimension to the role. Many aspects of the role emerge once projects are under way, as the process of design and collaboration with stakeholders reveals underlying intentions, conflicts and needs. The designer role also developed in response to gaps in roles undertaken by others. For example, neither project had a nominated curator or content manager, this role falling largely to the designers. Design aspects that were not specifically related to interpretation, but which were not completed by architects such as way finding and orientation, also fell to the interpretive team, although they had little influence in relation to architecture and landscape design. The role of the interpretation designer may therefore include curatorship, mediation, cultural liaison and educating the client about project structures, processes and possibilities, sometimes resulting in a tension between the role of service provider and that of educator or advisor. In both cases,
beyond the roles prescribed by the project brief, the designer role was affected by factors including the hierarchy of contracts, timing of engagement, client inexperience and underlying project aims.

In the case of the WHEC, where the client rejected design concepts or parts of them, the design team acceded to offering alternative designs rather than arguing for the worth of the original design and demonstrating its merits within the context of the whole project and the resulting visitor experience. When the projected interactive map proposed for the theatre area was removed from the design, the exhibition lost its tourism related content and physical orientation in relation to the World Heritage Area. This also meant that a significant interactive element was lost. Similarly, the rejection of the activity table from Nature’s Stars reduced interactivity and had consequences for the view from the skylights. The designers’ desire to please the client overruled their commitment to their own understanding of visitor needs, stated project aims and design intent. Clients in this context have the power to demand new concepts and revisions until they are satisfied, yet a shopping list approach based on acceptance and rejection of individual items can have a detrimental effect on the overall balance of elements and meanings. This selection of individual items goes against Schön’s proposition that in an effective design process, the designer constantly shifts between the whole and the part, oscillating between immersion in the detail of the design process and detachment to evaluate the whole design.\footnote{Schon, 1983, The Reflective Practitioner, 102.}

Designers must encourage clients to assess the value of each design element as a component of the whole project.

Designers in effect have two audiences for their work: the client as the audience for the drawings and planning documentation and the visitor to the completed work. Depending on the level of experience and understanding on the part of the client, designers can expend a disproportionate amount of their time satisfying the client rather than the visitor. In the WHEC case, the underdeveloped concept sketches may have contributed to the client’s rejection of the concepts. Designers choose how best to allocate resources; whether to prepare beautiful illustrations that may assist in selling a concept to the client or to apply the resources to design development or fabrication. The case indicates that clients may be attracted to aesthetically pleasing items that directly carry information in preference to important spatial, orientation and connecting elements.

Visitor experience is at the heart of interpretation design practice and theory. Interpretation designer expertise includes understanding of audience behaviour and needs
and how visitor interaction with the environment serves to co-construct their experience. This is an undervalued aspect of designer knowledge deserving of a more central focus within projects. Knowledge and theory from other design fields such as interaction design and human-centred design could contribute to such expertise and to articulation of its value to clients.

Designers act as mediators between the interests of the organisation and its audience, frequently adopting the role of audience advocate. Designers act as the visitor’s representative in discussions about design and content with the client and knowledge specialists. Wenger’s concept of communities of practice is useful in understanding the role that the design team plays in relation to other project stakeholders, particularly the specialist content providers. Applying Wenger’s concept to design of virtual exhibitions, Kocsis and Barnes argue that design serves an important brokering role between the content providers’ demands for content accuracy and detail and the needs and interests of the audience for immersive qualities of experience. Hall also argues that the professional designer is not only exercising skill in the visual arts, but is acting as a broker between the other interests behind the project. In the two cases under examination, this is manifest in discussions regarding the nature and quantity of ‘content’, designers frequently arguing for a reduction in the quantity of information and text-based content to reduce visitor fatigue and emphasising the quality of experience created. Designers advocated for audience needs in relation to integrating orientation and way finding to support visitor comfort and reduce confusion. They argued for reducing overload of stimulation and competing elements and providing a range of communication methods and modes of visitor engagement to meet the needs of diverse learning styles and interests. Findings support the following proposition from the interviews:

- Designers act as audience advocates, representing their needs and interests in the design process.

496 Kocsis and Barnes, 2008, “Making Exhibitions, Brokering Meaning: Designing New Connections Across Communities of Practice.”
Kocsis and Barnes argue that, through brokering between the divergent perspectives of expert content providers and the visiting public, the designer’s role thus involves mediating meaning and experience. In relation to the Te Wao Nui case, the project parameters did not allow sufficient time for the designers to effectively enact this role, although some significant achievements are evident. Through the design process, it became evident that although the zoo staff felt they had a shared vision for the precinct, they in fact shared an overarching aim, comprised of many individual visions. These differences became evident in responses to design presentations and, in some cases, the completed work. Similarly, in the WHEC case, the differences among stakeholders’ conceptions of the project emerged in response to design presentations, in this case the divergent perspectives relating to the fundamental project aims and location. Designers must navigate such differences within the predetermined time and budget constraints, impacting on design outcomes.

The tension between the demands of the client or content provider and the audience is a potential site of fruitful exploration and manipulation by the designers, as they often navigate competing interests. Strategic and effective navigation of this tension demands a consistent team, sufficient time for design revisions and expertise in persuasion and relationship management. The two cases demonstrate varying degrees of success in this regard.

Designers are generally trained within a specific discipline such as architecture, communication design, industrial design or digital media. However, much of an interpretation designer’s creativity, skill and value is situated in multidisciplinary design practice. Rather than simply designing individual interpretive components, effective interpretation designers can develop threads that cross the entire visitor experience using a range of direct and embedded methods to communicate with audiences. It is this multi-layered, multi-modal approach that can succeed in meeting the needs of diverse audiences with a range of learning styles and interests. Interpretation design in this case involves balancing, coordinating and strategically employing a range of media and methods to create a holistic visitor experience. Such strategic aspects of the role are largely unrecognised by clients, particularly at the beginning of a project.

Findings:
1. The designer role is frequently poorly articulated within a design brief, providing limited guidance as to the scope and relative weighting of tasks and time required.
2. The role of designer draws on a range of interdisciplinary skills and knowledge, encompassing many activities outside traditional design practice. These include strategic application of media, cross cultural negotiation and understanding of audience behaviour and experience.

3. There are several points of tension in the designer role resulting from the frequently conflicting demands of client and audience. A similar tension often exists between the demands of content providers and principles of interpretation and visitor experience theory, and the sometimes divergent interests of different stakeholders.

4. The designer role includes many aspects not prescribed or recognised by the client. The designer may be required to fill a role by default due to the lack of such a role within the client organisation.

Table 29 summarises the range of roles undertaken by designers in the two cases.

<table>
<thead>
<tr>
<th>Prescribed / recognised by client</th>
<th>Underlying/ not recognised by client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research – visual, experiential, literature</td>
<td>Identifying and clarifying project aims</td>
</tr>
<tr>
<td>Concept design and illustration</td>
<td>Advocating for the audience</td>
</tr>
<tr>
<td>Consultation and workshop facilitation</td>
<td>Curatorship</td>
</tr>
<tr>
<td>Technical design and specification</td>
<td>Cross-cultural negotiation</td>
</tr>
<tr>
<td>Content and text development</td>
<td>Client education in relation to interpretation design principles and techniques</td>
</tr>
<tr>
<td>Art and illustration</td>
<td>Materials and methods research</td>
</tr>
<tr>
<td>Fabrication management</td>
<td>Strategic planning and design</td>
</tr>
<tr>
<td>Management of multimedia development</td>
<td>Mediating between content provider and audience interests</td>
</tr>
<tr>
<td></td>
<td>Balancing elements in a holistic vision</td>
</tr>
<tr>
<td></td>
<td>Innovation in design communication</td>
</tr>
<tr>
<td></td>
<td>Mediating between divergent stakeholder interests</td>
</tr>
<tr>
<td></td>
<td>Resource management</td>
</tr>
<tr>
<td></td>
<td>Relationship management</td>
</tr>
</tbody>
</table>

Recommendations:
The range and proportional weighting of aspects of designer roles need to be detailed within a project brief. Where it is not, a designer’s return brief should challenge client assumptions and articulate the diversity and depth of the designer’s role, particularly in relation to design strategy.
Designers ought not recoil from the conflict inherent in the design process that results from the tension between the interest of the client or content provider and the audience, but embrace this as a site of creative exploration where the meaning of the work is constructed. Projects may benefit from designers taking a more authoritative role and arguing for important design elements to prevent clients taking a shopping list approach. This requires careful navigation of power relationships and the balance between designers acting as expert advisors and service providers.

Designers need skills and strategies for demonstrating the purpose of a proposed design and how it contributes to the overall project, traditional forms of visual documentation often being insufficient in this regard. Traditional practice and rule-based knowledge are insufficient; designers require agility and innovation to develop appropriate tools and design methods to respond to project needs.

Although each project is unique and therefore demands a project structure and process suited to the individual project, a multidisciplinary interpretive design team approach carries many benefits and is widely applicable to manage the varied demands of complex projects. Such a design team can traverse boundaries between disciplines to create a seamless integration of landscape, architecture, way finding, interpretation, play and art.

Research Question 2: How do attitudes to the role of design by institutions and other project factors support or constrain the contribution of designers?

Lack of client understanding and experience

The client is as important to the success of any project as the designer, being responsible for establishing the aims and parameters of the project, managing its development and resolution. Clarity of intent as represented in the design brief provides a foundation for effective design development and successful outcomes. Sound project management requires client understanding of the contribution of all contractors and expertise in supporting the development process. The two cases demonstrate aspects in which the client organisations lacked understanding of interpretation design with several negative consequences for the design process and outcomes. There are numerous possible causes for this lack of understanding, the most notable being a lack of prior experience of such projects. In both cases, the project under examination was the only significant interpretive project either director had undertaken and the largest in the history of the organisation.

Interpretation design is not the core business of either organisation, both focusing instead on sourcing, displaying and maintaining species collections, primarily using signage, volunteer guides and staff to deliver interpretation. Funding and project management models from other institutions with greater infrastructure and in-house interpretation expertise may contribute to the misconception that interpretation should take only a small portion of an overall budget and commence in the final stages of a project’s development, thus presenting unsuitable examples for smaller organisations and those contracting external interpretation designers.

As established in the literature review, avenues for learning about interpretation design management are few, interpretation design being poorly represented within the academic literature and practice-based publications generally not considering designer perspectives. Within the interpretation field, design has a low profile compared with face-to-face guidance, despite its widespread significance in the realisation of interpretive projects and creation of visitor experiences.

In both cases, client inexperience was demonstrated by the underdeveloped brief presented to designers. Unresolved issues within a design brief will be present in the finished product.\textsuperscript{499} They consume design time and other project resources, which may be insufficient to resolve such issues. In the WHEC case, the two client organisations had some differences in their understandings of the aims and intended content of the centre, arising from differences in the mission of the two organisations and the project being originally conceived for another site. The client demonstrated a lack of understanding of the importance of a resolved vision for the centre prior to briefing designers, or an inability to achieve this.\textsuperscript{500} The project’s vision was not effectively embedded within the vision of the host institution and not all parties were fully supportive of the botanic garden context. As the project progressed, the differing visions became more evident to the design team as design concepts were rejected and project aims adjusted to align with the organisation’s audience. This consumed significant design time that could otherwise have contributed to design refinement or fabrication.

The underdeveloped brief for the WHEC demonstrated the client’s inexperience through its lack of curatorial direction, particularly given the lack of a collection. The focus on World Heritage ‘values’ meant that discussion remained entrenched in abstract terms and concepts. At the outset, the client organisations struggled to unpack these values and

\textsuperscript{499} Ibid., 2.

\textsuperscript{500} Fox, 2012, “The Design Brief.”
provide meaningful direction for designers such as storylines and themes. The multidisciplinary design team was able and willing to research and build a curatorial concept from the beginning; however this undertaking impacted on design team budget and time.

In the Te Wao Nui case, client inexperience and lack of understanding of interpretation design was evident in the project brief and accompanying material. Through the 13 years spent planning the project, the discussion had focused primarily on species and overarching aspirations, without developing clear messages and defining the role each exhibit might play in telling the story. The zoo focused on matters of animal management and aesthetics over the role of species in the visitor experience. Lack of clarity of the design brief was exacerbated by staff changes over the long lead up to the building works, including changes in director and Maori advisors.

In addition to the unresolved project brief, the client team structure reflected a lack of understanding of the needs of interpretation design development in that the zoo did not nominate a project manager or other conduit for consultation and planning. The flat organisational structure meant that the design team had to meet with a group of staff for all decisions, slowing the decision-making process. The benefits of broad ownership and input from staff must be balanced with the efficiency of large and often lengthy meetings for decision-making.

In both cases, in addition to their impact on the design brief, client inexperience and lack of understanding directly contributed to the late appointment of designers such that they were unable to significantly contribute to the architectural design. This may in part be due to the constraints of project structures and funding requirements and because those with little experience see design as a final stage of implementation leading to production rather than as being central to developing the vision, interpretive messages and audience experiences. Directors of both commissioning organisations expressed regret at not engaging interpretation design specialists earlier in the project, citing as negative impacts lost opportunities for integration of interpretation into the environment, a more strategic consideration of audience experiences and improved visitor flow. A more central role for designers would require their involvement from the early stages of a project’s conception to completion.

In the WHEC case, timing of engagement was critical in relation to the building design, the tender process for interpretation designers not commencing until after the
architectural design was complete. In this case, funding requirements may have contributed to the timing; however the client could have sought advice from interpretation designers during the architectural design phase. The resulting constraints due to the building design were great, leading to an unsuitable exhibition space including: uninviting entry, poor visitor orientation and way finding, narrow space, uncontrolled light, lack of through-flow and dependence on technology to open and close blinds. The architect and client both lacked understanding of the need for architecture to create spaces for visitor orientation, support intuitive way finding and afford fixing of interpretive elements such as wall graphics. Controlled lighting is important to reduce glare and surface reflection and to enable the use of lighting for object display, emphasis and theatricality. Such architectural issues cannot be resolved through an additional interpretive layer of design.

In the Te Wao Nui case, the zoo’s lack of experience led them to leave interpretation design until very late in the project. The architect’s extensive knowledge of the needs of interpretation design ameliorated the client’s lack of knowledge in relation to the architecture, landscape and infrastructure but did not entirely compensate for the late engagement of interpretation designers. The Director expressed a wish that he had increased the budget and time for interpretation design, stating that he would have liked to consider interpretation in the site planning to create opportunities for social interaction and reflection, locations for major works and so forth. As there was an overlap between the contracts of the architect and the interpretation designers, some coordination and integration of work was possible, particularly within the landscape, which had a more fluid development process. No coordination and integration was possible in relation to the overall layout, pathways and major structures. The Director’s change in attitude through the course of the project demonstrates the importance of client experience in gaining an understanding of the significance of interpretation design.

In addition to the concrete effects of late engagement of designers, more subtle effects can be seen. In both cases, clients and stakeholders had spent some time developing individual visions for the installation, without being challenged by the practicalities and philosophy of a design leader. This led to certain ideas or components becoming fixed, rather than the project being viewed as a coherent whole comprised of interdependent parts. Engagement of designers during the conceptual development phase of a project would enable designers to serve a
design leadership role and more effectively develop a collaborative vision with stakeholders.

Evidence from the practitioner interviews and the Te Wao Nui case indicates that interpretation design is largely seen as part of the final stages of a project, designers being seen by contracting organisations as providing the ‘icing on the cake’, adding an interpretive layer to an established visitor environment, rather than contributing to the foundations of the visitor experience such as physical environment, journey pathway and layout. Such cases neglect the role of designers as strategic planners who consider the whole visitor experience as an interpretive opportunity. It is largely through undertaking projects and experiencing what designers have to offer that organisations develop a better understanding of the contribution of interpretation design to the overall visitor experience.

Based on the case study evidence, the thesis proposes that project context aspects play a significant role in shaping design outcomes, the most significant being as follows:

Client inexperience or lack of understanding of the contribution of designers is likely to lead to:

- An underdeveloped design brief;
- Late engagement of designers;
- Designers taking an educative role with their clients; and
- Difficulty in effective management of the design process.

In turn, the lack of a comprehensive design brief generally results in:

- Lack of clarity around designers’ roles; and
- Lost time articulating project aims and philosophy.

Late engagement of designers limits:

- Designer input into architecture and landscape to support interpretive aims;
- Development of shared understanding between the client, stakeholders and designers in regard to design potential and philosophy; and
- Development of a holistic, strategic approach to design.
Case analysis is supported by the following propositions from the practitioner interviews:

- A client’s lack of experience and understanding about managing interpretation design projects places a burden on the designer to educate the client about project management, site requirements and design processes.
- Late engagement of designers limits their contribution to functional, spatial and conceptual aspects of the building, often leading to environments unsuitable for interpretive works. This limits the designer’s creative contribution and hinders the potential use of architecture as an interpretive element.
- Ideally, consultant contracts overlap to enable opportunities for collaboration in developing interpretive environments.

Findings:

1. Lack of understanding and experience of interpretation design on the part of client organisations can result in a poorly developed brief that demands extra time to clarify and resolve aims and issues during the design process.
2. Lack of client understanding and experience can result in late engagement of designers so that they are unable to contribute to architectural design that supports audience needs and interpretive aims.
3. Engagement of designers during the architectural design phase of the project development process optimises their capacity to contribute to effective conceptualisation and design of interpretive environments.

Recommendations:

The lack of knowledge and experience on the part of client organisations indicates a potential role for a design consultant to help organisations prepare for and manage such projects. Such a person could assist organisations in preparing the design brief including advising on timing of contracts and budget allocations. Their role could include creating opportunities for collaboration between consultants, educating organisation staff in understanding interpretation and the language of design, preparing them to better engage in the design process and working with staff in a curatorial role to develop storylines and content outlines in a way that would be useful to designers and facilitate a more effective design development process. The consultant could potentially engage in market research to better understand audience characteristics and needs and critique outcomes, two aspects identified by the research as lacking in many organisations. Alternatively, clients could select designers based on folio rather than tender so they can contribute to the
planning stages by collaborating in preparing their own brief and advising on building design. Equally, organisations could build such capacity within their own staff.

To remedy an underdeveloped design brief, designers need to make a return brief standard practice. A return brief articulates the designer role and process, clarifies project parameters and articulates assumptions. It can include questions that provoke clients to learn and prepare for the project. A limitation to this recommendation is that such work is not recognised within project budgets, providing a financial disincentive for designers. Further, it is generally only possible to prepare a return brief after the designer has been granted the project when budget, sequence of contracts and time provisions are already set. A return brief may, however, provide benefits and time-savings over the whole project in relation to clarification of aims and negotiation of responsibilities.

To remedy the general lack of understanding of the field, designers need to promote interpretation design through greater participation in conferences and contribution to practice journals and scholarly publications in relevant fields. Designers can collaborate to conduct education and training programs for contracting organisations and interpretation planners similar to the one conducted by Museums Australia entitled, ‘Working with designers’, which covered such topics as the design brief, interpreting difficult stories and interactive design.501 In all, designers can seek to become more visible within their professional fields.

Designers contribute to greater understanding of their field through building stronger connections between theory and practice, recognising knowledge from practice and undertaking research about practice. The creation of professional development activities for designers and related professions, professional guidelines and best practice principles would contribute to greater professionalisation, recognition and understanding. Post-graduate programs in interpretation design would support research in the field, in turn providing academics capable of supervising higher-degree research students in interpretation.

**Impact on interpretation design process**

Meaningful dialogue between a design consultant and the commissioning organisation to critique interpretive concepts requires the development of a shared language of design.502 Such a shared understanding occurs over time, through an iterative process of presentation, critique and refinement of ideas and solutions. The designer, client and

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content specialists share their expertise to arrive at solutions that integrate the needs of the visitor, client organisation and project aims in a coherent design. The designer learns about the complexities of the subject matter while the client learns about interpretation principles and methods. In the Te Wao Nui case, a common language and understanding of design strategies were not developed early enough to be effective, due to the compressed project time frame and urgency of design output. Many designs could not be refined through an iterative process due to time pressures. The standard design process of concept, development and documentation was modified to suit the needs of production, items being designed in order of fabrication lead times, that is, Maori art, major works and sculptural items, physical interactives, theming, multimedia, signage, text and graphics. Any content not effectively included in the main design elements was pushed into inclusion in the text and graphics. Earlier engagement would have enabled designers to work with zoo staff to clarify the key messages and further develop secondary threads throughout the interpretation, reducing reliance on signage. The designers could have more effectively used text as one of the many forms of design within their overall strategy. As argued by Hall, editing of text helps the designer to manage the fourth dimension of design: time. Designers can use text to manage the pacing of visitors through an exhibition. 503 In this case, the late engagement of designers and a highly compressed project timeframe hindered the development of a shared language of design in the planning and critique of concepts. A longer design period may have aided the development of a common understanding of the language of interpretation, a more coherent vision and a more strategic approach to the use of a range of interpretive media.

As a result of the compressed time frame and scope of the Te Wao Nui project, the designers needed to develop methods of planning and presenting designs that communicated both the individual design elements and the overarching strategy for creating a visitor experience. Traditional forms of documentation through sets of drawings as used in architecture were not suitable as they fail to capture the experiential aspects of an environment and are time-consuming to produce. Furthermore, the design intent can remain opaque to those untrained in reading drawings. The designers’ development of a combination of flexible and agile design presentation methods comprised a creative activity in itself, one that aimed to meet the needs of the client as user or audience.

In many other design fields, it is common practice for a designed object to be prototyped and tested with a target audience, information from such trials being used to refine and develop the design to meet user needs. Principles of user-centred design include user testing at each stage of design to overcome potentially incorrect assumptions on the part of designers regarding user needs, wants and ways of interacting with a product, in particular how they learn to use the product.\(^{504}\) In the interpretation design field, projects do not generally allow for this as they must be completed and all funds acquitted within a set period; trialling starts on opening day. If an element is faulty or ineffective it will most likely be removed from display and not be replaced or redesigned. Apart from some well-funded major institutions, once a project is open to the public further funding is rarely available for ongoing development and refinement. As argued by Wineman and Peponis, design could extend beyond the project completion date to lengthen the exhibit permanence, retaining freshness for visitors.\(^{505}\) In both cases, although the major work is complete and it is now open to the public, its success will depend in part on further refinement and development over time, with ongoing change encouraging repeat visitation.

Case analysis accords with the following proposition from Chapter Four:

- Formative and summative evaluation is underutilised by client organisations and designers, particularly in relation to design outcomes.

The lack of evaluation through trialling with audiences lends support to the proposition that:

- An institution’s lack of knowledge about audience interest and needs can create unstable foundations for design.

Findings:
1. The development of a shared language of design among stakeholders and contributors requires collaboration time and an iterative design process.
2. Designers have two audiences: the client and the visitor. Designer expertise includes adapting methods of communicating ideas and strategy to stakeholders as well as creating experiential environments for visitors.
3. Formative and summative evaluation provides essential understanding of audiences but are not effectively utilised in design development. Ongoing development and


refinement of design after a project is open to the public would enable designers to better meet audience needs.

Recommendations:
Designers can assist in developing a shared language of design with clients by actively engaging with their educative role in relation to clients and developing tools for promoting strategic aspects of interpretation in language that clients understand. Articulation of the design process in a design brief, including aspects such as the need for an iterative design process and discussion of evaluation may assist designers in arguing for more time and greater budget allocation to develop concepts and refine ideas in collaboration with stakeholders.

Other design professions such as architecture and exhibition design have developed guidelines through professional organisations that set out schedules for designer fees and project stages. The research does not propose a single ideal project structure and process, but a matrix identifying the type of site, scope of work, range of design forms (landscape, architecture, multimedia) and a sliding scale of fees and costs would provide guidance for client organisations to more adequately address the variety of work undertaken by interpretation designers. This could be promoted to the industry through professional bodies such as national interpretation and design organisations. For example, the Design Institute of Australia Practice Notes could include fee schedules that detail the breadth of work involved in interpretation design as distinct from other fields. Such a guide could propose a project process that allocates a budget to formative evaluation through testing ideas and prototypes with audiences and to summative evaluation and post-opening modification in response to visitor feedback. Post-opening modification ought not to be seen as a failing but as part of the design process, separate to fabrication retentions for defects.

**Impact on design outcomes**
Interpretation design provides the primary interface between an organisation and its visitors, design outcomes playing a central role in creating visitor experiences and communicating intended messages to audiences. Design remains, however, an undervalued element of many projects, as indicated by late engagement of designers and often poor budgetary allocations. In the two cases examined, although clients professed

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recognition of interpretation design’s significance, they established certain project parameters that limited its contribution. In the WHEC case, this was primarily in relation to unsuitable building design, in particular regarding orientation, way finding and light control. In other ways, the client demonstrated recognition of the importance of design by providing a reasonable budget, timeline and creative freedom, together with acknowledgement of the emotional impact that design can create. In relation to the Te Wao Nui case, recognition of the importance of design grew rapidly through the design process, although too late to provide additional time or funding to the project. The Director moved from having little understanding of interpretation to becoming a champion of its value.

In both cases, project factors including sequencing of contracts, timing of designer engagement and lack of client understanding of interpretation design contributed to a fracturing of the link between the designers’ knowledge, philosophy and expertise and the design outcomes.

Interpretation design operates on multiple levels. At one level, it focuses on the communication of messages to audiences. At a deeper level, it serves to create a coherent environment that supports the interpretive messages, sense of place, intuitive way finding and integrated content. In the Te Wao case, the whale skeleton design element achieves a number of significant outcomes. It assists visitors with the otherwise problematic navigation of a hairpin bend soon after entry to the precinct by drawing them around the corner and up the hill, alleviating the need for directional signage. It orients the visitor sensorially and conceptually to The Coast habitat. It connects the landscape with the interpretive signage about whales further along the path and echoes messages about loss of species. In this way, design can play a role in integrating and connecting interpretive elements with other aspects of the visitor environment such as way finding and orientation. Visitors do not notice being manipulated as they are drawn from one place to the next, their attention being absorbed in the experience rather than in intentional navigation. Interpretation design can help to ameliorate problems with the architectural and landscape design such as unsightly infrastructure, confusing navigation and transitions between environments to create a meaningful context for experiencing nature, Figure 160.

Similarly, in the WHEC case, the tree forms serve an integrative role, orienting the visitor to a forest environment, conceptually linking to the indigenous concept that the trees hold the stories, symbolically highlighting the character of different species through individual bark patterns and physically creating intimate spaces for visitor engagement with the exhibition’s content. The series of tree forms maintains the garden’s ‘hide and reveal’ strategy, or progressive disclosure, as the grand view is not visible until the visitor reaches the theatre. This strategic, integrative approach could have been further applied to other areas in both projects where way finding is an issue and potentially to areas outside each project’s footprint, such as the café and retail areas to better incorporate the project into the wider visitor experience. This approach treats the whole environment as part of the visitor experience and therefore as an interpretive opportunity. To play this larger role, interpretation designers must be involved in the formative stages of development of landscape design, architecture, exhibit development, pathway layout and retail design. As argued by Polakowski, design synthesises diverse concepts and elements through a set of theories, principles and processes to create a balanced, harmonious solution and should be considered fundamental and critical to the entire development process, from conception to realisation.  

Findings:

1. Beyond creating objects and interactive experiences, design can be integrative, strategic and synthesising. That is, it can inter-weave the landscape, architecture, storylines, information, objects, way finding, orientation and sense of place into a coherent, meaningful holistic experience for visitors.
2. Interpretation design can be used strategically to compensate for deficiencies in the landscape or architecture and can reduce the need for signage.

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3. Early engagement, collaboration with other consultants and client understanding of design’s strategic role supports effective design.

Recommendations:
Designers need to educate clients beyond the scope of individual projects through showcasing specific achievements, providing analysis and highlighting strategic aspects of design over mere aesthetics. As interdisciplinary strategy is possibly the least understood aspect of design, design folios should seek to promote embedded, strategic, subtle aspects over primarily aesthetic works.

Identification and promotion of examples of best practice within the field may assist designers to promote strategic design as achieving greater visitor impact with less ‘noise’ in the visitor environment and lower use of resources.

A fishbone model of overlapping contracts for specialist contribution is widely applicable, providing greater opportunity for cross-disciplinary collaboration that results in strategic, integrated design outcomes.

Research Question 3: How do such project factors affect the expression of ideas of nature through design?

The two cases under examination took different approaches to the presentation of nature although both used the aesthetic appeal and restorative effects of nature as a central means of audience engagement. As the research does not extend to visitor studies, discussion of the understandings visitors gain from each of the interpretive projects would be somewhat speculative. Analysis therefore focuses on what is provided for audiences and the intent of such work.

In both cases, the design brief was limited in its clarity concerning messaging about nature. Ideally, the process of developing a design brief should help an organisation to clarify and articulate such aspects. In the WHEC case, there was some dissonance among stakeholders about the centre’s role in relation to communicating about the natural environment. The World Heritage listing identified biodiversity of dry sclerophyll forest and karst landscape as the most significant values of the area, with aesthetic and cultural values also being recognised. These objective guidelines drove the focus and balance of text and object displays, design directions emphasising aesthetic qualities in combination with natural objects and text about biodiversity and culture. The resulting interpretive environment creates a distinctive atmosphere and sense of place by referencing nature.
through sculptural form, photographic imagery and layered graphics. As a whole, WHEC situates the visitor within a stylised nature, with a strong emphasis on natural beauty and the importance of vast wild areas. Design elements such as the trees, slot canyon and film aim to surround and include the visitor rather than make them feel like an outside observer. Conservation messages are present but do not dominate the experience, the focus being on appreciation of nature. The film in particular focuses on the beauty of the World Heritage Area, aerial imagery illustrating the vast scale of the area, complemented with close up images of tiny rare plants to communicate the fragility of biodiversity. Thus, despite issues related to the build quality of the canyon and physical orientation issues, the design is largely successful in relation to the project’s aims of creating an affective visitor experience about wild natural areas within a constructed exhibition environment. However, the lack of authentic objects, combined with the centre being distant from the resource being interpreted, weakens the potential for the audience to feel a sense of connection with nature. The WHEC demands significant effort from the audience to engage with a somewhat theatrical, stylised environment and to draw links between the centre, the garden and the national parks they interpret,

In contrast to the WHEC project, the scale of the Te Wao Nui precinct affords a greater variety of exhibit types. However, the demands of a zoo environment limit the range of interactive and object displays. Te Wao Nui showcases a large range of animal and plant species set in a series of naturalistic habitat-themed environments. The precinct combines threads of flora, fauna and culture through a range of interpretive media. Single species exhibits, common in zoos, are rarely effective in communicating the relationships between plants, animals and humans that constitute biodiversity. Within Te Wao Nui, species are represented by individual specimens or pairs rather than natural social groups but many species on display are compatible so can be combined. This enables a more holistic view of biodiversity, augmented by models and artworks of species not on display. Species are presented as a part of a community rather than as isolated and separate, supporting the aims of helping visitors to understand and appreciate the natural environment. Some species not on display are represented in models or artwork. Furthermore, as many species are compatible with human presence, visitors can walk through the enclosures, offering genuine landscape immersion. In contrast to the WHEC case, the Te Wao Nui interpretation is supported by an abundance of natural objects set within an immersive landscape environment that provides a strong, immediate connection with nature.
The combination of media fills out the picture of natural biodiversity and its threats, video footage within Te Wao Nui demonstrating animal behaviours beyond those normally visible within the zoo environment. These include bats nesting in a tree hole, kiwi laying eggs and live footage of a penguin hatching within one of the zoo’s nesting boxes. The style of film varies to suit the different contexts within the precinct. In the boatshed it is a daytime TV fishing show, with people talking about marine reserves and fishing practices in a lively, direct manner. By contrast, in the Night area, video footage consists of documentary style close ups of animal activity with no narration or sound.

Aside from the organisation around habitats, the zoo did not articulate how they would like to represent nature. A key role of the designers was to tease out these ideas by discussing and presenting design options which were approved, amended or dismissed. Much of the finer discussion occurred during the final phase of text development, when zoo staff articulated a desire to focus on communicating the character of each species and the relationships and interdependencies between species, including those between animals and plants. By this stage in the project, such content could only be conveyed through text rather than other design forms. Had these aims been articulated earlier, with more time allocated to strategic design, it may have been possible to demonstrate these relationships more effectively through design, reducing reliance on signage text to explain them. The zoo’s focus on interpreting each species individually and the designers’ compressed timeline meant that limited resources were available for this. Furthermore, the text’s focus on threats and conservation for each species is somewhat repetitive as many species are affected by similar threats and benefit from similar conservation actions. Through further development, it may have been possible to satisfy the zoo’s desire to communicate conservation issues and actions with less repetition and through a wider range of means. This would encourage greater visitor connection with nature as a whole, as a precursor to concern for conservation.

With regard to interpreting the relationship between nature and culture, the thematic habitat arrangement provided opportunities to demonstrate human relationships with nature. In general, across references to western and Maori culture, the text refers to a contemporary human-nature relationship rather than an idealised, untouched nature. The design team intended that kaitiakitanga, or nature guardianship, would be a thread through the precinct, providing a balance of information about the negative impact of humans on nature and offering positive conservation actions that visitors can participate in. The means of achieving this changed through the process, becoming more signage based rather than sculptural due to time constraints and the difficulty in selecting
culturally appropriate images and forms. Ideally, any work involving integration of indigenous or sensitive cultural content should have a longer development period as all stakeholders need to be educated about the cultural issues to make appropriate design choices, preferably seeking more embedded and integrated means than signage.

Deletion of proposed Maori cultural artefacts from the program due to difficulty in gaining Maori advice and approval led to a division of cultural content that may distort visitor perceptions of human-nature relationships. Maori culture is presented primarily within the landscape through artworks, whereas western New Zealand culture is predominantly presented within scientific and conservation interior environments. The kaitiakitanga signage and Maori content in the boatshed are the main exceptions to this. Arrived at by default, this division may promote an overly idealised and mythologised native culture rather than a more contemporary, integrated culture. Similarly, it may distort perceptions of western cultural engagement with the land, excluding artistic, spiritual and personal relationships with natural places. The proposed poetic elements aim to redress this to some extent.

It is critical that project stakeholders consciously consider the link between interpretation practice and cultural constructions of nature. Articulation of the role of the animal on display, whether as a representative of its species, a member of a herd or family group, an example from a specific habitat or a rescued remnant of a near extinct species will contribute to strategic design. In both cases, greater discussion between the client organisation and the design team around a philosophy of nature interpretation, such as the balance of focus on conservation, nature appreciation and scientific information, would have assisted designers in meeting the aims of the project and the organisation. Designers, together with their clients, need to work through the complex issues surrounding interpreting nature to the general public, unpacking the underlying intentions and deeper messages to communicate to public audiences. The categories provided in Chapter Three are a useful contribution to such discussions.

Within the limitations of the research which does not include visitor studies, the case study analysis supports propositions from Chapter Four:

- Interpretation designers aim to distil the essence of a subject, creating a sense of place and providing affective experiences of nature that communicate ideas and arouse feelings in visitors.

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• There is little discussion about philosophical aspects of nature presentation in consultancy projects.
• Interpretation design can assist in communicating a more holistic view of nature and human relationships with the natural world.

Findings:
1. Interpretation design plays a significant role in communicating ideas about nature, yet is often not well informed by the client through formal or informal means.
2. Aesthetic appeal is often used to communicate the value of nature. Further research is needed to examine the relative value of a focus on direct conservation messaging and indirect persuasion through presentation of the beauty and complexity of nature.
3. Design can serve to create a holistic vision of nature that extends beyond the species on display. Through a range of media and objects, interpretation design can convey relationships between humans and nature, interrelationships between species and the complexity of environmental systems.
4. Projects involving sensitive cultural content require longer lead times to enable effective consultation and culturally appropriate design choices.

Recommendations:
As previously discussed, a return brief enables designers to clarify issues and challenge client assumptions. Designers can use a return brief to broach with clients the subject of how nature messages are conveyed through design as well as more familiar means such as text and image.

Designers should provide prompts and provocations for stakeholders to consider early in the project, to encourage deeper consideration of questions about the presentation of human-nature relationships and the relative weighting of conservation and other environment related messages. Designers should seek out informal opportunities for discussion with clients regarding philosophical aspects of the project. Client understanding of interpretation design together with earlier engagement of designers will support more nuanced approaches and strategic use of interpretive media.

Research Question 4: What are the distinguishing characteristics that define interpretation design practice?
The thesis has examined the field through investigation of historical, individual practitioner and case aspects, applying multiple methods to gain a holistic perspective of practice. It has established that interpretation design employs interpretive principles
within interdisciplinary design practice in diverse contexts including zoos and museums. Synthesising understandings gained from the research, the chapter culminates in a characterisation of interpretation design practice that provides a basis for further research and development of theory.

The field of interpretation design is defined by its intent rather than its form, unlike more traditional design fields such as architecture, landscape architecture or product design. Interpretation design uses diverse physical and sensory media including the medium of visitor time. Multidisciplinary, collaborative design teams traverse boundaries between disciplines to employ landscape, architecture, storytelling, information, art and play elements in communicating with audiences.

Interpretation design places the visitor experience at the heart of the design intent, ideally taking into account audience type, social interaction and movement and visitors’ diverse motivations, interests and learning styles. Driven by project aims, audience needs and organisational mission, design consists of approaches, techniques and types. The conceptual, physical and stylistic approaches establish a rationale for the application of design techniques and design of object types. Techniques include immersion, embedding and interactivity. Design outcomes engage visitors across cognitive, affective and physical modes in experiences that aim to influence thinking, emotion and behaviour. Designers provide a variety of activities, information, stories and heightened sensory experiences that contribute to visitor learning and meaning-making over time. Ideally, interpretation helps visitors to connect directly with nature, rather than creating conceptual or physical obstacles between the visitor and the resource. This ideal model or characterisation is shaped in practice by each designer’s range and depth of expertise, combination of skills and philosophy, together with the project’s content, aims and audience.

Design processes and outcomes are dependent on project structure, management, context and project parameters as well as designer expertise. Lack of understanding of interpretation design on the part of client organisations constrains the contribution of designers, while engagement of designers early in the exhibition development process optimises their capacity to create effective interpretive environments. Interpretation design has the potential to be strategic, integrative and coordinating: that is, effective design aims to achieve multiple specific outcomes such as physical and conceptual orientation, intuitive way finding, visitor reflection and social interaction while contributing to a coherent sense of place through the integration of landscape,
architecture, signage and art. Overlapping contracts between designers and other project contributors such as architects and landscape designers supports a strategic, integrative approach to interpretation design.

As a result of the research, interpretation design can be defined as follows:

Interpretation design is the strategic application of one or more design forms to create visitor experiences that communicate specific ideas, values and messages through visitor interaction. Interpretation design offers visitors cognitive, affective and physical means of engaging with their environment, through which visitors co-create their own experiences, learning and making meaning over time. Interpretation design aims to integrate and coordinate elements into a holistic visitor experience.

This definition situates interpretation design as overlapping the field of communication design, yet being differentiated in relation to visitor interaction with the environment and the use of diverse design forms, media and methods. It is distinguished from exhibition design in having specific interpretive intent, treating the whole visitor environment as an interpretive opportunity and aiming to integrate design elements into the wider visitor environment.

Chapter Seven analysed the two cases, identifying significant influences on the role, processes and outcomes of design. Applying the frameworks, vocabulary and understandings established in previous chapters, the findings support the propositions from the practitioner interviews and contribute deeper understanding of the impact of contextual factors on practice. The chapter makes recommendations to address the constraints and obstacles faced by designers within interpretation projects, which, although situated and specific, serve as useful examples from which to draw widely applicable insights. The chapter synthesises theoretical and practical knowledge to define interpretation design, laying the foundation for building knowledge of the field.
Conclusion

The practice of interpretation design has evolved in response to a desire by public institutions to educate their visiting public and increase visitation. From its origins in national park guidance and museum specimen labels, interpretation design continues to grow in importance as institutions aim to provide profound experiences that influence visitor behaviour, particularly in relation to conservation actions. However, published knowledge is not commensurate with this significant role, limiting the relationship between theory and practice and hindering the development of expertise in the field. This research builds understanding of practice to redress this gap in knowledge.

The boundary between exhibits and the visitor environment has blurred, interpretation design often playing a role in unifying the two into a holistic, coherent visitor journey. Interpretation designers have developed sophisticated methods for connecting visitors with nature displays. Aiming to educate, inspire, entertain, provoke and persuade audiences, designed objects invite visitor engagement and interaction through cognitive, sensory, emotional and kinaesthetic modes. The practice of interpretation design requires an understanding of the connections between learning, play, social interaction, emotion and free-choice movement that constitute the visitor experience. Visitors contribute their own set of motivations, knowledge, interests and aptitudes to the creation of their experience and understanding.

The thesis argues that interpretation design exists as a field of practice, replete with tacit knowledge. The field faces significant challenges as it emerges from a scattered range of practices and matures into a recognised field of expertise. Such challenges relate firstly to the context of the profession, where client project planning and institutional structures do not recognise the significance of interpretation design. Issues include the frequent lack of understanding on the part of client organisations, stakeholders and funding bodies of the potential for interpretation design to shape visitor experiences. The constraints of often unrealistic and limiting timeframes and budgets and a fragmented process of project development across planning, design, text development, marketing and public programs hampers the creation of coherent, dynamic, meaningful visitor experiences. For interpretation design to be more than just the ‘icing on the cake’ and become integral to creating the visitor experience, interpretation designers need to be engaged early in a project to inform development of the landscape, architecture, enclosures and site infrastructure. Increasing visibility and recognition through professional bodies and
published knowledge will serve to support wider understanding of the field. This research is an important early contribution to such recognition.

Second, the field of interpretation design does not effectively integrate theory and practice, with few exemplars, limited avenues for professional development, few design researchers and no conduit for gathering relevant research from other disciplines. Interpretation design faces a lack of theoretical frameworks and practical tools, designers needing to develop a vocabulary for communicating strategy and achieving wider understanding of practice. To build expertise, designers need to think beyond the specificities of the project at hand to develop planning frameworks and tools for critical analysis that strengthen the relationship between theory and practice. The model of the foundations of practice and the typology of design outcomes are a significant contribution in this regard. The development of exhibition evaluation frameworks that include design evaluation, development of best practice principles and further case studies would provide a valuable contribution, being closely aligned with practice. The field does not have a system of specialist training, practitioners transitioning from other design-related fields. Informed by diverse fields of knowledge from education to tourism and interaction design, the field of interpretation design faces the challenge of gathering and conducting relevant research, undertaking critical analysis and review of completed work and feeding these into professional practice. National and international interpretation and design organisations could play a greater role in gathering and disseminating such research. The interviews and case studies in this thesis constitute a small sample of the wealth of unpublished knowledge and conceptual and practical approaches to interpretation design.

Third, conceptions of nature and conservation aims underpin many interpretive projects, yet the communication of such ideas is rarely closely examined in relation to design approaches, techniques and media. Sustaining inherent conservation values and principles from its origins in national park guiding, interpretation design plays a significant role in communicating ideas about nature to visitors and encouraging appreciation of the natural world. The thesis proposes a fifth generation of zoo exhibit design, one of cultural landscape immersion that has become prevalent in recent years. Further research is needed into the effects of cultural immersion to measure the quality of visitor experience of nature, sense of affinity with nature and conservation behaviour. Interpretation design is well placed to develop more critical approaches to the interpretation of nature, providing client organisations with the vocabulary for articulating their aims and understanding of the strategic use of design. The research makes a significant
contribution in this regard by articulating a range of prevalent conceptions of nature that may be applied in interpretation projects.

Fourth, the field of practice requires definition and articulation of its aims and methods to support critique of outcomes. The thesis argues that good interpretation design transcends a focus on messages to create a whole visitor experience that integrates mind, body, senses and emotion. Interpretation designers use architecture, landscape, art and play components together with signage, interactive exhibits, theming and multimedia to form a coherent whole. Strategic planning and design of interpretation reduce the need for instructional and way finding signage, using techniques of attraction and affordance to draw visitors to the next location and invite them to interact. The thesis proposes that a multidisciplinary design team is best equipped to undertake the range of roles required by each project. Such a team is ideally involved from the start of a project, working in close collaboration on the concurrent development of curatorial and experiential elements to contribute to its conceptual, spatial and thematic development and to identify interpretive opportunities within the site.

This thesis is a first step towards meeting such challenges for the practice of interpretation design by providing theoretical models and vocabulary to support designers in clarifying their role, proposing improvements to practice and taking the first steps towards articulating the foundations of interpretation design practice.

**Original contribution and significance**

All fields of practice require exemplars to build expertise, case studies of interpretation and exhibition design being essential to consolidate knowledge from practice. The research is the first to examine interpretation design as an interdisciplinary design practice with a coordinating, integrative intent. This foundational knowledge-building research is an essential step for the field to recognise practitioner knowledge and create the foundations for further research.

The research draws on a range of sources and perspectives to contribute to the development of theory and practice. Based on the literature of interpretation, interviews with practitioners and my professional experience, the research proposes a model of the foundations of practice. Analysis of interviews with interpretation design practitioners reveals unpublished knowledge and identifies issues that affect design practice. The research is the first to set out the range of design outcomes, presenting an original typology that demonstrates how interpretation theory is realised. Two in-depth case
studies examine the impact of context and process on design outcomes. Characterisation and a working definition of interpretation design provide a basis for further research and development of knowledge in this significant field of practice.

The findings significantly deepen understanding of interpretation design, being among the first examinations of the subject. The research is relevant to practicing designers and their collaborators, researchers and commissioning organisations, contributing to the fields of interpretation, tourism, design and museum studies. It demonstrates the impact of design management on designer roles and outcomes. In particular, examination of interpretation design has the potential to shed light on the collaborative, cross-disciplinary and potentially integrative nature of other forms of contemporary design practice.

**Proposed future research**

As the first of its kind, the study is broad in scope and diverse in its intentions and outcomes. The role of interpretation design and the institutions that commission such work continue to change in response to social and economic influences. The field would benefit from replication of the research to investigate the value and validity of the conceptual frameworks and findings as they are applied in new contexts. For example, a comparison of the practice of interpretation design in hybrid institutions and more traditional zoos and museums may provide useful insights for the profession.

The visitor experience lies at the heart of interpretation design; this thesis identifies various approaches and techniques used by designers in interpretation projects but does not evaluate them in relation to visitor response. Visitor studies that investigate the impact of specific interpretation design approaches and techniques on aspects of visitor experience such as their understanding and appreciation of nature would provide evidence regarding the respective value of such approaches. Examination of the different types of experience offered to visitors and the different audiences each attracts may also shed light on the suitability of specific design practices. For example, in light of research indicating that visitor reflection is an important factor changing visitor conservation behaviour, investigation of how interpretation design can support reflective visitor experiences would provide a valuable contribution to the field.

An aspect raised by this research worthy of deeper investigation is the notion of a shared language between client and designer that is developed through collaborative planning and an iterative design process. Examples from other projects and other fields of design practice may contribute useful knowledge to the field. Given that practitioners come to
interpretation from a wide range of fields including education, architecture, exhibition
design, art, graphic design and theatre and that relevant research is generated within
diverse disciplines including psychology, museum studies, tourism and education,
research into cross-disciplinary communication strategies may be of value to practice.

Examination of how a designer’s philosophy and prior training influence their approach,
process and design outcomes within a collaborative, multidisciplinary project context
would also provide valuable insights for the profession. Such research could assist in
guiding professional development and training initiatives for interpretation designers.

Interpretation is based on a philosophy of valuing natural heritage and encouraging
behaviour change to encourage visitors to take action for heritage conservation. The
widely promoted maxim, ‘Through interpretation, understanding; through understanding,
appreciation; through appreciation, protection,’ can be summarised as: understand,
appreciate, protect. It could therefore be said that interpretation designers have a
responsibility to the species and environments on display to interpret them as fully as
possible in relation to their wild origins and captive or preserved context so that visitors
understand them through a more complete and complex vision of nature. In some cases a
dominance of conservation messaging replaces a focus on the species, habitat, system,
beauty or other aspect of nature, positioning nature to visitors as vulnerable, but not
necessarily promoting understanding and appreciation of it. Visitor research into the
effect of the portrayal of nature as fragile and threatened in relation to visitor’s enjoyment
and sense of affinity with nature would contribute to more informed design practice in
this regard. Investigation of the underlying philosophies of interpretation designers may
shed further light on the role of designed interpretive experiences in influencing public
attitudes and behaviour to contribute to critical discussion on this topic.

The research is a significant step towards an improved understanding of interpretation
design practice, a field deserving of greater attention from researchers in design,
interpretation, tourism and education. Emerging as a field of professional practice,
interpretation design is well positioned to undertake critical examination of practice and
further research to establish a solid foundation for its future development.

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Hi Toni,

I think this is the ethics approval that you are after.

Regards,
Rachel.

>>> Ann Gaeth 13/12/2010 2:12 PM >>>
To: Dr C Barnes Design; Ms Toni Roberts (bc)
CC: Ms Rachel Mosel, Research Administration Co-ordinator Design

Dear Dr Barnes and Ms Roberts,

**SURHEC Project 2010/285 The role of design in the practice of interpretation**

Dr C Barnes Ms Toni Roberts Design
Approved duration: 13/12/2010 to 31/12/2011 [Adjusted]

I refer to the ethical review of the above project protocol undertaken by a SUHREC Subcommittee (SHESC3). Your response to the review, as e-mailed on 10 December 2010, was approved inline with the guidelines set by a SUHREC delegate(s).

I am pleased to advise that, as submitted to date, the project may proceed in line with standard ongoing ethics clearance conditions here outlined:

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Research Involving Humans and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/ supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical approval/ clearance. SUHREC must be notified immediately or as soon as possible thereof of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this email as part of project record-keeping.

Best wishes for project.

Yours sincerely,

Ann Gaeth
Secretary, SHESC3
Ethics statement of compliance

I declare that all conditions pertaining to the ethics clearance for this research were met and that final reports have been submitted.

Toni Roberts

Signed: ______________________

Date: ________________________