

Towards an Evaluation-Based Framework of Collaborative Archaeology

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COLLABORATIVE ARCHAEOLOGY

Archaeologists are increasingly aware that their discipline and practices affect living people, including the descendant communities on whose lands projects are carried out (e.g., Atalay 2006, 2012; Ferris 2003; Layton 1994). Although there is extensive literature on the topic of community engagement in archaeology (e.g., Atalay 2012; Atalay et al. 2014; Colwell-Chanthaphonh and Ferguson, ed. 2008; Little and Shackel 2007; Lyons 2013; McDavid 2014; Marshall 2002; Nicholas 2008; Nicholas and Andrews 1997; Silliman 2008), there have been few analyses of what constitutes engaged research that meets the requirements of legal, ethical, and professional practice.

This paper is shaped by the recognition of a “collaborative continuum” (Colwell-Chanthaphonh and Ferguson 2008:1) and the associated difficulties of “differentiating various forms of collaborative practice” (Atalay 2012:48). Borrowing from other disciplines, including education (see Arnstein 1969; Austin 2004; Friend and Cook 2003; Lassiter 2008) and environmental management (see Armitage et al. 2009; Folke et al. 2005; Plummer et al. 2012 on adaptive co-management), a process is underway in collaborative archaeology to develop definitions, processes, and working models so that the concept of collaboration can be continually adopted, applied, and re-evaluated (Atalay 2012). The aim of this ongoing process is to develop a structured theoretical and methodological framework for collaborative projects

ABSTRACT

Collaborative archaeology is a growing field within the discipline, albeit one that is rarely analyzed. Although collaborative approaches are varied and diverse, we argue that they can all share a single methodological framework. Moreover, we suggest that collaborative archaeology projects can be evaluated to determine the variety among projects and to identify the elements of engaged research. We provide two case studies emphasizing project evaluation: (1) inter-project evaluation of community-engagement in British Columbia archaeology and (2) intra-project evaluation of co-management archaeology projects in Western Australia. The two case studies highlight that project evaluation is possible and that a single framework can be applied to many different types of projects. Collaborative archaeology requires analysis and evaluation to determine what facilitates engagement to further the discipline and to create better connections between archaeologists and community members. The discussed case studies illustrate two shared methods for accomplishing this. The paper argues that collaborative approaches are necessary for advancing archaeological practice.

La arqueología colaborativa es un área de estudio que se ha desarrollado dentro de esta disciplina, no obstante los limitados análisis que existen en torno a ella. Aunque los enfoques en colaboración son variados y diversos, sostenemos que en su conjunto pueden compartir un mismo marco metodológico. Además, se sugiere que los proyectos de arqueología colaborativa pueden ser evaluados para determinar la variedad que existe entre ellos y determinar en qué consiste una investigación con compromiso. Presentamos dos estudios de caso que se enfocan en la evaluación de proyectos: (1) una inter evaluación de un proyecto con compromiso comunitario en la arqueología de British Columbia y (2) una intra evaluación de proyectos de manejo compartido en Western Australia. Los dos estudios de caso destacan que es posible evaluar los proyectos y que una misma metodología puede evaluar diferentes tipos de proyectos. La arqueología colaborativa requiere analizarse y evaluarse para determinar qué es lo que facilita el compromiso para impulsar a la disciplina y crear mejores relaciones entre los arqueólogos y los miembros de la comunidad. Los estudios de caso analizados comparten dos métodos que hacen esto posible. Este artículo sostiene que las estrategias de colaboración son necesarias para impulsar la práctica arqueológica.

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so that the notion of collaboration becomes something more concrete than just a general philosophy shared by community-oriented practitioners.

However, as with all archaeology, there are diverse approaches to developing and implementing a collaborative project. There is so little consensus on what level of consultation, integration, engagement, or collaboration is required in community, research, and commercial projects that these terms are often used interchangeably. Additionally, little attempt has been made to subject projects to systematic comparative analysis against a framework of what constitutes successful collaboration (Dalley 2004:4).

Thus, for the evolution of collaborative (Indigenous) archaeologies within the broader field of Cultural Heritage Management (CHM), a formal assessment and evaluation process is required in order to develop an applicable theoretical framework. This necessarily involves some framework for how to develop, implement, and evaluate a collaborative CHM project. Without this framework, the level of collaboration in CHM projects will continue to vary greatly, so that, for instance, what might be considered by some to be “collaboration” may be viewed by others as only “engagement” or “consultation.” Alternatively, a project may have a high level of collaboration in one or more aspects but lack in others. Without a process of “structuring” this type of archaeology, collaborative approaches will remain on the periphery of mainstream scientific and commercially based archaeology, with little chance of becoming embedded within broader management regimes.

At the same time, it is acknowledged that a uniform collaborative approach will not fit in every circumstance (Plummer and Hashimoto 2011) and that successful models for implementing collaborative CHM need to be developed and adapted at the local community level—“what works for one community may not work for another” (McNiven and Russell 2005:242). Thus, while acknowledging the importance of the “local” and “community-specific” models, it is also important to identify both local and global understandings of the “new formations of colonialism” and collaborative research practices in “local, regional, national and international contexts” (Hemming and Rigney 2010:101).

On this basis, this paper contributes to the further development of collaborative CHM in delivering an operational theoretical and methodological framework for developing and implementing projects and a means for evaluating projects in terms of their relative *levels of collaboration*. The methodology involves identifying a qualitative and quantitative process for comparing projects along the notion of a “collaborative continuum” (Colwell-Chanthaphonh and Ferguson 2008:1).

WHY COLLABORATE?

There are many reasons to examine why we need collaborative projects in archaeology. Here we look briefly at the ethical and legal requirements currently in place. Our main argument is that these legal/ethical guidelines set only limited requirements that relate only to “consultation.” This section precedes our argument that evaluation and assessment help to provide practical guidelines so that legal and ethical frameworks can begin to

further incorporate collaborative archaeology. This is in addition to other important reasons why assessment is needed; for example, assessment can help us to improve practice and clarify methods and language, to name just a few.

Ethical Requirements

At an ethical level, all archaeologists and anthropologists recognize that there are fundamental protocols of working with descendant communities (Traditional Owners) when carrying out commercial, community, or research projects.

We must accept [Indigenous peoples] as full partners in exploring the past and making it relevant to the present, not because it is the politically correct thing to do, but because it is the right thing to do [Nicholas 2000:132].

The field has developed to embed the notion of collaborative Indigenous archaeology as a major component of the discipline, to the point where some would argue that archaeology must be collaborative, or it is nothing. Sonya Atalay emphasizes that “archaeology’s sustainability is linked to collaboration” (2012:7). The question of ‘why collaborate’ is therefore found within the context of a general movement toward a “decolonized archaeology”—a concept that has been widely explored in literature in the past two decades in Australia, Canada, and the United States (see Allen 1988; Clarke 2001; David and McNiven 2004; Ferguson 1996; Hemming and Rigney 2010; Lilley 2000; McDavid 2014; McNiven and Russell 2005; Marshall 2002; Nicholas 2010; Nicholas and Andrews 1997; Smith and Wobst 2005; Thomas 1994).

Thus, collaborative approaches contribute to this fundamental movement toward a decolonized heritage management system—the key premise of these models being a fundamental restructuring of power within archaeology and heritage management. This restructuring seeks to empower communities as the leading partner in heritage management, “not as equal stakeholders, but as the owners and controllers of their heritage” (McNiven and Russell 2005:236).

Professional Requirements

Archaeological professional standards require archaeologists to work together with those connected to the archaeological record, especially indigenous communities. For instance, the Society for American Archaeology has the “Principles of Archaeological Ethics,” which include eight principles mandating collaboration (1996). The Australian Archaeological Association (AAA) requires members to follow its Code of Ethics, which includes principles relating to the archaeological record, indigenous archaeology, and professional conduct and “requires members to “negotiate *equitable* agreements between archaeologists and the Indigenous communities whose cultural heritage is being investigated” (AAA 2012:Indigenous Archaeology, emphasis added). The Canadian Archaeological Association (CAA) objectives include “promoting, protecting, and conserving the archaeological heritage of Canada, and the dissemination of archaeological knowledge” (CAA 2014a:Introduction). The CAA requires members to follow two sets of professional standards: (1) the Principles of Ethical Conduct; and (2) the

Statement of Principles for Ethical Conduct Pertaining to Aboriginal Peoples (CAA 1997; CAA 2014b).

Legal Requirements

International Laws. From an international perspective, the United Nations Declaration for the Rights of Indigenous Peoples (UNDRIP) provides a mandate for free, prior, and informed consent when working with indigenous peoples (UNGA 2007). Article 27 specifies that:

States shall establish and implement, in conjunction with indigenous peoples concerned, a fair, independent, impartial, open and transparent process, giving due recognition to indigenous peoples' laws, traditions, customs and land tenure systems, to recognize and adjudicate the rights of indigenous peoples pertaining to their lands, territories and resources, including those which were traditionally owned or otherwise occupied or used. Indigenous peoples shall have the right to participate in this process [UNGA 2007:10].

This is the highest level of framework for assessing consultation and partnership with indigenous peoples and essentially requires worldwide consultation between indigenous peoples and those who want to work in their traditional territories. However, the UNDRIP lacks legal enforcement under national laws that do not recognize collective rights, and many "colonial governments" have issues with the self-determination theme expressed by the UNDRIP (Hammond 2009:44).

Federal Laws. Federal heritage legislation exists in some colonial countries, including the United States (with laws such as National Heritage Preservation Act [NHPA] and Native American Graves Protection and Repatriation Act [NAGPRA]) (Davis 2010) and Australia (with laws such as *Aboriginal and Torres Strait Islander Heritage Protection Act*) (Burke and Smith 2010), no such legislation exists in Canada. There are two Canadian Acts with some relation to heritage (Burley 1994; Pokotylo and Mason 2010), the *Historic Sites and Monuments Act*² and the *Canadian Environmental Assessment Act*.³ These two pieces of federal legislation have little or no potential to protect heritage sites and do not require any consultation within the heritage domain (including archaeology).

State and Provincial Laws. State and provincial laws require archaeologists to acquire a permit before doing archaeological work and require the permit holder to "consult with or obtain the consent of one or more parties whose heritage the property represents or may represent."⁴ Therefore, permit holders are required to at least consult with indigenous communities before archaeological work is done on their territory. However, consultation does not equate to collaboration and instead connotes "a process of information exchange in a decision making process structured through government-to-government relations" (Colwell-Chanthaphonh and Ferguson, ed. 2008:7). Many see consultation as a reactive process, in which the archaeologist sets the agenda (Greer et al. 2002:267).

However, the only legal responsibility of the state or provincial offices is its permitting process. For example, in British Columbia, all other undertakings are secondary and discretionary as

they do not fall under the legislation of the *Heritage Conservation Act* (Apland 1993:11). Many archaeologists question whether these agencies primarily serve heritage or development (Welch and Ferris 2014). The same can be said for the situation in Australia and the USA (Welch and Ferris 2014:95).

Consultation in archaeology is required through international, national, and provincial ethical codes, heritage legislation, and agreements with specific communities. Moreover, many archaeologists recognize the benefits of community consultation in their practice and have created many forms of community-engaged practice. However, ethical guidelines and legal frameworks focus only on parameters and guidelines for consultation—which is the "floor," not the "ceiling" of the collaborative process. Thus, in order to unify the various ethical and legal frameworks of community engagement, we need methods for assessing community engagement, not as an end in itself, but as the necessary step toward an equitable, collaborative undertaking.

EVALUATING COMMUNITY ENGAGEMENT

We must evaluate our programs for their effectiveness in collaboration and achieving goals. We really cannot know if we are being transformative if we do not evaluate [Stottman 2010:192].

We argue that criteria are required to evaluate different levels of engagement between projects and also to critically evaluate individual projects. We outline two overlapping case studies: the first assesses the range of engagement that may exist via an assessment of "community/collaborative" projects in British Columbia, and the second is based on a review of a number of interrelated projects undertaken over eight years with several communities in southern Western Australia that began as loosely-defined, collaborative archaeology projects and, through the key mechanism of "learning-by-doing," evolved as projects delivered within a formalized model. Focusing on case studies provides the dataset and also the methodological framework, as espoused here:

As experiences with adaptive co-management are relatively recent, further consideration and refinement of these frameworks and the variables therein are required in light of grounded case studies [Plummer 2009].

Case Study 1: Inter-Project Evaluation: Community Engagement in British Columbia

As we have discussed, evaluating our work as archaeologists is essential to the discipline. Hogg created a methodology for evaluation as part of her Master's thesis, in which she studied community engagement in British Columbia archaeology (Hogg 2014). To assess how archaeologists and communities are working together in British Columbia, Hogg created a set of attributes to assess effective aspects of engagement. We define an *attribute* as a measureable and definable aspect of commu-

nity engagement. To create these attributes, Hogg studied past attempts to provide defined methods for community engagement, specific archaeology projects with effective engagement, and past attempts to assess community engagement. This section summarizes each of these efforts and then discusses each of the five identified attributes.

Hogg interviewed archaeologists working throughout British Columbia and asked them to assess their past projects using these attributes, using a simple ordinal scale: high, medium, low, or not present. It is essential to note that she assessed community engagement from an archaeological perspective—she did not talk to non-archaeologists. Although this means that her assessment does not take into account all collaborators, it demonstrates that it is possible to use an assessment strategy to assess multiple projects. This assessment strategy could be used in the future to assess all collaborators. Unlike previous attempts to evaluate engagement in archaeology, in which project participants created an evaluation strategy and used it to assess their own project, this methodology used a single independent evaluative strategy to assess multiple projects. Therefore, the evaluative strategy (the set of attributes) needed to be simple to understand and explain and useful for evaluating many different types of projects.

Methodology. Hogg focused on two past attempts to provide defined methods for community engagement: Moser et al. (2002) and Atalay (2012). Moser et al. provide seven components for community archaeology (2002:229), emphasizing communication, collaboration, employment, and community-managed initiatives. These components were the main guidelines for their community archaeology project in Qesir, Egypt. Atalay identifies five principles that community-based participatory research all share, based on her experiences. She argues that these five principles can overlap with one another but that each “plays an important role in making an archaeological CBPR project successful” (Atalay 2012:63). Her principles emphasize partnership, participation, community capacity, reciprocity, and the recognition of multiple knowledge systems (Atalay 2012:63).

There are many examples of community engagement in archaeology projects, including notable projects such as the Ozette Archaeological Project in Makah territory, Washington (Samuels and Daugherty 1991), and the work of Janet Spector and the Wahpeton community at Little Rapids, Minnesota (Spector 1993). In addition, there are more recent examples such as T.J. Ferguson and Chip Colwell-Chanthaphonh’s work with the tribes in the San Pedro Valley (Colwell-Chanthaphonh and Ferguson 2004; Ferguson and Colwell-Chanthaphonh 2006); John Welch’s work with the White Mountain Apache (Welch 2000; Welch and Ferguson 2007; Welch et al. 2009); Sue Rowley’s work with the Inuit of the Eastern Arctic (Rowley 2002); George Nicholas’s work with the Secwepemc in British Columbia (Nicholas 2000); and Natasha Lyons’s work with the Inuvialuit in the Western Arctic (Lyons 2013). This far from exhaustive list includes examples of effective community engagement from around North America.

However, to determine aspects of effective community engagement, Hogg chose to look at a different set of projects—the 40 “Working Together” articles from the *SAA Bulletin* and *SAA Archaeological Record*. These articles were created to inform archaeologists of collaborative efforts with Native Americans

and function as early success stories in community engagement (Aldenderfer 1993). In fact, as their entire purpose was to emphasize aspects of effective engagement, they are the perfect source to study this topic. The articles were published somewhat regularly in the *SAA Bulletin* and then the *SAA Archaeological Record* from 1993 to 2010. The projects took place from the 1970s to 2010; most were based in the United States, but some projects took place in Mexico and Canada.

The articles emphasize the importance of communication, information sharing, and allowing for community control in the research. These characteristics contributed to the positive outcomes of the projects and highlight aspects of community engagement. Hogg analyzed these positive outcomes to identify effective characteristics of engagement.

Hogg also studied specific examples of community engagement in British Columbia, including Rick Budhwa’s (2005) work with the Wet’suwet’en and Klassen’s Ph.D. dissertation (2013) addressing indigenous heritage stewardship with the St’at’imc and Nlaka’paux Nations. These authors emphasize that community engagement includes community control from the onset of a project, forming meaningful relationships, and a dialogue between all involved. Klassen argues that, although community engagement in archaeology may not be the ultimate goal for the communities, it has meaningful effects for all involved (2013:304–307).

These different projects provide excellent examples of characteristics of effective community engagement and, together with the examples of methods, provide an excellent base to frame Hogg’s attributes. However, to create an even stronger base, Hogg also studied previous attempts to assess community engagement from within and outside of archaeology.

One example is John Welch et al.’s dimensions of collaboration. Welch et al. (2011) expanded upon Colwell-Chanthaphonh and Ferguson’s ideas of a continuum of collaboration (ed. 2008:9) to create a preliminary tool for assessing community engagement in the Sliamon First Nation-Simon Fraser University (SFU) Stewardship and Archaeology Program. They identified eight different collaborative dimensions that were described at each level of the continuum (resistance, participation, and collaboration) (Welch et al. 2011:180). Each dimension was graded on a scale of one to ten by project participants, thus creating a simple assessment tool to determine how collaboration had fared over the time of the project. A summary of the key components of engagement used to create evaluation attributes from these various studies is provided in Table 1.

Attributes. Hogg took the common themes and characteristics of these examples to create her set of attributes (Table 2). *Degree of Community Support* assesses the degree (high, medium, low, not present) to which the community supported the project. Hogg allowed archaeologists to identify what community support consisted of in their projects, which included financial, personal, and timely support. *Degree of Community Control* assesses the degree to which the community was in control of designing the project goals, outcomes, and processes. *Degree of Community Involvement* assesses the degree of personal participation by community members. Hogg also asked archaeologists what percentage of the community was aware

TABLE 1. Components of Engagement Used to Create Attributes.

| | | | |
|---|--|---|--|
| Moser et al.'s Components (2002) | | Welch et al.'s Collaborative Dimensions (2011) | |
| M1. Communication and Collaboration | | W1. Ownership | |
| M2. Employment and Training | | W2. Information Flow | |
| M3. Public Presentation | | W3. Engagement | |
| M4. Interviews and Oral History | | W4. Reciprocity | |
| M5. Educational Resources | | W5. Alignment with Community Values | |
| M6. Photographic and Video Archive | | W6. Alignment with Regional Values | |
| M7. Community-Controlled Merchandising | | W7. Alignment with Provincial Values | |
| Atalay's Principles (2012) | | W7. Alignment with National Values | |
| A1. A community-based, partnership process | | Guilfoyle's Structural Faces and Elements (this paper) | |
| A2. The aspiration to be participatory in all aspects | | G1. Power sharing | |
| A3. The building of community capacity | | G2. Institution building | |
| A4. The engagement of a spirit of reciprocity | | G3. Trust building | |
| A5. The recognition of the contribution of multiple knowledge systems | | G4. Process | |
| Working Together's Characteristics (Aldenderfer 1993) | | G5. Social learning | |
| WT1. Communication and Information Sharing between archaeologists and community members | | G6. Problem solving | |
| WT2. Allowing for Community Control in the project | | G7. Governance | |
| WT3. Acknowledging different Knowledge Systems | | G8. Leadership | |
| Budhwa's Characteristics (2005) | | G9. Networks | |
| B1. Community Control | | G10. Benefits sharing | |
| B2. Meaningful Relationships between project participants | | Friend and Cook's Elements (2003) | |
| B3. Dialogue/Information Flow between project participants | | FC1. Voluntary | |
| B4. Shared Responsibility between project participants | | FC2. Shared Goal | |
| B5. Capacity Building for the community | | FC3. Shared Responsibility | |
| B6. Open-Mindedness and Tolerance of project participants | | FC4. Shared Accountability | |
| Klassen's Values (2013) | | FC5. Shared Resources | |
| K1. Participation, Consultation, and Consent | | FC6. Emergent | |
| K2. Ownership, Control, and Authority | | | |
| K3. Intangible Heritage and Traditional Knowledge | | | |
| K4. Meaningful Places and Indigenous Landscape | | | |

TABLE 2. Attributes of Community Engagement.

| Attribute | Description |
|--|---|
| Degree of Community Support | What was the level of community support for the project? |
| Degree of Community Control | Was the community in control of designing the project goals/outcomes? Was the community in control of designing the project process/outcomes? |
| Degree of Community Involvement | What was the level of personal participation by community members? What percentage of the community was aware of the project? |
| Degree of Information Flow | Was there open communication and dialogue between the archaeologists and the community? |
| Degree of Community Needs Met/ Archaeologist Needs Met | Were the needs of the community met? Were the needs of the archaeologists met? |

of the project. *Degree of Information Flow* assesses the degree of openness and reciprocity in communication and dialogue between the community and archaeologists. Finally, *Degree of Community Needs Met* and *Degree of Archaeologist Needs Met* assess the degree to which the community's needs were met and the degree to which the needs of the archaeologists' were met.

These attributes are designed to be simple to understand and use, as well as mutually exclusive. As described, *Community Control* is different than *Community Support*. A community can support the archaeological project but have no control over how it is run. *Information Flow* and *Community Involvement* also speak to different aspects; these can involve a high degree of information sharing but no actual participation from community members.

These five attributes reflect the essential characteristics of community engagement. They are mutually exclusive and can be easily described to interview participants. The small number of attributes ensures that participants will not become overwhelmed or confused and will in general be able to use the attributes to assess their own projects (Bernard 2006:255–258).

This assessment strategy enabled Hogg to determine which attributes are more likely to occur in projects, therefore determining which attributes of community engagement are more effective. This is not the same as determining the success of the projects. Determining the success of community engagement and assessing the success of multiple projects is a challenging topic that few have attempted (Atalay 2012:253–256). Julia Wondolleck and Steven Yaffee (2000) studied successful collaborative projects in natural resource management. They emphasized that, for them, a project was successful if the project participants deemed it to be (Wondolleck and Yaffee 2000:xiii). Although different participants might have different ideas of success, the primary goal is for all participants to be satisfied with the outcome and deem it to be a success (Atalay 2012:254). George Nicholas, John Welch, and Eldon Yellowhorn (2008:293) provide five “hallmarks” to assess the success or meaningfulness of community engagement: (1) personal satisfaction; (2) the community recognizes the value of the project; (3) the project provides future interactions between archaeologists and the community; (4) the project is seen as profitable; and (5) there is a commitment to a long-term relationship between the community and archaeologists. These examples illustrate that attributes of engagement are not necessarily related to the success of the project. All five attributes could be present in some degree in the project, without any of Nicholas et al.'s (2008) “hallmarks” being met. However, the aim of this work was not to determine the success of community engagement, but rather to determine what it consists of—which is why Hogg created these encompassing and synthetic attributes.

Results. Hogg used these attributes in interviews with archaeologists working in British Columbia. She asked each archaeologist to use her attributes to assess their own projects. In this way archaeologists assessed their own different projects using a singular framework. Through the interviews, Hogg gained information on 29 projects, including eight consulting projects, twelve field schools, and nine research projects (Figure 1).

The results of the interviews indicated that some attributes of engagement were more likely to be present in projects than others. As indicated in Figure 1, *Degree of Archaeologist Needs Met* was high in 97 percent of the assessed projects, *Degree of Community Needs Met* was high in 83 percent of the projects, and *Degree of Community Support* was high in 72 percent of the projects.

To further analyze the effectiveness of each attribute, Hogg created a radar graph of the ninetieth, seventy-fifth, and fiftieth percentiles of each attribute (Figure 2).⁵ The three percentiles are plotted as three data points for each attribute, thus creating three shapes of ascending size. The ninetieth percentile is the solid inside line, the seventy-fifth percentile is the long-dashed middle line, and the fiftieth percentile is the dotted outside line. These data points indicate the effectiveness of each attribute, as well as the relationship between them.

As indicated in Figure 2, 90 percent of the projects (solid line) had a medium degree of *Community Needs Met*; a low degree of *Archaeologist Needs Met*, *Community Support*, *Community Involvement*, and *Information Flow*. *Degree of Community Control* was not present. Seventy-five percent of the projects (long-dashed line) had a high degree of *Community Needs Met*, *Archaeologist Needs Met*, and *Community Support*; a medium degree of *Community Involvement* and *Information Flow*; and a low degree of *Community Control*. Fifty percent of the projects (dotted line) had a high degree of *Information Flow*, *Community Needs Met*, *Archaeologist Needs Met*, and *Community Support*; and a medium degree of *Community Control* and *Community Involvement*.

These results indicate which attributes are more likely to be present in a project. As *Degree of Community Support* is high for 75 percent of the projects, it is likely easier to implement this attribute in projects. However, if there is a high degree of community support for a project, then one would assume that other attributes would also be present in the project. For example, it would seem strange for there to be a high level of community support without the needs of the community being met. These other attributes may not need to be at the same degree as community support, but they should be present in some amount.

The Degree of Community Control is lower in comparison to Support. Seventy-five percent of projects either had a low or not present *Degree of Community Control*. However, many participants acknowledged that community control was not necessary for community engagement. If you have a strong relationship with the community, then there is a level of trust that does not always require control over the project.

Seventy-five percent of projects had at least a medium *Degree of Community Involvement*. Therefore, *Community Involvement* is more present in projects than *Community Control*, but not as present as *Community Support*. *Community Involvement* can be influenced by many factors, not all controlled by archaeologists. These factors can include available resources, community interests, location, and cultural concerns. However, effective involvement needs to be long-lasting and should build community capacity. Many participants indicated that they had tried to involve the community as much as possible but were restricted by community interests and time. For example, although com-

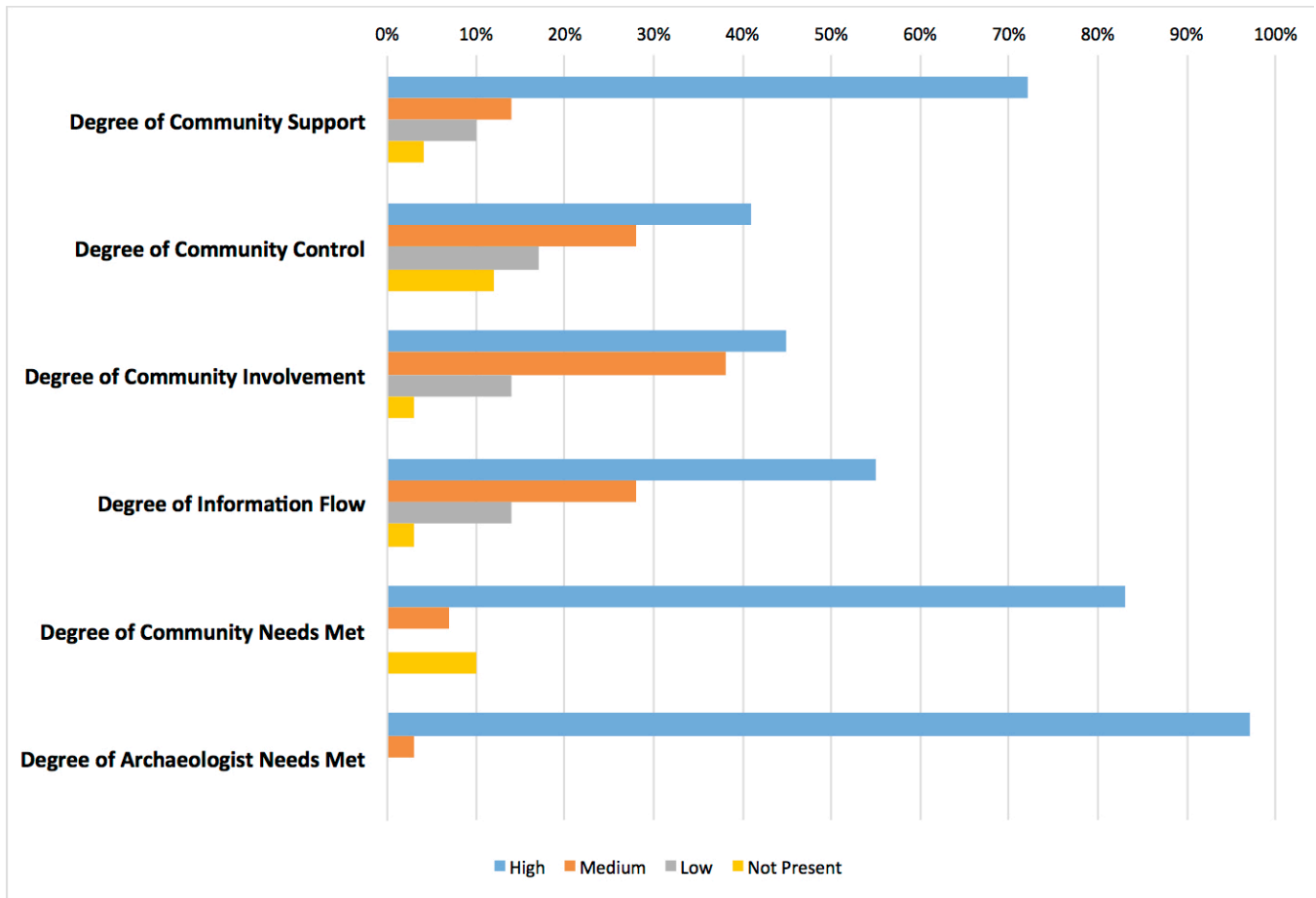


FIGURE 1. Attribute results.

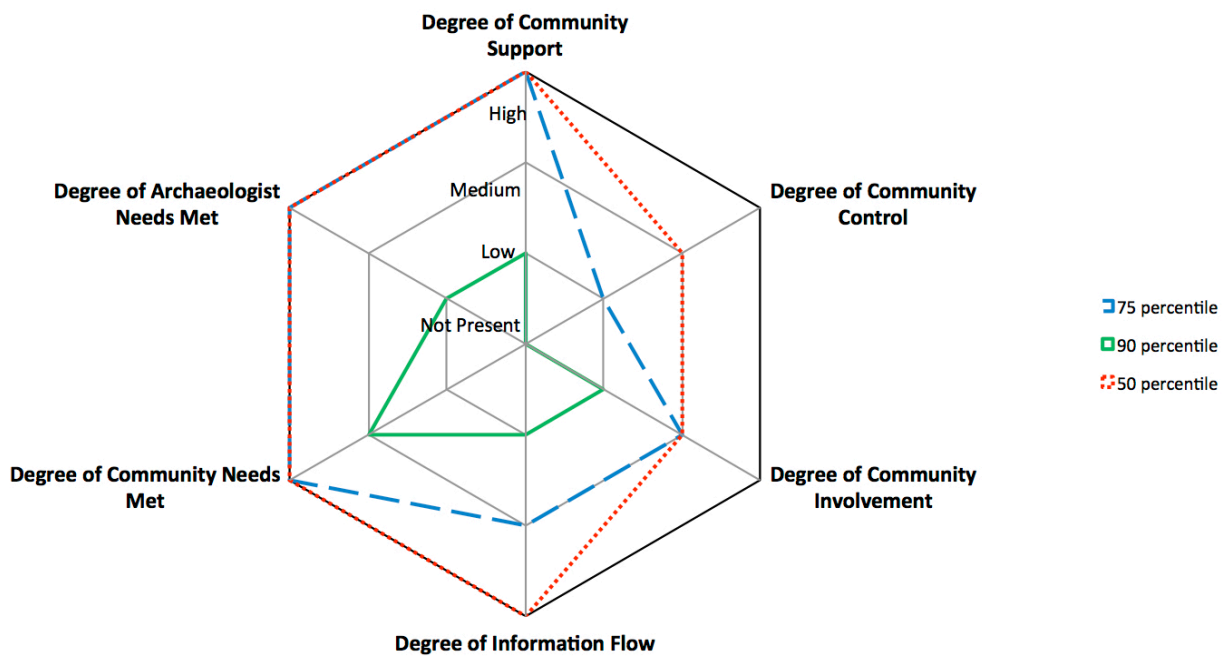


FIGURE 2. Radar graph illustrating the ninetieth, seventy-fifth, and fiftieth percentiles of attributes.

community members may value the project, they may not be interested in directly participating, or the project may be in a remote location, making direct involvement challenging. Participants emphasized providing community members with education opportunities, including Resources Information Standards Committee (RISC) training (BCAPA 2011).

Degree of Information Flow, *Degree of Community Needs Met*, and *Degree of Archaeologist Needs Met* are all medium to high in most projects. *Degree of Information Flow* is medium in 75 percent of projects and high in 50 percent of projects. *Degree of Community Needs Met* and *Degree of Archaeologist Needs Met* are both high in 75 percent of the projects. Therefore, like *Community Support*, these attributes seem to be easier to implement into projects. Participants acknowledged that the only time that community needs were not met was when communities did not indicate any needs to begin with. Some participants felt uncomfortable with the question of community needs, as they did not want to speak for the community. The majority of participants indicated that their needs were met by getting to participate in archaeology. Participants also indicated that they always tried to provide as much information to the community as possible.

Community engagement in British Columbia is occurring without effective legislation. Figure 2 indicates that some aspects of engagement are more effective than others, in particular, *Degree of Community Support*, *Degree of Information Flow*, *Degree of Community Needs Met*, and *Degree of Archaeologist Needs Met*. Most archaeologists recognize the importance of these attributes and are more likely to utilize them in their projects. *Community Control* and *Community Involvement* are affected by many factors and can be more challenging to implement, at least as indicated by Hogg's analysis. For example, in certain projects the community may not want to have control over parts of the project, as they may trust that the archaeologists know what to do. By breaking down the type of engagement into these attributes, it is clear that each project will have different results and that it is important to treat each project as unique. However, by making sure that each attribute is addressed, archaeologists can provide the highest possible level of engagement.

This assessment strategy is just one way to assess and evaluate collaboration. It was effective for Hogg's work as it allowed her to assess and evaluate many different types of projects. By allowing others to use these attributes, she was able to receive a wealth of information about community engagement in British Columbia archaeology.

Case Study 2: Intra-project Evaluation: Co-Management in Western Australia

This case study focuses on work undertaken in southern Western Australia between 2005 and 2013. The case studies for this analysis were all developed and implemented by Guilfoyle in collaboration with a range of community leaders, local natural resource management (NRM) organizations, conservation groups, local governments, and heritage agencies in Western Australia. The projects discussed here were developed largely in response to the disillusionment of many Traditional Owners with mainstream land and heritage management regimes

in the region, from which they felt disengaged and disenfranchised. The projects included community heritage management projects focused on conservation and research, associated projects aimed at integrating Indigenous natural and cultural heritage management in this region, and community, research, and commercial archaeology (Guilfoyle, Bennell, Webb, et al. 2009; Guilfoyle, Guilfoyle, and Reynolds 2009; Guilfoyle et al. 2011; Guilfoyle et al. 2013; Guilfoyle and Mitchell 2015; Mitchell et al. 2013). The projects are designed and implemented by the community leaders in collaboration with heritage personnel and specialists. The diversity of project structures and results provides an adequate basis from which to evaluate each one individually and collectively.

The cultural and archaeological heritage management projects discussed here were developed within one of three main contexts.:

1. Cultural Natural Resource Management (NRM) Projects (aimed at heritage place restoration, protection and management)
2. Community Foundations (aimed at community sustainable development and landscape management)
3. Commercial Cultural Heritage Management Projects (aimed at counter-mapping and effective cultural place protection and management)

However, as is explained below, each project involved, at varying levels, a similar set of aims that blurs this distinction of the original project contexts. In some case, for example, an Indigenous NRM project expanded and was advanced through subsequent commercial CHM projects. Nonetheless, to facilitate the analysis and evaluation, a total of 14 projects are discussed, from each of these major contexts (Table 3).

For these projects, an important measure of "success" is the level of collaboration and ownership embedded in the local Traditional Owner community. If control/ownership was tokenistic, short-term, or undeveloped, the project outcomes remained limited by default—in the understanding that cultural heritage management is linked to community identity and wellbeing and requires delivery under customary practice/protocols.

Methodology. This analysis is aimed at determining how the concept of Adaptive Co-Management (ACM), which is increasingly becoming embedded in natural resource management, can be adopted in the field of CHM (and borrows from the co-creative project designs [Simon 2010]). In drawing from conceptual frameworks within the field of adaptive co-management, this study applies a "grounded theory approach" (Charmaz 2000; Corbin and Strauss 2008; Glaser and Strauss 1967; Miles and Huberman 1994) that involves developing theoretical constructs from qualitative, comparative data that is obtained and "coded" via the analysis of a number of CHM projects/case studies. As mentioned, while there is a unifying goal structuring the various CHM projects discussed here—aimed at protection and management of specific cultural places identified as priorities by various community groups—they were delivered without any plan to formalize a context of "collaboration" or co-management. However, an adaptive management process

TABLE 3. Projects and Case Studies.

| Project # | Project Name | Description |
|--------------------------------------|---|--|
| Cultural NRM Projects | | |
| 1 MP | Yoolberup (Many Peaks) Wetlands Cultural Landscape Management Project | The result of a five-year cultural heritage landscape conservation and management action plan developed for a property purchased for the community organization and bordering Lake Pleasant View, near Many Peaks (50 kilometers east of Albany) (Guilfoyle et al. 2013). |
| 2 SF | Southern Forests Community Cultural Heritage Management Program | A series of discrete yet overlapping projects that identified cultural heritage values and priorities and provided a platform/process for supporting local communities to drive the project work, with secondary support from agencies and organizations. A number of discrete projects within this larger program included project work at heritage complexes such as "Lake Jasper", and "Boonwiup Pools" and also on private land. (Guilfoyle et al. 2009). |
| 3 GN | Gnowangerup Community NRM Project | NRM project that involved an integrated community development and training plan that involved development of a native tree nursery, cultural display, re-vegetation project, and cultural mapping program (Guilfoyle 2007a). |
| 4 TM | Tambellup Graves Protection Project | A natural resource management project focused on addressing issues of town site salinity in the Great Southern Region of Western Australia that adopted a specifically "cultural values" approach to the environmental issue associated with flooded, Aboriginal graves. The on-ground works involved a community action plan involving constructing of a drain, re-vegetation, Ground Penetrating Radar Survey and work toward an integrated community monitoring system (Guilfoyle 2007b). |
| 5 WG | Marribank/Wagin Community NRM Project | A natural resource management project that involved an integrated community development and training plan that involved development of a heritage trails, sustainable agriculture (community) plan, re-vegetation project and cultural mapping program, and an Indigenous community NRM team (Bishop 2005). |
| 6 NW | Nowanup Meeting Place and the Pallinup Catchment | This NRM project involved the construction of a cultural "meeting place," large-scale cultural mapping associated with the Gondwana Link macro-conservation corridor, long-term community training and employment program, and TEK studies, for overall integration with conservation and management planning and on-ground (adaptive management) conservation works (Dortch and Guilfoyle 2007; Guilfoyle 2010a). |
| Community Foundation Projects | | |
| 7 GK | Gabbie Kylie | Community-based operation involving regional cultural mapping, integrated research, heritage assessment, identified protection plan, rock art conservation works, development of a heritage management walk trail, and documentation of the associated cultural features for strategic planning (see Mitchell et al. 2013). |
| 8 DW | Dowark Foundation Cultural Landscape Mapping Project | The Dowark Foundation conducts community heritage management projects focused on conservation and research. The projects are designed and implemented by the Wadandi people in collaboration with Foundation personnel and specialists. The Dowark Foundation received Australian Government funding and commercial (NRM) contracts to carry out a regional cultural mapping project and project-specific management plans; including an integrated plan to protect and manage a number of priority areas with overlapping ecological, historical, archaeological and ethnographic values (Guilfoyle 2011a). |
| Commercial CHM Projects | | |
| 9 FR | Fitzgerald River National Park Heritage Assessments | This project involved several commercial heritage assessment projects within the Fitzgerald River National Park, associated with discrete development plans provided to the archaeologist and the community. The response was a process of place-based assessment and mapping and a counter-mapping alternative that in some cases, altered or diverted the proposed development plans of the proponents, and in other cases, were ignored completely by the proponents (Guilfoyle and Mitchell 2015). |

TABLE 3. Projects and Case Studies.

| | | |
|-------|--|--|
| 10 QN | Quindalup (Dunsborough) Playing Fields | This project involved a commercial archaeology project associated with construction of a new football oval (Guilfoyle et al 2012). The community-based structure ensured a multifaceted level of investigation without demanding any additional resources upon the client, and a place-based approach to documenting and incorporating the range of values associated with archaeological heritage that delivered multiple, positive outcomes. At an operational level this necessarily entailed a process for working beyond the site to fully integrate traditional and archaeological understandings of interconnected cultural landscapes (Guilfoyle et al. 2011). |
| 11 CT | Cattlin Mine Development Project | This commercial heritage project involved a place-based and counter-mapping approach in response to a mine development that aimed to identify archaeological site patterning with associated ethnographic information to associated waterways and landforms for more effective management (Guilfoyle et al. 2015). |
| 12 NR | Nornalup Inlet, Frankland River and Denmark River Co-Management Plan | This commercial heritage project involved a place-based and counter-mapping approach to register a number of archaeological places with associated ethnographic information that linked together a number of discrete sites as part of an integrated cultural landscape. The resultant cultural heritage management plans were adopted by the local government shire (Guilfoyle 2010b). |
| 13 MK | Mokidup (Ellensbrook) Integrated Natural and Cultural Heritage Management Plan | The Mokidup area contains many Dreaming Places, which include places with mythological and ritual significance. The intent and scope for this Plan was to produce a holistic and comprehensive environmental plan that builds upon and compliments existing documents and promotes ongoing conservation of the place, respecting and promoting heritage values (both Indigenous and European). Its primary focus is on the management of environmental values, while considering indigenous values and practices, where possible. This case study evaluates this process of integration (Guilfoyle 2010c). |
| 14 QP | Quaranup Peninsula Community Management and Protection Project | This cultural mapping project aimed to develop a co-management plan for a prominent peninsula with significant ecological and cultural values, and developed from a small-scale Indigenous NRM training program to an ongoing cultural mapping program that aimed to first have the area legally-registered as a cultural landscape, and then integration into a community-controlled cultural heritage management plan (Guilfoyle 2011b). |

unfolded via the process of learning-by-doing, and more formal structures were implemented incrementally as new projects were developed over time.

The (Main) Elements of Adaptive Co-Management. Researchers had explored the multiple “faces” of co-management that collectively define the components of *adaptive* co-management. These “faces” therefore provide a theoretical and methodological framework from which to evaluate a number of projects that were developed with the aim of creating a working model for implementing “structured” collaborative CHM projects. Here, based on a review of current co-management syntheses, Guilfoyle isolates structural faces and their key elements of adaptive co-management, though acknowledging that there is much crossover within and between these various components (Table 4).

Researchers (Armitage et al. 2009; Folke et al. 2005; Plummer et al. 2012) have synthesized ACM projects around the world and noted a number of common elements. With the limitations of space, Table 4 summarizes this review and identifies the key structural elements required in developing a collaborative CHM project, based on major “faces” with associated “elements.”

As each of these faces can have a wide range in terms of the level of collaboration, a rating system is developed and applied to each “face.” This section provides the qualitative data analysis framework for evaluating the development of a *cultural heritage* ACM project (CHACM): evaluating the processes

employed and evaluating the outcomes (success and failures). In this regard, Guilfoyle examined the structure of each project as the dependent variable affecting the relative degree of success or failure of the project in terms of the criteria defined for CHACM (Tables 5 and 6). The purpose is to isolate key factors influencing the relative success of individual projects, while having a baseline framework for comparing and evaluating different projects.

The results can also be portrayed graphically for quick analysis. The following graph compares the above projects for illustrative purposes (Figure 3). The data provide a baseline from which to compare and contrast projects, whether through project leader self-evaluation or community or stakeholder rankings. It allows review of the relative stage of a project as it progresses toward more advanced collaboration. It provides a means to track how a collaborative partnership improves or worsens over time. Importantly, it provides some mechanism to identify key areas where improvements or changes should be made.

Outcomes and Potential. The current structures described in the variety of case studies were encouraged to develop at their own pace and avoid interventions from external organizational control and decision-making that can undermine people’s sense of involvement and ownership. Although the projects differ in background context, changes in externals, aims, and the length of time they have been underway, it remains valid to compare and contrast their relative level of collaboration in order to

TABLE 4. Structural Faces and Elements of ACM projects (adapted from Plummer et al. 2012).

| Face | Element |
|----------------------|--|
| Power sharing | Relates to sharing responsibility for management and how much control the community has over land, resources, authority, etc. High-level collaboration for this component is power sharing at multiple scales. |
| Institution Building | Examines the degree that partners develop cross-cultural partnerships that involves restructuring of systems in operation by individual agency, organizations or community groups to develop a new level of collaborative structure. |
| Trust Building | Trust relates to working relationships and there are different levels of trust—ranging from “deterrence-based trust,” to “knowledge-based trust,” and “identification-based trust” |
| Process | This relates to ensuring that power sharing and all other components of collaboration are not an endpoint, but embedded in operational processes. |
| Social Learning | Relates to feedback mechanisms so parties can learn from past experiences, adapt, and respond—management flexibility. |
| Problem Solving | Advanced collaboration means there are more opportunities to transfer learning/skills and so progress more complex issues or projects over time. |
| Governance | Relates to the principles of good governance—transparency and accountability at all levels shared amongst all partners. |
| Leadership | A successful ACM project requires a combination of Knowledge Carriers - Interpreters- Networkers - Leaders - Visionaries - Entrepreneurs – Followers. |
| Networks | Assumes that larger networks provide more opportunities for problem solving, development of more complex projects and expansion with more elaborate outcomes. |
| Revenue Sharing | Level of monetary payment/equity across all partners and collaborators derived from the project funds and/or external resources created by the project. |

isolate limitations and also opportunities for further development. For instance, the Gabbie Kylie projects (see Mitchell et al. 2013) scored high on all levels because it was a community program that directly set out to establish solid operational structures. Conversely, the more recent Fitzgerald River project (see Guilfoyle and Mitchell 2015) lacked key governance structures, processes, and learning mechanisms, as it was a reactionary project in response to a plan developed by an external agency that did not see collaboration in planning and development as a goal. Despite the different contexts of these projects, there is justification for applying a uniform qualitative rating system for how each project was “developed” or “structured” because doing so allows us to identify ways forward for future programs in specific areas, in order to contribute to social outcomes or simply to avoid conflict or delays.

One identified theme from this (abbreviated⁴) analysis is that the community programs have been most successful as drivers for collaboration and change. The community programs provide a conduit to negotiate dynamics through a flexible, action-orientated approach that affords Traditional Owners a means for engagement based on flexibility and independence while working directly with agencies, stakeholders, and partners. For agencies and stakeholders, the community structures provide a means to work with a community directly as a partner in projects and general operations, without some of the challenges associated with integrating community dynamics with agency policies and procedures. Thus, agencies or land managers may benefit by investing in a community initiative, as these inherently establish structures that facilitate the development of mutually beneficial goals of conservation, management, and research.

A key challenge for “scoring” high is developing programs that necessarily *embrace external partnerships* but remain steadfast in the commitment to *upholding customary protocols and priorities*. By identifying the relative level of advancement of each structural component of a program, we can directly meet these challenges with support from those operating in disciplines such as archaeology, anthropology, and natural resource management. These are fields that require the constant development of projects that are of greater relevance to communities and so require understanding of the social context of their operations (Lu Holt 2005:199). At the same time, by attempting to develop formal evaluation measures of each project, we address the growing demand from community groups that are seeking more from agencies and researchers to become *genuine* partners in community-based cultural heritage management.

CONCLUSION

The basic ethical and legal principles of community collaboration are understood and promoted by most heritage professionals and are manifested in many truly collaborative projects around the world. At the same time, however, the highly developed and diverse discipline of archaeology, and the associated regulatory and academic structures that support the field, have continued in some instances to widen the gulf between archaeologists and descendant communities. There is no doubt that community involvement in archaeology and cultural heritage projects can be of scientific, social, and economic benefit to practitioners and communities alike; however, there remains much variation in practice with regard to embedding collaboration.

TABLE 5. Qualitative Ratings.

| Face | Qualitative Ratings | Score |
|----------------------|--|-------|
| Power sharing | Consultation | 1 |
| | Engagement | 2 |
| | Agreement/MoU | 3 |
| | Project-specific partnership | 4 |
| | Shared management rights and responsibilities (ongoing) | 5 |
| Institution Building | Informal structure | 1 |
| | Third-party structure/ engagement | 2 |
| | Project-specific partnership | 3 |
| | Community and stakeholder-based structure – project or local level | 4 |
| | Community and stakeholder-based structure – multi-project or regional level | 5 |
| Trust Building | No previous relationship/interaction | 1 |
| | Deterrence-based trust | 2 |
| | Knowledge-based trust | 3 |
| | Identity-based trust | 4 |
| | Identity-based trust with legal/operational framework | 5 |
| Process | Preliminary engagement/toward initiated a process | 1 |
| | Project-specific co-management | 2 |
| | Stop-start co-management | 3 |
| | Fixed, multi-year or multi-project process | 4 |
| | Formal co-management, long-term arrangement | 5 |
| Social Learning | Provides results only | 1 |
| | Identifies recommendations for limitations/further work/refinement only toward co-management | 2 |
| | Project-specific review process | 3 |
| | Program-review process | 4 |
| | Formal review and evaluation structure | 5 |
| Problem Solving | Recognizes problems only | 1 |
| | Identifies/defines problems only | 2 |
| | Identifies problems and possible solutions | 3 |
| | Identifies problems and evaluates solutions | 4 |
| | Addresses problems/implements solutions | 5 |
| Governance | Host-guest model | 1 |
| | Stakeholder model | 2 |
| | Agreement/MoU | 3 |
| | Project-specific partnership | 4 |
| | Formalized collaboration (ongoing) | 5 |
| Leaders | Project leaders only | 1 |
| | Community leaders facilitators | 2 |
| | Steering group | 3 |
| | Community/multiple leaders | 4 |
| | Program leaders and Committee/Board | 5 |

TABLE 5. Qualitative Ratings.

| | | |
|-----------------|---|---|
| Networks | One partnership | 1 |
| | Two partners | 2 |
| | Three partners | 3 |
| | Four partners | 4 |
| | Five-plus partners | 5 |
| Revenue Sharing | One-off remuneration | 1 |
| | Project-specific remuneration | 2 |
| | Casual (ongoing) remuneration | 3 |
| | Ongoing remuneration within internal program | 4 |
| | Ongoing remuneration expanded to both internal and external systems | 5 |

TABLE 6. Rating the Structural Processes of the Case Studies.

| Project/ Component | MP | SF | GN | TM | WG | NW | GK | DW | FR | QN | CT | NR | MK | QP |
|-----------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Power sharing | 5 | 4 | 2 | 3 | 3 | 5 | 5 | 4 | 2 | 2 | 1 | 2 | 2 | 2 |
| Institution Building | 5 | 4 | 3 | 2 | 5 | 5 | 5 | 3 | 2 | 4 | 2 | 1 | 2 | 4 |
| Trust Building | 5 | 3 | 2 | 2 | 4 | 4 | 5 | 5 | 3 | 4 | 2 | 4 | 4 | 4 |
| Process | 5 | 3 | 1 | 2 | 3 | 5 | 4 | 2 | 1 | 2 | 1 | 3 | 2 | 3 |
| Social Learning | 3 | 3 | 1 | 3 | 2 | 4 | 4 | 3 | 1 | 3 | 2 | 2 | 4 | 2 |
| Problem Solving | 5 | 3 | 2 | 5 | 1 | 5 | 5 | 3 | 3 | 5 | 3 | 4 | 5 | 3 |
| Governance | 4 | 4 | 2 | 2 | 4 | 4 | 5 | 3 | 1 | 2 | 2 | 2 | 2 | 4 |
| Leadership | 4 | 5 | 2 | 2 | 3 | 4 | 5 | 2 | 2 | 2 | 1 | 2 | 3 | 3 |
| Networks | 5 | 5 | 3 | 3 | 5 | 5 | 5 | 5 | 3 | 2 | 1 | 3 | 5 | 4 |
| Revenue Sharing | 4 | 4 | 2 | 2 | 3 | 3 | 5 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| Total | 45 | 38 | 20 | 26 | 33 | 44 | 48 | 32 | 20 | 27 | 16 | 25 | 31 | 31 |

We may ask whether the discipline is, collectively, doing enough to address the historical, social, economic, and even legal structures, all well-known and well-documented, that act as barriers to higher levels of equity between archaeologists and descendant communities. For instance, the president's keynote address at the 2013 Society for American Archaeology Annual Meeting was entitled "The Future of Archaeology: Engagement with Descendant Communities." This future should not be limited to engagement, but should require a commitment to a collaborative environment practice, with associated ethical and legal guidelines in place.

The case studies presented here are inherently local in focus, arguably objective but necessarily subjective, as the two dimensions are indeed inseparable (Rizvi and Lingard 2013:32); and they are based on the particularities of many different communities and practitioners. Nonetheless, it is suggested that, through these types of analyses, the identified frameworks and measures may have applicability for heritage practitioners and descendant communities in a range of different international contexts. The imperative to evaluate is based on the recognition that effective cultural heritage management requires protecting and managing not only heritage places and landscapes, but also the associated values related to (community-identified) social and cultural activity (Atalay et al. 2014; Byrne et al. 2003). In so doing, profes-

sional, ethical, and legal structures are required to enable these activities to take place, and this necessarily involves moving beyond the specific research design or project goals. The goal is to embed processes that allows social and cultural systems to take their own shape within and around the project.

We argue that a formal framework from which to evaluate "the level of collaboration" in a cultural heritage management project becomes the very platform for expansion beyond collaborative arrangements between heritage practitioners and community to a mechanism that can lead to effective co-management of cultural resources and landscapes across all levels of government, institutions, and community. In other words, a formal structure is required as a preliminary mechanism to advance a "socially useful heritage" (Little 2007:2) as a collective, structurally sound process that will continue to evolve. At this level, the archaeological management process itself may contribute to increasing social resilience and emancipation (Atalay et al. 2014; Chapin et al. 2009; McGuire 2008).

We argue that evaluation methods should be adopted to compare different projects undertaken in different contexts, along with methods to analyze and critique an individual program or individual practitioner. Each project, wherever it may be, and despite the challenges of cross-cultural comparison, should be

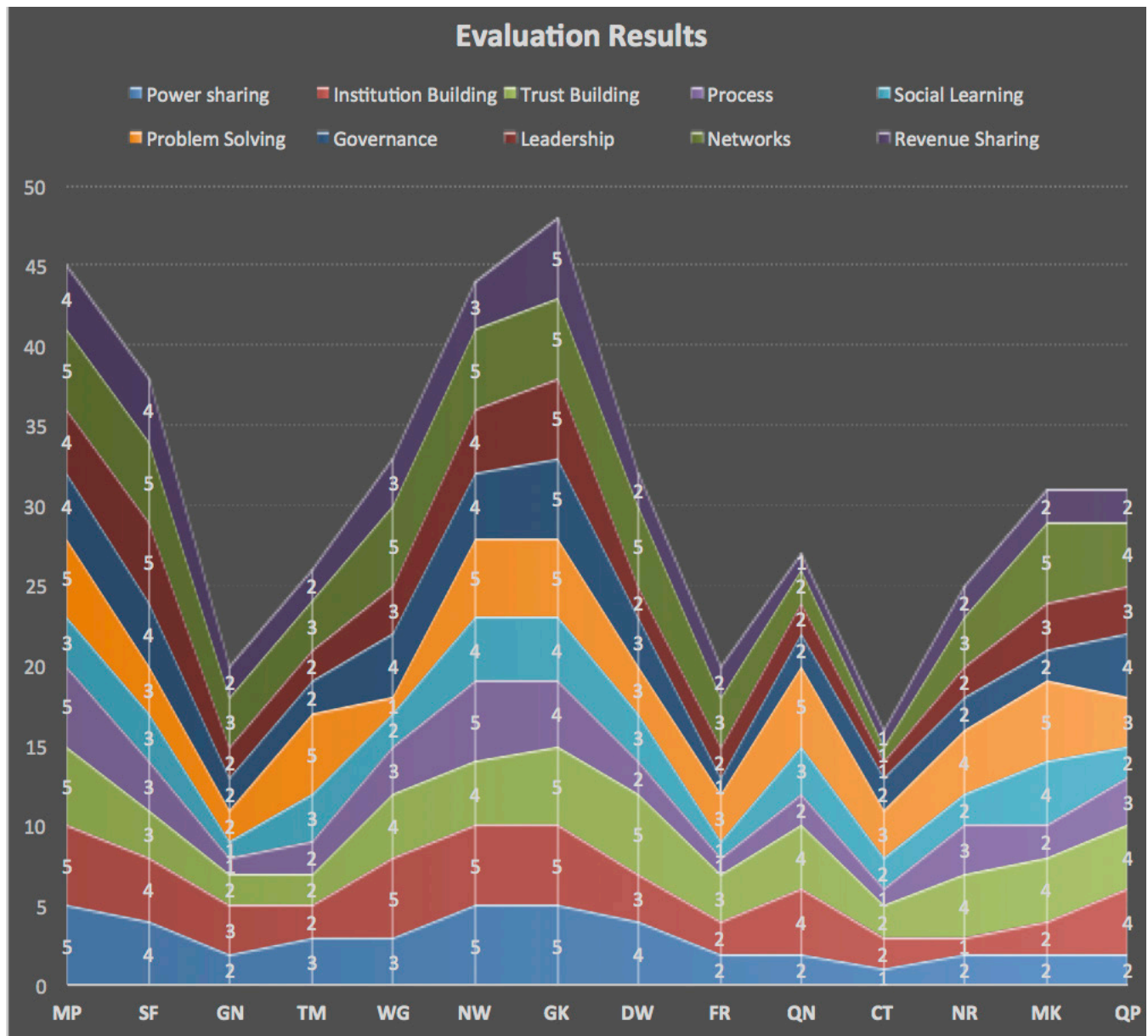


FIGURE 3. Results of the evaluation analysis of 14 projects in southern Western Australia.

organized in a way to allow a baseline comparative analysis, so that each project may be peer- and community-reviewed and thus improved in identified areas.

Examining a range of measures for how a project will be evaluated at the earliest stages of project development in terms of its relative level of collaboration is an ethically sound process. At the very least, it demonstrates good intent. Those projects that do not consider any measure of evaluation relating to level of collaboration and equity demonstrate a different intent. The process allows for continual review and expansion of outcomes beyond the immediate needs of the original research or project scope. This ensures that each project contributes to refining

frameworks for evaluation such as those adopted here, but also provides mechanisms for learning other ways of doing or seeing things, beyond the sometimes tunnel-vision trap of archaeological research design and associated paradigms. Thus, exploring collaborative evaluation methods advances archaeological practice.

Data Availability Statement

All data are freely available based on independent research carried out by the authors. All data are cited within this paper.

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NOTES

1. *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth.).
2. R.S.C. 1985, c. H-4.
3. S.C. 2012, c. 19.
4. R.S.B.C. 1996, c. 185, s. 12 (3b).
5. Radar graphs plot multivariate data and are useful to display outliers and commonalities in ordinal data. The data points are linked together by a line, creating a shape (or shapes) within the graph. The outside of the graph represents the highest value and the middle represents the lowest. For example, in Figure 1 the middle point represents “not present,” whereas the outside of the graph represents “high.”
6. More detailed analysis is currently being undertaken as part of a co-management project Guilfoyle is involved in with various groups in northwestern Australia and Alaska.

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