Appendix on Protected and Conserved Area (PCA) Management Effectiveness

Updated: May 27, 2025

Introduction

Who is this for:

- The target audience is TNC staff who are working on area-based conservation for freshwater, including staff directly involved in conservation planning and Monitoring, Evaluation, and Learning (MEL).

How can it be used:

- Please read Chapter 6 of the 2024 IUCN World Commission on Protected Areas (WCPA) technical report on *Designing and Managing Protected and Conserved Areas to Support Inland Water Ecosystems and Biodiversity* (hereafter IUCN WCPA inland waters report) first. The report can be downloaded here: https://portals.iucn.org/library/node/51774).
- The purpose of this appendix document is to complement content in the 2024 IUCN WCPA inland waters report, and to provide additional context on terminologies and definitions (including what "management effectiveness" means, whether it is a synonym to "conservation effectiveness", existing frameworks, how does it link to conservation planning and/or MEL, etc.).
- This should only be used as a reference point to initiate discussion and planning around measuring management effectiveness. This appendix does not prescribe any tool or framework.
- Readers should reach out to TNC's Global Durable Freshwater Protection (DFP) team as needed for additional information and support.

What's the take-home:

- Protected and conserved area (PCA) management effectiveness is defined as the degree to which area-based conservation is successful in achieving clearly defined conservation objectives and delivering intended positive and long-term biodiversity conservation and social outcomes.
- The core components of measuring PCA management effectiveness are built upon the same core components of conservation planning (including MEL). Management effectiveness is integral to any conservation initiative and should not be seen as a separate element or an afterthought.
- Assessment of PCA management effectiveness should encompass the following key components of PCA management: (1) design (including context and planning), (2) adequacy and appropriateness of management (including management actions, systems and processes) and (3) delivery of PCA objectives and conservation outcomes (outputs and outcomes).
- Several frameworks and tools have been developed to assess PCA management effectiveness, including the Protected Area Management Effectiveness (PAME) framework, Management effectiveness tracking tool (METT) and IUCN Green List of Protected and Conserved Areas Standard.
- The integrity of freshwater ecological systems within PCAs is not only influenced by management actions within the PCAs but also results from the condition of the catchments that contribute flows to the PCAs. If stresses or threats originating outside PCAs are not sufficiently addressed, the potential effectiveness of management actions inside the PCA on freshwater ecosystems can be limited. It is therefore imperative to evaluate potential threats beyond PCA boundaries that could undermine freshwater conservation outcomes. Management of freshwater ecosystems in PCAs to deliver conservation outcomes depends on effective and sufficient management within PCAs as well as addressing and/or mitigating disturbances across the wider catchments.

Definitions

In the context of area-based conservation, "management effectiveness" focuses on the effectiveness of protected and conserved areas (including protected areas and other area-based measures (OECMs)) to achieve its conservation goals. Bullet points 1-4 summarize common definitions of management effectiveness from select sources. Bullet points 5 and 6 complement the definitions with a few additional considerations.

1. **Protected area management effectiveness (PAME) framework**
   The definition of PAME is well established, with multiple tools and methods developed. For example, a TNC guide on PAME described "*protected area management effectiveness is the degree to which protected area management protects biological and cultural resources, and achieves the goals and objectives for which the protected area was established. Protected area management effectiveness assessments have been conducted in over 75 countries worldwide. There are dozens of different methodologies, and they vary considerably in their scale, depth, duration and data collection methods.*" (from TNC (n.d.))

   IUCN WCPA published a framework on management effectiveness in 2006 to guide assessment methodologies. Central to the IUCN WCPA PAME framework is that PCA management follows a cyclical process as precursor for assessing management effectiveness (Hockings 2003; Hockings et al. 2006):

   - It begins with understanding the **context** of the PCA, by assessing such factors as the ecological and socio-economic importance of the site, threats, stakeholders, policies and political environment, etc.,
   - progresses through **planning** to reduce threats and conserve values (often including establishing goals and objectives, developing management plans and annual work plans),
   - allocates resources of time, equipment, staff and finance (**inputs**),
   - implements management actions (**processes**), and
   - produces **outputs**, typically identified in the management plan or work plan,
   - resulting in impacts or **outcomes** in terms of nature conservation benefits, ecosystem services and social benefits.

   These components can be grouped into three main themes of PCA management: (1) **design** issues relating to individual PCA and PCA networks/systems (covering context and planning); (2) **adequacy and appropriateness** of management systems and processes (covering inputs and processes); and (3) **delivery** of PCA objectives including conservation of values (covering outputs and outcomes) (Hockings et al. 2006; Figure 1).

   As a result, management effectiveness assessments should also reflect these three themes of PCA management:

   (1) **Design** – whether the layout of the PCA site or system is adequate for protecting the focal biodiversity features within it;

   (2) **Management adequacy and appropriateness** – whether the systems and processes are adequate for the needs of the site; and

   (3) **Ecological integrity** – whether management is effective in maintaining biodiversity and abating key threats.



Figure 1 PAME framework. Source: Hockings et al. 2006.

"*Management effectiveness assessments [methods] also generally fall into four types: 1) in-depth, evidence-based assessments; 2) comprehensive system-wide peer-based assessments; 3) rapid expert-based scorecard; and 4) categorical assumption-based assessments*";

"*The results of a management effectiveness assessment directly contribute to a [protected area] master plan by identifying: 1) critical management weaknesses; 2) key threats; 3) inappropriate policies; 4) issues for capacity building; 5) management gaps in the protected area network; and 6) financial constraints and needs.*" (from TNC (n.d.))

To summarize, within the PAME framework, the assessment of the three main themes of management, using qualitative and quantitative methods, will help answer three main sets of questions:

- Were management actions implemented as planned?
- Did actions lead to expected results?
- What other factors may have influenced results, and were there any unintended consequences?

This information, in turn, will inform adaptive management of a PA.

The 2024 IUCN WCPA inland waters report includes a whole chapter (Chapter 6) discussing management plan development and management effectiveness. It also includes discussion on the application of WCPA's PAME framework in OECMs. See full IUCN WCPA Technical Report here: https://portals.iucn.org/library/node/51774

Other resource: Global Database on Protected Area Management Effectiveness: https://www.protectedplanet.net/en/thematic-areas/protected-areas-management-effectiveness-pame?tab=About+%26+Manuals

2. Management effectiveness in the Global Biodiversity Framework

In the Global Biodiversity Framework (GBF), adopted by Parties to the Convention on Biological Diversity in 2022, Target 3 (the "30x30" target),[1] "**effectively conserved and managed**" is a key element of how Target 3 should be implemented.

[1] GBF Target 3: Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively

A guide on Target 3 implementation (WWF and IUCN WCPA 2023) defines management and conservation effectiveness as:

"*In terms of conservation effectiveness this is usually related to achieving clearly defined conservation objectives, which in turn should be driven by the intended outcomes. All forms of effective area-based conservation need to demonstrate and deliver positive and sustained long-term conservation outcomes either related to specific conservation goals and objectives for protected areas, or as a result of other goals and objectives. Effective conservation of systems and sites results in flourishing biodiversity and positive sociocultural outcomes in the landscape and seascape. To be effective, sites should represent areas of biodiversity importance, be connected, have effective management and equitable governance, i.e., all the elements of GBF Target 3.* ***Success is based around assessing how effectively objectives have been met.*** *These might be planned conservation targets, or the result of traditional values, or be recognized later in the case of OECMs.* ***Such objectives will therefore be culturally or contextually distinct but must ensure conservation effectiveness to meet the GBF.*** *Management effectiveness evaluation is a tool for adaptive management that needs to include a focus on conservation outcomes. It does not necessarily require the same approach as measuring progress against global targets*".

Building on PAME framework (Hockings et al. 2006), this guide also emphasizes that "*effective management is based on the* ***adequacy and appropriateness of resources and processes*** *to enable positive and sustained* ***long-term biodiversity (and concomitant social outcomes)****. What is considered effective will vary from site to site, and should be agreed by a participatory process, and influenced by context (e.g., governance, pressures, enabling conditions such as legislation), decisions relating to design and connectivity taken during establishment / recognition and evolving management actions (including inputs/resources and management practices) informed by monitoring and assessment.* ***Specific management processes vary, but global guidance exists in terms of management standards, capacity, competence, assessment and monitoring****; all of which should contribute to management that is adaptive, inclusive and transparent*". (WWF and IUCN WCPA 2023)

Other resources: Additional resources shared in the WWF and IUCN WCPA 2023 report and website: https://www.30x30.solutions/effectively-conserved-and-managed/

3. IUCN Green List of Protected and Conserved Areas Standard

The IUCN Green List of Protected and Conserved Areas Standard (hereafter Green List Standard) describes 17 criteria categorized under 4 components (see Figure 2), accompanied by 50 indicators, that define successful conservation in PCAs. The Green List Standard aims to provide a suitable measure for strengthening conservation outcomes and improving equitable and effective management of PCAs.

conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognising indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognising and respecting the rights of indigenous peoples and local communities, including over their traditional territories.



Figure 2 Structure of the IUCN Green List Standard. Source: IUCN 2017.

The "Effective Management" component of the Green List Standard includes the following criteria:

(1) Develop and implement a long-term management strategy

(2) Management ecological conditions

(3) Manage within the social and economic context of the site

(4) Manage threats

(5) Effectively and fairly enforce laws and regulations

(6) Manage access, resource use and visitation

(7) Measure success

For each criterion under this component, a set of generic indicators and criteria guidance are developed. These indicators generally focus more on the process of developing PCA management objectives, management plans, and implementation of management strategies and actions. For details on proposed indicators, see https://iucngreenlist.org/standard/components-criteria/#component-3.

It is worth pointing out that Management Effectiveness defined in PAME is broader (see bullet 1 above) and includes other components of the Green List Standards, namely "Sound Design and Planning" and "Successful Conservation Outcomes"; in other words, the "Effective Management" component of the Green List Standards alone is more narrowly associated with the management systems and processes, and should be used in conjunction with other components/criteria/indicators within the Standards to assess conservation outcomes and effectiveness of PCA. The different scope of "management effectiveness" used in various frameworks and confusion that arises from such difference is further described in bullet 4 below.

4. **Conservation effectiveness vs. management effectiveness**

While GBF Target 3 language "effectively conserved and managed" suggests that conservation effectiveness and management effectiveness are not the same, a number of articles and reports have treated these terms as synonyms. For instance, Salafsky et al. (2024) argue that for area-based conservation, "protected and additional conservation areas (PACA) effectiveness", "network or system effectiveness", "management effectiveness", "conservation effectiveness" are all synonyms, defining it as

"*ultimately, an assessment of the degree to which a given area or network/system is delivering on its stated outcomes (aka goals and objectives). In practice and in the shorter term, this assessment can be made against standard components and criteria in a good effectiveness framework*".

"*In the business, planning, and impact evaluation worlds, effectiveness can generally only be assessed in relation to one's desired outcomes (also known as goals and objectives) (Gill et al., 2017; Pressey et al., 2021). In practice, achievement of these outcomes requires achieving certain results, which can then be translated into a set of proxy components and criteria outlined in an effectiveness framework. Therefore, in the context of PACAs, the components of good governance, sound design and planning, and adaptive strategy implementation are necessary—but not sufficient—stepping stones on the pathway to achievement of desired outcomes. The term management effectiveness, although widely adopted, causes some confusion"* (Salafsky et al. 2024).

As described above in bullet point 1, management effectiveness should encompass the three main themes of PCA management – design, adequacy and appropriateness of management, delivery of PCA objectives and conservation outcomes – suggesting that PCA management effectiveness can be treated as synonym to "conservation effectiveness". However, there are also cases (for example, IUCN Green List Standard in bullet 3 above) where "*effective management has been more narrowly associated with the management systems and processes in component 2 (adequacy and appropriateness) above*" (Salafsky et al. 2024), implying that "management effectiveness" focuses more on the implementation of management actions and delivery of management objectives, while "conservation effectiveness" focuses on delivery of conservation outcomes. To address this confusion, IUCN WCPA formed a task force to provide clearer definition and guidance on measuring effectiveness.

In general, it is recommended to review what aspects or themes of a PCA management cycle are being assessed for effectiveness, and adopt a broader approach to assess all major components (as defined in PAME or WWF and IUCN WCPA 2023) if possible.

For freshwater conservation projects implementing actions or strategies other than area-based approaches, the term "conservation effectiveness" may be more applicable and relevant. It is important to note that the same guiding principles (design, adequacy and appropriateness of conservation actions, delivery of objectives and conservation outcomes) would apply. For freshwater work internally at TNC, the Freshwater Council, together with the Freshwater Metrics Advisory Group, is developing additional framework and guidance on assessing and reporting conservation effectiveness for freshwater, focusing on the **condition**, **sufficiency, and durability** and freshwater key ecological attributes. For more information about this effort, please reach out to the Freshwater Metrics Advisory Group.

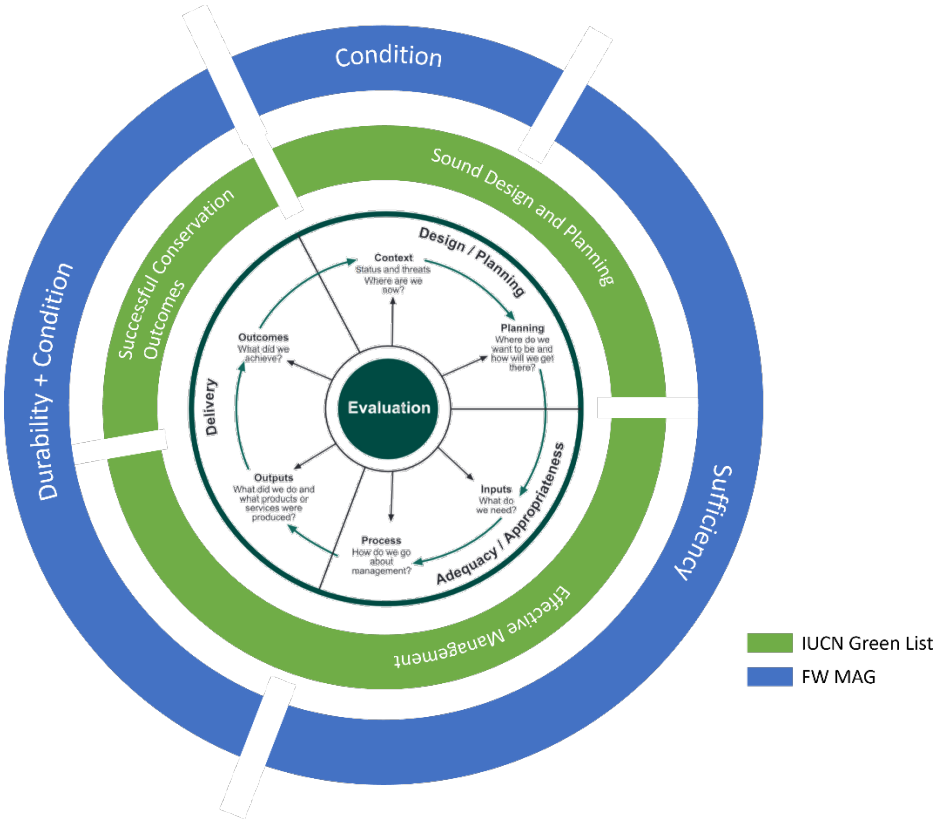


Figure 3 Alignment of components of management or conservation effectiveness between PAME, IUCN Green List Standards, and FW MAG's Condition, Sufficiency, Durability dimensions.

Other resources: Related on-going work led by IUCN: https://www.iucn.org/our-union/commissions/group/iucn-wcpa-defining-and-measuring-conservation-effectiveness-or-outcomes and presentation: Link to Effectiveness Presentation.

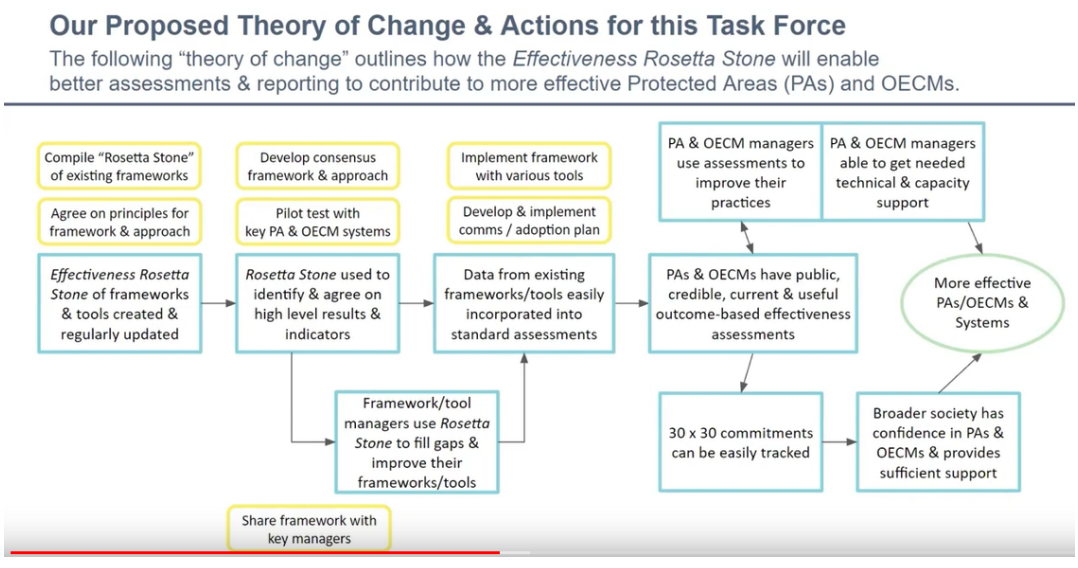


Figure 4 Screenshot from the IUCN conservation effectiveness task force webinar.

5. In freshwater contexts

Following the original PAME framework, in addition to the three main components (design/planning in area-based freshwater conservation, sufficiency of management actions, and delivery of freshwater conservation outcomes/ecological conditions), it is imperative to evaluate potential threats beyond PCA boundaries that could undermine management and conservation outcomes within PCAs (e.g., land conversion in contributing watersheds that changes water quality and quantity in the PCA). The integrity of freshwater ecological systems within PCAs is not only influenced by management actions within the PCAs; it also results from the condition of the catchments that contribute flows to the PCAs. Conversion of lands upstream of PCAs, e.g., from natural habitat to agricultural or urban areas, can increase surface runoff and degrade water quality. Installation of dams and other barriers in rivers upstream can reduce or seasonally eliminate flows. Stream channel alteration for flood control upstream, e.g., through installation of levees or stream channelization, can increase flashiness and exacerbate the impacts of storm events downstream. These external impacts should be taken into account when interpreting monitoring results for freshwater systems within PCAs, to help understand observed trends and to better inform adaptive management responses. Potential upstream changes that may be monitored include the extent and type of land use change; changes in the number of dams and other barriers; volume and seasonality of water withdrawals (e.g., for agriculture); alterations to stream morphology and the extent of levees; and increases in extractive activities (mining, oil), wastewater, or other sources of contamination; among others. While these changes can be monitored directly, stream gauges upstream of PCAs can be an excellent source of data to understand the aggregate impacts of upstream impacts.

While PCAs focusing on terrestrial or marine ecosystems also need to assess and address threats that originate beyond PCA boundaries, it is worth underscoring that for freshwater ecosystems there are particularly challenging and unique complexities given the characteristics of freshwater ecosystems (especially rivers and groundwater systems) and the extent of interconnections between terrestrial and in-stream actions.

6. Site-level vs. country-level

PAME focuses on site-level management effectiveness. Another aspect of management effectiveness, especially in the context of GBF and reporting, focuses on data-gathering on the global/national status of PCAs. Reporting on management effectiveness at a national level requires different types and levels of information and ultimately helps inform different types of decisions, compared to individual PCA level assessment and reporting. Current guidance on indicators of the monitoring framework of GBF describes that "*the 'effectively conserved and managed' element of Target 3 can be assessed by disaggregating protected area and OECM coverage using data on management effectiveness, governance quality, conservation outcomes, and the quality of design and planning to group protected areas and OECMs according to their level of effectiveness or change in effectiveness over time. A methodology for disaggregating the indicator in this way at the global level, building on the existing Global Database on Protected Area Management Effectiveness (GD-PAME),* ***is in development.***"

For management effectiveness evaluation beyond PCA boundaries and at the national level, it is useful to consider applying spatial analysis methods to assess freshwater ecological integrity, threats to freshwater ecosystems and key ecological attributes, etc., as described in the Freshwater Spatial Planning Guidance or other related studies (e.g. Kuehne et al. 2023 on river health monitoring, Freshwater Health Index), to complement site-level assessments.

In the future, the TNC Global DFP team is planning to develop additional guidance on how to evaluate PCA management and conservation effectiveness for freshwater at the national and global level. For more information, contact the DFP team.

Other resources: Global Database on Protected Area Management Effectiveness: https://www.protectedplanet.net/en/thematic-areas/protected-areas-management-effectiveness-pame?tab=About+%26+Manuals

Connection to conservation planning and MEL

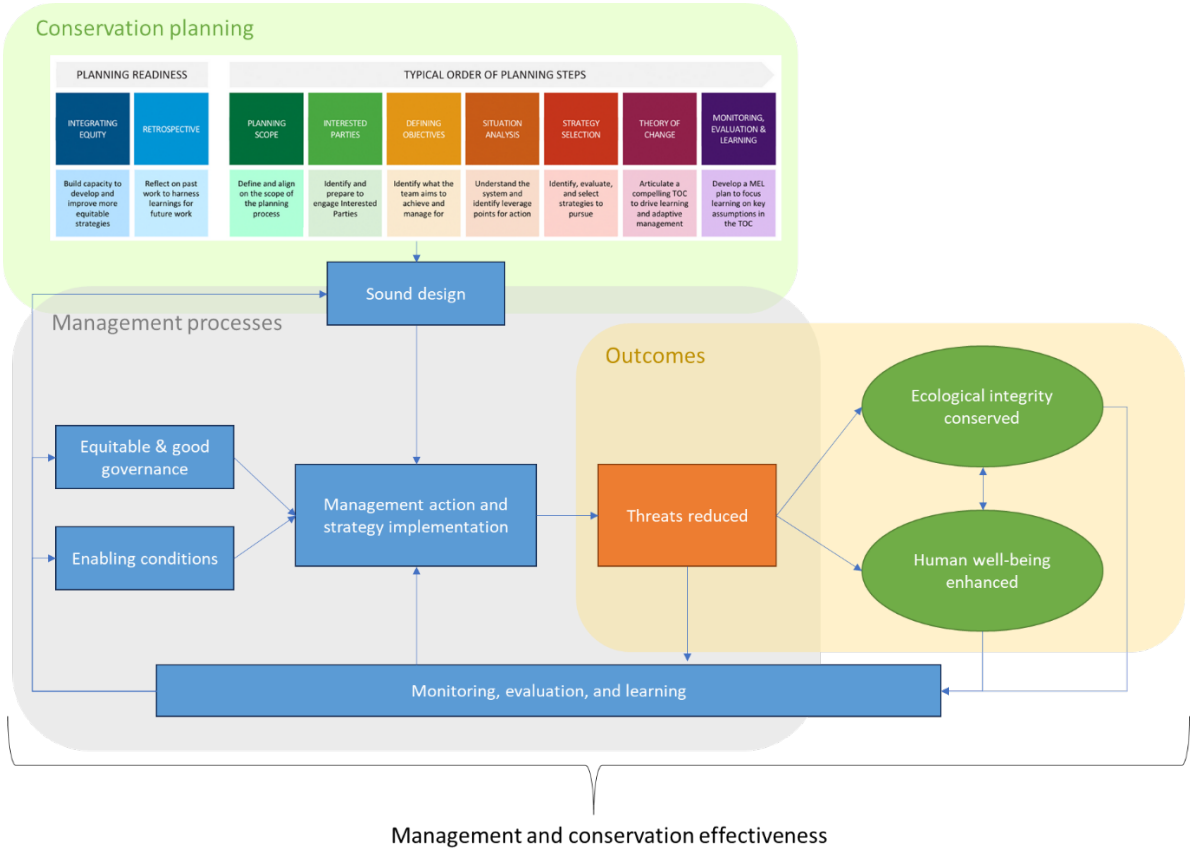


Figure 5 Simplified chart illustrating what management effectiveness assessment should cover in theory, and its connection to conservation planning and MEL. Figure for conservation planning adapted from Conservation by Design modules.

Monitoring, evaluation, and learning (MEL) summarizes the overall process of data collection, management, analyses, and adaptive management. Depending on different purposes of monitoring, four types of monitoring commonly exist in conservation programs: (1) trend monitoring (tracking the changes in condition or status of habitat or biodiversity), (2) implementation monitoring (tracking completion of management actions), (3) effectiveness or impact monitoring (assessing whether management action(s) is effective in delivering desired conservation outcomes), and (4) basic research (collecting data to advance fundamental science) (DFP MEL guidance 2024). Management effectiveness assessment or evaluation, by definition, is one type of monitoring that seeks to answer a set of specific monitoring questions. Data collected and analyzed through the MEL process is fundamental to assessing management effectiveness.

For a given protected and conserved area, a MEL plan should be developed as part of the PCA management plan. A good MEL plan, predicated on sound conservation and management planning, should capture all six elements of the management cycle described in the PAME framework and reflect all three main themes of PCA management. At its core, management effectiveness seeks to answer the same sets of questions as project-level

MEL: (1) were management actions implemented as planned? (2) did actions lead to expected results? (3) what other factors may have influenced results, and were there any unintended consequences? This information, in turn, will inform adaptive management of the PCA (or other conservation strategy). The core components of measuring/evaluating management effectiveness are built upon the same core components of conservation planning (including MEL). Management effectiveness is integral to any conservation initiative and should not be seen as a separate element or an afterthought.

Therefore, it is strongly recommended to consider management and conservation effectiveness in combination with Freshwater Conservation Planning (note: new guidance is being developed as part of Conservation by Design and will be available soon) and DFP MEL guidance. Additional information on the connection between conservation planning, monitoring, and management effectiveness is described in the IUCN WCPA inland waters report (https://portals.iucn.org/library/node/51774).

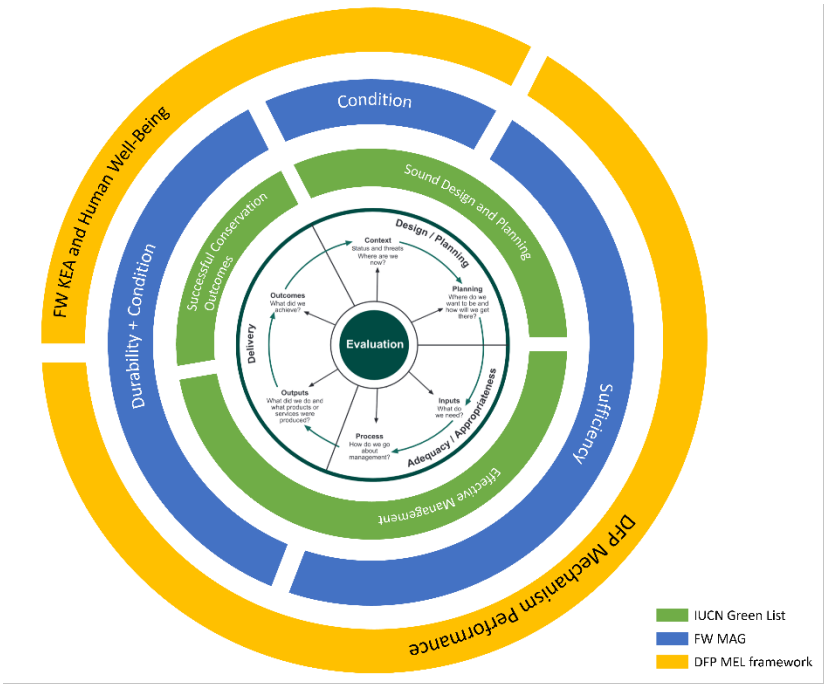


Figure 6 Alignment of components of management or conservation effectiveness between (1) PAME (central in this figure), (2) IUCN Green List Standards (green ring), (3) FW MAG's Condition, Sufficiency, Durability dimensions (blue ring), and (4) DFP MEL guidance (yellow ring).

Example tools

- **Management Effectiveness Tracking Tool (METT)**: METT is one of the two most widely used/adapted globally applicable generic systems developed to track and monitor progress towards worldwide protected area management effectiveness. The methodology is a rapid assessment based on a scorecard questionnaire. The scorecard includes all six elements of management identified in the PAME framework (context, planning, inputs, process, outputs and outcomes), but has an emphasis on context, planning, inputs and processes. It is basic and simple to use and provides a mechanism for monitoring progress towards more effective management over time. The most recent edition was released in 2021 (METT-4). For more information, see https://www.protectedplanet.net/en/thematic-areas/protected-areas-management-effectiveness-pame?tab=METT
- **Ramsar Site Management Effectiveness Tracking Tool (R-METT)**: R-METT is a voluntary self-assessment tool for evaluating the management effectiveness of Ramsar Sites and other wetlands. It is a Ramsar-adapted version of the METT and contains a set of questions (similar to METT) grouped into the

following sections: (1) Contextual information, (2) Identifying and describing values from the Ecological Character Description and the Ramsar information Sheet, (3) National and international designations, (4) Ramsar sites threats, and (5) assessment form. For more information, see https://www.ramsar.org/sites/default/files/documents/library/guide_r-mett_e.pdf

- **Integrated Management Effectiveness Tool (IMET)**: IMET is a quantitative PAME tool that collects data, supports digitization of PCAs and assesses management effectiveness. It identifies management strengths, constraints, and weaknesses of PCA management, and also allows undertaking easy comparison of variation in PCA management effectiveness over time, as well as analyses of PCA networks at a landscape or country/regional level. The tool is structured into 3 main modules, closely interlinked: (1) Context of intervention, (2) Management Effectiveness, (3) Analysis Report. In 2024, IMET made available a new module focusing on conserved areas (IMET conserved areas tool), to support management effectiveness assessment in community areas such as OECMs, Locally-Managed Marine Areas (LMMAs), Indigenous and Community Conserved Areas (ICCAs), community forests and in buffer areas of Protected Areas. For more information, see https://biopama.org/service/assessment-tools-and-their-application/ and https://rris.biopama.org/node/18795
- **IUCN Green List Standards**: See bullet 3 and https://iucngreenlist.org/

For additional example tools and appraisal on their strengths, weaknesses, and application in freshwater contexts, please refer to Table 6.5 of the 2024 IUCN WCPA inland waters report.

Key References

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