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En route vers l'objectif 1 du Canada

Discussion Paper: Evaluating Management Effectiveness

Final

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Executive summary

Background

Protected areas are locations that receive protection because of their recognized natural, ecological or cultural value. Protected areas and other conservation areas are the cornerstone of biodiversity conservation. They are designated and intended to provide refuge for species, communities and ecosystems, provide critical ecosystem services such as clean water and air for people, carbon-storage to buffer the effects of climate change and other ecological benefits, and serve as an ecological benchmark for surrounding landscapes. The aim of designating protected areas is also to provide economic, social and cultural benefits including the provision of sustainable livelihoods for Indigenous peoples, health and well-being of individuals and communities, nature-based recreation, tourism and education. But are they effective at achieving these intended outcomes?

Global studies demonstrate that protected areas have been successful in slowing—but not necessarily preventing—the global loss of at least some aspects of biodiversity. Protected areas are at the centre of strategies to tackle the global biodiversity crisis. Worldwide, however, protected areas systems are often not sufficiently large, well-planned, connected or well-managed to effectively protect biodiversity (Geldmann et al., 2015). The act of designating an area as protected does not guarantee effective management sufficient to protect the resources within it. In response, there has been a focus on evaluating the management of protected areas (e.g., presence of a management plan, designated boundaries, adequate staff and financial resources).

This focus on management effectiveness evaluation is built on research that demonstrates that improved management leads to improved conservation outcomes (Coad et al., 2015; Geldmann et al., 2015; Hockings, Stolton, Leverington, Dudley, & Courrau, 2006; Fiona Leverington et al., 2010; Gill et al., 2017). These studies, and many others, support the centrality of effective management to the achievement of conservation outcomes and identify a number of the specific factors (e.g., sustainable finance, well-defined boundaries, and legal frameworks) that are critical elements of that management.

> **WHAT IS PROTECTED AREA MANAGEMENT EFFECTIVENESS (PAME?)**
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> PAME is defined as *"the assessment of how well the protected area is being managed —— primarily the extent to which it is protecting values and achieving goals and objectives. The term management effectiveness reflects three main themes:*
> - *design issues relating to both individual sites and protected area systems;*
> - *adequacy and appropriateness of management systems and processes; and*
> - *delivery of protected area objectives including conservation of values."*
>
> (Hockings *et al.* 2006).

The evolution of protected areas management effectiveness (PAME) evaluation began in the 1990s with a first phase led primarily by academic and Non-governmental organization (NGO) communities. In the second phase, PAME evaluations became a way to evaluate performance for funding agencies. For example, Global Environment Facility (GEF) requires the completion of the METT tool as a condition of renewed funding (Coad et al., 2015). Now in the third phase, agencies and governments are conducting evaluations to better implement adaptive management, improve planning and priority setting, and

report on the status of protected area management. By 2000, a number of methods to evaluate PAME had been developed. The International Union for Conservation of Nature (IUCN) World Commission on Protected Areas (WCPA) published a framework and guidelines to assess management, drawing on methodologies that had been developed to date (Woodhouse et al., 2015). The evaluative framework parallels stages of a typical management cycle, moving from understanding the context, through planning, allocation of inputs, implementation of management processes, production of outputs, and resulting in specific impacts or outcomes. Since the publication of a revised framework in 2006 PAME tools have been developed and revised to largely correspond to the framework (Hockings et al, 2006). To date, over 18,000 PAME evaluations have been conducted using 95 methodologies in over 9,000 protected areas across 180 countries (Coad et al., 2015; Geldmann et al., 2015).

While implementation of a PAME process serves to meet international obligations under the Convention on Biodiversity, evaluation has more direct benefits to individual parks, agencies, partners and governments (Paleczny, 2010). Broadly, evaluation can help to

- improve conservation management and planning of protected areas (Leverington et al., 2010);
- build improvements in information to support management;
- provide support for increased political and financial resources;
- increase transparency and improve accountability;
- achieve international recognition (e.g., IUCN Green List of Protected Areas); and
- improve management of protected areas for human well-being (Woodhouse et al., 2015).

In addition to the substantive value of conducting management effectiveness evaluations, evidence gathered from PAME evaluations globally has demonstrated that there are significant benefits to participants and organizations from engaging in such processes including:

- increasing site knowledge;
- improving communication and cooperation between managers and other stakeholders;
- stepping back from day-to-day concerns to consider issues/challenges in a new light;
- building capacity for protected area personnel; and
- encouraging a learning organization and culture.

Global studies of PAME evaluations have also shown that the process of simply conducting a management effectiveness evaluation has the potential to improve management.

Paper purpose and structure

The Convention on Biological Diversity (CBD) Aichi Targets commit the parties to "expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of protected areas by 2015 using various national and regional tools and report the results into the global database on management effectiveness" (CBD, 1992). To date, 17.5% of countries have reached this target (UNEP-WCMC and IUCN, 2016). In Canada, no formal Protected Areas Management Effectiveness (PAME) evaluations were completed by the 2015 target. Since that time there has been

limited experience with PAME, including application of one tool by Environment and Climate Change Canada and a Canadian pilot project application of PAME approaches in Alberta[1].

This paper provides a review of the PAME framework and tools used internationally to measure management effectiveness of protected areas. It includes an overview of the status of management effectiveness evaluations and the state of readiness of a sample of jurisdictions in Canada. The last chapters of this paper offer considerations, principles and options on key topics with respect to how to achieve an effectively managed network of protected areas and other effective area-based conservation measures (OECMs) in Canada.

Challenges and best practices

The theory behind management effectiveness and the global experience to date has identified significant value in conducting PAME evaluations. However, there are also documented challenges and critiques of PAME that are worth addressing, as doing so can help overcome these limitations.

Measures of outcomes compared to PAME

Measuring outcomes (e.g., biodiversity outcomes) is different and complementary to PAME with both important management tools.

Best practices to overcome the limitations:

- Conduct PAME on the entirety of protected area values.
- Improve data quality.
- Repeat the assessment.
- Develop and monitor performance indicators.
- Prioritize monitoring.
- Monitor biodiversity outcomes whenever possible.

Ecological performance is not always linked to management

Although there is evidence of the value of conducting PAME, there are also research studies that have found limited relationships.

Best practices to overcome the limitations:

- Improve data quality.
- Use or refer back to quantitative data.
- Verify results.
- Diagnose and implement the recommendations.
- Develop and monitor performance indicators.
- Prioritize monitoring.

Evaluating management to what end?

Protected areas are designed to address multiple objectives from biodiversity conservation to provision of recreation opportunities. Many PAME tools place limited emphasis on the systematic and consistent

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[1] A paired set of pilot projects in Ontario will be completed in fall of 2017.

identification of the wide range of values for which the area is managed. Similarly, most PAME tools have a narrowly scoped assessment of design risks and threats facing these values.

Best practices to overcome the limitations:

- Match the tool to the purpose.
- Review and adapt the tools.
- Assess and address minimum information requirements and availability.

Types of evidence that contribute to evaluations

Beyond limited data on the outcomes of management there is also typically limited research data to support other elements evaluated in PAME. In lieu of this, professional assessments (by individuals or teams) ranging from qualitative descriptions to score cards are used as evaluation inputs.

Best practices to overcome the limitations:

- Keep it cost effective.
- Assess and address minimum information requirements and availability.
- Improve data quality.
- Use or refer back to quantitative data.
- Consult and get consensus.
- Verify results.
- Make it transparent.
- Revise as needed: evaluation is a learning process.
- Repeat the assessment.
- Develop and monitor performance indicators.
- Prioritize monitoring.

All indicators of management effectiveness are not created equally

The IUCN Framework for management effectiveness and associated tools and methods contain a wide list of indicators (i.e., elements) of management to be examined. Approaches that take a more quantitative approach to score management performance typically do so weighting the indicators equally. The reality is that the indicators are typically not equal and simple scoring methods can misrepresent the results.

Best practices to overcome the limitations:

- Match the tool with the purpose.
- Report on all six of the elements of the IUCN framework
- Use caution in producing summary or overall scores.

Lessons learned from both PAME application in Canadian Wildlife Service's sites, and the Canadian PAME pilot project in Alberta (see Appendix A), in combination with Parks Canada's long-term program for monitoring ecological integrity, have direct benefits and lessons that can be applied more widely throughout Canada:

- Planning — Scoping, tool adaptation and building awareness are foundational.
- Understanding values, risks and threats is essential.
- Deciding who and how many to involve is key.
- Providing context for future assessments is important.

- Biodiversity outcome monitoring is critical, but not sufficient.

Principles for effective management

Canada is relatively new to the management effectiveness field, but can gain much from starting with the lessons learned from global efforts to develop useful and practical methods of monitoring and evaluation that are summarized throughout the literature. The following ten principles listed here for consideration identify key elements to achieve an effective network of protected areas and OECMs in Canada.

1. **No paper parks: Moving networks in Canada beyond protection to persistence**
   Designation of new areas will not be enough to stem the loss of biodiversity in Canada. New and existing areas need to be *managed effectively* to advance biodiversity conservation.

2. **Evaluation is fundamental**
   Continued loss of biodiversity within protected areas around the world indicates that we may not be managing these areas effectively. Evaluation is fundamental to understanding how well an area is achieving the *in-situ* (i.e., managed conservation for that area) conservation of biodiversity. Repeated evaluation is also the cornerstone of an adaptive management approach; it helps to identify strengths and weaknesses of management and guide the investment of effort and resources.

3. **A common approach**
   A common approach across jurisdictions and governance models is required to evaluate the management effectiveness of Canada's *network* of protected areas and OECMs. Evaluating the network requires consistency across jurisdictions and governance models using the IUCN WCPA framework.

4. **Tools: One size does not fit all**
   Protected Areas and OECMs across Canada vary widely in ownership and governance structures, understanding of the values and threats of the site, level of existing program guidance and capacity. Despite the need for a common approach, any tools (or toolbox) used to evaluate management effectiveness will need to be adaptable to accommodate these differences.

5. **Indigenous peoples and protected and conserved areas**
   Landscapes are inherently cultural and thus evaluations of protected areas must acknowledge and respect different world views and value systems even where they may or may not align. Evaluating management effectiveness must be done in the context of the 2008 United Nations Declaration of the Rights of Indigenous Peoples and the 2000 World Commission on Protected Areas document - *Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies.*

6. **Set the stage: understand the values and threats**
   Understanding the values, risks and threats of an area is perhaps the most critical aspect of the evaluative process. Most existing PAME tools place a limited focus on this context, resulting in effectiveness being evaluated against an unclear notion of the objectives of management. Comprehensive and systematic identification of the site's values, risks and threats is critical and must remain the central focus of the evaluation of management effectiveness in Canada.

7. **Outcomes tell it best**

   The headline indicators of management effectiveness associated with the IUCN PAME framework are *predictors* of biological outcomes. This approach does not negate the need for direct monitoring of biological outcomes. The added value of the PAME framework is that it enables an evaluation of *all* of the elements of the management cycle (context, planning, inputs, processes, outputs and outcomes). The management effectiveness indicators are valuable for prioritizing management effort and resources, and can contribute to the design of an efficient monitoring program that employs quantitative and qualitative data. Direct monitoring of the biological indicators provides confidence in the overall evaluation of the effectiveness of the area to advance the conservation of biodiversity.

8. **Make it more than a ✅ exercise**

   A system-wide assessment and broad-scale reporting on the management effectiveness of Canada's network of protected areas and OECMs will identify strengths and shortcomings to be addressed at the national or sub-national scale. A simple score-card approach by itself may have limited value, however, to on-site protected area managers and practitioners, especially when applied in a limited manner. Experience suggests that the real value of management effectiveness evaluations comes from an inclusive, evaluative *process*. Invite assessment and critical comment on management performance from those who can best provide legitimate and credible assessments for each objective or area of management responsibility. Management effectiveness evaluation tools can also help to build program capacity in areas where it may be lacking, including in design and planning, community, stakeholder and Indigenous engagement, and in the design of monitoring systems.

9. **Form a partnership with the local community**

   Knowledge of a protected area is often held widely. Involving external partners, rightsholders, and stakeholders in PAME evaluations provides additional perspective, increased transparency and can check biases or help to build a sense of collective responsibility for the effective management of the protected area. Global recommendations have identified the need to support greater efforts into communication, community involvement and programs of community benefit, as these factors show very strong links to effective management and outcomes.

10. **Transparency is important**

    Transparent reporting of evaluation results is needed for public support and accountability related to the challenges associated with effective management of Protected Areas and OECMs at both a system and local level. The benefits associated with a national commitment to clear, measurable targets, common indicators, and transparent reporting outweigh risks associated with the potential for organizational criticism.

11. **Improvement takes time and resources**

    Achieving a common standard of effective management across Canada's network of protected areas and OECMs will take time and new resources. A long-term commitment to protected area improvement is essential to the achievement of this goal.

Conclusions

As the cornerstone of Canada's biodiversity conservation efforts, protected areas must not only protect and connect critical habitat, they must be effectively managed to ensure persistence. Protected area management effectiveness evaluations are a powerful tool to help in this endeavour. Although there is leadership shown in Canada (primarily from Parks Canada) with outcome monitoring, overall Canada is well behind many nations around the world who have made significant movement towards evaluating management effectiveness and meeting associated international targets.

PAME represents a major shift in the way many jurisdictions and organizations in Canada have been managing protected areas, with a strong focus on whether or not biodiversity outcomes are being achieved. This requires detailed analysis of sites values, risks and threats, and a focused examination on whether management actions are effective in responding to these threats. PAME is not a tool to assess an individual's performance but rather how the site, within its local, regional and sub/national context is performing. To be effective and sustainable, it must be repeated and integrated into management processes and tools.

PAME tools help measure things associated with management that are tangible and able to be addressed directly. The PAME indicators have been well researched and focus evaluation efforts on those things that help predict biodiversity outcomes. PAME tools alone, however, are insufficient. Biodiversity outcome monitoring programs must be developed and implemented across the Protected Area system that works hand-in-hand with management effectiveness evaluations.

Implementing PAME requires commitment at all levels of the protected areas system. There is a need to nationally promote the approach to evaluation, provide incentives to implement it and remove barriers to start. PAME approaches must be recognized as additional, but critical work for already lean staff that will help Canada become more efficient in its approach to management and help prioritize its actions. There is a need for increased capacity, training, tools and resources to implement this approach.

Protected areas exist within a larger and dramatically changing landscape. Without speedy and dramatic responses, the loss of biodiversity is likely to continue in the larger landscape, and to a lesser extent, within protected areas. PAME can help slow that decline in protected areas, OECMs and Indigenous Protected and Conserved Areas (IPCAs).

1 Introduction to Pathway

A Strategic Plan for Biodiversity was adopted in 2010 at the Conference of the Parties for the Convention on Biological Diversity (CBD). Canada, the European Community and another 195 member states are Parties (participants) to the CBD. The Strategic Plan includes the Aichi Targets, 20 biodiversity targets to be achieved by 2020 to reverse the global decline of biodiversity. Aichi Target 11 focuses on the conservation of biological diversity through protected areas and other measures:

> *"By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape."*

Parties were urged to develop their own national targets to support the strategic plan, guided by the Aichi Targets. In 2015, Canada adopted the 2020 Biodiversity Goals and Targets for Canada, a set of 19 targets covering issues including species at risk, sustainable forestry, connecting Canadians to nature, and others. The first of these 19 targets (from this point called Canada Target 1) is aligned with the numeric component of Aichi Target 11, and states:

> *"By 2020, at least 17 per cent of terrestrial areas and inland waters, and 10 per cent of coastal and marine areas of Canada, are conserved through networks of protected areas and other effective area-based measures."*

While Canada Target 1 does not include the qualitative elements of Aichi Target 11 ("...especially areas of importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape."), jurisdictions are encouraged to consider these elements when developing strategies. There are significant differences in conservation, management and governance issues as well as measurable targets in terrestrial (i.e., land) regions as compared to marine (water) regions. The Government of Canada has therefore developed separate processes for terrestrial areas and inland waters versus coastal and marine areas.

On April 11, 2016, federal, provincial, and territorial (FPT) Deputy Ministers responsible for parks agreed to establish a national steering committee through the Canadian Parks Council (CPC) to develop a pathway for jurisdictions to follow in their efforts toward the terrestrial areas and inland waters component of Canada Target 1. This National Steering Committee—as a major component of its Pathway to Canada Target 1—established a set of expert task teams to provide information and analysis on each qualitative element to assist in the development of guidance for achieving Canada Target 1. An expert task team is assigned to each of the qualitative elements below:

1. Defining protected areas and other effective area-based conservation measures
2. Equitable management from a local community perspective
3. Ecological representation

4. Management effectiveness
5. Areas important for biodiversity and ecological services
6. Connecting conservation areas and integrating into landscapes

The role of each expert task team is to produce a discussion paper that researches, assesses and summarizes existing information related to their qualitative element of focus. This includes the element's application to the designation and management of protected area networks for the conservation of biodiversity. More specifically, the National Steering Committee has assigned the expert task teams to perform/do the following for each qualitative element:

- Research, assess, and summarize existing guidance (or direction), paying attention to different views where appropriate).
- List the pros and cons (related to criteria, best practices, and indicators for measuring progress) for options identified.
- Identify potential issues in applying the qualitative element to Canada Target 1.

The focus of this discussion paper is on #4. Management Effectiveness.

2 Paper scope and purpose

Protected areas must be effectively managed if they are to produce successful conservation outcomes. Hockings et al. (2016) defines Protected Areas Management Effectiveness (PAME) as "the assessment of how well the protected area is being managed—primarily the extent to which it is protecting values and achieving goals and objectives." In this discussion paper, the word "values" refers to the attributes to protect, maintain and conserve for which the protected area is designated. Given the focus of the Pathway, the emphasis in this paper is on the link between management effectiveness and the conservation of biological diversity. This does not negate the value and importance of management effectiveness at helping measure and achieve other protected areas values including social, cultural, recreational and economic.

Recognizing the importance of management effectiveness, the Convention on Biological Diversity (CBD) Aichi Targets commit the parties to "expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of protected areas by 2015 using various national and regional tools and report the results into the global database on management effectiveness" (CBD, 1992). To date, only 17.5% of countries have reached this target (Coad et al., 2015). Effective management is further included in the text associated with Aichi Target 11.

In Canada, no formal Protected Areas Management Effectiveness (PAME) evaluations were completed by the 2015 target[2]. In 2016, Environment and Climate Change Canada was the first organization in Canada to undertake PAME evaluations, completing them for 118 National Wildlife Areas and Migratory Bird Sanctuaries (80% of their properties). A small number of PAME evaluations have been completed in Alberta and are planned in Ontario as part of a Canadian PAME pilot project in 2017. Altogether, PAME evaluations (http://www.ccea.org/carts-reports) have been completed for only 1.6% of the total number of protected areas currently reported in Canada.

This paper provides a summary of the framework and tools used internationally to measure management effectiveness of protected areas. It includes an overview of the status of management effectiveness evaluations and the state of readiness of a sample of jurisdictions in Canada. The last chapter of this paper offers principles, options and considerations on key topics to be used for

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[2] We note that Parks Canada has published State of the Park reports that include a high level summary of ecological condition. Additionally, we note that many privately protected areas are guided by property management plans that summarize biodiversity conditions, threats and may include monitoring of biodiversity outcomes. Although outcomes based monitoring is a critical component of management effectiveness evaluation it is not the same thing as PAME.

recommending how to achieve an effectively managed network of protected areas and OECMs in Canada.

To date, the management effectiveness research and assessment, as well as the development of tools used, have focused on protected areas, and are therefore the focus of this paper. The concept of *other effective area-based conservation measures* (OECMs) is relatively new, so little or no related management effectiveness research or experience has been applied to these areas. The possibility of applying the concepts and tools to OECMs is discussed in the final chapter of this paper. This will ultimately be determined by how OECMs are defined. Additionally, although the term "protected areas management effectiveness" or PAME is used throughout this document, the concepts and framework described in this paper are not intended to exclude OECMs or any other conserved areas.

2.1 Why management effectiveness?

2.1.1 Do protected areas protect biodiversity?
Protected areas are the cornerstone of biodiversity conservation. Through their recognized protected status, they are designated and intended to:

- provide habitat and shelter for species, communities and ecosystems;
- produce vital ecosystem services such as clean water and air, carbon storage to buffer the effects of climate change, and other ecological benefits; and
- serve as an ecological benchmark for surrounding landscapes.

Protected areas are also designated to:

- provide economic, social and cultural benefits including continuing livelihoods for local peoples;
- contribute to the health and well-being of individuals and communities; and
- be the source of nature-based recreation, tourism and education.

But are they effective at achieving these intended outcomes?

Global studies demonstrate that protected areas have been successful in slowing, but not necessarily preventing, the global loss of some aspects of biodiversity. According to Living Planet Index, 14,152 populations of 3,706 terrestrial vertebrate species declined overall by 58% between 1970 and 2012 (WWF, 2016). Over the same time period however, the same populations declined in protected areas by only 18% (WWF & GFN, 2014). A wide-ranging statistical analysis of existing studies found that the results are not unanimous. Species and habitat continued to decline to various degrees in terrestrial (land-based) protected areas around the world (Geldmann et al., 2015). As such, it is probable that current levels of management within protected areas at a global scale are insufficient to "halt the loss of biodiversity" (Watson, Dudley, Segan, & Hockings, 2014).

2.1.2 Protected areas are under threat
Worldwide, protected areas systems are often not sufficiently large, well-planned, connected or well-managed to effectively protect biodiversity (Geldmann et al., 2015). Protected areas are increasingly

under threat from a range of internal and external pressures. In Canada, park-specific evaluations (e.g., Banff-Bow Valley Task Force, 1996), system-wide evaluations (Canadian Parks and Wilderness Society, 2015a, 2015b, Parks Canada, 1997, 2000) and academic research (Glenn & Nudds, 1989; Landry, Thomas, & Nudds, 2001; Timko & Innes, 2009a) identified a variety of planning and management issues with Canada's protected areas.

For example, Canada's protected areas are not large enough to protect complete ecosystems, particularly those for large mammals (Glenn & Nudds, 1989). In 2010, only 32% of Canada's 5,095 protected areas were larger than 10 km^2. These areas could also be better connected, particularly in areas where neighbouring land uses add pressure along the boundaries of protected areas (Wiersma, Nudds, & Rivard, 2004). Some ecosystems also remain underrepresented in Canada's protected areas network (Canadian Parks and Wilderness Society, 2015b). Finally, there are internal stressors such as incompatible types or levels of recreation, invasive species, and insufficient funding that hamper Canada's ability to maintain biodiversity in its protected areas (Barnes et al., 2016; Timko & Innes, 2009b). It is clear that the act of designating an area as protected does not guarantee effective management sufficient to protect the natural resources within it.

2.1.3 From protection to persistence

Current commitments to biodiversity are aimed at growing and developing networks of protected areas and other conservation measures aimed to achieve the managed conservation of biodiversity for that area in new and expansive ways. The total area protected is expected to grow. As well, a widening of the categories, ownership, and administration of protected areas is expected, along with "other effective area-based conservation measures" being reported towards Canadian and international biodiversity targets.

While increases in quantity of area protected is important, "what is clear is that quality of protected areas matters more than quantity" (Achim Steiner, United Nations Environment Program Executive Director in Slezak, 2014). Determining important resources and benefits values to protect, system and site design, and designating areas are fundamental elements of the first step towards biodiversity conservation. In Canada and elsewhere, most efforts and attention have been devoted to this first step with less attention and far fewer resources dedicated to ensuring that protected areas continue to deliver on conservation outcomes, once they have been designated. The move of focus from one solely on *protection* to include *persistence* will require a concentrated effort to achieve effective management of new and existing conserved areas.

2.2   What management elements affect biodiversity outcomes?

Since the early 1990s, there has been a focus on assessing the management of protected areas (e.g., existing management plan, designated boundaries, adequate staff and financial resources). This focus on management effectiveness evaluation is based on research proving that better management leads to

better conservation results (Coad et al., 2015; Geldmann et al., 2015; Hockings, Stolton, Leverington, Dudley, & Courrau, 2006; Leverington et al., 2010, Gill et al., 2017)[3].

A collection of studies examined the threats and barriers to effective management of protected areas (Hockings, Stolton, Leverington, et al., 2006). Poaching (illegal harvesting), overharvesting and park visitors were most often named as factors that weakened the condition of protected areas. Also, a survey of IUCN WCPA delegates at the 2003 Worlds Parks Congress identified elements of the management process itself as key barriers to effective management: insufficient resourcing, evaluation, support, leadership, relationships and enforcement.

A global study reviewed the management factors to find out which were most linked to overall effectiveness and positive outcomes for biodiversity. The factors identified as most strongly linked to management effectiveness were:
- adequate infrastructure, equipment and information
- good administration
- communication
- adequacy of data and information
- staff training
- good management planning (Leverington et al., 2010).

The condition of protected area ecological values was most strongly correlated with external supports and constraints, management inputs and processes including research and monitoring, staff numbers and training, effectiveness of administration, natural resource management, and communication (Leverington et al., 2010) (see

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[3] Note: There is also contrary evidence to this link. See Challenges with PAME section later in this paper.

Table 1). In other words, biodiversity (condition of values) benefited from sufficient staffing, resources and strong communication.

TABLE 1: CORRELATIONS OF HEADLINE INDICATORS WITH ESTIMATED CONDITION OF VALUES (SIG. AT P=.000) (LEVERINGTON ET AL., 2010, P. 37)

Indicator (top 12 shown)	Type of indicator	Correlation with condition of values
Constraint or support by external political and civil environment	CONTEXT	0.42
Research and monitoring of natural/cultural management	PROCESS	0.35
Appropriateness of design	PLANNING	0.334
Adequacy of relevant, available information for management	INPUT	0.332
Effectiveness of administration including financial management	PROCESS	0.322
Adequacy of staff numbers	INPUT	0.309
Natural resource and cultural protection activities	PROCESS	0.306
Communication program	PROCESS	0.303
Adequacy of infrastructure, equipment and facilities	INPUT	0.3
Adequacy of staff training	PROCESS	0.296
Adequacy of law enforcement capacity	PROCESS	0.295
Adequacy of PA legislation	PLANNING	0.294

Likewise, a review of 118 studies on the effectiveness of protected areas found that isolation from disturbance (e.g., by slope and elevation) had positive effects. In addition, the presence of regulations, strictness of protection, legislation, management plans and enforcement made positive contributions to conservation (Geldmann et al., 2015). Craigie and others identified investment in management, protected areas size and age as being key contributors to effectiveness, and noted that management of protected areas is more important for achievement of biodiversity outcomes within a 20-year time frame than other factors (such as size, shape and habitat fragmentation). These factors were more important over a longer time frame (Craigie et al., 2010).

A recent global analysis of indicators that increased the effectiveness of protected areas management also found that good governance and management (regulations, enforcement and Indigenous governance) were most strongly linked to positive conservation outcomes (see

Table 2) (Woodley, 2017).

TABLE 2: PREDICTORS OF INCREASING EFFECTIVENESS (WOODLEY 2017)

Predictors of increasing effectiveness	Reference	Generalized elements of success
No-take or harvest	Edgar et al. (2014)	Sound governance/sound management
Established protected area regulations	Geldmann et al. (2013)	Sound governance/sound management
Increased anti-poaching	Geldmann et al. (2013)	Sound management
Increased enforcement	Geldmann et al. (2013)	Sound governance
Established legislation	Geldmann et al. (2013)	Sound governance
Established protected area targeted interventions	Geldmann et al. (2013)	Sound management
Greater protected area age	Edgar et al. (2014)	Sound management
Larger protected area size	Blackman et al. (2015)	Sound ecological design
Greater indigenous governance	Nolte et al. (2013)	Sound governance
Greater gross domestic product per capita	Barnes et al. (2016)	Sound governance/sound management
Greater Gini score	Barnes et al. (2016)	Sound governance/sound management
Large animal body size	Barnes et al. (2016)	Sound management
Greater benefits to local community	Bruner et al. (2001)	Sound governance/sound management
Clearer boundary demarcation	Bruner et al. (2001)	Sound management
Lower corruption	Smith and Walpole (2005)	Sound governance
Strictness of protection	Sciberras et al. (2015)	Sound governance/sound management

Many of the studies to date have used data collected *in-situ* (within the protected area) on changes to species distributions and population trends or professional appraisals on the state of the protected area. These studies have looked for relationships between those data and appraisals and area management assessments.

On-site data (changes to species distributions and population trends) + professional appraisals

Measure of success

Comparison with assessments of area management
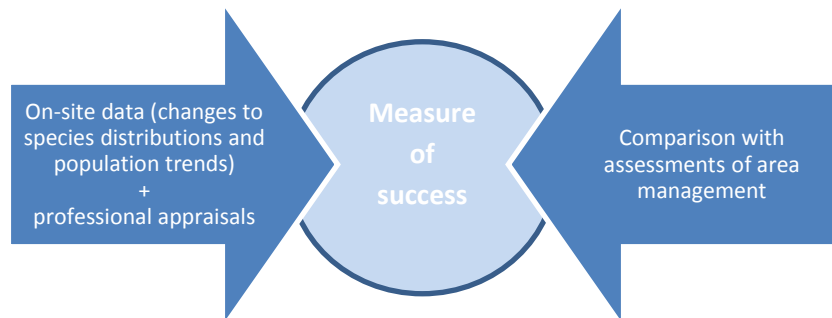
DIAGRAM 1: STUDY METHOD 1

Other studies have identified changes in forest cover or other natural values using remote sensing data, compared changes within the protected area to the wider landscape (surrounding areas), and then used that comparison to evaluate the impact of management processes (Coad et al., 2015).
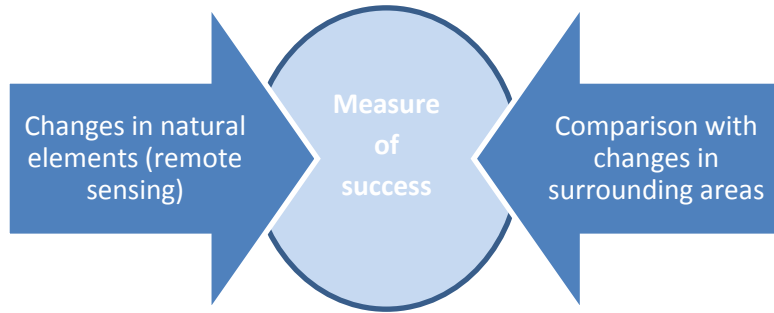
DIAGRAM 2: STUDY METHOD 2

A recent study published in *Nature* examined the management processes and ecological condition of marine protected areas (MPAs). This was the first study to directly examine the impact of management on conservation outcomes, in this case the fish populations. The study showed the strongest predictors of conservation impact to be staff capacity, budget capacity and boundary demarcation, all elements of the management of the protected areas, and not MPA size or regulatory restrictions (see Table 3).

TABLE 3: KEY DOMAINS ALONG WITH ILLUSTRATIVE INDICATORS AND THRESHOLDS FOR ASSESSING MANAGEMENT EFFICACY AND EQUITY (MODIFIED FROM GILL ET AL 2017)

Indicator categories	Indicator	Definition for measurement	Hypotheses and rationale for inclusion	Sources
Management capacity[4,9]	Budget capacity	Adequacy of budget to meet management needs	Management capacity includes the human, financial, physical, information and other resources without which, management will not be able to achieve its pre-determined objectives. Lack of resources has been cited as a key reason for management failure[67,68]	a,b
	Staff capacity and/or presence	Adequacy of (on-site) staff capacity/numbers to carry out management activities (including designated community staff)		a,b,c
Implementation of management activities[4,9]	Implementation of planned management activities	Existence and implementation of a management plan to guide management activities	MPAs are more likely to achieve their objectives if a management plan is in place and being implemented[4,9]	a,b,c
Monitoring and enforcement systems[6,7,8]	Degree of monitoring of management, users, and/ or resource conditions	Monitoring of MPA management and/or MPA conditions (biophysical, socioeconomic) where information is used to inform management	Monitoring of management activities, resource conditions, and resource users facilitates adaptive management, allowing management to be more responsive to dynamic social and ecological processes within an MPA[3]	a,b,c
	Level of enforcement	Capacity for and/or consistency of the enforcement of MPA legislation and regulations	Surveillance of resource use activities creates disincentives for non-compliance with MPA rules and regulations[7]	a,b,c
Resource use rights[6,7,8]	Delineation of MPA boundaries	MPA boundaries are clearly defined/demarcated and well known to local stakeholders	If resource use rules are clearly defined and known to all users (e.g. no-take boundaries demarcated), they increase the likelihood of conservation meeting its policy objectives[6].	a,b,c

Indicator categories	Indicator	Definition for measurement	Hypotheses and rationale for inclusion	Sources
	Appropriateness of regulations controlling use	Appropriate regulations to control use/unsustainable activities are defined and in place	Ambiguous and unstable resource use rights and boundaries can create uncertainty regarding the effectiveness of management to conserve resources, affecting its legitimacy, and can lead to conflicts among user groups[6,7]	a,c
	Level of legislative support	Legal status of the MPA	MPA gazettement provides legislative support for MPA rules and regulations and can increase legitimacy	a,b
Decision making arrangements[6,7,8]	Degree of stakeholder involvement in decision making	Contribution of local communities/stakeholders to management decision making, including planning and implementation	Including a diversity of stakeholders can increase: 1) the likelihood of equitable outcomes; 2) the likelihood that management will be better suited to the local social and ecological context (i.e. fit), and; 3) the perceived legitimacy of the protected area and compliance[6,7,69-71]	a,b,c
	Degree of devolution of mgmt. authority	The devolution of management from state to non-state actors or shared management	Devolved management could provide enabling conditions for multiple stakeholders to be involved in decision making	a,b,c
Conflict resolution mechanisms (not included in this study)[6,7]	Accessibility of conflict resolution mechanisms	Conflict resolution mechanism have low transaction costs and are accessible to stakeholders	Having accessible conflict resolution mechanisms can mitigate conflicts arising within the MPA and can also give voice to marginalized groups[7]	c
Resource condition	Status or change in species or habitat condition	Change in biodiversity/habitat conditions relative to non-MPA areas/time periods (improvements, no change, or moderated declines relative to non-MPA areas/time periods). In this study, we used fish biomass as the indicator	Management of human activity can result in improvements in resource conditions in MPAs relative to corresponding non-MPA areas or pre-MPA conditions[72]	d

More theoretical background information can be found in ref. 4,6-9. Data sources for indicators include the Management Effectiveness Tracking Tool (METT)[a], World Bank MPA Scorecard[b], NOAA CRCP MPA Management Assessment Checklist[c], and six underwater visual census datasets and a meta-analysis of MPA ecological impacts[45,72] (see Gill et al., 2017 Supplementary Table 2).

These studies, and many others, show the critical importance of effective management to the achievement of conservation. They also identify many of the specific factors (e.g., sustainable finance, well-defined boundaries and legal frameworks) that are the foundations of that management.

However, we cannot use measures of inputs and processes to fully predict outcomes. Input and process indicators are much easier to track and monitor, but outcome measures (e.g., number of returning salmon) are direct measures of biodiversity relative to an input indicator (e.g., dollars spent on salmon restoration). Therefore, when assessing management effectiveness, it is essential to include outcome measures of biodiversity and other parts of the management cycle (Leverington et al., 2010a). Evolution of protected areas management effectiveness (PAME)

> a *"high level of input does not always translate into a similarly high level of output."*
> *(Maclaren et al., 1996)*

2.2.1   What is PAME?

PAME is defined as an "assessment of how well protected areas are being managed—primarily the extent to which management is protecting values and achieving goals and objectives." (Hockings, Stolton, Leverington, et al., 2006). In the examination of effective management, it is recognized that just having a given management element in place is not enough to ensure good management. In simple terms, PAME examines and evaluates the management context, structure and approach for an area focused on to learn whether or not those elements of management are effectively and efficiently contributing to the site objectives. For example, just having a means (e.g., legislation) to provide protection of a conservation area is insufficient. The legislation must be *effective* in its ability to manage or prevent harmful activities, or to provide long-term protection.

2.2.2   Development of PAME

Concerns about the effectiveness of protected areas in meeting *multiple* objectives (e.g., biodiversity conservation, nature-based recreation opportunities, and supporting local communities) have led PAME approaches and tools to address a wide range of objectives from biodiversity conservation, to social equity, to recreation (Bruner, Gullison, Rice, & Fonseca, 2001; Leverington, Hockings, & Costa, 2008; Rodrigues et al., 2004; Vanclay, 2001).

The evolution of PAME evaluation began in the 1990s with an initial phase led by academic communities and non-governmental organizations (NGOs). In the second phase, PAME evaluations became a way to assess performance for funding agencies. For example, Global Environment Facility (GEF) often required the completion of tools such as the Management Effectiveness Tracking Tool (METT) as a condition of renewed funding (Coad et al., 2015). In phase three, agencies and governments are now conducting evaluations to better implement adaptive management, improve planning and priority setting, and report on the status of protected area management (see Figure 1). By 2000, several methods to evaluate PAME had been developed that began to merge with the publication of the IUCN WCPA framework and guidelines to assess management (Woodhouse et al., 2015). Since the publication of a revised framework in 2006, PAME tools have been developed and revised to largely correspond to the framework.
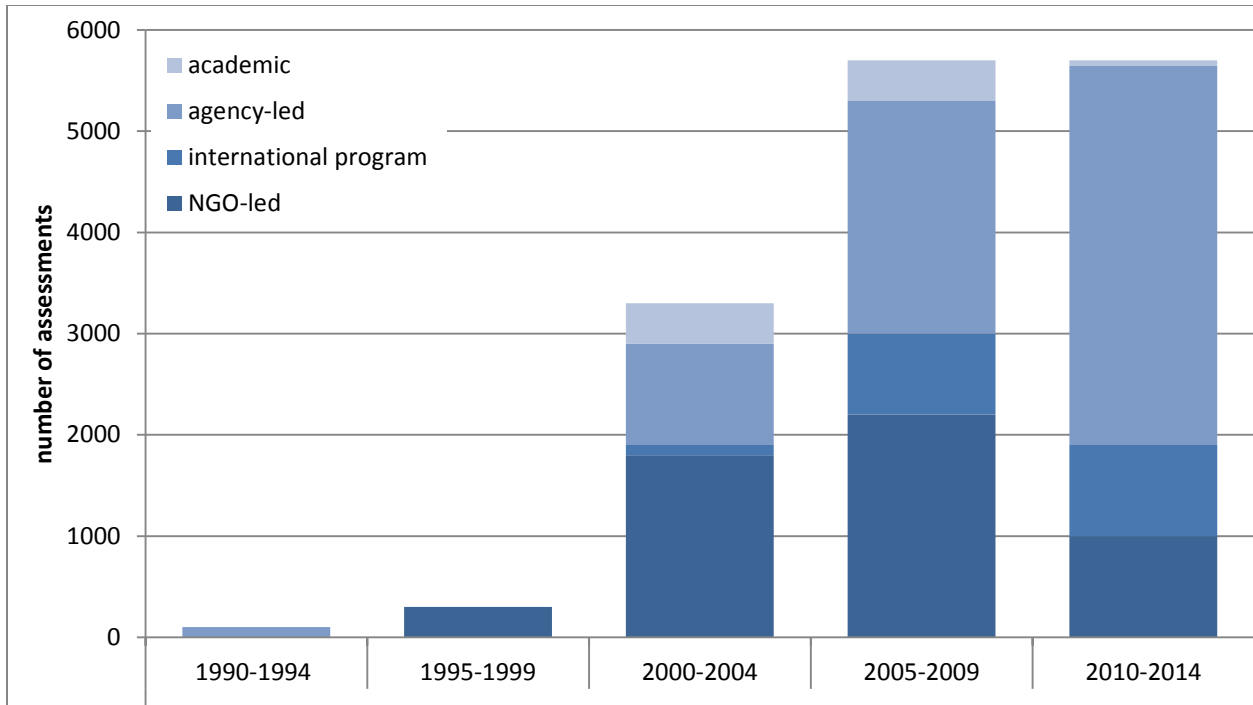
FIGURE 1. APPLICATION OF PAME TOOLS FROM 1990 TO 2014, ACCORDING TO THE IMPLEMENTATION ORGANIZATION. SOURCE: COAD ET AL., 2015)

2.3 Why evaluate?

2.3.1 Benefits of evaluation

While implementation of a protected areas management effectiveness process meets international obligations under the Convention on Biodiversity, evaluation has more direct benefits to individual parks, agencies, partners and governments (see

Table 4).

Generally, evaluation can help to:

- improve conservation management and planning of protected areas (Leverington et al., 2010);
- build improvements in information to support management;
- provide support for increased political and financial resources;
- increase transparency and improve accountability;
- achieve international recognition (e.g., IUCN Green List of Protected Areas); and
- improve management of protected areas for human well-being (Woodhouse et al., 2015).

Strengthening legislative/policy frameworks

Improve management of protected areas:
- Identify management strengths and weaknesses
- Enable and support an adaptive approach to management
- Identify how protected areas compare with one another (or over time) in terms of infrastructure or management capacity or producing outputs and conservation outcomes
- Assist in effective resource allocation;
- Identify the most important values within and across sites ("identify values" areas of high ecological and social importance and vulnerability);
- Identify the condition of values and threats to those values (analyze scope, severity, prevalence and distribution of a variety of threats and pressures)
- Identify urgency and conservation priority for individual protected areas
- Identify areas of greatest need in terms of any shortfall
- Identify differences between desired and actual outcomes
- Identify places of relative efficiency in terms of outcomes achieved for resources invested in management

Improve planning:
- System-wide planning and policy analysis
- Management planning
- Annual or operational planning
- Project planning

Build improvements in information to support management
- Identify information deficiencies and prioritize
- Reinforce need for implementation monitoring
- Help develop monitoring program
- Build need for outcomes monitoring
- Identify priority research needs

Document need for increased resources

Improve social equity
- Increase transparency and improve accountability
- Improve benefit distribution for rights-holders
- Promote accountability and transparency
- Help involve the community, build constituency and promote protected area values
- Fulfill reporting/accountability requirements
- Strengthening stakeholder involvement
- Develop or support new forms of equitable governance

In addition to the substantive value of conducting management effectiveness evaluations, evidence gathered from PAME evaluations globally has shown significant benefits to participants and organizations from engaging in such processes, including:

- increasing site knowledge;
- improving communication and cooperation between managers and other stakeholders;
- stepping back from day-to-day concerns to consider issues/challenges in a new light;
- building capacity for protected area personnel; and
- encouraging a learning organization and culture.

Global studies of PAME evaluations have shown that simply conducting a management effectiveness evaluation may improve management. An examination of over 250 protected areas with repeat evaluations using the same approach (Leverington et al., 2010) found that a large majority improved by an average of 158% from the original score; improvements increased with the number of repeat evaluations (up to seven) (see Figure 2). Results from other studies suggest that when funding and resources are allocated to protected areas under greater threat, they have a greater impact—potentially including slowing the loss of biodiversity (Geldmann et al., 2015).
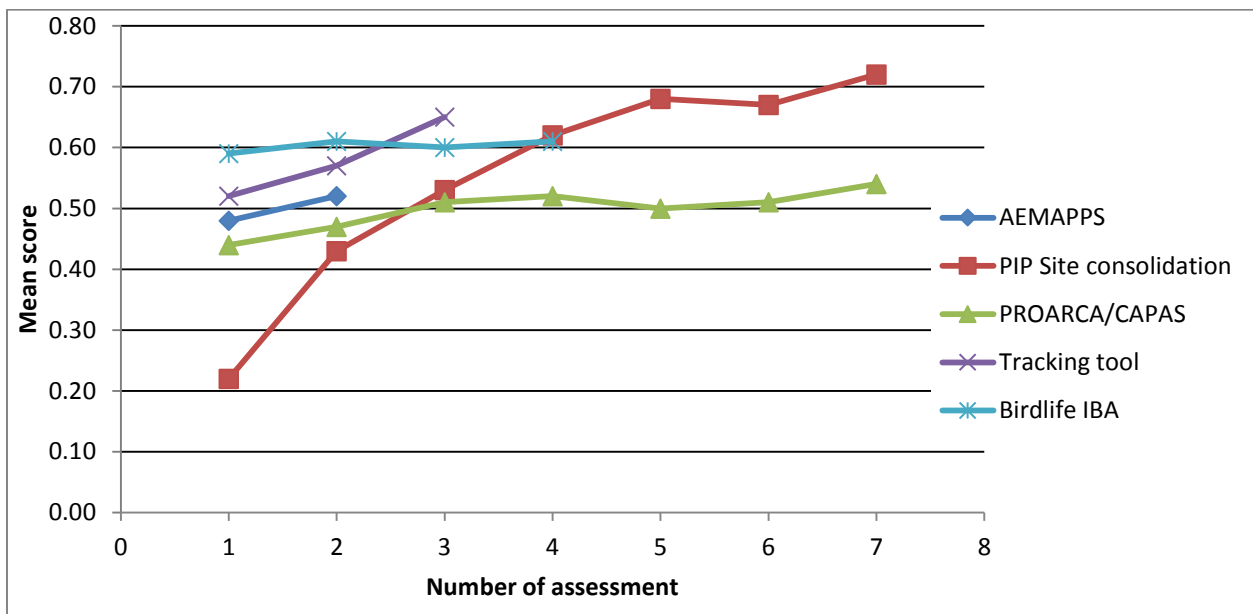
FIGURE 2. TRENDS FOR REPEAT EVALUATIONS BY METHODOLOGY (F. LEVERINGTON ET AL., 2010, P. 50)

3   Measuring management effectiveness

Worldwide, evaluation of management effectiveness has been developing since the 1990s. Funding agencies including the World Bank, Global Environment Fund and Worldwide Fund for Nature (WWF) began requiring evaluations for all projects that involved protected areas (Belokurov et al., 2009). Many countries developed PAME methodologies to assess the effectiveness of their protected area sites and systems. During this growth period, many tools and approaches were developed for different contexts, purposes and audiences, differing participants, differing capacities and differing degree and frequency of evaluation. For example, some tools were designed for use by communities and others for use by external auditors. Some tools focused on particular types of sites, such as Ramsar wetlands and World Heritage Sites. As there are clear differences between jurisdictions, and potentially within jurisdictions, no single PAME tool or approach can address all needs.

3.1   A common framework

Despite the need for flexibility in approach, the benefit of using a common reporting system to be able to "draw general conclusions about the effectiveness of protected area management at national, regional or global levels" became clear (Hockings et al., 2006, p. 6). As a result, the International Union for Conservation of Nature's (IUCN) World Commission on Protected Areas (WCPA) developed a common framework for an underlying logic structure and international standard. This framework is based on commonly identified criteria or elements that research has demonstrated are predictors of biodiversity outcomes. (See previous discussion on management drivers of biodiversity outcomes.)

The framework parallels stages of a typical management cycle, moving from understanding the context, through planning, allocation of inputs, implementation of management processes and production of outputs, and resulting in specific impacts or outcomes (Figure 3Figure 3).

FIGURE 3.THE IUCN WCPA FRAMEWORK FOR ASSESSING MANAGEMENT EFFECTIVENESS OF PROTECTED AREAS (HOCKINGS ET AL., 2006)

The framework places emphasis on six stages for the evaluation[4].

1. **Context:** The focus in this stage is on understanding the current situation. This includes an understanding of the national context, the policy environment, the conservation values of the site, and the vulnerabilities and threats the site is facing both internally and due to influences from the surrounding landscape.
2. **Planning**: The focus in this stage is on an examination of the protected area design (e.g., size, shape, connectivity) and planning situation. This includes an examination of the legislation and policy, the design of the site and the management planning processing.
3. **Input:** The focus in this stage is on an examination of the resources (financial, human, equipment) that are needed to carry out management objectives identified in the planning stage.
4. **Process**: The focus in this stage is on examining the efficiency and appropriateness of management planning and site management (i.e., whether the site is being managed in the way that was intended).
5. **Outputs:** This stage identifies the outputs of management including an assessment of the results of management (e.g., visitor days, resource management activities completed) by the actions, products and services produced.
6. **Outcomes**: This final stage examines the effectiveness of the management actions to achieve the outcomes specified at the outset. What was achieved in terms of conserving biodiversity attributes, for example?

3.1.1   Indicators of protected area management effectiveness

Ideally, a PAME evaluation tool would address all six of the framework stages with a series of indicators. Because of the diversity of methods and tools, a global study was commissioned to evaluate over 1800 indicators to identify the "most common questions asked in evaluations" (Leverington et al., 2010a p. 14). The result was a nested set of 45 headline indicators into which indicators from any PAME methodology could be grouped and matched. The fourteen resulting summary indicators are used in global PAME reporting. Ideally, (see

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[4] For detailed information on the IUCN framework, the reader is referred to the guidebook (Hockings et al., 2006)).

Table 5). Now, further narrowed down, 14 summary indicators are used in global PAME reporting. Ideally, indicators that evaluate each stage of the cycle would be used.

ELEMENT	SUMMARY INDICATOR	HEADLINE INDICATORS
Context	Value and significance	Level of significance
		Important values*
	Threats and constraints	Level of extent and severity of threats
		Trend of threats
		Important threats*
		Constraint or support by external political and civil environment
Planning	Site design and establishment	Park gazettal
		Tenure security and issues
		Appropriateness of design
		Marking and security/fencing of park boundaries
		Adequacy of protected area legislation and other legal controls
	Management planning	Management planning
Input	Management resources	Adequacy of current funding
		Security/reliability of funding
		Adequacy of infrastructure, equipment and facilities
		Adequacy of staff numbers
	Information base	Adequacy of relevant, available information for management
Process	Internal management systems and processes	Staff morale
		Effectiveness of governance and leadership
		Model of governance*
		Effectiveness of administration including financial management
		Management effectiveness evaluation undertaken
		Adequacy of building and maintenance systems
		Staff/other management partners skill level
		Adequacy of staff training
		Adequacy of policies and procedures
	Visitor management	Character of visitor facilities and services
		Visitors catered for and impacts managed appropriately
		Level of visitor use
	Natural and cultural resource management systems	Threat monitoring
		Natural resource and cultural protection activities undertaken
		Sustainable resource use - management and audit
		Research and monitoring of natural/cultural management
	Stakeholder relations	Communication program
		Involvement of communities and stakeholders
		Appropriate program of community benefit/ assistance
		Community benefit/ assistance program
	Law enforcement	Adequacy of law enforcement capacity
		Five main issues for law enforcement
Output	Achievement of work program	Achievement of set work program
		Results and outputs have been produced

Outcome	Conservation outcomes	Proportion of stated objectives achieved
		Conservation of nominated values -condition
		Conservation of nominated values - trend
	Community outcomes	Effect of park management on local community

The indicator types (sub-headings) are to some extent hierarchical. For example, input elements such as reduced staff capacity may provide some early warning of change (e.g., reduced enforcement), but the outcome measures provide higher quality data and more direct measurement of the change (e.g., change in harvest levels, or change in population levels). Typically, input and process elements are much easier to track and monitor. Maclaren et al. note (1996), however, that a "high level of input does not always translate into a similarly high level of output" or outcome. Many of the PAME tools have indicators that focus on inputs and process with less development of indicators measuring outputs or outcomes. Ideally a PAME tool would contain a balance of types of indicators. Different approaches to measuring outcomes and challenges associated with them are discussed later in the paper.

3.2 Tools and methods for protected area management effectiveness

Over 95 different tools or methods for PAME evaluation have been developed globally[5]. Although some are unique, many are modifications of one of the more common tools or methods. For example, the Korean METT is a jurisdictional variation of METT; the Rapid Evaluation of Management Effectiveness in Marine Protected Areas of Mesoamerica is a variation of RAPPAM (i.e., Rapid Evaluations and Prioritization of Protected Area Management) for a specific environment (marine). In addition, different tools emphasize different content areas. Although most tools focus on management effectiveness more widely, some have a specific focus on components such as governance or social benefit distribution/equity.

Different PAME tools also vary in these elements:

Element	Variation examples
Spatial scale level	• System-wide • Individual site/protected area
Focus	• Scoring • Capacity-building
Type of data used	• Outcomes/evidence-based • Peer-based

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[5] Refer to https://www.protectedplanet.net/c/protected-areas-management-effectiveness-pame/methodologies for a partial listing of PAME tools.

1. **System-wide peer-based assessment** is conducted at the scale of the organization's jurisdiction (e.g., all provincial parks in a province), although the data source is peer-based (not outcomes-based) assessment.

2. **Capacity-building systems** include worksheets to guide the management design/planning process with a clear link to conservation outcomes (e.g., Enhancing our Heritage or EoH). The focus is at the site or individual protected area.

3. **Score card expert-based evaluations** for individual protected areas include evaluative questions scored by an individual/team of individuals. Management Effectiveness Tracking Tool (METT) is an example.

4. **In-depth, evidence-based** evaluations are aimed at building monitoring systems. These typically work with monitoring data on conservation outcomes (e.g., U.S. State of Park evaluations)

Some tools are hybrids that combine elements of these four categories.

3.2.1 Most widely-used tools

A recent examination of the Global Database on PAME (Coad et al., 2015) found that the Management Effectiveness Tracking Tool (METT) was the most widely used, at 4046 times in 2045 protected areas. The New South Wales State of Our Parks (SOP) methodology was used 3552 times in 859 protected areas. The Rapid Evaluation and Prioritization of Protected Area Management (RAPPAM) was used 2276 times in 1930 protected areas. A summary of some of the major tools and their features is provided in Table 6.

	Overall Structure	Tool Type	Data Types	Limitations	Implementation	Outcomes Data
Management Effectiveness Tracking Tool (METT)	Rapid assessment scorecard of 30 questions across all six IUCN-WCPA elements but with an emphasis on context, planning, inputs, and processes. Also collects information on budgets, staffing, principal protected areas values, objectives, and threats.	Scorecard expert-based assessment (individual protected areas).	Lists of principal values and assessment of extent of nominated threats. Scorecard records performance on four-point ordinal scale using descriptions of management performance, where 3 describes an ideal situation and 0 represents very poor or no performance.	Limited assessment of outcomes; all questions assigned equal weight; can be difficult to compare across sites if questions interpreted differently.	Usually done in less than a day with input from managers and project staff.	One indicator on biological outcomes.
Rapid Assessment and Prioritization of Protected Area Management (RAPPAM)	Designed for broad-level comparisons among many protected areas that together make a protected areas network or system. It covers five of the WCPA management effectiveness elements (context, planning, inputs, processes and outputs).	Capacity-building/ Scorecard expert-based assessment.	Most questions use a standard 4-point scale (no = 0, mostly no = 1, mostly yes = 3, yes = 5), where 'yes' describes an ideal situation. Threats (vulnerability) are rated according to their extent, impact and trend.	Designed to set priorities across entire protected area system so limited management outcome measures in depth at an individual protected area. Largely perception-based so there are some subjectivity issues in assigning scores if knowledge is limited; although, if applied in a workshop fashion this can be mitigated.	Workshop format (1–2 days) with managers and other knowledgeable participants (e.g. Agency and NGO staff, scientists) across the range of protected areas involved in the assessment.	None.

	Overall Structure	Tool Type	Data Types	Limitations	Implementation	Outcomes Data
Enhancing Our Heritage (EoH)	Workbook of 12 tools based on all six IUCN-WCPA elements. The tools identify main site values (biodiversity, social, economic and cultural) and assess whether appropriate objectives, based on these values, have been set. Then, the effectiveness of management in achieving these objectives is evaluated.	Capacity building.	Mix of quantitative, qualitative, and scoring data. Identified key values and threats are used to design monitoring programmes to provide quantitative data on condition. Includes collection of information on sources of evidence for evaluations.	Worksheets very general and need to be adapted. Very time-consuming. Builds capacity but less strength at evaluation.	Compilation of data from monitoring and other sources. Mix of workshops with staff and stakeholders, scientists and community representatives and preparation of assessment report by project staff, usually over a period of a few months.	Indicators for status and trend of key values defined for each site.

	Overall Structure	Tool Type	Data Types	Limitations	Implementation	Outcomes Data
New South Wales – State of The Parks (SOP)	A proforma that addresses each of the six elements of the IUCN-WCPA Framework. The proforma is designed to be completed for all or most protected areas in a system. It incorporates both quantitative and qualitative assessment items with information values, threats and stakeholders, resourcing and planning, and 30 items assessing management performance and outcomes.	Score-card expert based assessment/ In-depth evidence based.	Mix of quantitative, qualitative and scoring data. Includes collection of information on sources of evidence for evaluations.	Needs significant adaptation to other contexts. Many aspects of the IUCN Framework are not evaluated in as much detail as in other tools although outcomes are better addressed.	Usually undertaken in workshop (1 day) by managers and other specialist staff. Follow-up audit and validation of data by central agency staff working with assessors as needed.	Indicators for outcomes related to each status and trend of biological and cultural values and threats, with optional detailed information by species.

Note: All of these tools are based on available or expert driven assessment of outcomes, rather than a science based monitoring program.

3.2.2 Tool selection and implementation

Selection of the appropriate PAME tool(s) requires a clear understanding of the purpose(s) and objectives of the assessment; how these data will be used; and organizational (and partner) capacity. Tool selection directly shapes the methodology and determines the value that can be gained by the assessment. Based on their global assessment, (Leverington et al., 2010a, p. 51), developed a set of principles for selection of PAME tools, noting that all methodologies selected should be:

- "Useful and relevant in improving protected area management; yielding explanations and showing patterns; and in improving communication, relationships and awareness;
- Logical and systematic: working in a logical and accepted framework with balanced approach;
- Based on good indicators, which are holistic, balanced, and useful;
- Accurate: providing true, objective, consistent and up-to-date information;
- Practical to implement within available resources, giving a good balance between measuring, reporting and managing;
- Part of an effective management cycle: linked to defined values, objectives and policies and part of strategic planning, park planning and business and financial cycles;
- Cooperative: with good communication, teamwork and participation of protected area managers and stakeholders throughout all stages of the project wherever possible; and
- Focused on positive and timely communication and application of results."

The purpose and objectives of conducting management effectiveness evaluations vary. The ways of using the results from these evaluations also vary. Some PAME tools are designed with less focus on evaluation and more focus on capacity-building (e.g., Enhancing our Heritage). These types of tools are very useful where the protected area's organization lacks the capacity, systems or approaches to management and expertise to guide management planning. For example, the EoH tool contains a series of worksheets that a team can complete over a week or more to develop many of the components of a management system for the protected area. These tools can build capacity, but they are less useful in their whole form for consistent, system-wide reporting. It is difficult to summarize the results of these evaluations, although aspects of them can often be adapted for this purpose. In addition, these capacity-building tools require intensive time commitments. In contrast, other tools (e.g., Management Effectiveness Tracking Tool) are designed to be completed quickly (in hours instead of days) and evaluate the current state of the management system. Consistent reporting, summary and comparisons are much easier with these types of tools, but without a clear and complete identification of values and their risk and threats, appropriate and meaningful background information can be lost.

How an organization chooses to implement a PAME process will also influence the value of the tool and its selection. Processes that involve a range of expertise may benefit from the shared or collective understanding that results from a team of people discussing and completing the evaluation. Some tools can be completed by one or a few individuals, and this could potentially lower the strength of the evaluation, introduce bias, and minimize the advantages of the collaborative and learning elements of the evaluation.

In reality, an organization may pick one tool or a hybrid of multiple tools or may choose to adopt more than one tool to be applied variably, depending on the complexity, capacity or needs of the protected area system. For example, an organization might choose to select one tool for situations where management planning (or equivalent) documents exist and another tool where there is no planning guidance available. Different tools may also be used for protected areas with very high use or profile (e.g., a protected area that is also a world heritage site) versus remote protected areas with significant conservation focus. When more than one tool is selected, the organization will have to differentiate when to apply a specific tool, how the different reporting systems will relate to each other, and how the combined information will be reported and interpreted.

> **Adapting tools to a Canadian context**
>
> The pilot PAME project in Alberta and Ontario identified several indicators in their approach that were particularly important – that were either new, or they felt should receive more emphasis than in the standard PAME tools examined. These included:
> - Identification of important conservation values (extensive/detailed assessment compared to most tools)
> - Parallel identification of important recreation values (non-existent in most PAME tools)
> - Identification of "other" values including cultural, social, research, community etc.
> - Detailed examination of design risks
> - Transboundary management issues (were relevant)
> - Planning/managing for climate change (as a specific threat)
> - Enhanced governance and social equity section for protected area with an extensive indigenous/co-management or similar approach
> - Staff time spent addressing specific threats/values
> - Outcomes monitoring program development

4   International status of PAME

4.1   Global commitment to PAME

Building on initial discussions begun at the 3rd World Parks Congress, the 4th World Parks Congress (2004) identified the effective management of protected areas as a major issue of global concern (Leverington et al., 2010). This resulted in an emerging area of academic study on PAME (e.g., indicator and scoring methods). These include work by conservation NGOs evaluating programs and strengthening management and work by government agencies in conducting internal evaluations. Subsequently, the CBD Aichi Targets committed the parties to "expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of protected areas by 2015

using various national and regional tools and report the results into the global database on management effectiveness" (CBD Aichi Targets, COP 10 Decision X/31, 19a). To date, 17.5% of countries have reached this target (UNEP-WCMC and IUCN, 2016).

4.2 How many PAME evaluations have been completed?

Over 18,000 PAME evaluations have been conducted using 95 methodologies in over 9,000 protected areas across 180 countries (Coad et al., 2015; Geldmann et al., 2015). This means that a significant number of sites have completed multiple evaluations. The majority of evaluations have been completed in Oceania and Latin America, with North America lagging far behind the rest of the world (Leverington et al., 2010) (see Figure 4). As of 2017, the Global Database on PAME alone contained 14,297 evaluations carried out in 6,802 protected areas in 72 countries and territories (UNEP-WCMC, 2017). Of note is that the accuracy and completeness of the PAMEs depends on the evaluative tools used[6].
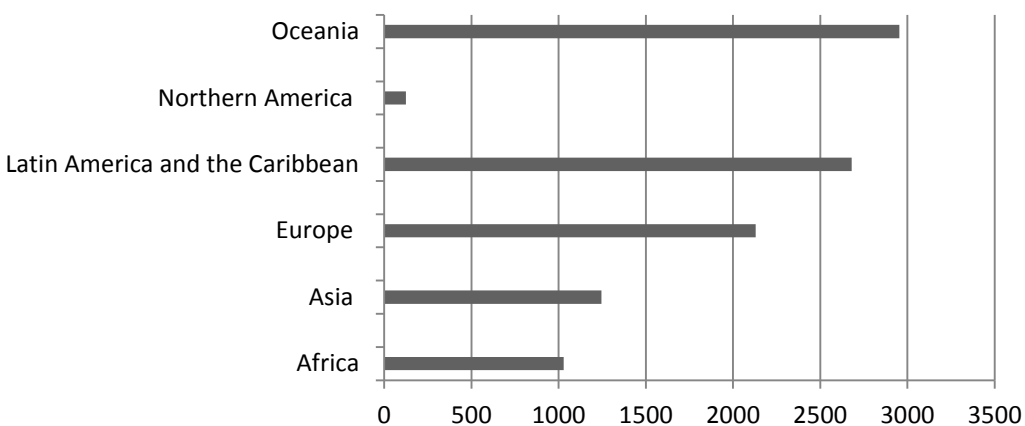
FIGURE 4. THE APPLICATION OF PAME METHODOLOGIES ACROSS DIFFERENT REGIONS (SOURCE: LEVERINGTON ET AL., 2010)

4.3 How effectively managed are protected areas?

A number of recent global studies of PAME have identified how protected areas are performing on management effectiveness evaluations as well as the specific indicators (i.e., markers) consistently performing well and those performing poorly. The average results of over 4,000 of the most recent PAME evaluations from the Global Database on protected area management effectiveness were scored as providing basic management or achieving a summary score of just over 50% effective management (Leverington et al., 2010). There were no evaluations available for the U.S. or Canada[7]. All regions had a

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[6] For example, Canadian National Parks appear in the database as having completed PAME. Although Parks Canada has a well-developed monitoring program for ecological integrity outcomes and reports on other performance measures, Parks Canada has not conducted PAME evaluations that cover the headline indicators.

[7] See Leverington et al. (2010) for details on how scores from various methodologies were standardized and calculated.

mix of well and poorly managed areas. However, more of the poorly managed areas were in African protected areas. Latin American areas scored consistently in the "basic" range.

Four of the five strongest scores for the headline indicators were achieved in the 'planning' element of the IUCN PAME framework, specifically: regulatory documentation and legal status; protected area boundaries; tenure issues; and protected area design. Management planning itself, however, did not generally score well. The fifth strongest score was associated with the process indicator of governance and leadership (see Figure 5).

Factors consistently reported as challenges include:
- management planning (i.e., lack of, inadequate, out-of-date planning, poorly integrated into management);
- budget adequacy and reliability;
- staffing, infrastructure and equipment;
- research and monitoring;
- provision of programs designed to benefit local communities; and
- management of visitor impacts.

Paleczny (2010, p. 178-179) reported some other potential challenges "primarily related to obtaining or managing data and information, dealing with the demanding nature of the reporting task, and securing participation and cooperation from all interested groups". Other challenges include difficulties in establishing indicators and rating approaches, and insufficient funds leading to concerns about sustainability and continuity of evaluation efforts.
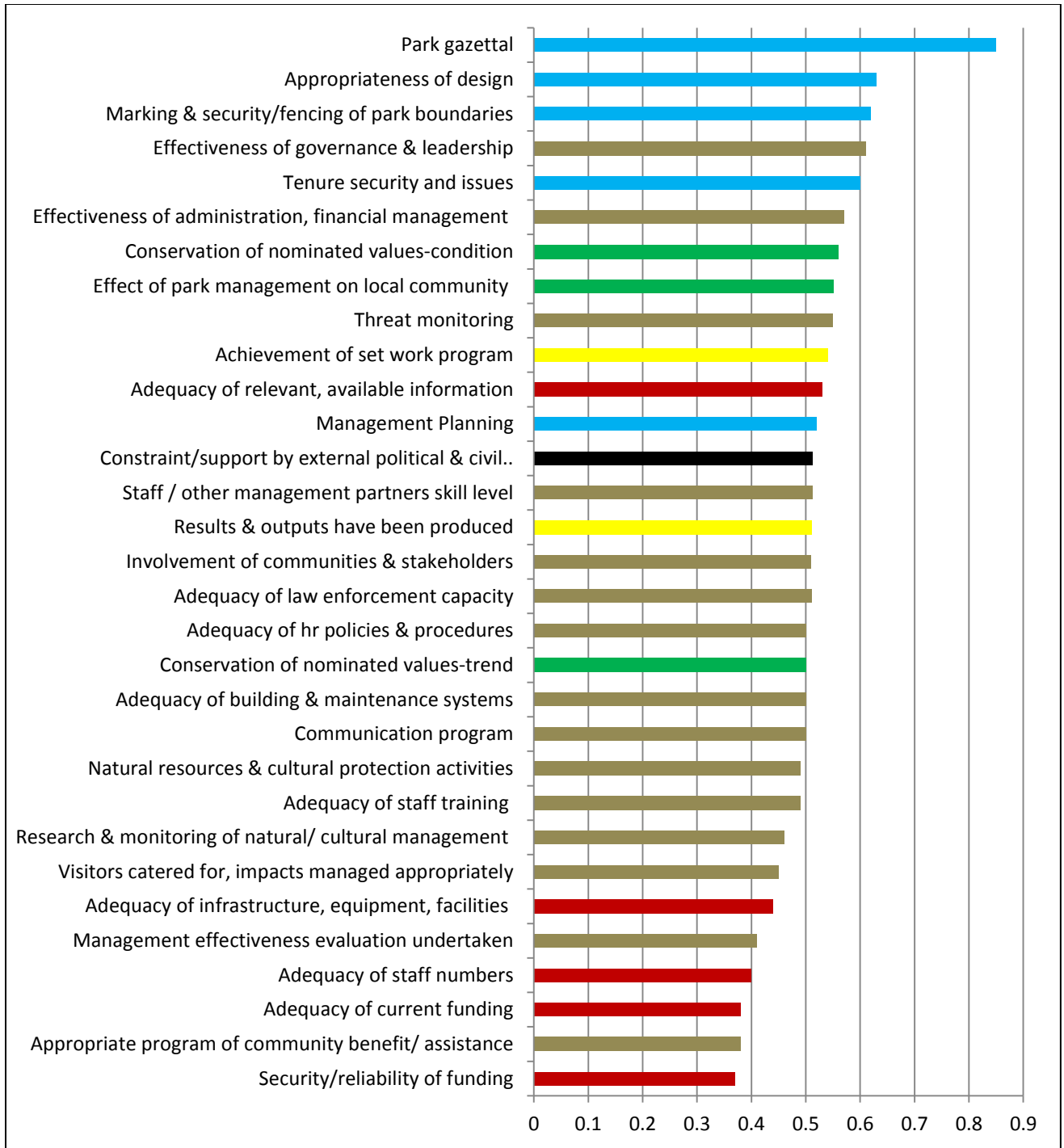
FIGURE 5. AVERAGE SCORES FOR HEADLINE INDICATORS (LEVERINGTON ET AL., 2010, P. 44) WHERE BLACK = CONTEXT FACTORS, AQUA = PLANNING, RED = INPUTS, BROWN = PROCESS, YELLOW = OUTPUTS, AND GREEN = OUTCOME.

A similar study of over 300 evaluations of the METT in forested protected areas found similar results (see Table 7) (Stolton et al., 2007).

TABLE 7. TOP TEN HIGHEST AND LOWEST SCORED INDICATORS FROM METT ANALYSIS OF 331 FORESTED PROTECTED AREAS (STOLTON ET AL., 2007).

Ten highest scored questions (in descending order)	Ten lowest scored questions (in descending order)
Legal status	Education and awareness
Protected area demarcation	Current budget
Protected area design	Security of budget
Biodiversity condition assessment	Fees
Protected area objectives	Management plan
Resource inventory	Monitoring and evaluation
Regular work plan	Indigenous peoples
Protected area regulations	Local communities
Resource management	Visitor facilities
Economic benefits assessment	Commercial tourism

For 433 marine protected areas (MPA), legal gazetting (i.e., documentation) (79%) and appropriate regulations (69%) had been instituted by the majority of MPAs, whereas other factors such as acceptable budget (35%), clearly defined boundaries (29%) and adequate staff capacity (9%) were less consistently in place (Gill et al., 2017). For natural World Heritage Sites, many of which are protected areas, factors that contributed to site evaluations as "highly effective" also included context and planning elements (Osipova et al., 2014).

These and many other studies support the importance of effective management to the achievement of conservation outcomes. The studies also identify several of the specific factors (e.g., well-defined boundaries, legal frameworks and sustainable finance) that are elements of that management. This is extremely important as the numbers of terrestrial and marine environments conserved increase and definitions widen to encompass other forms of conservation areas—including Indigenous Protected and Conserved Areas, local government protected areas, private land trusts and others. As this happens, definitions of what is effective (e.g., social equity and concerns for Indigenous rights) must be extended to ensure that these other areas—possibly with different institutional structures—are able to achieve the conservation of biodiversity and other outcomes.

5 State of management effectiveness in Canada

The use of formal protected area management effectiveness evaluation in Canada has just begun. Early reporting on progress towards international obligations through the Canadian Protected Area Status Reports (see, for example, Government of Canada, 2015), and other documents initially showed that some of the jurisdictions had performed management effectiveness evaluations. For example, Saskatchewan reported evaluation of budget expenditures, revenues and visitor satisfaction, and British Columbia identified the use of processes such as conservation risk assessment and impact assessment as performance measures of management effectiveness. The current program elements reported by jurisdictions as measures of management effectiveness could be used as supporting information for a management effectiveness (ME) evaluation. However, they do not meet the *evaluative* (rather than descriptive) standard of PAME, and often omit aspects of the PAME cycle. Most of the current reported program elements also do not address the full idea of management effectiveness as captured in the IUCN Framework.

To date within Canada, formal PAME evaluations have only been conducted by Environment Canada (on National Wildlife Areas and Migratory Bird Sanctuaries) and in pilots currently being conducted with Alberta Parks and Ontario's Parks and Protected Areas. In addition to these more formal and comprehensive PAME processes there are many other limited examinations of effectiveness that have been typically completed as a part of research.

5.1 Approaches to PAME in Canada

5.1.1 Parks Canada/State of the Parks assessments

Parks Canada has the most comprehensive, system-wide outcomes monitoring program in place in Canada, built around its ecological integrity function. To ensure that parks are protecting and restoring functioning ecosystems, Parks Canada monitors ecological integrity (EI) in order to "gain better understanding of natural ecological processes, biodiversity, and the state of ecosystem health" (Office of the Auditor General of Canada, 2013). For Parks Canada, ecosystems have integrity when they have the "full complement of native species and the processes that ensure their survival" (Canada National Parks Act, 2000). That is, natural processes must be present and function normally in order to support native species populations. This includes abiotic processes such as fire and forest regeneration (Hawthorn, Kirik, & Eagles, 2002; Parks Canada, 2017a).

Parks Canada is mandated to assess biodiversity outcomes; the Canada National Parks Act (2000) requires the development of ecological indicators as part of management planning[8]. Ecological integrity

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[8] 11. (1) The Minister shall, within five years after a park is established, prepare a management plan for the park containing a long-term ecological vision for the park, a set of ecological integrity objectives and indicators and provisions for resource protection and restoration, zoning, visitor use, public awareness and performance evaluation, which shall be tabled in each House of Parliament.

(EI) indicators are used to gauge the biodiversity and biophysical processes of park ecosystems within the larger scale natural processes. For park administrators, the most important role of park condition monitoring is the collection of these potential EI issues along with relevant background information to prioritize those identified issues that can be most effectively influenced through park management activities. This information helps managers to address and prioritize potential ecosystem threats when making administrative, management and investment decisions.

Parks Canada does not currently complete formal PAME evaluations and instead reports on management effectiveness through the completion of the EI State of the Park reports. Other elements of management effectiveness are reported in the discussion of processes used (e.g., management planning processes). These reports are not evaluated. The relationship between management effectiveness and biodiversity outcomes is also not assessed.

5.1.2   Environment and Climate Change Canada (ECCC)

Management effectiveness was evaluated for 80% of the protected areas in the ECCC network in 2013–2014 using the standardized METT tool (Stolton et al., 2007) (see Figure 6). This evaluation included all 54 National Wildlife Areas and 64 of the 92 Migratory Bird Sanctuaries[9], dispersed across eight regions and subregions (Atlantic, Quebec, Ontario, Prairies, Nunavut and the Northwest Territories, Yukon, British Columbia, Canadian Forces Base Suffield National Wildlife Area), and employed one or two site manager respondents for each region or subregion. Additional details on the Environment and Climate Change Canada PAME process and outcomes are shown in a case study in Appendix A.
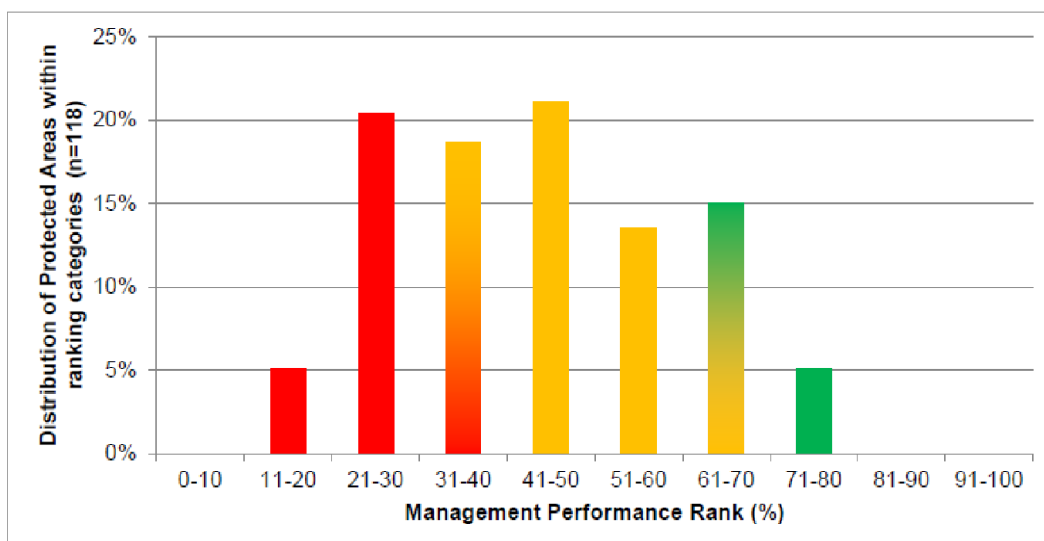

FIGURE 6. EXCERPT OF THE METT RESULTS FOR ENVIRONMENT AND CLIMATE CHANGE CANADA (2016). THE FIGURE PRESENTS THE FREQUENCY DISTRIBUTION (%) OF ALL EVALUATED PROTECTED AREAS WHERE:
RED = LESS THAN 33%, MANAGEMENT IS CLEARLY INADEQUATE
ORANGE = BETWEEN 34-67%, MANAGEMENT IS BASIC WITH SIGNIFICANT DEFICIENCIES

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[9] Quebec region was unable to provide survey results for its Sanctuaries.

5.1.3   Canadian Protected Area Management Effectiveness Pilot Project (Alberta/Ontario)

In 2017, Alberta Provincial Parks and the Ontario Ministry of Natural Resources and Forestry began a pilot project in conjunction with the University of Northern British Columbia (led by Dr. P. Wright) to develop and test a PAME system for Canada. In addition to tool adaptation and development, pilot projects were or are being conducted in five to six protected areas in each jurisdiction. This pilot project initiative uses a combination of tools that includes a conservation values and risk assessment, a parallel recreation values and risk assessment, a significantly enhanced version of the METT and elements of the Enhancing our Heritage process. The results of this pilot project are discussed in other places in this report and detailed in a case study in Appendix A.

5.1.4   Management plan implementation / Grasslands National Park

In 2007, Grasslands National Park asked an external review committee to review the 2002 Park Management Plan. In keeping with legal requirements for five-year reviews of plans, the Field Unit Superintendent requested a review that was beyond the usual scope and involved a review committee of experts in natural and cultural resource management, public education and public experience. This process involved:

- gathering of documented material by Parks Canada;
- presentations by Parks Canada and stakeholders;
- site visits by the review team and expert team to rate the degree of implementation of management plan actions (see Figure 7); and
- an assessment of the capability of the actions in meeting ecological, cultural or visitor experience objectives.

Although the evaluation was not structured using one of the formal PAME tools, it did address a full list of activities. These included inventory, research, monitoring, management actions, consultation and stakeholder involvement, ecological management for grazing, fire and bison, endangered species recovery and other issues related to biodiversity outcomes in addition to cultural and visitor experience elements.

Goal #	Subsection	Rating	# of Key Actions by Rating				
			N/A	1	2	3	N/R
2	Managing Grazing	yellow			4	1	
3A	Wildfire	green		1		3	1
3B	Prescribed Fire	red					
4A&B	Revegetation	yellow		1	1	1	
5A&B	Species at Risk	green			1	4	
6A&B	Wildlife Reintroduction	green			1	2	
7	Aquatic Resources	yellow		1	1	1	

FIGURE 7. EXCERPT OF THE NATURAL RESOURCES ASSESSMENT OF MANAGEMENT PLAN IMPLEMENTATION

5.1.5   University of Waterloo (P. Eagles)/Ontario Provincial Park System Pilot Study

In 2002, a University of Waterloo team published a report detailing a proposed method to evaluate management effectiveness of parks and park systems using a pilot study in 10 Ontario protected areas (Hawthorn, Kirik, & Eagles, 2002). Primarily oriented toward developing a method to examine management effectiveness, this study identified five main indicators of effectiveness:

1. Management plan (implementation and evaluation)
2. Ecological integrity (goals and evaluation)
3. Historical and cultural heritage integrity (goals and evaluation)
4. Visitor satisfaction and use data (collection and evaluation)
5. Financial self-sufficiency

As part of this study, some assessment of these five indicators above took place across some of the provincial agencies and in the 10 pilot project parks in Ontario. However, as the proposed approach was not fully put into action in detail, there has been no evaluation of management and data for most of the indicators. More specific details for the Ontario pilot projects can be found in an undergraduate thesis (Kirik, 2001). This proposed methodology was developed before the PAME framework and related methodologies were developed. It represents a preliminary approach to examining management effectiveness that has since been more fully developed by others (for example, Hockings et al., 2008, 2006; Leverington, Hockings, & Costa, 2008).

5.1.6   Landscape-level governance / Muskwa Kechika Management Area Case Study

One element of management effectiveness focuses on governance approaches. A project launched under an international partnership at Vancouver Island University focused on protected areas and poverty reduction in Africa. This project developed a landscape level approach to evaluating governance of ecosystem-based management initiatives, including protected areas. This tool was used for the Muskwa-Kechika Management Area (Law, 2013) in northern British Columbia—a vast area that contains 10 provincial protected areas (see Figure 8).

FIGURE 8. EXCERPT FROM LAW'S (2013) ASSESSMENT OF GOVERNANCE IN THE MUSKWA-KECHIKA MANAGEMENT AREA. SCORES ARE DEPICTED ON A SCALE FROM 1 TO 4 TO ASSESS THE 16 GOVERNANCE INDICATORS.

5.1.7 Management effectiveness in marine protected areas

A forthcoming project by N. Ban (University of Victoria) and R. Devillers (Memorial University) is researching management effectiveness in Canadian marine protected areas[10].

5.2 Canadian preparedness and readiness for PAME

As previously noted, most agencies that manage protected areas in Canada have not yet conducted protected area management effectiveness, except for limited participation in pilot or research projects. However, many of these agencies have several processes or procedures in place that would help to provide further information for these evaluations. Ideally, PAME tools build upon these processes and are not repetitive. A range of provincial and territorial jurisdictions across Canada with protected areas systems varying in geography, size and development was sampled to provide information for this

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[10] https://chone2.ca/find-research/development-indicators-assessing-marine-conservation-success-spatial-management-effectiveness/

examination. Their results demonstrate an example of the potential fit of PAME approaches within their existing capacities and approaches.

5.2.1 DFO marine protected areas

The Department of Fisheries and Oceans Canada (DFO) currently has 10 marine protected areas (MPAs) within its authority. The creation of additional MPAs is a priority for them given the Convention on Biological Diversity and Canadian targets. Although the DFO has not conducted management effectiveness evaluations, it does create management plans for all MPAs; these are typically reviewed every five years. For each MPA, the DFO also creates monitoring frameworks that focus on ecological indicators and governance. To date, 4 of the 10 MPAs have trend reports based on this monitoring information. Current initiatives are focused on developing a more consistent/organized approach to setting conservation objectives and monitoring indicators for the MPAs.

5.2.2 Yukon Parks

Yukon has not undertaken formal PAME evaluations for its territorial parks (Parks and Land Certainty Act) or Habitat Protection Areas (Wildlife Act). However, other evaluation tools have been employed (e.g., Canadian Evaluation Society approach used to evaluate the Park Officer program; performance indicators have been used in branch plans; visitor use is tracked in parks). Territorial parks have an inventory, management and research program; biodiversity outcomes oriented monitoring is variable, depending upon needs, capacity and budgets. Most parks and protected areas are established under Final Agreements which assure the involvement of First Nations in collaborative planning and management processes. Plans can be different from one another in response to the needs and interests of First Nation partners, but all are typically reviewed within five years. Threat assessments to inform planning are variable for the situation, with no common structured approach, although generally speaking there are fewer threats facing these protected areas than in the more populated regions of Canada. Parks and protected areas are reported upon in the State of the Environment Report, tabled annually in the legislature.

5.2.3 NWT Parks

As with Yukon, the territorial park system in the Northwest Territories is very new. The Government of Northwest Territories has recently begun to collaborate with Aboriginal governments on the creation of new territorial protected areas legislation. Although ecological, renewable, cultural and economic resource assessments have been completed for many areas and preliminary objectives are defined, work is just beginning on an approach to collaboratively draft management plans. Therefore, engagement has begun with the literature and approaches to management effectiveness evaluation—particularly those with a focus on governance and social equity—to help identify the benefits of thinking about management effectiveness from the beginning. Managing across the NWT conservation network to ensure protected areas are achieving their overall goal of conserving biodiversity is part of an objective outlined in a workplan released by the territorial government. The workplan[11] details

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[11] http://www.enr.gov.nt.ca/sites/enr/files/hlhp_cnp_priorities_2016-2021.pdf

priorities for moving ahead with conservation network planning in the territory. Additionally, NWT has initiated reporting on the state of their conservation network, which includes elements that could inform management effectiveness[12].

5.2.4   BC Parks

BC Parks does not undertake formal PAME evaluations although it has management and evaluation elements in place that help to provide information for PAME implementation (see Figure 9). In particular, BC Parks has instituted a park-level conservation risk assessment (CRA)[13] process that is continuously updated and involves a systematic and comprehensive identification of conservation attributes within each protected area, identifies design risks, and evaluates threats facing each park. In addition, BC Parks has strategically set up a long-term ecological monitoring (LTEM)[14] program at over 80 park sites. While still very new, the LTEM monitoring program is providing high-level biodiversity outcome data across the system. Impact assessments are required for activities that are proposed within BC Parks. This includes recreation, park use permits and infrastructure. The social, economic and environmental impacts are assessed and a recommendation is provided to a decision maker. Performance indicators associated with the Ecological Integrity objectives for BC Parks report on several measures that are useful to informing PAME including performance measures on: completion of annual management plans; updates to the CRA; input from the CRA to annual management planning; site-level implementation of the LTEM program; implementation and mitigations associated with impact assessments specifically those focusing on climate change adaptation; and management plans completed that consider climate change adaptation.

PERFORMANCE INDICATOR	2013/14	2014/15
% of BC Parks sections (11) that conducted annual management planning	100	100
% of BC Parks sections (11) that supported the annual management planning process with the use of the Conservation Risk Assessment database	89	73
% of BC Parks management areas (47) that updated information in the Conservation Risk Assessment database	51	40
Number of management areas (47) that added data to the Conservation Risk Assessment database	33	28

FIGURE 9. EXCERPT FROM THE 2014-2015 BC PARKS ANNUAL REPORT

5.2.5   Alberta Parks

Although Alberta Parks has well developed management tools, prior to 2017, it had not conducted management effectiveness (ME) evaluations for any of its protected areas. Even so, ME is recognized as a core aspect of protected areas planning and management. It was a critical motivation for initiating the pilot project mentioned previously. Additionally, one of the key deficiencies facing Alberta is a lack of basic ecological information for many of the 473 sites in the system. Representation values specifically

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[12] http://www.enr.gov.nt.ca/sites/enr/files/128-conreport_2016_press_no_marks.pdf

[13][1] http://www.env.gov.bc.ca/bcparks/conserve/conservation-policy2014.pdf?v=1493891155679

[14][2] http://www.env.gov.bc.ca/bcparks/partnerships/ltem/

are fully tracked for every site in the system. Site-specific evaluations for both values and threats are completed through the development of Regional Park Plan, and site-specific management plans. The evaluations only apply to a small number of sites in the system. These plans also outline specific management and research needs and the program's Science Strategy has identified critical research questions for every parks region in Alberta. However, biodiversity monitoring is sporadic and largely site or issue specific (e.g., grizzly bear tracking in Kananaskis Country protected areas). Notably, a regulatory requirement to evaluate the effectiveness of all conservation areas in meeting relevant conservation objectives was set out in two of Alberta's completed Regional Land Use Plans. However, no resulting programs or indicators for evaluating effectiveness have been developed for reporting to date.

5.2.6   Ontario Parks and Protected Areas

Ontario does not perform formal PAME evaluations for its provincial parks and conservation reserves, but does have some management and evaluation elements in place that contribute to implementation. These include a comprehensive management planning process, with 97% of 635 sites having some form of management direction in place; a systematic tool to prioritize management planning needs in provincial parks; and a method of evaluating the ongoing relevance of that management direction. A detailed visitor survey is also conducted every four years in provincial parks that provide visitor infrastructure and services. The Ontario Parks Operating Standards were recently updated, and operational audits are carried out in parks, generally every three to five years. Ontario also has a legislated mandate to report publicly on the state of the Provincial Park and Conservation Reserve System every 10 years.

5.2.7   New Brunswick Protected Natural Areas

In New Brunswick, 81% of the protected areas are designated under provincial legislation as Protected Natural Areas (PNAs). There are 208 crown and private PNAs covering close to 4% of the province. Formal management planning within this system is still in the early stages, with strategic plans (broad guidance) under development for 10 of the largest areas at this time. For these areas, the province has introduced the NatureServe threats assessment process (Faber-Langendoen et al., 2009) to identify internal and external threats facing these PNAs[15]. The goals and objectives within the strategic plans are directly tied to these threats and identify how the plans will address these issues, serving as a follow-through from threat identification to management planning.

5.2.8   Nova Scotia Parks

The Nova Scotia park and protected areas system consists of parklands that are primarily focused on recreation and tourism opportunities and wilderness areas and nature reserves that are focused on ecological values. The system has recently expanded, and now about 12% of the province has been designated as areas generally contributing to IUCN categories I–III (predominantly the wilderness areas and nature reserves). Although provincially there is only one completed management plan, to date

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[15][3] This threats tool is the same approach used in the Alberta and Ontario PAME pilot project process and represents one of the three main components to the Canadian PAME pilot project tools.

several different tools or processes are in place that contribute to a management planning framework. Recognizing the need to prioritize management planning efforts, Nova Scotia's Environment, Protected Areas and Ecosystem Branch has completed an ecological risk analysis. This analysis uses existing data to methodically examine threats from factors such as climate change, adjacent land uses and human access to rank every protected area. Next, sensitive elements such as species and ecosystems at risk, gathering areas for wildlife and old forest are ranked for each protected area based on the number of sensitive elements. Together, the ecological risk ratings and sensitive element ratings are combined to create a single ecological risk rating to help identify priorities for planning and management.

In addition to the ecological risk analysis, a recreation and tourism audit examines potential opportunities, and a three-dimensional database of the effects of human activities on the environment is in development. These elements are designed to work together to help in building a management planning framework and contribute to the subsequent development of management plans. The comprehensive examination of conservation values and ecological risk and the identification of recreation and tourism opportunities will enable the use of PAME evaluations.

5.2.9 Nature Conservancy of Canada

The Nature Conservancy owns > 1200 properties (212,707 hectares) across Canada. Conservation action on these properties is guided by Property Management Plans (PMPs) that are developed following baseline biological and anthropogenic features inventories undertaken upon acquisition. PMPs incorporate the summation of biodiversity viability and an analysis of threats, as well as the development of goals and a long term management vision. Plans include a suite of conservation actions designed to abate threats, improve biodiversity outcomes and achieve the property's goals and vision. Each PMP includes a monitoring table designed to inform development of subsequent plan iterations. Plans are regularly reviewed and improved (5 year cycle is typical). PMPs have been developed for 72% of NCCs fee simple owned properties to-date (the remainder are in progress).

NCCs approach to planning, monitoring and adaptive management has advanced considerably over the past 15 years, in particular with NCCs adoption of the Open Standards for the Practice of Conservation in 2015. The roll-out of changes across the organization is in-progress. Two types of monitoring inform NCCs broader adaptive management framework:

> **Open Standards for the Practice of Conservation**
>
> NCC is a member of the Conservation Measures Partnership (CMP) and recently adopted CMPs Open Standards for the Practice of Conservation. This conservation planning framework represents an evolution in NCCs adaptive management approach. The Open Standards "help teams be systematic about planning, implementing, and monitoring their conservation initiatives so they can learn what works, what does not work, and why – and ultimately adapt and improve their efforts' (Conservation Measures Partnership, 2017).

- **Status monitoring -** regular assessment of the status of key ecological attributes of biodiversity 'targets' and key threats

- **Effectiveness monitoring** - systematic measurements against established thresholds to determine whether the implementation of conservation strategies is achieving predicted outcomes (or stated objectives)

Recognizing that the achievement of biodiversity conservation goals often necessitates working beyond the scale of individual protected areas, NCC has developed landscape-scale conservation plans for 80 priority conservation areas across Canada. They encompass the majority of NCCs active programming areas. Monitoring at the landscape scale complements and builds upon Property-scale monitoring.

Caveats. NCC's effectiveness monitoring is a "work in progress" and NCC is open to adopting international effectiveness monitoring protocols, if this would result in better coordination amongst Privately Protected Areas networks. NCC's effectiveness monitoring approach is not reflective of the Privately Protected Areas community in Canada. Having a consistent effectiveness monitoring protocol for Privately Protected Areas is desirable but would need to be scalable to varying capacities (i.e. from all volunteer organisations to those with professional staff).

Additional details are provided in Appendix A case study 3.

5.3 State of factors for effective management for protected areas in Canada

The factors or elements of effective management identified previously in this paper are consistently identified in many studies and in guidance on protected areas management. A subgroup of these factors is presented in sub-national or national reports (e.g., Canadian Parks and Wilderness Society, 2015; Office of the Auditor General of British Columbia, 2010). The factors as reported to the National Status Report on Canadian Protected Areas are presented below according to the IUCN Common Framework for assessing management effectiveness of protected areas. The National Status report provides a self-reported summary of the state of use of a subset of effective management factors across Canada. Although the report focuses on implementation—an important first step in understanding the state of factors that contribute to management—it does not include a standardized or complete assessment of the quality or report on how effective those management elements are. Where available, comments from external sources such as Auditors General reports or non-governmental organizations are included to provide a small piece of information relating to evaluation.

To better enable comparison, the factors below are organized by the wide headline (high-level) indicators from the PAME framework.

5.3.1 Context

Legislation and policy
Every jurisdiction in Canada has legislative tools that enable the creation of protected areas. Federal, provincial and territorial jurisdictions now have 55 separate Acts that enable the designation of 77 types of terrestrial and marine protected areas. These are diverse and include national and provincial parks, wildlife areas, conservation areas, private nature reserves, Indigenous protected areas, bird sanctuaries and marine parks. *The report does not assess whether legislation and policy is seen to be effective in various jurisdictions and contexts*.

Site and system objectives
Most jurisdictions in Canada identify the conservation of biodiversity as either the primary or secondary objective for both terrestrial (87%) and marine (78%) protected areas. Representative areas, habitat connectivity, large and un-fragmented (i.e., continuous) areas, and ecological integrity were also important protection objectives among the jurisdictions surveyed. However, only three jurisdictions in Canada reported mostly or fully identified objectives, indicators or targets for biodiversity.

5.3.2 Planning

Management planning
While nearly all jurisdictions have reported having some management plans in place, the overall number of protected areas in Canada with up-to-date management plans (i.e., less than 10 years old) remains low (16%). *The assessments do not address whether management plans are seen as sufficiently addressing site values and objectives.*

Community consultation and Indigenous involvement
For terrestrial areas, most jurisdictions (87%) are either required by law or have policies in place for consulting with communities located near or adjacent to terrestrial protected areas; 73% have management plans that include specific consultation requirements with communities for certain protected areas. (For marine areas, 78% have legal requirements or policies, and 56% include community consulting in management plans.) However, most jurisdictions either occasionally or infrequently held such consultations. Only Nunavut and the Northwest Territories reported consulting on day-to-day management decisions with local communities.

Whether through consultations or collaborative agreements, all surveyed jurisdictions responsible for protected areas have procedures for involving Indigenous peoples in the designation and management of both marine and terrestrial protected areas. In the Northwest Territories, British Columbia, Ontario and Manitoba, new protected areas were identified jointly by Indigenous peoples and governments through community-based land use planning.

5.3.3 Inputs

Funding and resources for protected areas

The amount of funding and staff available to designate and manage protected areas varies widely by jurisdiction. Significantly, 12 out of 15 jurisdictions responsible for terrestrial protected areas and 4 out of 9 for marine protected areas identify not having enough staff or other resources to manage their sites and to conduct monitoring.

Approximately half of surveyed jurisdictions (40% terrestrial area; 56% marine area) report that an assessment of the resources required to fulfil their protected areas program had been carried out—although it is unclear which aspect of management was the focus of the assessment results. Saskatchewan and Alberta reported conducting assessments of capital, infrastructure and operations. Environment and Climate Change Canada reported that its current needs assessment estimates that the Protected Areas Program would require significantly more funding to operate effectively—related to management plans, fixed and operational costs as well as the set-up of a performance measurement framework.

Resource assessments may not distinguish where staff time and resources are being directed. Categorization of funding and resource assessments by management purpose (i.e., recreation or conservation) rather than expenditure type would be important in the context of evaluating management effectiveness for achieving biodiversity outcomes.

Information needs

Adequate information for evaluations is a significant limitation to management effectiveness in Canada. Most surveyed jurisdictions in Canada (64% to 82%) reported that they had a limited level of information on the occurrence of invasive species, ecological processes and ecological isolation or connectedness of their protected areas. The availability of scientific information on ecological integrity also appears to be sparse—almost three-quarters of surveyed jurisdictions noted that scientific information on ecological integrity is only partially available (60%) or the status of this information is unknown (13%). In 2013, the Auditor General of Ontario reported that "The Ministry's [Ministry of Natural Resources and Forestry's] 2011 survey of park planners, ecologists, biologists and park superintendents indicated that the Ministry lacked baseline scientific data on the provincial park system. The survey results revealed gaps in information with respect to native biological and non-biological components and processes that exist in individual parks and the pressures that affect them" (Auditor General, Ontario, 2013, p. 208).

5.3.4 Process

Management plan implementation

The use of management planning is improving among Canadian jurisdictions for terrestrial areas; 67% report that they monitor the implementation of management plans, and 93% report that they are in the process of implementing management actions, at least partially (only 27% report extensive or

"substantial" implementation). These numbers are 44%, 67% and 44% respectively for marine area jurisdictions.

5.3.5 Outputs and outcomes

Monitoring and managing for biodiversity

The amount of biodiversity monitoring done varies greatly between jurisdictional organizations—from a relatively strong monitoring program at Parks Canada to occasional ecological integrity monitoring in three provinces (British Columbia, Manitoba, and Newfoundland and Labrador). The proportion of protected areas in Canada covered by monitoring protocols varied from less than 1% in Manitoba to 97% in Prince Edward Island. Regardless, no organization in Canada reported having a full monitoring program in place; 12 out of 15 jurisdictions responsible for terrestrial protected areas and 4 out of 9 for marine protected areas reported not having enough staff or other resources to manage their sites and to conduct monitoring.

Along with Quebec, Saskatchewan and Yukon, Ontario has ongoing monitoring at some of its protected areas. In 2013, however, the Auditor General of Ontario reported that the province's ability to conduct rigorous and regular monitoring is likely weakened:

- "Each park zone has only one full-time ecologist on staff. The ecologist, aided by a seasonal assistant ecologist and a few park biologists, is responsible for conducting research and monitoring activities in all the parks within the zone. Therefore, this one ecologist may be responsible for 20 to 50 provincial parks. As a comparison, Parks Canada informed us that each park in the federal system is assigned a science team composed of at least one park ecologist supported by a team of technicians; the size of the team depends on the size of the park and its ecological issues" (Auditor General, Ontario, 2013, p. 209).

Similarly, in 2010, the BC Auditor General reported that "Program plans are incomplete and lack adequate performance measures; conservation policies are not consistently upheld; the parks and protected areas system has not been designed to ensure ecological integrity; management plans are dated and incomplete; little action has been taken to ensure the conservation of ecological integrity" (Auditor General, B.C., p. 6).

5.3.6 Challenges and barriers

All jurisdictional organizations with responsibility for terrestrial protected areas identified the existence of management challenges or barriers. A lack of staff and resources for monitoring is identified as the most significant barrier, followed by the lack of objectives within management plans to guide decisions. Additional challenges include difficulty meeting mutual interests with Indigenous governments and a lack of priority and commitment by government authorities for managing protected areas, including the absence of long-term funding.

6 Connecting best practices with PAME challenges and the Canadian experience

The theory behind management effectiveness and the global experience to date has identified significant value in conducting PAME evaluations. Although in very early stages, the work to evaluate or implement monitoring with the purpose to achieve management effectiveness in Canada has already begun. The experience of three Canadian jurisdictional organizations is outlined in detailed case studies in Appendix A. Although the Canadian experience with PAME is limited, there are over 20 years worth of literature identifying best practices and principles for PAME. These best practices and principles are mentioned throughout this paper and also summarized in Appendix B. However, the recognized challenges and critiques of PAME are also worth addressing in order to resolve them. The main goal of this section is to tie best practices (referred to in Appendix B of this paper) together with the known challenges and the Canadian experience to contribute to future implementation of PAME in jurisdictions and organizations across Canada.

6.1 Challenges with PAME

Challenges with PAME that are most likely to apply the Canadian context are discussed briefly below, along with related best practices that could be used to enhance or adjust the process.

6.1.1 Measures of outcomes compared with PAME

Measuring outcomes (e.g., biodiversity outcomes) through state of park reporting (for example Parks Canada) or effectiveness monitoring (for example NCC) are critical and important endeavours. Within these programs a small suite of indicators are repeatedly measured over the long term to detect changes.

Establishing rigorous and comprehensive outcome-based monitoring programs with repeated measures of select indicators is critical to effective management. It can also be costly and time consuming requiring long-term commitment and attendant resources to achieve results. The programs that are in place are relatively recent, and most are subject to fluctuations in focus, funding and purpose. Consequently, most protected areas organizations have not implemented comprehensive outcomes monitoring programs.

Protected area management effectiveness evaluation focuses on assessing all aspects of management and site values for the entirety of the protected area and not just of a specific policy or plan (or aspect of management?). Ideally, evaluations are informed by monitoring (along with other data sources) and are forward looking in scope, but may also be informed by subject matter expertise where data or monitoring is lacking. Management evaluation is not an alternative to outcome monitoring but rather both are important management tools.

What is needed is a comprehensive outcomes monitoring program and management effectiveness evaluation along with research to examine the relationship between the management activities and approaches and the effectiveness in terms of actual outcomes.

Best practices to overcome the limitations:

- Conduct PAME on the entirety of protected area values
- Improve data quality;
- Repeat the evaluation periodically;
- Develop and monitor outcome (performance) indicators;
- Prioritize monitoring;
- Monitor biodiversity outcomes whenever possible; and
- Conduct research into the relationship between management effectiveness and biodiversity outcomes.

6.1.2   Ecological performance is not always linked to management

Although there is evidence of the value of conducting PAME, some research studies that have found that "positive ecological performance can be unrelated to management indicator scores, and as such are only a proxy measurement for positive ecological performance" (Coetzee, 2017, p. 232; see also Carranza, Manica, Kapos, & Balmford, 2014). Finding evidence to support PAME is complicated because of the lag between management action and biological response.

Best practices to overcome the limitations:

- Improve data quality;
- Use or refer back to quantitative data;
- Verify results;
- Diagnose and implement the recommendations;
- Develop and monitor performance indicators; and
- Prioritize monitoring.

6.1.3   Evaluating management to what end?

Protected areas are designed to undertake multiple objectives, from conserving biodiversity to providing recreation opportunities. Many PAME tools place limited emphasis on the systematic and consistent identification of the broad range of values for which the area is managed. Similarly, most PAME tools have a limited capacity for examining protected area design risks and threats facing the values. Design risks are factors related to the size, shape, connectivity, adjacent land use, etc. of the protected area that can influence the land manager's ability to effectively conserve biodiversity within the site.

Best practices to overcome the limitations:

- Match the tool to the purpose;
- Conduct a detailed assessment of the values and threats facing the protected area;
- Make the values and risks/threats assessment the centerpiece of the management effectiveness evaluation;

- Review and adapt the tools;
- Assess and address minimum information requirements and availability; and
- Improve data quality.

6.1.4 Types of evidence to provide input to evaluations

There is limited data on the results of management. Often, research data to support other elements evaluated in PAME is also incomplete. In place of this data, professional assessments (by individuals or teams) from qualitative descriptions to score cards are also used in evaluation. These are excellent sources of information but can be influenced by the views and motivations of the participant(s). For example, evaluations completed by an individual or limited number of individuals are less extensive than those conducted by a wider team of participants; participants may have defensive (afraid of looking bad) or counter-defensive motivations (wanting to justify the need for additional resources) in their assessments. Evaluations conducted with a wide group of protected area staff and stakeholders and by supplementing professional assessments with data, where available, can help counter these critiques. Engaging Indigenous groups can help to integrate traditional knowledge.

Best practices to overcome the limitations:

- Keep it cost effective;
- Assess and address minimum information requirements and availability;
- Include a wide range of perspectives in any qualitative assessments;
- Improve data quality;
- Use or refer back to quantitative data; and
- Consult and reach consensus.

6.1.5 All indicators of management effectiveness are not created equally

The International Union for Conservation of Nature Framework for management effectiveness and accompanying tools and methods contain a wide list of indicators of management to be examined. Approaches with a more quantitative approach to score management performance typically assign equal weight to all indicators. In reality, however, the indicators are typically not of equal importance, so simple scoring methods can misrepresent the results. However, with simple numeric summary tools, specific weighting needs to be developed (e.g., tailored to each agency or to an individual protected area). This approach may introduce additional bias into the process.

Best practices to overcome the limitations:

- Match the tool with the purpose;
- Report on all six elements of the IUCN framework;
- Verify results; and
- Prepare summary scores with caution—always include contextual information.

6.2 Connecting best practices with the Canadian experience

Lessons learned from both PAME application in Canadian Wildlife Service's sites and the Canadian PAME pilot project in Alberta (see Appendix A)—in combination with Parks Canada's long-term program for monitoring ecological integrity—have direct benefits and lessons that can be applied more widely throughout Canada.

Lesson 1: Planning — scoping, tool adaptation and building awareness are foundational

Best practices:

- Start evaluating;
- Match the tool with the purpose;
- Review and adapt the tools;
- Assess and address minimum information requirements and availability;
- Improve data quality;
- Build capacity and guidance; and
- Consult and get consensus.

Conducting an improperly designed PAME process can be worse than doing no PAME at all. Virtually all best practices related to planning for an assessment were listed in both the positive and negative outcomes of the Canadian Experience. Much of the interim success of the Canadian PAME pilot project in Alberta was later attributed to the intensive scoping exercise, a solid awareness of the project's potential benefits and a collective effort to adapt the tools. The scoping exercise led to setting and clearly understanding the primary objectives that were most valuable and possible for the organization. These primary objectives set up the pilot project for success: enabling early, focused and positive communication with essential partners throughout the process on the benefits of the process and potential efficiencies that could be gained. These partners included executive, directors, park staff and subject matter experts. Both scoping and communication aided in the selection of tools to achieve the primary objectives. The working group also adapted the tools throughout the assessment and implementation phase. The iterative adaptation allowed the working group to gather comments from the participants and generate further buy-in for the process and its implementation along with support for adding these tools to existing processes.

Several of the identified shortcomings of the Environment and Climate Change Canada (ECCC) PAME assessments related to best practices in the planning phase.

Concerns included:

- lack of clarity on the objective of the exercise
- lack of consistency
- scoring bias
- confusion with the tool, and

- lack of buy-in for the process.

In particular, involving and providing staff with adequate context on the purpose and training to complete assessments is shown to have a significant effect on the overall buy-in for the process itself, its potential benefits, as well as the practical application and implementation of the outcomes.

Involving staff in the planning phase, particularly in the scoping and testing and adapting of questions, as well as expanding participation in the assessment process proved to be highly successful in the Alberta pilot, reducing confusion and bias and increased consistency in how questions were interpreted and answered.

Additionally, the Canadian experience echoed the need for the process to provide increased benefits to all participants. Where the benefits and outcomes of the process are not communicated clearly, the process may just be seen as a repetition of what staff and managers already know from the ECCC assessment outcomes. Building on the interest of the organization and creating awareness with managers and field staff from the start was identified as a way of overcoming that concern (also expressed in the Alberta pilot). Alberta Parks and the participants saw this pilot project as an opportunity to incorporate better adaptive management tools into existing processes.

Lesson 2: Understanding values, risks and threats is essential

<u>Best practices:</u>

- Keep it cost effective;
- Assess and address minimum information requirements and availability;
- Improve data quality;
- Allow enough time;
- Complete all elements and questions in the evaluation; and
- Provide context for the assessment.

Especially where data and monitoring may be lacking, having a complete and consistently measured assessment of site values, risks and threats may be the most useful and critical contribution to the PAME process. The resulting threats assessment tools that were developed as part of the Canadian pilot project in Alberta provided a comprehensive picture of the site to add to the PAME evaluations. However, these assessment tools have also been vital in clarifying the range of information and research gaps, understanding the connections between biodiversity and recreation values and threats in particular and expanding and sharing knowledge of the site and system. Where data was incomplete or lacking for a site, substantial expert-driven assessment by staff with experience in the site or information provided was needed by experts outside the parks system to carry out the necessary assessments. This added to the time required for the assessment process. However, recognizing that PAME questions require subjective judgements and can carry respondent bias, having the questions provided by a consistently objective, formalized and systematic approach to identifying values and

threats for all sites provided an opportunity to check those biases. In this way, a much more complete understanding of site values and management implications was gained. Overall, pilot project participants reported that these "informing pieces" were essential to the process. Additionally, this process of identifying values, risks and threats provided a means of assessing biodiversity outcomes to a greater extent than previously. Although a more far-reaching biodiversity outcome monitoring program is still needed, this interim method of assessment is significantly richer than most PAME processes.

Lesson 3: Deciding who and how many to involve

Best practices:

> - Improve data quality;
> - Build capacity and guidance;
> - Allow enough time; and
> - Consult widely and get consensus.

The lack of basic data for protected areas in many areas of Canada will continue to necessitate PAMEs receiving the contribution of expert-driven analysis. In these kinds of assessments, involving more individuals can help to offset respondent bias and to round out assessments—as was an identified concern in the Environment and Climate Change Canada PAME experience. Additionally, where a single agency may not have sole authority, more participants in the process would be necessary to adequately strengthen an assessment.

Despite the additional time required, the involvement of more people in an assessment process is highly valuable. In the Canadian PAME pilot project in Alberta, the involvement of multiple staff, site experts and technical or subject matter experts provided many different benefits beyond reducing bias and increasing consistency. These included elements of building capacity and knowledge networks, recognizing and finding efficiencies, increasing morale and even providing a level of successional planning related to sharing of site information. One of the most valuable outcomes from one of the Alberta pilots was that it provided a rare opportunity to understand the site from multiple professional perspectives, and ultimately

> Benefits of involving more people in an assessment process:
>
> - build capacity and knowledge networks;
> - recognize and find efficiencies;
> - increase morale;
> - provide a level of successional planning;
> - provide opportunity to understand the site from various professional perspectives;
> - increase understanding of the site; and
> - understand possible ways to manage it more effectively.

changed their understanding of the site and how it might be managed more effectively.

Lesson 4: The details matter — provide context for future assessments

Best practices:

> - Include detailed notes explaining scoring or evaluation and identify next steps;
> - Use or refer back to quantitative data;
> - Verify results;
> - Diagnose and implement the recommendations; and
> - Repeat the assessment.

Although it is not explained in the assessment tools used in any of the Canadian PAME experiences, all the parties involved recognized the importance of the narrative and comment fields. Expert-driven or subjective assessments benefit from the ability to explain the values, threats or scores that were assigned—for providing verification, information to management action or management evaluation, or for providing context for repeat assessments. In addition, identifying the rationale for scoring helped to quickly identify next steps to improve scores.

Lesson 5: Biodiversity outcome monitoring is critical, but not sufficient

Best practices:

> - Make it transparent;
> - Integrate and institutionalize;
> - Develop and monitor performance indicators; and
> - Prioritize monitoring.

Although Parks Canada has not completed PAME assessments to date, their ecological integrity monitoring program is a good example of far-reaching biodiversity outcomes that are fleshed out by direct monitoring. Monitoring of ecological integrity is prioritized, as required by legislation as a part of the management planning cycle. Certainly, PAME assessments or additional management effectiveness measures could improve park management and improve the current monitoring program. For example, an evaluation of the relationship among expenditures for monitoring, active management, and conservation/restoration outcomes would illustrate whether management actions were effective and efficient. Although the monitoring program is part of the management planning cycle, cost cutting in 2012 reduced the breadth and depth of the "State of" assessments, substantially reducing opportunity to evaluate, learn and communicate about the condition of ecological integrity in national parks. In addition, biodiversity monitoring programs are necessarily insufficient at capturing the breadth of complexity of ecosystems (McDonald-Madden et al., 2010). As a result, additional assessments of management may capture issues missed by relying on only a limited series of biodiversity measures. Finally, human dimensions such as partnerships, visitation, ecosystem services and economic benefits may be critical to the management effectiveness of protected areas and are generally absent from biodiversity monitoring programs.

7 A pathway toward effective management in Canada

"One of the great mistakes is to judge policies and programs by their intentions rather than their results" Milton Friedman

The premise of this paper, and in particular the principles, considerations and options outlined in this section are based on the idea that the *sharing of experiences and lessons learned just makes good sense*. Canada is relatively new to the management effectiveness field, but can gain much from starting with the lessons learned from global efforts to develop useful and practical methods of monitoring and evaluation that are summarized throughout the literature (Hockings, Stolton, & Dudley, 2006; Leverington et al., 2010). The extensive global work and the evaluation experiences from preliminary efforts of Canadian jurisdictional organizations should guide Canada's efforts on achieving effective management of its networks of protected areas, other effective area-based conservation measures (OECMs) and Indigenous and Protected Conserved Areas (IPCAs).

This section outlines issues, principles and options for consideration for the development of Pathway to Canada Target 1 Guidance. Collectively, the considerations and principles are a collection of the lessons learned from the literature as applied to the Canadian experience that, together with the options, provide a clear path to achieving the effective management of all Canada Target 1 areas.

7.1 Principles for consideration

The following 11 principles listed here identify the key elements to achieve an effective network of protected areas and OECMs in Canada.

1. **No paper parks: moving networks in Canada beyond protection to persistence**
   Designation of protected areas is one of the most important tools for conservation of biodiversity. Protected areas are not, however, immune to biodiversity loss, or to pressures related to human use and external threats.

   Designation of new areas will not be enough to stem the loss of biodiversity in Canada. New and existing areas must be *managed effectively* to advance biodiversity conservation.

2. **Evaluation is fundamental**
   Continued loss of biodiversity within protected areas around the world indicates that authorities may not be managing these areas effectively. It also acknowledges that parks are not islands and that they cannot be managed in isolation from their surrounding area.

> **PAME principles**
> 1. No paper parks: – moving networks in Canada beyond protection to persistence
> 2. Evaluation is fundamental
> 3. A common approach
> 4. Tools: One size does not fit all
> 5. Respect Indigenous rights holders
> 6. Set the stage: – understand the values and threats
> 7. Outcomes tell it best
> 8. Make it more than a checkmark exercise
> 9. Form a partnership with the local community
> 10. Transparency is important
> 11. Improvement takes time and resources

Evaluation is fundamental to understanding how well an area is achieving the conservation of its biodiversity. Repeated evaluation is the cornerstone of an adaptive management approach; it helps to identify strengths and weaknesses of management and guide the investment of effort and resources.

3. **A common approach**
Evaluating Canada's *network* of protected areas and OECMs requires some degree of consistency across jurisdictions and governance (i.e., administrative) models.

The IUCN-WCPA *Evaluating Effectiveness* (Hockings et al., 2006) report outlines a framework for evaluating and reporting on each stage of the management cycle, and provides a common, science-based approach. This framework is being used worldwide for the development of a range of evaluation tools. It is the common framework for international reporting—including the Convention on Biological Diversity. The framework is based on six core elements of protected areas management—context (i.e., values and threats), planning, inputs, processes, outputs and outcomes—and 45 key or "headline" indicators that research has shown to be predictors of biological outcomes.

4. **Tools: One size does not fit all**
Protected Areas and OECMs across Canada vary widely in ownership and governance (administrative) structures, leading to variation in the understanding of the values and threats of a site, the level of existing program guidance, and the capacity of the jurisdiction to effectively manage it. Within the common approach, any tools (or toolbox) used to evaluate management effectiveness must therefore be adaptable to accommodate these differences. Guidelines for tools are discussed in the "Set the stage" section below; experience is discussed in the "Which tools work best for Canada?" section. Many jurisdictions may find the "Adaptation in Canadian PAME pilots in Alberta and Ontario" section useful.

5. **Indigenous peoples and protected and conserved areas:**
Landscapes are inherently cultural and thus evaluations of protected areas must acknowledge and respect different world views and value systems even where they may or may not align. This is in respect to not only indigenous rights, but also understanding and evaluating protected areas recognizing different world views, traditionally held wisdom…and ultimately different ways of knowing and valuing the land. This requires an environment in which collaboration and a two-way dialogue is fostered, centering on shared values and outcomes. Evaluating management effectiveness must be done in the context of the 2008 United Nations Declaration of the Rights of Indigenous Peoples and the 2000 World Commission on Protected Areas document - *Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies.*

Internationally, PAME has been developed and used by and for Indigenous protected areas. For Indigenous Protected and Conserved Areas in Canada, it is most appropriate to seek advice from the Indigenous Circle of Experts on the implementation of management effectiveness evaluations and potential tools. If appropriate, adaptation of existing tools, or development of new ones, may be needed for Indigenous communities to evaluate if these areas are effectively protecting terrestrial

and aquatic domains, as well as the people and cultures they contain, in the manner to which they were intended.

6. **Set the stage: understand the values and threats**
    Understanding the values, risks and threats of a protected area is perhaps the most critical aspect of the evaluative process. Most existing PAME tools place little focus on this context, resulting in effectiveness being evaluated against an unclear understanding of the objectives of the site's management.

    Comprehensive and systematic identification of the site's values, risks and threats is critical and must be the central focus of the evaluation of management effectiveness in Canada. (For example, when evaluating the budget, the context must be a decision of the adequacy of the budget to address the core values and threats associated with the site. Similarly, evaluating the appropriateness of the management plan objectives must consider whether they deal with the core values and threats.)

7. **Outcomes tell it best**
    The headline indicators of management effectiveness of the IUCN PAME framework are *predictors* of biological outcomes. This approach does not remove the need for direct monitoring of biological outcomes.

    The benefit of the PAME framework is that it enables an evaluation of *all* elements of the management cycle—context, planning, inputs, processes, outputs and outcomes. The management effectiveness indicators are helpful for prioritizing management effort and resources, and can contribute to designing an efficient monitoring program that uses both quantitative and qualitative data. Direct monitoring of the biological indicators provides confidence in the overall evaluation of the effectiveness of the area to advance the conservation of biodiversity. Both work together in a complementary fashion.

8. **Make it more than a ✅ exercise**
    Experience suggests that the real value of management effectiveness evaluations comes from a wide-ranging evaluative *process*. Assessment and critical comment on management performance from those who can best provide this for each objective or area of management responsibility is highly useful. The most important element of the evaluation is the dialogue and comments that explain or justify why and how the item is scored and the potential steps that can be taken for improvement. Just completing a simple score-card approach by itself does not properly benefit on-site protected area managers and practitioners, especially when not used often or widely.

    Management effectiveness evaluation tools can also help to build program capacity in areas where it may be lacking, including design and planning; community, stakeholder and Indigenous engagement; and in the design of monitoring systems.

9. **Partnerships improve evaluations: No protected area is an island**

    Useful knowledge of a protected area is often held widely. Involving Indigenous rights holders, local community, external partners, and stakeholders in PAME evaluations provides additional perspective and increased clarity. The gathering of this knowledge can check biases or improve equitability and help to build a sense of collective responsibility for the effective management of the protected area.

    Global recommendations have highlighted the need to place greater effort into communication, involvement of Indigenous rights holders and the local community, and in programs that are of benefit to these partners, as these factors show very strong links to effective management and outcomes.

    In addition, protected areas cannot be managed in isolation from the surrounding land matrix. Involving managers, users, and Indigenous rights holders of adjacent lands can encourage a collective approach to reduce stressors and threats.

10. **Transparency is important**

    Clear and transparent reporting of evaluation results is needed for public support and accountability related to the challenges associated with effective management of protected areas and OECMs—at both a system and local level. The benefits associated with a national commitment to clear, measurable targets, common indicators and transparent reporting outweigh risks associated with the potential for organizational criticism.

11. **Improvement takes time and resources**

    Achieving a common approach to effective management across Canada's network of protected areas and OECMs will take time and new resources. A long-term commitment to protected area improvement is essential to the achievement of this goal.

7.2   Key considerations: The path forward

7.2.1   Which tools work best for Canada?

The diversity of protected areas in Canada calls for customization of potential evaluation methods and processes to achieve the desired results. Most of the core tools for PAME are generic, having been developed to work across multiple jurisdictions (e.g., METT) but lack specifics for a given context. Other tools, in contrast, have been developed for a very specific context (e.g., The New South Wales State of Our Parks) and would need adaptation to a Canadian environment. The IUCN supports this "plurality and encourages users to develop systems that fit individual needs" (Hockings & IUCN World Commission on Protected Areas, 2006, p. 4). This plurality, however, benefits from the globally accepted common framework (the IUCN-WCPA framework) as the basis for tool selection and allows for some consistency in implementation and reporting. This current paper provides a summary of some of the most suitable existing tools that are based on the IUCN-WCPA framework and can be applied in the Canadian context. Nonetheless, within Canada and other jurisdictions, the suitability of the range of tools is likely to vary.

International lessons learned suggest that no single tool should be identified as the Canadian standard, recognizing that one size is unlikely to fit all. This is particularly important as we consider the potential to apply PAME to other types of areas, including OECMs, IPCAs, municipal parks, privately conserved areas and others. However, regardless of differing institutional structures or objectives, all Canada Target 1 areas must be effective in achieving the conservation of biodiversity and other identified values.

Using the common IUCN-WCPA framework as their guide, jurisdictional organizations should be encouraged to choose a methodology based on the purpose best suited to their needs and context. Managers may pick one tool, a hybrid of multiple tools, or they may adopt more than one tool to be used as applicable to the complexity, capacity or needs of the site in question. As tools are developed or adopted across Canada, it should be recognized that some adaptation will likely always be required to maximize the benefit of a given assessment.

Recommendations for consideration:

> **Flexibility is best:** As no single tool should be identified as the Canadian standard, tool choice in Canada should be flexible to ensure that managers are empowered to select or adapt approaches and tools to meet the needs and maximize the benefits to their systems across Canada.

> **Adopt the common framework:** With flexibility for tool selection maintained, some level of consistency is required for reporting. Applying the common framework (IUCN-WCPA framework) to guide tool selection will ensure that tools are wide-ranging and will enable dependable reporting on progress and outcomes.

7.2.2 A common standard for tool selection
The tools used in Canada should strive to achieve a common standard of procedure and measurement. The elements included in Box 1, were considered to be the minimum required elements for tool selection and adaptation in the 2017 Canadian pilots (see Appendix A). These elements could be considered or implemented by jurisdictional organizations elsewhere in Canada with minimal adaptation where necessary.

Protected areas are designed to address multiple objectives, from biodiversity conservation to providing recreation opportunities. However, many PAME tools place limited emphasis on the methodical and consistent identification of the wide range of values for which the area is managed. Similarly, the scope of most PAME tools is narrow in its assessment of design risks and threats facing these values. These limitations result in the evaluation of management without taking into account what the protected areas is being managed for and what pressures it faces. PAME tools should include thorough values identification and risk assessment and explicitly link the evaluation of management actions to values at risk.

As individual jurisdictions in Canada move forward in this endeavour, they may choose to adapt or customize their own processes, adopt or modify an existing tool or develop a new one. In all instances, they will benefit from the comprehensive international guidance and two decades of literature (see Appendix B for a summary of best practices). In particular, Hockings et al., 2006, Leverington et al., 2010 and Stolton and Dudley, 2016 provide excellent guidelines, summaries and best practices for planning, implementing and following through on management effectiveness evaluations. Additionally, the World Database on Protected Areas (WDPA) has a database and technical webpage dedicated to information and resources related to PAME. This database includes information on how to report results of PAME evaluations, information on and links to the various methodologies, as well as resources and guidelines. (https://www.protectedplanet.net/c/protected-areas-management-effectiveness-pame).

Recommendations for consideration

> **Application of minimum guidelines for tool selection:** Adhering to a common Canadian guideline for tool selection will help to provide consistency in approach and tools selection, enable shared learning, and guide jurisdictions to maximize the value of PAME in Canada. A common guideline will also better enable consistency in reporting and in the understanding of assessment results.

7.2.3 Applying PAME tools beyond protected areas

To date, PAME has been applied worldwide in a broad range of protected areas, from government protected areas to private and Indigenous protected areas. However, most of the tools have evolved to assess protected areas as defined by IUCN. To extend the application of PAME assessments to other effective area-based conservation measures (OECMs) and IPCAs (that may have varied or differing objectives and institutional structures) will require adaptation.

It is too early to identify the type of tools or approaches that would be most appropriate for OECMs. A score-card assessment tool (e.g., METT) may work across area types, although some questions will be less applicable, and the indicators used in the assessment may differ from those used for protected areas. Current draft direction from IUCN and Canadian Council on Ecological Areas (CCEA) suggests that OECMs do not require overriding site objectives related to the *in-situ* conservation of biodiversity. As effectiveness is inherent in the definition of OECMs, PAME evaluative tools could provide an important element of assurance that biodiversity outcomes are likely to be achieved and continue regardless of site objectives. The draft IUCN guidance on OECMs identifies that measuring PAME will, in many cases, be the most practical way to measure the effectiveness of OECMs—especially where the tools are supported by additional information on biodiversity outcomes (IUCN Task Force on OECMs, 2017).

PAME has been applied globally in Indigenous protected areas. For IPCAs in Canada, it is most appropriate to seek advice from the Indigenous Circle of Experts on the implementation of management effectiveness evaluations and potential tools. This advice could be presented in their reflection piece as part of the Pathway process.

Regardless of the tool chosen and the focus of management (e.g., achieving conservation outcomes, ensuring an equitable distribution of benefits to rights-holders and stakeholders, providing nature-based recreation and educational opportunities for visitors, or all of these), the evaluative process is critical. The process of evaluating and demonstrating effectiveness is applicable to management in national or subnational protected areas, private conservation trusts and lands, or lands defined as OECMs or IPCAs.

Recommendations for consideration

> **Adaptability:** Management effectiveness is equally applicable to all measures under Canada Target 1 and PAME may provide a realistic means of measuring effectiveness and providing evidence of biodiversity outcomes. Tool and process adaptation will be particularly important for use beyond protected areas. The choice of tools must be flexible, and managers of OECMs and IPCAs should be allowed to select or adapt tools that fit with existing management and meet the needs of their areas or systems across Canada.

7.2.4 Targets and indicators for monitoring progress of PAME implementation

In the event that the direct measurement of biodiversity outcomes does not take place, management effectiveness evaluations may be the only measurement of effectiveness of Canada's network of protected areas and OECMs. Setting targets and monitoring implementation of PAME across Canada is a

first step in bringing about and supporting PAME implementation. All protected areas in Canada are important and the focus cannot be easily divided into a north vs south, or similar, divisions. Instead within each jurisdiction and organization priorities for implementation will be based on their knowledge and needs.

Having signed the Convention on Biodiversity (CBD), Canada already has a commitment that pre-dates Canada Target 1 to achieve national management effectiveness. As stated earlier in this report, the CBD Program of Work on Protected Areas (POWPA) (target 4.2.2) committed Canada to "expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of protected areas by 2015 using various national and regional tools and report the results to the global database on management effectiveness" (GD-PAME). As with the vast majority of other co-signing countries, Canada did *not* accomplish that goal. In fact, Canada still remains well behind the progress made in the rest of the world. The only PAME evaluations conducted in Canada have been on a small portion (205) of its' over 7000 protected areas.

Recommendations for consideration:

> **Set a national target:** Pathway's call to action should include a confirmation of Canada's commitment to achieve the management effectiveness target. It should also be acknowledged that Canada's achievement falls largely on the shoulders of the provinces, territories, private conservation agencies and IPCA managers across the country. Consideration should be given to how the target may specifically apply to OECMs and IPCAs that are not considered protected areas. Canada Target 1 specifies that all networks should be striving to achieve effectiveness as proven by biodiversity outcomes.

> **Recognize the time and effort required:** Whether reaffirming or setting a new target, it must be recognized that the effort required to complete PAMEs is significant. A concerted focus, development of capacity and resources, time and support will be needed for progress.

> **Prioritize target achievement:** Selecting the areas to focus on as priorities is critical to achieving the target and ultimately its intent. This would also help to direct jurisdictional decision-making. Any prioritization for the completion of PAMEs to reach the target across Canada will need to consider important sub-scale issues. Such site concerns include:
> - management intent, such as natural environment priority or recreation priority area;
> - geography (remoteness);
> - size;
> - age since establishment;
> - operating/non-operating areas, or areas with staff/without staff; and
> - risk or threats to values.

> There are no clear divisions between, for example, north and south and priorities for implementation are best made based on the knowledge and needs of each jurisdiction and organization.

7.2.5 Reporting to support and maximize benefits of PAME

In Canada, summary reporting of PAME completion could be accommodated using national databases (e.g., CARTS) or direct reporting to the GD-PAME. Alone, this reporting will not benefit Canada's network of protected areas nor will it encourage PAME completion. For targets, threshold, standards and reporting to be valuable beyond a "headquarters checkmark", they must be strongly supported. They also must benefit the community of practice. Existing reporting mechanisms in Canada (e.g., National Status Report on Protected Areas) have limited usefulness for the jurisdictional organizations on which they report and thus a tendency to invest minimally in the associated reporting. As such, there is often a tendency to inflate or suppress results. The goal of PAME reporting structures and mechanisms in Canada should provide useful information to the community of practice and contribute to decision-making, improve common understanding of management challenges of protected areas, and enable cooperative development of solutions. A reporting system should be designed to minimize actual or perceived penalization, or public criticism to enable and encourage more complete and transparent reporting of positive *and negative* outcomes.

In-depth reporting on the successes and failures specific to Canada's networks could remove barriers and enable jurisdictions to improve effectiveness. Such reporting could also determine whether to identify where national efforts could be focused, and target investment or research and information needs. It could also contribute to more efficient collective effort and shared learning. For example, collecting evaluations and results into one database or reporting mechanism from multiple jurisdictions and agencies can help to identify common management challenges, data needs, threats and opportunities. This can help to prioritize resource allocations, help organizations work across institutional lines and geographical boundaries, and make adaptive management practices possible.

To improve integration and communication among jurisdictions in Canada, organizations would benefit from using consistent terminology and a standard approach to adaptive management. For example, the international conservation community is embracing a set of standards that improve an organization's ability to measure success and adaptively manage its resources. These guidelines are collectively known as the *Open Standards for the Practice of Conservation*.[16] The Open Standards remedies common weaknesses of conservation and restoration plans by applying a simple, transparent adaptive management framework that improves team unity, long-term efficiency, and the assessment of conservation outcomes. The Open Standards threats categories and terminology were used in the Canadian PAME pilot and are suggested as a minimum standard for tool selection and process.

Management at all levels needs regular information that is relevant to their particular governance systems and to the questions they need answered. Global recommendations for best practices recognize that information systems must make data available to managers in an easily accessible form and must be strongly linked to decision-making systems (Leverington et al., 2010). This would be a critical step in reporting but also in building capacity for PAME in Canada (see following section), and encouraging cross-boundary collaboration. In addition, in-depth reporting will make it possible to examine the relationships between management effectiveness and biodiversity outcomes in the Canadian context.

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[16] Open Standards for the Practice of Conservation, Version 3.0, April 2013

Recommendations for consideration:

Adopt national reporting indicators for monitoring PAME Implementation*:* In addition to simple reporting of PAMEs completed, monitoring a series of implementation indicators would give a greater understanding of assessments in Canada.

Report on outcomes: To be useful, reporting should go beyond simply recording a target, such as the progress of PAME completion in Canada. It should also include results. In-depth reporting and monitoring of PAME results can enable cooperative action and better understanding of where there is a need for the community of practice to do better. At a high level, reporting on evaluation results related to the six elements of the common framework as well as the headline indicators should be supported and encouraged. The reporting can then contribute to management decisions and give focus for cooperative efforts. All data should be open, transparent and publicly available.

Capitalize on existing infrastructure, processes and resources wherever possible: Progress reporting on PAME could use the existing Conservation Areas Reporting and Tracking System (CARTS) database and existing reporting processes. It would also benefit from the existing infrastructure and resources of GD-PAME to translate PAME outcomes against the common framework and headline indicators. Some modification to include Canadian indicators could be requested or included in an adaptation of the existing CARTS database or any new parallel accounting tracking and reporting database developed for Canada Target 1.

Streamline reporting systems: Streamlining existing reporting systems both nationally and within jurisdictions or agencies will be important to benefit from existing efforts. Nationally, the process and outputs of existing "state of" reporting (National Status Report) should be streamlined and adapted to reflect implementation progress toward the target. It should also allow for and include in-depth results for the six common framework elements and headline indicators.

Use common terminology: To enhance the collective impact of multi-jurisdictional PAME, organizations will need to agree upon common terminology to describe the process and results of protected area management. National adoption of the definitions used in the *Open Standards* (*Normes ouvertes*) (2013), for example, would ensure a common understanding of the process of evaluation.

7.2.6 Building capacity for PAME in Canada

Current experience and capacity within jurisdictions to complete PAMEs is limited. This is a significant concern that needs to be addressed in Pathway Guidance. Once tools are adapted and integrated into existing management processes, there is potential for significant opportunities for cost savings. PAME can be used to optimize resource allocation and design smarter, more strategic outcome monitoring programs. Developing, completing and implementing the results of PAME, however, is complex. The process requires a significant amount of expertise and capacity, especially in the initial investment. This

is prior to and separate from the significant capacity and resources required to acquire data, develop indicators, and monitor and adapt management actions to mitigate the threats to conservation and biodiversity values. It is also the aim of any evaluation. This cost should not overshadow the long-term value and efficiencies that result from PAME.

At a 2016 CCEA national workshop, participants identified a far-reaching level of support for

- conducting pilot projects nationally to test tools;
- developing guidelines for implementing PAME in Canada; and
- having some level of agreed-upon national thresholds of "effective management" (CCEA, unpublished workshop report).

The workshop participants also recognized that some level of standardization would help with consistent reporting and comparisons or shared learning between jurisdictions. The CCEA workshop participants recommended the development of a "METT-plus" tool, to which more Canadian context fields would be added for use across Canada—the development of which has been part of the Canadian PAME pilot.

Generally, an approach is needed to remove real or perceived barriers to performing evaluations and to enable regular repeat assessments to find trends. This approach should also address significant shortcomings, such as a lack of data and monitoring (as identified in the National Status Report on Canadian Protected Areas and summarized in this report).

Recommendations for consideration:

Overcome barriers: Approval and support will be required at an organizational level to implement PAME, regardless of national targets. Managers must feel empowered and required to complete evaluations—using effective and efficient processes that lead to clear benefits—or other priorities will continue to prevail. Phasing or grouping evaluations could be considered.

Funding and support to complete PAMEs: Additional funding or significant reallocation of resources will be required to reach PAME completion targets. This may be particularly challenging for small, private protected areas, OECMs and IPCAs.

Develop collective guidelines: The community of practice in Canada would benefit from a common forum and the cooperative development of comprehensive guidelines for implementing management effectiveness for Canada. A specific set of guidelines is needed for the Canadian context. These guidelines could include key elements, definitions, principles, common terminology and should meet minimum standards or best practices for testing, selecting, adapting and developing tools, developing processes for internal, stakeholder and community involvement, and providing guidance on implementation (including development of monitoring programs with selection of indicators). Such guidelines could also address and test the adaptation of tools to OECMs and IPCAs if appropriate.

Use common terminology: To enhance the collective impact of multi-jurisdictional PAME, organizations will need to agree upon common terminology to describe the process and results of protected area management. For example, many organizations use terms such as goal, target and objective interchangeably and inconsistently. National adoption of the definitions used in the Open Standards (*Normes ouvertes*) (2013), for example, would ensure a common understanding of the process of evaluation.

Increase expertise: A train-the-trainer approach to implementation of PAME would be beneficial to increase and share expertise across Canada. A collective national training forum would allow staff to benefit from established expertise and shared understanding and use.

Communicate/Share knowledge: Communication and shared learning—positive and negative—both within and beyond the community of practice is a key aspect of building capacity for PAME in Canada. Information, knowledge and expertise gained from PAME implementation can help to foster effectiveness, lower barriers, and address deficiencies with other networks practitioners, agencies and researchers across Canada. Sharing information and communicating PAME needs and outcomes with the research community and/or citizen science initiatives can potentially address monitoring and information needs. There is a role for interpretive staff to communicate messages and build support for key attributes that PAME has identified to help ensure biodiversity and other outcomes.

7.2.7 Information and monitoring

In Canada, PAME should be combined with efforts to address critical information gaps and systematic *monitoring* of biodiversity outcomes—to benefit and achieve the potential of the assessment process. One of the most common barriers identified by Canadian protected areas organizations is a lack of site-specific information that can contribute to assessments of values or threats, complete effectiveness evaluations and identify appropriate or priority management actions. Across the country, there is also a serious lack of capacity to suitably monitor biodiversity outcomes. There are multiple approaches, methods, protocols and scales of monitoring that could be applied in Canada, from the highest quality version to the practical to the most basic. To impose a national program of standardized indicators is unlikely to be practical or even potentially useful for many jurisdictions or site-level managers. Without additional support, funding, resources and capacity, jurisdictions are unlikely to be successful on any level. In order to move forward with this, a level of national coordination and sharing in developing monitoring programs across Canada is needed. There is also a significant weakness in taking the information from monitoring and research and building it into a management framework and organizational structure that is useful.

Recommendations for consideration:

Address critical information gaps, but support expert-driven assessments: Funding is likely required both nationally and regionally to identify and fill critical information gaps. In the absence of adequate information, PAME evaluations will need to rely on expert-driven

assessments, and be enhanced by best available information where possible. Efficiencies can be gained by involving key knowledge holders and collaborating with other agencies or partners. Having cross-sectorial and cross-jurisdictional dialogue among resource management professional agencies and protected area agencies can identify key knowledge gaps and/or opportunities to make better use of existing data.

Monitor and understand outcomes: Measuring whether management improves over time and understanding the external factors that affect the observed changes in management form a crucial biodiversity benchmark for all Canada Target 1 areas (CBD 2010). Monitoring is a key component of adaptive management and thus must be built into any management framework. To impose a management action without understanding the effect of that action on biodiversity outcomes goes against the purpose of the adaptive management concept.

Enable monitoring: Without some level of monitoring of biodiversity outcomes, PAME and managers are unlikely to be successful in the long term. With limited budgets and staffing, enthusiasm alone for monitoring will not change outcomes. Rather, the significant effort required to monitor must be recognized and supported with a commitment to resourcing (including capacity) and implementation.

Learn from other monitoring approaches, build expertise: There are approaches to monitoring in Canada and elsewhere that could be cooperatively used to develop expertise where capacity is lacking. Park agencies can use or adapt guidelines from organizations that have had success (e.g., U.S. National Park Service). Another option is to build on existing, alternative approaches, where monitoring each site is unlikely or impossible (e.g., development of biome based indicators applied to representative sites such as in BC Parks).

Develop or adopt national monitoring protocols: There are many existing monitoring protocols that could be beneficial at a national scale, for all jurisdictions and organizations. An organized identification and assessment of the usefulness of commonly used indicators would address some critical capacity gaps in jurisdictions across Canada. The assessment would include a Strengths, Weaknesses, Opportunities Threats (SWOT) analysis of jurisdictional needs across Canada relative to available indicators and protocols.

LINK to other pathway monitoring needs: There are strong links between PAME and all the remaining guiding elements of Pathway. In making recommendations, these links should be specifically recognized to maximize benefits and investments in monitoring.

Undertake further research: Research is still needed on the most important factors driving effectiveness in Canada. Research or landscape-level analysis of various *factors driving biodiversity outcomes* in Canada would be useful to contribute to evaluations and to focus monitoring efforts—especially in remote areas where information, resources or capacity to undertake monitoring is scarce. Counterfactual studies and meta-analysis are required to improve and focus efforts.

7.2.8   Implementation Costs

Costs associated with implementing PAME will likely vary widely across Canadian jurisdictions / organizations based on the approach and tools chosen, the degree of adaptation required, and how easily the approach and tools can be integrated into or with existing programs or processes. Once tools and processes are in place and normalized, it is likely that fewer resources will be required. Nonetheless, costs must consider that ongoing repeat evaluations are a core aspect of PAME. For many jurisdictions, the highest cost associated with the implementation of PAME will be filling information gaps and rectifying the lack of systematic biodiversity outcome monitoring.

7.3   Options for consideration

The burden of achieving the effective management of protected areas and OECMs that target the *in-situ* (i.e., managed for the particular area) conservation of biodiversity cannot rest on evaluation of management alone, but instead *must* be paired with actual measurement of biodiversity outcomes. As such, Canada's approach to effective management needs to be much more than just "evaluation for evaluation's sake" if the goal is to see progress in this country. Completing an evaluation by itself— without directly connecting to the values being conserved or the threats to those values—will limit any ability to make meaningful adaptive management decisions or develop or target monitoring programs to ensure biodiversity outcomes are being met. This is the real objective.

Managers recognize the need to do *something*, but often lack the tools to determine where to focus efforts or what the most critical aspects of management are for biodiversity in a site or sites. Where there are so few dedicated resources, without clear and formalized tracking and reporting systems for focusing efforts, they are likely to go to waste or to be directed toward other objectives (i.e., visitor use, capital expenditures, recreation development) which are often more front of mind, whether politically or revenue oriented. Without a significant focus on and support for implementation of PAME in Canada, the situation is unlikely to progress. Dedicated capacity and resources are needed to complete the evaluations as well as the development or acquisition of data to support evaluations and to implement monitoring—even at the most basic level.

The development of options was limited to those aspects seen as fundamental to operationalizing (i.e., rigidly defining variables into measurable factors) PAME in Canada, and that would benefit from a level of approval or endorsement at a ministerial level. Such authorization goes beyond simply best practice guidelines. They include a range of options related specifically to targets and implementation, including implications for tool selection and process, the transparency of reporting and information, and monitoring needs. Regardless of the outcome, moving beyond the current situation in Canada will require, at a minimum, some level of increased support, funding and capacity to ensure Canada Target 1 networks can move from protection to persistence.

7.3.1 Targets (timing)

Option 1: Reaffirm the Convention of Biological Diversity (CBD) PAME Target of 60% completion by 2015, (with late completion date of 2020).

> **Explanation:** This basic target option uses a phased approach to achieve the CBD commitment, but with a late target that aligns with Canada Target 1. However, with no target for completing PAMEs for the remainder of sites, uncertainty results.

Option 2: Reaffirm the CBD PAME Target with a late completion target of 60% by 2020, and 100% by 2025.

> **Explanation:** This target option uses a phased approach to achieve the CBD commitment, but with a late target that aligns with Canada Target 1. It includes a reasonably ambitious, but realistic commitment to a 10-year delay (past the 2015 target date) to achieve 100% completion.

Option 3: Reaffirm the CBD PAME Target with a late completion target of 60% by 2020, and 100% by 2025, with a commitment to repeat assessments every 5 to 10 years at a minimum, or with a significant change to site values or threats that may affect management effectiveness.

> **Explanation:** This target option uses the same phased approach to completing PAME assessments that is aligned with Canada Target 1 and a 10-year delay. A significant aspect of this target option is the addition of the commitment by jurisdictions to repeat assessments, which is central to the concept of understanding and improving management and, ultimately, biodiversity outcomes. A 5-to-10-year repeat cycle is roughly in alignment with the sunset clause (regulated end dates) of most management plans for protected areas.

7.3.2 Application of target (scope)

Option 1: Target applies to protected areas (PAs) only — selected for achievement within each jurisdiction/authority and aspirational only for OECMs and any other Canada Target 1 measures.

> **Explanation:** The target for PAME completion in this option would only be required for protected areas, and would apply within each jurisdiction or management authority. However, the target should also function as an aspirational target for OECMs and other Canada Target 1 areas.

Option 2: Target applies to PAs + OECMs — targeted for achievement within each jurisdiction/authority.

Explanation: Completing PAME assessments may be one of the most realistic means of assuring that the untested concept of OECMs has the potential for success. This is therefore included in the target for PAME completion on protected areas. The target would apply within each jurisdiction or management authority.

Option 3: **_PAs and OECMs targeted for achievement by ecoregion._**

Explanation: As with option 2, the PAME completion target applies to all Canada Target 1 areas, but, under this option, would be targeted by ecoregion. Ensuring or maximizing the likelihood that Canada Target 1 sites are effective and enable biodiversity outcomes may be better targeted toward those areas in Canada at higher risk. Such areas include ecoregions that are fragmented, or those with very few or very small representative protected areas. Applying the target by ecoregion instead of by jurisdiction could partially address this issue. It would also have the benefits of collaboration among jurisdictions where ecoregions are in more than one jurisdiction.

7.3.3   Implementation

Option 1: **_Endorse a Basic Approach to PAME Implementation — support and enable implementation through the adoption of minimum guidelines for tool selection, with biodiversity outcomes supported by commitments to gather basic information; perform basic monitoring; and create transparent outcome reports_**

Explanation:

- **Tools**: This option allows flexibility in choosing tools but follows the proposed minimum guidelines for tool selection using the common framework. With simpler evaluation tools in place, there is a risk of a higher level of uncertainty and inconsistency or lack of focus associated with these tools. However, some of this risk can be reduced by following minimum standards for tool selection that use the Common Framework.

- **Reporting**: A central aspect of all PAME approaches- transparent reporting of evaluation outcomes is performed.

- **Information**: This option commits to identifying and acquiring minimum information required to support PAME evaluations and values assessments (differentiated from monitoring of indicators related specifically to desired biodiversity outcomes). Counterfactual studies are undertaken at a national scale.

- **Monitoring**: At a minimum, PAME evaluations are paired with identifying and monitoring a group of key systems-level indicators that are adaptable to the protected areas/site level and include structure, function and composition.

Option 2: ***Endorse a Moderately Enhanced Approach to PAME Implementation — Support and enable implementation by endorsing better tools for PAME completion; with biodiversity outcomes supported by commitments to acquire basic information and undertake monitoring of key indicators that is supplemented by site-level ecosystem health assessment and transparent reporting of evaluation outcomes and headline indicators.***

Explanation:

- **Tools and process**: This option also allows flexibility and maintains consistencies via the adoption of minimum standards for tool selection, but promotes the use of better tools that enable a more comprehensive or in-depth evaluation and that focus on biodiversity outcomes. An enhanced approach would also include the promotion of stakeholder inclusion in evaluations or undertaking supplemental stakeholder assessments. Better tools and inclusion of stakeholders in assessments require additional effort, resources and time to complete, but are more likely to result in better management outcomes and support for management actions.

- **Reporting**: Transparent reporting of evaluation outcomes and headline indicators is performed.

- **Information**: This option also commits to identifying and acquiring critical information to support evaluations and values assessments, but is supplemented by undertaking counterfactuals at system level (i.e., within a jurisdiction for a range of sites).

- **Monitoring**: In this option, PAME evaluations are paired with the identification and monitoring of a more robust set of scalable indicators that includes structure, function and composition. This option is supplemented by ecosystem health assessments (combination of subject matter expertise and best available information).

Option 3: ***Endorse a High-Level Approach to PAME Implementation — Support and enable implementation through the promotion of better tools for PAME completion, with biodiversity outcomes supported by the implementation of an EI monitoring program as well as research on the relationship between management effectiveness and biodiversity outcomes undertaken and the transparent reporting of evaluation outcomes and headline indicators and development of associated performance metrics.***

Explanation:

- **Tools and process:** The high-level option also allows flexibility but promotes the use of better tools (and the adoption of minimum standards for tool selection). The high-level approach would include a commitment to ensure stakeholder inclusion in evaluations or to undertake supplemental stakeholder assessments. Better tools and stakeholder inclusion in assessments require additional effort, resources, and certainly time to complete—but are more likely to result in better management outcomes and support for management actions.

- **Reporting:** Transparent reporting of evaluation outcomes and headline indicators. Development of performance metrics related to completion and outcomes.

- **Information**: Identification and commitment to acquire minimum data or research requirements to contribute to evaluations and values assessments and undertake counterfactual studies of biodiversity outcomes and detailed meta-analysis to provide information for effective management actions. Although conducting counterfactual studies and completing detailed meta-analysis are more costly and time-consuming, they may be the most powerful tool to employ over the long term to achieve effective management. These kinds of studies objectively identify correlations between management actions and biodiversity outcomes and help managers make meaningful adaptive management decisions.

- **Monitoring:** In this option, PAME evaluations are paired with the implementation of a well-designed, comprehensive and transparent monitoring program for ecological integrity.

7.4 Conclusions

As the cornerstone of our biodiversity conservation efforts, protected areas must protect and connect critical habitat and must be effectively managed to ensure continuity. Protected area management effectiveness evaluations are a powerful tool to help in this objective. Although there is leadership shown in Canada (primarily from Parks Canada) with outcome monitoring, overall Canada is well behind many nations around the world who have made significant movement towards evaluating management effectiveness and meeting associated international targets.

PAME represents a major shift in the way protected areas are managed, with a strong focus on whether or not biodiversity outcomes are being achieved. This requires detailed analysis of sites' values, risks and threats and a focused assessment of whether management actions are responding to these threats effectively. PAME is not a tool to assess an individual's performance but rather how the site, within its local, regional and sub-national context is performing. For PAME to be effective and sustainable, it must be repeated and integrated into management processes and tools

PAME tools help to measure details associated with management that are factual and can be dealt with directly. The PAME indicators have been well researched and place evaluation efforts on those factors that help to predict biodiversity outcomes. PAME tools alone, however, are insufficient. It is essential to develop and implement biodiversity outcome monitoring programs across the protected area system to work hand-in-hand with management effectiveness evaluations.

Implementing PAME requires commitment at all levels of the protected areas system. There is a need to nationally promote the approach to evaluation, provide incentives to implement it and remove barriers to starting. PAME approaches must be recognized as additional, but critical work on already limited staff that will help in becoming more efficient in the approach to management and help to prioritize actions. There is a need for increased capacity, training, tools and resources to implement this approach.

Challenges associated with implementing PAME, and associated biodiversity outcome monitoring, across Canada should not be used as a reason for further delay. Building on the lessons from the

international PAME experience, public and private protected area land managers should be strongly encouraged to get started evaluating the effectiveness of Canadian protected areas.

Protected areas exist within a large and dramatically changing landscape. Without speedy and dramatic responses, the loss of biodiversity is likely to continue in the larger landscape, and to a lesser extent within protected areas. PAME can help to slow that decline in protected areas, OECMs and IPCAs.

8 Appendix A - Canadian Case Studies

Case Study 1: Environment Canada and Climate Change: Canadian Wildlife Service METT Analysis

1. Background

Canadian Wildlife Service Protected Areas Program
North America's oldest waterfowl sanctuary at Last Mountain Lake in Saskatchewan was set aside by Parliament in 1887 to protect breeding grounds for "Wild Fowl". Since that time, the Protected Areas Program of the Canadian Wildlife Service at Environment and Climate Change Canada (ECCC) has aimed to protect wildlife and migratory bird habitats of national importance according to specific conservation objectives. Today, this national network protects over 12.4 million hectares (an area more than twice the size of Nova Scotia) across 146 sites, including 54 National Wildlife Areas and 92 Migratory Bird Sanctuaries.

Our objectives for management effectiveness evaluation
Late in 2015, in response to recent program evaluation recommendations to improve its management planning operations, the Program began to measure its management effectiveness. The purpose was to "take a snapshot" of its management performance as a whole network, for a baseline against which to compare future assessments. The goal was to find network trends and to compile specific recommendations for management action to improve overall performance for future evaluations. It was also hoped that the assessment could be done using international PAME standards, for comparison with other national protected area networks.

2. Methods
The Management Effectiveness Tracking Tool (METT) was selected to do this assessment on the basis of several qualities:

- It is an off-the-shelf, relatively simple evaluation tool that does not rely on a large investment of effort or funding;
- It enables rapid assessment of management effectiveness while providing recommendations for where management can improve;
- It is easily understood by non-specialists; and
- It satisfies the need for consistency with other networks around the world.

In early 2016, the METT questionnaire was distributed to the managers of 80% of the protected areas in the ECCC network: all 54 National Wildlife Areas and 64 of the 92 Migratory Bird Sanctuaries (Quebec region was unable to provide survey results for its Sanctuaries) across the country, dispersed across eight regions or subregions (Atlantic, Quebec, Ontario, Prairies, Nunavut and NWT, Yukon, BC, and CFB Suffield NWA). Each manager (or their delegate) responded to the survey for all the sites in their region or subregion, drawing only upon personal knowledge, history and experience to answer questions. Most

took between a half and a full day to complete the survey, with each respondent scoring for between 5 and 35 sites.

3. Results

Overall, protected areas have a good legal status; however, management performance is basic at best and there are significant weaknesses resulting from not enough resources and a lack of personnel[17]. Consequently, inventories and monitoring of species at risk and migratory birds are not being completed, management plans are not being drafted in a timely fashion, and there is limited engagement with stakeholders and other interested parties. The review of trends in the identified management issues gave rise to many recommended actions to pursue in the near future. These findings are consistent with the 2001, 2008, and 2013 reports of the Commissioner of Environment and Sustainable Development and consistent with the findings of an internal 2014 evaluation[18].

4. Conclusions

While the METT was relatively simple, cost-effective (completed for approximately $11,000—contractor time to prepare and administer the questionnaire, guide respondents and compile and analyze results), and straight-forward to apply, a number of shortcomings in the tool emerged during implementation. Assessments for each question are subjective, and being scored separately for each region, introduced scoring bias between regions. Comments and next-steps fields were left largely unanswered, as a lack of resources in the network makes it difficult to determine next steps. In general, it was difficult to make comparisons between regions due to the potential bias in the scoring method while certain of the survey questions did not apply to some types of protected areas. Examples are migratory bird sanctuaries, which are not established or managed in the same way as national wildlife areas (many are located on provincial or even private land, so not under federal ownership), and many sites in the north that are co-managed with the Inuit communities and very differently from the "south-of-60" network.

The survey respondents saw the management effectiveness evaluation process as most valuable in the formal identification of areas in need of attention, although it mainly confirmed issues that were already known to staff. Respondents responsible for completing the METT surveys were concerned about the feasibility and applicability of the results to every day management. Overall, capacity to carry out

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[17] The protected areas program operates on an annual budget of approximately $13M (capital, operations, contributions and salary).

[18] The Auditor General (2001) stated in her 2001 report that National Wildlife Areas and Migratory Bird Sanctuaries are at risk, "…*their potential as a conservation tool is unfulfilled… there is limited monitoring of public access to and use of National Wildlife Areas, and the federal government undertakes limited scientific research in them*." These conclusions were repeated and expanded upon in the 2008 and 2013 reports of the Commissioner of Environment and Sustainable Development: management plans are not completed, monitoring is not occurring, ecological integrity is at risk, facilities are in poor condition, and EC lacks the resources to address its problems. The 2014 EC evaluation (Audit and Evaluation Branch) expressed similar concerns. Finally, CPAWS in their July, 2015 report noted that the "*situation is dire*" in respect of EC's Protected Areas.

management improvements and to implement adaptive management responses was seen as extremely limited.

The real value of a tool like the METT appears to be its ability to provide an overall baseline assessment of a network or system at some point in time, which can serve for comparison with future scores to determine whether changes in management practice result in greater effectiveness. While the METT is not intended to be used to compare different protected areas or networks to each other, there may be future need for jurisdictions to compare their degree of management effectiveness to each other, and over time. As such, there is a need for some adjustments to be made to the survey questions that would reduce their ambiguity and subjectivity, so that jurisdictions could rely on one standard tool for the purpose of comparison.

Case Study 2: Alberta Canadian PAME Pilot Project

1. Background

Alberta Parks manages a system of 473 provincial sites that play a critical role in the conservation of biodiversity and other intrinsic social and cultural values. All of the sites fall under one of eight classifications: Wilderness Areas, Ecological Reserves, Heritage Rangelands, Willmore Wilderness Area, Wildland Provincial Parks, Provincial Parks, Natural Areas, and Provincial Recreation Areas. Over 250 of the sites in the parks and protected area system are helping Canada meet its commitment to achieving Canada Target 1, including meeting quantitative targets like effective management.

In June of 2016, a joint partnership between Alberta Parks, Ontario Parks and University of Northern British Columbia (UNBC) researcher, Dr. Pamela Wright, was initiated to test the evaluation of protected area management effectiveness (PAME) in a sample of protected areas. Project planning was guided by a Management Effectiveness Working Group consisting of Parks Planning staff, Dr. Pamela Wright from UNBC and Dr. Joyce Gould, Science Coordinator for Alberta Parks.

Initial scoping

A critical component of the pilot project was the initial scoping exercise led by Dr. Pam Wright to help choose evaluation tools. Scoping helped the working group identify what they wanted to achieve with the pilot project in terms of 1) Primary Objectives, 2) Reporting Outcomes, 3) Scale, 4) Frequency, 5) Level of External Involvement, 6) Building Support, and 7) Evaluation Criteria (summarized in Table 8).

TABLE 8: SCOPING ASSESSMENT OUTCOMES IN THE ALBERTA PILOT

	Alberta
Primary Objectives	1. Improve protected area management 2. Strengthen legislative/policy frameworks 3. Provide support for increased political and financial resources 4. Increase transparency and improve accountability 5. Achieve international alignment and recognition
Reporting outcomes	• Combination of numeric and descriptive format • Site-specific scoring but able to roll-up into system wide network evaluation • Need to describe and rank threats, identify most important issue to focus on for each site, and understand management processes/responses.
Scale	• Individual site-level evaluation • Complete as part of regional parks planning process • But focus on sites identified as being under high threat
Frequency	• 5 years: sites with high use/high threat • 10 years: remote sites with large land bases
External Involvement	• Complete the pilot internally with no external involvement • Ongoing discussion about how to involve stakeholders, First Nations/rightsholders, and other external communities in a future Parks PAME program.
Communication	• Initial presentation to Parks Directors Committee • Formation of Management Effectiveness Working Group involved regional staff (planners) • Presentations to partners
Evaluation Criteria	• Capacity and cost-effectiveness • Provide valuable information • Replicable across sites and times • Robust, valid, credible and simple

Planning and Adaptation

Once the scoping exercise was complete, the working group evaluated a short-list of PAME evaluation tools to see how they met identified needs. With 473 sites in the Parks system that fall under a range of classifications, sizes, remoteness and accessibility and use, the working group wanted to test tools that would be quick and easy to use while providing a detailed and fulsome evaluation. The tools needed to be accessible and applicable to frequently used sites as well as remote sites with little information available. It also needed to be a tool that could be adapted to the specific needs of Alberta Parks.

Two tools were chosen, the Management Effectiveness Tracking Tool (METT) and the Enhancing Our Heritage Tool (EOH), which were then customized and adapted to an Alberta context. The intention was

to apply each tool to specific sites to help determine which tool works best on which type of site. However, after the first pilot workshop the tools were combined and the core evaluative component was based on the METT tool (renamed Enhanced METT or METT+). Significant adaptations were made:

- The language and terminology were adjusted to suit a Canadian context (and also modified from jurisdiction to jurisdiction).
- Where the wording on some questions was found to be consistently unclear, it was reworded or sometimes separated into 'double barreled' questions into unique parts where the responses could be different.
- Questions related to certain issues across all the jurisdictions were enhanced (e.g., an enhanced examination of Management Planning).
- Where there were jurisdictionally specific processes (e.g., examining Management Plan renewals and currency) that assessed planning adequacy more thoroughly, these completed rankings were substituted in place of METT questions.
- All available data were used in our rankings (e.g., spatial analysis in other tools used for the PAME pilots provided information on design risks that were linked with the evaluative professional judgment questions within the METT+).
- The tool was supplemented with extra questions on topics of specific concern that were pan-Canadian, for example, climate change, stakeholder consultation, Indigenous/rights-holder shared management.
- Capacity-building modules, typically from the EOH toolkit, were built in where a poorer evaluation on an item or topic was linked to a more detailed worksheet from the EOH (or elsewhere). This allowed intensive work on the topic, either as part of the PAME evaluation or as a next step.
- Additionally, a combination of tools was chosen to support or enhance the actual METT + evaluation tool. This allowed the working group, within the bounds of data available, to include a more comprehensive focus on the conservation, recreation and other social values, the threats to those values and to enhance examination of the outcomes of management.

Tools to Inform the Evaluation: Values and Threats Assessments

An integral component of the PAME framework is establishing site context by identifying the values of the site and the threats to those values. Evaluators need to begin with a clear understanding of what values each site is supposed to be protecting. In many cases in Alberta, management plans are out of date or non-existent or the values of the sites are unknown, unclear and/or have changed. Every PAME tool includes a basic values and threats assessment component. However, after a review of these basic tools, the working group concluded that the assessments within the METT and EOH tools were not comprehensive enough to meet the identified needs. Instead, additional tools were developed and adapted internally to identify conservation and recreation values and design risks and identify and rank the threats to those values.

A Conservation Values and Risk Assessment (CVRA) tool was adapted for Alberta by Dr. Joyce Gould based on the Conservation Risk Assessment (CRA) tool initially developed by Dr. Pam Wright for BC Parks. Drafts of the adapted tool were reviewed by ecologists in each of the regions as well as to scientists within other divisions in the department for feedback. The tool captures conservation values

at a variety of scales, including ecosystems, ecological communities and species for both terrestrial and aquatic systems as well as structural components and function. It includes a section on design risk to capture key components related to the most effective design. Data sources include, but are not limited to, the Alberta Conservation Information Management System, corporate datasets, monitoring information, professional opinion and traditional knowledge. The NatureServe species rank calculator adapted by Dr. Gould to function as the conservation threats assessment calculator for an entire protected area for threats stemming from both inside and outside the site. The calculator captures a standardized list of primary threats based on the Open Standards threats categories and terminology[19] developed by the IUCN-CMP. It assesses threats based on factors of severity, scope and timing.

Complementary Recreation Values and Risk Assessment tools based on the CVRA format were developed by members of the Working Group to identify and assess the main recreation values of the site. A recreation assessment was included because it is an important value in many Alberta Parks sites and plays a key role in how Albertans understand and interact with the parks and protected area system. The values assessment tool provides an overview of the key recreation values and design or use risks through the use of a set of questions based on supporting indicators for each factor. It uses data from Alberta's draft Recreation Framework inventory, planning documents, pre-existing inventories and digital data such as the provincial Recreation and Tourism Features Inventory (RTFI) and subject matter or local area experts. The associated risk assessment tool mirrors the conservation threats calculator, but with recreation specific threats categories. The tool identifies and assesses the pressures affecting identified recreation values of the site.

Site Selection
The Working Group chose six sites across Alberta based on a range of criteria including classification, size, values, location, issues, intensity and range of use, existing and potential threats and available information to contribute to and guide management actions. Several sites were proposed to each participating region and the final site selection decision was made by each region according to their own needs. The final list of sites included three Provincial Parks, two Wildland Provincial Parks and one Provincial Recreation Area (see table below). At least one site was chosen for each Parks region (Northwest, Northeast, Central and Kananaskis) and a seventh site representing the South Region will be evaluated in Fall 2017, apart from the pilot study.

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[19] http://cmp-openstandards.org/using-os/tools/threats-taxonomy/

Site	Region	Rationale for Selection
Lois Hole Centennial Provincial Park	Central	Urban, Management Plan in development
Birch Mountains Wildland Provincial Park	Northwest	Large, remote, northern
Bow Valley Wildland Provincial Park	Kananaskis	High use/high risk
Lakeland Provincial Park and Provincial Recreation Area	Northwest	High use/high risk
Peter Lougheed Provincial Park	Kananaskis	High use/high risk
Hay-Zama Wildland Provincial Park	Northeast	Large, remote, northern
Castle Mountain Wildland Provincial Park	South	Recently established

2. Implementation

The workshop process evolved throughout the duration of the pilot project, based on the experiences and feedback from participants and facilitators. Much of what was learned about the process came about as a result of being organizationally flexible and adapting the process to meet the needs and capacity of the participants. Each workshop began with a clear plan in terms of the length, schedule and preparatory instructions and materials, and each of these elements was adjusted throughout the pilot. Regional planning team leads from each region decided who was to be invited, but were encouraged to include a wide range of voices from boots-on-the-ground staff to the higher-level managers and directors.

The first workshop made it very clear that while the values and threats assessments were integral to the process, they required extra time that had not been factored in. An extra day was then added to workshops that had been originally scheduled for one day. Detailed information was initially sent out for review ahead of time, but it was quickly recognized that staff did not have the resources to devote more time to the project than what was allotted for the workshop. Instead, a brief overview of PAME and the pilot project was emailed to participants ahead of the workshop.

A challenge that was encountered in almost every workshop was the desire to rush through the values and threats assessments due to time constraints, but these components were essential to understanding what values the site was being managed for. It was also important to allow staff the opportunity to express their own frustrations with management challenges. Sites that had a high number of threats tended to elicit much discussion, so a time-saving device was to identify and prioritize the perceived top threats and focus on those first before moving on to the next tool component, and then going back to review the remaining threats if there was time at the end. Wrapping up each tool component with a "checking-in" exercise provided an opportunity to gauge how the participants felt about the tool, the process so far, what they were learning, and how the results from the tools compared to their lived experiences and expert knowledge of the site.

3. Outcomes

Results: How did we do?

The workshops were successful in engaging the staff and developing a deeper understanding of the site. There was a major learning curve for all participants as they learned about the tools—as they were using them for the first time. Staff described feeling exhausted but exhilarated at the end of each day.

In terms of values, sites in the Kananaskis region had high conservation values related to providing critical and essential habitat for keystone species and apex predators. High ranking of recreation values reflected the sites' very high usage. Central and northern sites had high conservation values, as areas of low disturbance surrounded disturbed landscapes. Residential development is the predominant threat in the central region site while energy development was the most significant threat assessed in the northern sites. Additionally, northern sites with challenging accessibility tended to have low recreation values while the central and northern sites with easy access had high recreation values. The highest-ranking threats to each site are summarized in the table below.

Threat Categories	LHCPP	Birch	BVWPP	Lakeland	PLPP	HZ WPP
Residential & Commercial Development	✔					
Energy Production & Mining		✔				✔
Transportation & Service Corridors	✔					
Biological Resource Use				✔		
Human Intrusion & Disturbance	✔		✔	✔	✔	
Natural System Modifications	✔		✔	✔	✔	
Ecological Management / Natural Factors					✔	✔
Pollution	✔					
Climate Change & Severe Weather	✔				✔	

For METT+ results, the score for each component was shown as a percentage and rated based on a predetermined scoring level standard. During each workshop, participants were given thirty minutes to complete the survey individually, which was then completed as a group. Where there were differing scores based on individual assessments, a final score was based on discussion and consensus. The comments recorded for each question are extremely valuable and used to identify issues and gaps, providing useful information for recommendations. Interestingly, the outcomes component tended to score high even where the other management elements scored low. Alberta Parks has limited and inconsistent outcomes monitoring for individual sites, and the outcomes questions were answered subjectively. This may change over time as a Parks monitoring program is developed.

PAME Component	LHCPP	BMWPP	BVWPP	LLPP & PRA	PLPP	HZ WPP		Scoring Level Standard	
Context	56%	44%	56%	61%	56%	56%	(67%-100%)		Sound Management
Planning	21%	46%	55%	44%	52%	50%	(51%-66%)		Basic Management
Input	51%	45%	47%	63%	47%	45%	(34%-50%)		Basic Management with Significant Deficiencies
Process	47%	31%	49%	51%	53%	60%	(0- 33%)		Clearly Inadequate Management
Output	33%	64%	75%	67%	76%	75%			
Outcomes	35%	81%	75%	82%	84%	83%			

Key learnings

- **Understand and articulate what you want to achieve**. The scoping exercise was critical in understanding the desired goals, purpose and outcomes and helped the working group to pick the appropriate tools.
- **Assess and gauge the temperature of the organization.** Alberta has been seeking a way to implement a cultural shift and saw this pilot project as an opportunity to incorporate adaptive management tools into existing processes.
- **Reach out broadly within the department to build a network of resources and expertise**. The pilot project process has functioned as a tool to build bridges between divisions and departments. There are a lot of data gaps, so it is important to supplement experts in to the process beyond your organization.
- **Beware your biases**. One of the biggest challenges to a fulsome assessment was the lack of data available. While it is perfectly acceptable to somewhat rely on professional opinion, it is important to pair technical experts, who may be more impartial, with site experts to retain objectivity about the site.
- **A comprehensive values/risk/threats assessment component is essential to the process**. The assessment component helped to clarify what the conservation and recreation values the sites were being **managed** for and provided an opportunity to identify and rank the threats to those values, which, in turn enhanced the management effectiveness evaluation component. It is important to allow for lots of time to develop and adapt assessment tools and not rush through the values and threats assessments component.
- **The process is about collective learning**. Opportunities for a broad range of staff to gather together to discuss one site are very rare. One of the most frequent comments was that the process provided an incredible learning opportunity for the staff to develop an understanding of the site from a range of different perspectives. This ultimately changed the way they thought about how it was being managed.
- **Include a wide range of voices/perspectives/participants in the room**. There is a need for both technical staff whom are not necessarily **tied** directly to the site but can contribute and provide less biased context to the values/threats, and staff and site managers who are familiar with the site itself.

- **Have faith in your process but be flexible**. Significant changes were made to the tools, but the overall process remained the same: the values and threats assessments upfront followed by the management effectiveness evaluation. Due to the range of backgrounds and expertise of participants, it was **sometimes** challenging to keep participants engaged, especially during the conservation values assessment, but it was an opportunity for everyone to fundamentally understand the site's conservation values.
- **Test the tools and the process first**. When the pilot project began, it was not known what tools would work with what types of sites or how much time each component would take. With a completed a pilot project, there is a much stronger sense of how to develop and implement a PAME program.

4. Next steps

The response to the PAME pilot project in Alberta has been overwhelmingly positive and the number one question asked at the end of each workshop is "This is great but what's next?". The main concern is that the project will lose momentum and be shelved. Over and over again, participants have stated that a management effectiveness program could initiate a fundamental shift in how protected areas are managed in Alberta, making Alberta Parks a more proactive, rather than reactive, organization. Participants could envision how this suite of tools could support adaptive management. The PAME pilot project has been invaluable in revealing a path forward for Alberta by showing what does and does not work and by identifying the major concerns and potential barriers to overcome for a successful program.

Toolkit Development

The Enhancing our Heritage (EOH) toolkit in its entire format (12 worksheets) was considered too time-consuming for the needs of the pilot project; however, the individual worksheets within the toolkit package are an excellent resource for focusing on specific components of management effectiveness that may be identified through the METT evaluation. Other components of the toolkit, such as the reporting tools, are being developed from scratch.

A. **Management plan survey**: Tool to assess the adequacy of the management planning document. Useful for sites with out of date plans and plans under review or development.

B. **Stakeholder/Indigenous METT**: Tool to help identify stakeholders and work with them to assess what their relationship is like with the site and the site values.

C. **Assessment and evaluation linking tool:** Tool or process to bridge the values and threats assessments with the management effectiveness evaluation. Current practice is a discussion to summarize results from the assessments prior to completing the METT.

D. **Other values assessment**: Tool to assess other social values (beyond recreation). Currently these have been identified and captured in different ways throughout the workshops.

E. **Training and tool guides:** Developed for both the conservation and recreation assessment tools. The existing METT tool guide will likely need to be adapted to incorporate changes. There are ongoing discussions about whether to include a tool training component such as a video tutorial, which may be incorporated as part of facilitator training when the Alberta PAME program is developed.

F. **Output assessment tool:** A tool from the EOH toolkit that assesses the achievement of annual

work program targets and other output indicators for the site.

G. **Monitoring management outcomes tool:** A tool to help identify whether the site is protecting its values and achieving its management objectives. Involves the development of a long-term monitoring program.

H. **Reporting tools**: A range of PAME reporting tools is being considered and developed as part of the outcomes of each workshop including:

- A PAME Workshop Report that provides a summary of all results from each of the tools and recommendations
- Values and threats assessment summary tables within management plans
- Summary of data and research gaps
- "PAME Report Card" that gives a letter grade based on the overall score from the METT+ as well as the score from each component and includes summary of comments for each component.

Monitoring Pilot Project

A monitoring pilot project of parks and protected areas based on the outcomes of the PAME pilot project is currently being developed in partnership with the Environmental Monitoring and Science Division. The five-year project will design, plan and initiate a system for monitoring biodiversity and ecosystem health in Alberta's parks relative to the broader provincial landscape. It will include outcomes on monitoring design and standard operating protocols. The project will also examine the value of Alberta's parks as benchmarks for ecological integrity.

Case Study 3. Nature Conservancy of Canada's Effectiveness Monitoring Program

Creating efficiencies and supporting decision-making. The motivation for implementing a monitoring framework is to create efficiencies and support decision-making. Formalized effectiveness monitoring and status monitoring should not be considered an attempt to study and measure every possible factor in minute detail, but rather to strategically support decision making so that managers and donors gain the information and confidence they need to expand upon and reinforce strategies that work.

Balancing efficiency (minimal cost) with effectiveness (providing suitable information to inform management decisions) should guide monitoring plan development. Undertaking monitoring on a property-by-property basis via Property Management Plans while disregarding the remainder of the landscape/watershed does not allow for scale-linked, cost-saving considerations. Monitoring allows NCC to demonstrate:

Effective use of donor dollars. If, despite continued application of donor dollars to a particular conservation action, the status of a target is declining (or a key threat is increasing), then new approaches will be considered

Efficient use of donor dollars/cost savings. Developing monitoring protocols that address common targets and threats across multiple properties within a landscape/watershed will allow for development of pan-property monitoring approaches that maximize efficiencies of scale and timing. Much landscape/watershed-scale monitoring information is already collected by partners and applies to most or all NCC properties within landscapes (e.g., large mammal counts by provincial environment departments, annual forest insect and fire extent, invasive species distribution information collected by provincial invasive species councils)

Success in achieving biodiversity conservation goals

Better biodiversity conservation outcomes through an adaptive management approach that ensures that NCC uses tools that maintain or improve biodiversity targets and/or reduce threats

Our ability to take advantage of new opportunities to conserve biodiversity and to adapt to changing conditions and challenges by having in place a robust monitoring program that allows managers to demonstrate to donors that the link between biodiversity outcomes and expenditures will be paramount and accounted for

9 Appendix B: Best practices for management effectiveness

Experience conducting PAME evaluations across multiple jurisdictions has yielded a number of excellent best practices supported by decades of learning. These best practices provide valuable guidance to other jurisdictions. The best practices identified below have been summarized from a number of sources (Hockings et al., 2006; Jones, 2005; F. Leverington et al., 2010; Stolton & Dudley, 2016) and adapted to the Canadian context, or from application of PAME in Canada (see case studies). Although derived from experience with protected areas, the guidance and lessons could apply equally to OECMs or IPCAs. Appendix B contains a compilation of best practices for PAME evaluation compiled from multiple sources.

Best Practices and Lessons Learned from PAME Evaluation Internationally

- Evaluation is part of an effective management cycle.
- Assessments can benefit from being based on a credible and tested Framework.
- Management objectives and standards are needed.
- Evaluation works best with a clear plan.
- The methodology needs to suit the purpose.
- Indicators need to be carefully chosen.
- Good communication, team-building and stakeholder involvement is essential in all phases of the project.
- A long-term evaluation plan with a good monitoring program is preferable.
- Evaluation findings must be communicated and used positively.

(Hockings et al, 2006, p. 48)

Carefully plan an assessment

An assessment is only useful for its purpose if planned and completed properly, including the right people in the room. Many protected area managers and staff, including those involved in the Canadian pilots, have noted that the major benefits of PAME have come during the assessment process rather than from any form a report produces as a result, so getting the process right is critical to success.

1. **Start evaluating**, recognizing that evaluation is a vital component of governance. Obstacles to evaluation are diverse and are often associated with lack of political will. Emphasis needs to be on continual improvement rather than on judgment, and evaluations need to ensure that benefits accrue to all the participants. (F. Leverington et al., 2010). 'Sell' the advantages of evaluation as a means of providing sound information that equips managers and other decision-makers to make the best use of resources; increasing transparency in management, improving on-ground management result; and reducing community conflicts (Tasmania).

2. **Match the tool with the purpose.** Scoping is a critical aspect of the process and is where flexibility should be retained. Assessing the organization's capacity and purpose for undertaking the assessments prior to picking a tool and implementing a process will ensure that the tool is appropriate and responsive to the needs of the organization. Communicating the results of this

step is important to ensure that staff involved do not become overwhelmed, disillusioned or misconstrue the intent or outcomes of the assessment. (i.e., is the assessment only to fulfil a systems-level reporting requirement, or intended to improve site specific management).

3. **Review and adapt the tools** before undertaking the assessment and assess the information available to complete it. Then think about capacity and pre-assessment training needs, adaptation, timing, scope and scale, verification, etc. As most tools are generic, designed for global use, adaptation is encouraged to ensure tools fit a specific context and meet organizational needs (adapted from Stolton and Dudley 2016).

4. **Keep it cost-effective**, in balance with other aspects of management. Keeping PAME studies small and simple in early assessment cycles may be a good guiding principle. Potential for cost-saving through cooperation between agencies and reporting systems should be explored. (F. Leverington et al., 2010).

5. **Assess and address minimum information requirements and availability.** Every PAME tool requires an understanding of site values and objectives as well as an assessment of the threats to those values. Recognizing that quantitative data to inform the evaluation was lacking, site specific only or inaccessible to field staff, the Canadian PAME pilot project developed a comprehensive suite of tools to consistently provide information for the evaluations that could be largely completed centrally, prior to the workshops. Staff involved in the workshops recognized that spending the time to collectively go through a comprehensive assessment of values, design risks and threats prior to completing the evaluation was perhaps one of the most beneficial aspects of the assessment.

6. **Improve data quality.** Diversifying information sources and involving external experts in interpreting results can make assessments more useful and more credible. Questionnaires should be properly designed and pre-tested. While quantitative data is often regarded as more credible than qualitative information, this is not always the case. The type of data collected should be matched to the issue being examined and the capacity of the agency or organization to collect data in a rigorous manner (Hockings et al. 2009). Qualitative data collected using appropriate processes can be as reliable as quantitative data—it is most important that the data used is matched to the issue being examined. Targeted monitoring of the status of key values and threats should be undertaken and reported on, to provide more credible outcome assessments. (F. Leverington et al., 2010).

7. **Build capacity and guidance.** Although typically designed as simple tools, implementing an evaluation may be the first time that protected area staff and other Indigenous rightsholders and stakeholders have been involved in assessing effectiveness. Thus, some capacity building or training is advisable so that all participants understand the purpose and potential outcomes prior to being involved in an assessment. "Evaluations that do not appear to have any useful outcomes can be worse than useless, as those involved are often less willing to be involved in other evaluations in the future (Leverington et al. 2010)". In particular, it is important to explain that PAME is in no way intended to be an individual performance evaluation, but rather should be a tool to guide improvement.

Completing an assessment

8. **Allow enough time** to complete the assessment in full. A good PAME cannot be done in a quick hour, as most questions take serious thought. The METT guidelines suggest at least a day is required for the first assessment, although subsequent repeat PAMEs may be a little quicker. In the Canadian pilot project, PAME project teams found that two days were really required to conduct the comprehensive assessment for more complex, highly-used sites, and a day and a half for less complex, remote sites. However, they anticipated that as staff became familiar with the tools there would be definite time savings on repeat applications.

9. **Do it all and provide context**. When using the tools, even score-card assessment tools like the METT, ensure to complete all the questions on the datasheets as well as the narrative sections related to the questions. The narrative comment and next step type comment fields are critically important to explain and contextualize answers and to create a quick check list of needed actions. The Canadian PAME pilot project found this to be equally important in the identification of threats based on subjective assessment, to qualify and refer back to the context or specific value being affected.

10. **Use or refer back to quantitative data** wherever available to support assessment, this is most important of all in the outcomes questions.

11. **Consult and get consensus.** Many tools are intended to involve a wide range of Indigenous rights holders and stakeholders in the assessment process to reduce potential bias and aid insight in the assessment results. Including participants outside the protected area, such as local communities, will bring richer insights (Stolton and Dudley 2016). Group discussions have been shown to result in better PAME results (Cook, Carter, & Hockings, 2014). Invite assessment and critical comment on management performance from those who can best provide legitimate and credible assessments for each objective or area of management responsibility. The inclusion of external sources for assessments increases the credibility of the evaluation and can provide a protective buffer for the program during periods of potentially destabilizing change, such as agency restructuring, personnel changes, or changes in government (Tasmanian World Heritage).

Implementation

Management effectiveness evaluations, like other forms of monitoring and assessments, are only worth doing if the results are analyzed and implemented. The intent is to move beyond a reporting exercise to utilize the information as an adaptive management tool. Planning how the results will be summarized, stored, shared and reported on are important considerations to make in advance of selecting and adapting the methodology or tool to use as they will, in part, determine the best tool to use. Some suggestions to facilitate implementation, reporting and communication include:

12. **Verify results.** Although most PAME tools are designed as straight-forward team tools, implementation can involve verification processes, from simple checking of completed forms to more detailed field verification exercises.

13. **Diagnose and implement the recommendations**. Review the evaluation and spend time diagnosing the root causes of management success and management failure, linking PAME results to management actions. This information can be used to develop an action plan for

adaptive management or to implement the results. This would include who will address the task and the timeline to translate the evaluation into actionable outcomes. This will help to "identify activities to improve low scoring questions and set targets for improvement" (Stolton & Dudley, 2016).

14. **Make it transparent.** Implementation should include a communications process to share results locally and globally to the greatest possible extent, so that data can be shared and collated and learning better applied (F. Leverington et al., 2010; Stolton & Dudley, 2016). Develop community expectations for transparency and accountability in management through performance evaluation and reporting in regular State of the Parks Reports (Tasmanian Wilderness World Heritage Area). Upon initial measurement, poor effectiveness outcomes are likely across any jurisdiction including Canada, given that management effectiveness is a new standard being evaluated against. Additionally, given the size and larger context where conservation areas are located, biodiversity values within the site may still decline. However, the focus on effective management is intended to slow the decline, restore what is possible and act on those things that are within the control or sphere of influence of the site.

15. **Revise as needed: evaluation is a learning process.** Though consistency is useful for comparisons over time, adaptation and revision of methodologies are valuable steps in a learning process. Where indicators are changed or added, efforts to maintain comparability should be made. Learning and discussions should be encouraged among people developing and practicing PAME (F. Leverington et al., 2010).

16. **Move beyond site-level assessments**. Much important information is relevant to system-level assessments and these are becoming more frequent. The combination of site- and system-level assessments can provide a solid basis for improvement of an entire protected area network in a country (F. Leverington et al., 2010).

Monitoring and Improving

17. **Repeat the assessment.** The global PAME targets identify thresholds for implementation of evaluations. However, they don't make clear that PAME is intended to be a repeated measures initiative designed to track progress and trends over time. Sites and networks planning to implement PAME should aim to conduct regular, repeat assessments on agreed upon intervals (i.e., three to give years) although the time interval will vary depending on site conditions and also on the tools used. Some elements will need more frequent repeated measure but others may only be adjusted if a significant element changes. The Canadian PAME pilot project in Alberta tentatively identified that each of the pre-evaluation assessment elements (values, design risks and threats) could be updated on a different frequency (i.e., more often than the evaluation itself), depending on the nature of the data. Ideally PAME assessment needs and timing should be built into existing annual planning processes.

18. **Integrate and institutionalize.** Although initial application of PAME is likely a stand-alone initiative, ideally the PAME process needs to be integrated with existing processes (i.e., part of management plan review) within an effective management cycle, and linked to defined values, objectives and policies as well as existing budget processes. The implementation of necessary changes often rests on the capacity of the evaluating jurisdictional organizations to influence funding and policy and communicating the results of evaluation and the progress made to improve management can help drive further support. The Tasmanian Wilderness World

Heritage Area program[20] celebrates successes by using the findings of the evaluations to give recognition to management programs that have been demonstrated to be effective, and to acknowledge the people behind those programs.

19. **Develop and monitor performance indicators.** For each management objective ask 'how would we know if management was working well?' and just as importantly 'how would we know if management was failing?' The answers to these questions assist in developing meaningful statements of key desired outcomes, and suggest the types of performance indicators that should be monitored for evidence of management effectiveness. Use the in-depth knowledge of those with management responsibility and/or expertise in particular fields to assist in identifying appropriate and practical performance indicators and monitoring methodologies. Make sure your indicators are monitoring effectiveness in achieving the key desired outcomes, not just activities or processes.[21]

20. **Prioritize monitoring**. Remember, it's not possible to monitor everything! Prioritize monitoring needs so that they will compete realistically alongside other demands on the total management budget. Start monitoring programs simply, with a core set of essential performance indicators. Expand the program as time and experience dictate. Where possible, integrate monitoring programs for performance indicators into the relevant operational management program.

Reporting

21. **Report on PAME completion.** The Global Database on PAME (GD-PAME) is intended to compile all PAME evaluations throughout the world and can be used to report at national, regional and global levels. The database includes information about the methodologies and indicators used, and records details of individual assessment. Site-level data is not publicly available unless specific approval for this has been granted by the data provider. GD-PAME also reports PAME results under a set of 14 summary headline indicators, standardizing data from a wide range of methodologies. As of 2017 there are 14,297 assessments, carried out in 6,802 protected areas in 72 countries and territories (UNEP-WCMC, 2017). For inclusion, PAs must be included already in the WDPA as a recognized protected area, although this is definition, and consequently the database, is currently been revised to include OECMs. The intent of the GD-PAME is to

- Indicate whether a protected area in the WDPA has been assessed; and
- Indicate whether the protected area's assessment is publicly available.

The fourteen Summary Indicators in GD-PAME
• Values and significance
• Threats and constraints
• Site design and establishment
• Management planning
• Management resources
• Information base
• Internal management systems and processes
• Law enforcement
• Stakeholder relations
• Visitor management
• Achievement of work program
• Conservation outcomes
• Natural and& cultural resource management systems
• Community outcomes

[20] http://www.parks.tas.gov.au/file.aspx?id=39589
[21] http://www.parks.tas.gov.au/file.aspx?id=39589)

The benefits of submitting PAME evaluations include facilitating reporting on indicators for international processes such as the CBD and the IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). Beyond international-level reporting, however, gathering of PAME evaluations into one database can bring together information from multiple jurisdictions within a country or subnational level to identify for example common management challenges, threats and opportunities. This can help prioritize resource allocations, help organizations work across institutional lines and enable adaptive management practices. Standards for data preparation, contributor agreements and other information is provided in the manual (UNEP-WCMC, 2017) or can be requested from protectedareas@unep-wcmc.org. To provide PAME information for a site not currently in the WDPA, contact the protectedareas@unep-wcmc.org

22. **Consider the value of moving from an evaluation system to a certification system.** While assessments can give generalized advice on best practice or where to improve, they do not set standards intended to evaluate a site's management against peer-reviewed best practice. However, there are programs that provide a system of external verification or certification approaches to management effectiveness. Certification moves beyond the peer-based assessments to an external verification tool. To date, the most relevant approach to Canada is the IUCN Green List of Protected and Conserved Area (Green List[22]), which applies to both protected areas and OECMs. The overarching intent of the Green List and globally applicable Standard is to "increase the number of protected and conserved areas that are effectively and equitably managed and deliver conservation outcomes" ("IUCN Green List," 2016). Underlying objectives include: the provision of a measure for strengthening conservation outcomes and improving management; providing a channel for conservation capacity development; and promoting collaboration and investment in committed areas. The IUCN Green List Standard identifies a suite of components, criteria and indicators for successful conservation in protected areas that serve as a benchmark for assessment. Protected or conserved areas that are committed to the Standard clearly demonstrate and maintain performance and deliver real nature conservation results.

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[22] https://www.iucn.org/theme/protected-areas/our-work/iucn-green-list

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