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World Heritage Marine Sites

Managing effectively the world's most iconic Marine Protected Areas

BEST PRACTICE GUIDE

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Author
Fanny Douvere, Marine Programme, UNESCO World Heritage Centre

Editor
Tory Read

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World Heritage Marine Sites

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BEST PRACTICE GUIDE

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Foreword

At the 2010 Conference of Parties to the Convention on Biological Diversity, nations agreed to increase the coverage of protected areas around the world to improve the conservation of areas of particular importance for biodiversity and ecosystem services. Under Aichi Target 11, by 2020 at least 10 percent of coastal and marine areas—especially those of high importance to biodiversity and ecosystem services—is required to be conserved through effective, equitable management that includes area-based conservation measures that are integrated into the wider seascape.

The 1972 World Heritage Convention unites nations behind a shared commitment to preserve the world's outstanding heritage for the benefit of the present and future generations. It recognizes that the protection of these exceptional places is the duty of the international community as a whole, and it ensures that the preservation of these special sites becomes a shared responsibility, while fully respecting the sovereignty of States. Over its 40-year history, the World Heritage Convention has recognised over 1,000 cultural and natural treasures considered of Outstanding Universal Value (OUV). Their disappearance would be an irreversible loss to humanity.

The UNESCO World Heritage List includes 47 ocean places—distributed across 36 countries—recognized for their unique marine biodiversity, singular ecosystem, unique geological processes or incomparable beauty. World Heritage marine sites comprise some of the most iconic ocean places on earth such as the Great Barrier Reef in Australia, the Galápagos Islands in Ecuador, and Banc d'Arguin National Park in Mauritania. Together, these 47 sites cover nearly 20 percent by surface area of all existing marine protected areas (MPAs).

Since the first listing of a marine site on the UNESCO World Heritage List in 1978, World Heritage marine sites have seen many conservation successes:

- In Mexico, skilled use of the Convention helped local stakeholders in the Whale Sanctuary of El Vizcaino prevent commercial salt factories from disrupting the last pristine reproduction lagoon for the Pacific grey whale;
- In South Africa, the listing of iSimangaliso Wetland Park helped transform one of the country's poorest regions into a prosperous, job-generating community engaged in managing the wildlife-rich wetlands;
- In Seychelles, Aldabra Atoll has seen its green turtle population go from near extinction to one of the largest on earth.

These successes are just a few examples of how strategic use of the World Heritage Convention, wise government action, the skilled work of site managers, and support from experts, advocates and donors can yield rich dividends for conservation. In each example, the World Heritage Convention has played a crucial role in ensuring that local conservation problems receive international attention when stressors impact on the exceptional values that make up a site's World Heritage status.

Although it stands to reason that these flagship MPAs should be well protected and subject to the best available management practices, the reality is more complex. While many sites produce ample conservation successes, and their management of multiple-use areas serves as a gold standard, others need to improve management effectiveness. Furthermore, none of them are immune to the effects of accelerating ocean industrialization, increasing pressure for coastal development or the serious impacts of climate change. Few sites fully

appreciate the increasingly dangerous cocktail of cumulative and combined effects that together may trigger fundamental alterations in a site's ecosystem composition. Site managers typically have their hands full with day-to-day management activities and have little time to ponder the impact that today's decisions will have 10 to 20 years into the future. Site managers and partners are constantly facing questions about new development and yet have little time and few tools to help them keep the long-term view in mind. Future planning is crucial if site managers are to successfully answer the question - How much development is too much development?

This guide seeks to help site managers answer management questions today that also safeguard the long-term health and viability of their sites' OUV into the future. It presents step-by-step guidance and brings together best practices and management success stories from many World Heritage marine sites. For individual sites, improving management will help site managers and partners attract funding, improve visitor experience, and provide a guarantee that the OUV for which the property was inscribed will last in perpetuity. Raising the level of management effectiveness in World Heritage marine sites will also position host nations, site managers, and partners as powerful voices in larger debates and initiatives tackling regional and global ocean issues. By sharing this step-by-step process and exemplary success stories, we aim to help other World Heritage marine site managers raise the bar on management effectiveness in their sites. More broadly, we hope that this guide will provide useful information that can spur thinking and inform practice in MPA management worldwide. Because they are so visible, World Heritage marine sites are in a unique position to lead by example, as the global community seeks to improve management in MPAs the world over and achieve the Convention on Biological Diversity's Aichi Target 11 by 2020.

By working together, documenting best practices, delivering effective management and sharing experiences on what works, it becomes possible to accelerate progress towards lasting, effective and sustainable management of these unique areas of the world ocean.

Kishore Rao, Director,
World Heritage Centre

About this guide

What is the purpose of this guide?

This guide is a primer on how to accomplish effective, pro-active management to ensure the long-term conservation and sustainable development of World Heritage marine sites. It also lays the groundwork toward establishing a common standard for effective management and pro-active decision-making for World Heritage marine site managers and site managers in other marine protected areas (MPAs).

There are two critical tools at the heart of the approach presented here. First is **using each site's Outstanding Universal Value (OUV)—as described at the time of inscription of the site on the World Heritage List—as the guiding star at the center of each site's management system.**

A review of World Heritage marine sites reveals that the Statement of OUV is very rarely used for this purpose. Managers often have little or no interpretation of the OUV of their site and insufficient understanding regarding how it can be used as a tangible tool for guiding the site toward a sustainable future. This guide therefore fills a critical gap in the implementation of effective management systems for marine sites and shows, in a step-by-step way, how OUV can help managers and partners organize their work and also facilitate reporting to the World Heritage Committee on the state of conservation of a site.

The concept of OUV can help site managers and partners identify conservation priorities, taking into account both current conditions and future trends and outlooks. For MPAs outside of the World Heritage marine network, site managers will likely have a statement of conservation goals for the site that they can use in lieu of OUV.

The second core tool in the management approach outlined in this guide is a focus on **using area-based tools—such as marine spatial planning (MSP)—to plan for and achieve environmental, social, and economic objectives** in such a way as to ensure that sustainable development is both tangible and operational and safeguards a site's exceptional values.

Future-scenario planning is an important part of effective MSP. Rapid increases in demands for ocean space, growing influxes of tourism, and global effects of climate change make future-oriented, pro-active management a requirement for successful results. Yet, most MPAs do not manage for a desirable future but tend to concentrate reactively on the here and now. This guide helps site managers use area-based tools to understand current conditions and to plan forward towards a clearly defined vision for the site 10 to 20 years in the future.

BOX 1:
What This Guide Offers

1. **A roadmap for pro-active management and decision-making for today and for a planned-for future** – *As opposed to reactive management driven by the issues of the here and now.*
2. **A blueprint for using Outstanding Universal Value (OUV) as a guiding star for management** – *Uniting stakeholders, planners, scientists and conservationists behind agreed-upon conservation goals.*
3. **A set of practices pooled together from World Heritage marine sites** – *Presenting the "how to" along with specific examples.*
4. **A living document that evolves over time** – *Working in conjunction with the World Heritage Marine site managers network, IUCN and others.*

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Who should use this guide?

This guide is primarily intended for professionals responsible for the planning and management of World Heritage marine sites and takes into account the vast spectrum of management and capacity challenges that exist in the current constellation of sites. It assumes that the majority of site managers face situations in which time, finances, human resources, and information are limited.

While the guide is geared toward site managers, it is also useful to the broader conservation community working in these places. The statement of OUV is available to everyone working in World Heritage sites. Additionally, in collaboration with the World Heritage Centre, the International Union for the Conservation of Nature (IUCN) prepares State of Conservation reports that the World Heritage Committee uses to make decisions about sites on the World Heritage List during its yearly meeting. These State of Conservation reports are public documents and are available for use by interested parties. World Heritage Committee decisions are based on official advice in the reports, complemented by information from an array of experts and scientists who have first-hand knowledge about the impacts and conservation challenges of these sites. These decisions reflect the viewpoints of the international community about what needs to be done to ensure the conservation of each site's OUV. All reports are available through the World Heritage Centre website and the application for smart phones and tablets.

Figure 1: World Heritage Committee decisions for 47 World Heritage marine sites available through smartphone and tablet applications.

✎ REMEMBER!

Anybody who is involved in the management of World Heritage marine sites can use this guide as a means to focus efforts and resources where they are most needed. Around the globe, a multitude of agencies and organizations are heavily involved in the conservation of World Heritage sites, and the most successfully managed sites are those that are managed through active partnerships across civil society, national government and regional government, research institutions, and NGOs, many of which bring additional resources to the table.

This guide outlines generic steps towards improving management of World Heritage marine sites and provides links to additional resources that contain more in-depth or specialized guidance for MPA management. Thus, the broader community of conservation planners and managers can also benefit from using the guide.

Because site managers come from a wide range of backgrounds and cultures, the guide is written in plain language, avoiding overly technical terms whenever possible while at the same time ensuring that innovative scientific and ocean conservation concepts such as **ecosystem-based management, marine spatial planning and adaptive management** are embedded throughout the steps. The guide is also written to include both high- and low-cost options to ensure that sites with very limited resources can still apply the basic framework.

Why is this guide needed?

Most professionals responsible for the planning and management of World Heritage marine sites and the resources contained therein usually have scientific or technical training in areas such as ecology, biology, oceanography or engineering. Few have been trained as professional planners and managers. This guide makes a contribution toward filling that gap.

This guide differs from many other MPA management guides in that it incorporates future-scenario planning for multiple-use sites and calls for pro-active management within and beyond the boundaries of the site. In this regard, the work presented here builds on UNESCO's Intergovernmental Oceanographic Commission Marine Spatial Planning Initiative.[1] Both the European Union and the Convention on Biological Diversity – two important drivers for ocean conservation today – have pointed to the need for more tangible guidance, based on practice and actual experience. Such guidance should integrate MPA management into wider seascape environments and adequately link it to land-based and freshwater practices. Developing this capacity is considered a prerequisite for achieving key international biodiversity targets.

1 UNESCO Intergovernmental Oceanographic Commission: http://www.unesco-ioc-marinesp.be/marine_spatial_planning_msp

To address these issues, this guide presents a step-by-step approach for effective management that integrates the latest science and management thinking, directs readers to the best sources for more detailed information, and illustrates concepts with success stories from World Heritage marine sites. It provides an understanding of the diverse skills and expertise a site manager needs to develop and sustain in order to adequately conserve the OUV of their World Heritage site.

This guide offers the added benefit that it can assist States Parties to self-assess whether their management system is consistent with what other World Heritage marine sites have established and what is considered a best practice. States Parties preparing a new nomination can also use the guide to self-assess the management system in their proposed site.

How was this guide developed?

The idea for this guide originated at the first global World Heritage marine site managers' conference, held in Hawaii, United States of America, in December 2010. During the conference, it became clear that not all World Heritage marine site managers had a similar understanding of what an effective management system looks like, and the site managers agreed that they would benefit from comprehensive guidance that included best practice illustrations.

Over the course of the next four years, the World Heritage Marine Programme worked to address site managers' need for more information and cross-site sharing, including a second site managers' meeting in Scandola, France in October 2013. Today, the entire World Heritage marine site managers' community has access to all the management plans and major publications from every site via an interactive web portal that also includes live chat environments where users can interact. A bi-monthly e-newsletter shares stories, the latest news, and relevant funding opportunities across the network.

The best practice examples have come to light through a variety of routes, including information compiled during statutory World Heritage missions; the author's in-depth field visits to over 15 sites during the past five years; site-based training and capacity building initiatives; and from site managers' interactions

with Non-Governmental Organizations (NGOs), scientists, and other interest groups.

The general approach and broad contours of the guide were developed through two intensive working meetings on the Island of Vilm, Germany. The first gathering brought together a small selection of site managers from sites that are often held up as good examples for effective management. The second working meeting brought together a larger selection of sites, with a majority of Spanish-speaking sites represented. Participants discussed an initial draft outline for the guide, and the focus on Spanish-speaking site managers helped to ensure that the language, direction and concepts would translate across languages (see annex 3 for a list of participants).

The draft text of the guide was then refined on the basis of feedback derived from an online consultation. The first draft of the guide was shared with all 47 World Heritage marine site managers and a small group of internationally recognized experts in marine management and World Heritage conservation. Their valuable feedback is integrated in the final version presented here.

How is this guide organized?

The guide is organized in two parts. The first part lays out a step-by-step approach that brings together the various components of an effective management system. It shows in clear terms how the description of a site's OUV can provide the basis from which all management principles, goals, and objectives can be derived.

Throughout the guide, best practice examples illustrate the various steps and tasks. Readers are pointed to notes to remember and are directed to other resources for more detailed information on certain topics. The guide also contains special text boxes where appropriate to direct site managers to specific World Heritage opportunities, obligations, tools, and procedures. These are separated out to ensure that the main text of the guide is maximally useful for MPA managers outside of the World Heritage marine network.

The second part of the guide presents annexes and references, including an overview of the 47 World Heritage marine sites with links to their OUV descriptions and World Heritage Committee decisions.

How to use this guide

There is clearly no "one-model-fits-all" type of best practice, but there are certain steps that all site managers will need to take on their journey to effective management, and this guide lays out these crucial steps. The guide is written in sections that follow the general structure and elements of well known coastal and marine management cycles but focuses on making the OUV of a site central to its management and using area-based conservation tools to make such approach tangible and practical.

You can use the guide in two ways:

You can start at Step 1 (*Where are you today?*) and follow the step-by-step approach all the way through to Step 4 (*What are you achieving?*). This will give you a good understanding of the logical steps for an effective management system that is both pro-active and allows for adaptation based on changing conditions in the site, in the broader surrounding seascape and in the ever-shifting socio-economic realities in our changing world.

Alternatively, you can use the 'at a glance' table of contents to quickly find the parts of the guide that you need most. In this way, you will be able to use the elements most relevant to your specific questions or to where you are in your planning and management cycle.

PART 1

Step-by-step
Best practice guidance
toward effective management

Embarking on a path to effective management entails coming to terms with the present, understanding the trends and outlooks of your site, and taking actions that can lead to a desirable future. It means understanding the unique values that make up your World Heritage designation, the activities taking place in the site, and how management measures respond to local, regional and global threats. Given that financial and human resources are typically limited, it also entails prioritizing action where it is most needed.

Each World Heritage marine site has different needs, varying capacity, and is at a different stage in the management implementation process. Although there is no "one-model-fits-all" when it comes to site management, the process does essentially boil down to addressing four basic questions:[2]

1. WHERE ARE YOU TODAY?
2. WHERE DO YOU WANT TO BE?
3. HOW WILL YOU GET THERE?
4. WHAT ARE YOU ACHIEVING?

Answers to these questions can be drafted on the back of an envelope or planned for meticulously through a multiple-year and all-encompassing stakeholder process. Both have been done all over the world, each with varying degrees of success.

First, it is essential to understand the characteristics that won a site its World Heritage status. **No World Heritage marine site can be conserved properly unless its managers and their teams are clearly aware of the OUV of their site and of the activities that impact upon this value**. It is essential to use this information as the backbone against which all actions are evaluated.

Second, it is important to have a clear understanding what the site should look like in 10 to 20 years. Balancing economic development and conservation is one of the most important issues facing nearly all World Heritage marine sites today. It requires a thorough understanding of the different alternative-use scenarios and their impacts on the marine features that make up a World Heritage site.

Third, it is critical to understand which management actions are needed to achieve the desired future state of a site. Since all human activities take place in space and time, and technology in recent years has revealed what was previously hidden, spatial management measures are becoming increasingly more important. It is also important to understand which incentive-based approaches could encourage resource users and others to change behavior and actively support conservation of OUV and a sustainable future for the site.

Fourth, no site can be managed sustainably over time without embracing change, learning and adapting as you go. Change is inevitable and comes in many forms, including those that are socio-economic, political, and environmental. Management of World Heritage marine sites is not a one-time, all-encompassing task. It is a recurring, adaptive process that requires regular monitoring and evaluation to help ensure that the collective sum of your efforts leads to the desired outcomes.

2 These four questions are a simplification of various well-known MPA management cycles published throughout the MPA literature, including Enhancing our Heritage Toolkit. Hockings M. et al. 2008. Assessing management effectiveness of natural World Heritage sites. World Heritage Papers no. 23.

✎ REMEMBER!

Consider basic questions and take small steps. There is no one-model-fits-all, but effective management does boil down to addressing four essential questions:

1. Where are you today?
2. Where do you want to be?
3. How will you get there?
4. What are you achieving?

Answering these can lead to a pro-active, future-oriented management system that delivers both socio-economic and environmental sustainability on a long-term basis. The OUV should be your guiding star for answering these questions and your benchmark against which to measure your success.

The step-by-step guidance in the following sections addresses each of these four questions in detail, taking into account the latest scientific knowledge and tools for effective MPA management. Many of the steps are illustrated with best practice examples from World Heritage marine sites. Where appropriate, the guide refers to additional resources and further reading. A graphic at the end of the guide shows the entire cycle, including steps and tasks, for easy reference.

Ogasawara Islands, Japan.
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STEP 1

Where are you today?

Shiretoko, Japan.

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Introduction

What outputs should be delivered from this step?

1. Clear goals and objectives derived from your OUV that define what you manage for;
2. An understanding of your *planning boundaries* and your *implementation boundaries*;
3. Spatial and temporal distribution of key features of your OUV and their current condition;
4. Spatial and temporal distribution of human activities that (might) affect the OUV;
5. Assessment of conflicts and opportunities that define where to prioritize management action.

Know what you are managing for

Despite their prestigious status, World Heritage sites are not immune to the increasingly challenging task of ocean conservation, nor are they immune from the often limited management budgets and staff that are typical for most MPAs around the world.

Limited resources require a sharp look at priorities, followed by targeting all actions to where they are most needed. It is essential to figure out exactly what it is you are managing for, including what it is you wish to halt, reverse, or conserve for the future. No World Heritage marine site can be managed effectively without a minimum understanding of the present condition of the site's unique features and the activities affecting them. Making such an assessment can be a daunting and expensive task that can easily take many years and resources to complete.

The following sequence of tasks can help tailor your initiatives:

Task 1:	Use OUV as the guiding star.
Task 2:	Organize the planning process.
Task 3:	Describe the spatial and temporal distribution and current condition of key ecological features.
Task 4:	Describe the spatial and temporal distribution of human activities and their possible impacts.
Task 5:	Assess conflicts and decide what matters most.

These steps can provide you the necessary insights that will enable you to respond efficiently and within a reasonable timeframe to the question, "*Where are you today?*"

TASK 1: Use OUV as the guiding star

The principal goal of all World Heritage marine management is the preservation of the assets for which the site was inscribed on the World Heritage List, collectively known as its **Outstanding Universal Value (OUV)**. The OUV is central to any World Heritage site and serves as the reference point against which the state of conservation of a World Heritage site is monitored and evaluated.

OUV is the benchmark against which the World Heritage Committee makes its decisions to inscribe a site on the UNESCO List of World Heritage in Danger—when the OUV is substantially deteriorating—or to scrap a site from the list all together if the exceptional values are irrevocably lost. The moment a site is inscribed on the World Heritage List, the State Party takes the responsibility to ensure the site's exceptional features will be conserved so they endure through government transitions, and so the OUV is the logical guide for management planning and action.

All too frequently, the OUV is not used to guide management decisions. However, nations have typically spent years defining the exact characteristics that make up a site's uniqueness, including scientific surveys and analyses and extensive stakeholder consultations that are reflected in a site's nomination dossier. This substantial process of defining exactly what requires protection gives World Heritage marine sites a great advantage when setting clear, measurable objectives in comparison to most other MPAs. Not using the OUV for management purposes is a lost opportunity.

Using the OUV description as the foundation to guide management actions allows you to:

1. Gain a concrete understanding of the key features that require protection and derive measurable objectives from them;
2. Focus research and management actions where they are most needed;
3. Identify synergies with others who work in your site (NGOs, charitable foundations, etc.) and coordinate all efforts to maximize efficiency and impact in securing the site's conservation;
4. Define clear spatial scenarios of what your site should look like in the future;
5. Develop your core story and use the World Heritage brand wisely to attract partners and resources that are crucial for ensuring long-term sustainability.

Cocos Island National Park, Costa Rica.
© Jose Alejandro Alvarez / Fundación Amigos de la Isla del Coco

✎ REMEMBER!

The overall goal of any World Heritage site is the conservation of the characteristics that make up the OUV. Legislation and regulations, incentives, spatial planning and zoning, surveillance and monitoring, enforcement and compliance, and resolution of conflicts are all best achieved with specific objectives in mind. You can tease apart your OUV into core elements to identify measurable objectives for your site that can guide all your management actions.

Typically, the OUV statement includes a description of the key features for which your site is recognized as World Heritage. Identifying those key features can serve as the foundation for targeted management objectives.

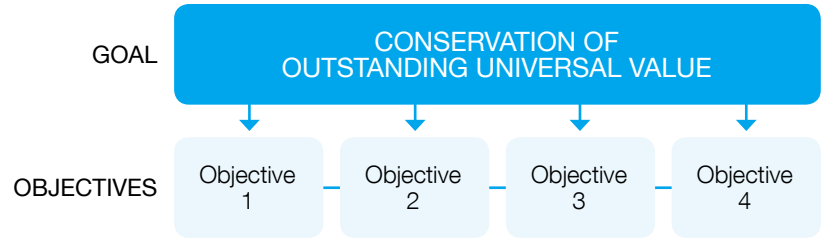
The following steps can get you started identifying the OUV[3]:

1. Locate the OUV statement for your site that was adopted by the World Heritage Committee at inscription or was made retrospectively;[4]
2. Tease apart the statement of OUV to specific key elements (see Box 2);
3. Rephrase the elements of OUV you identified into specific management goals and objectives (see Figure 2 for the correlation of goals and objectives);
4. Scan the list of management objectives to quickly assess how objectives may be complementary to and/or dependent on one another. Also determine if there are objectives that are incompatible. Assessing compatibility or the lack thereof is an important early step for moving toward an effective and robust management system.

In some cases, OUV has been specifically described in detail during the inscription process, and in these cases the inscription provides ample guidance for management that aims to maintain or even enhance the OUV of a site. However, older properties may have somewhat vague statements of OUV, making it more difficult to use the OUV statement as a foundation to develop management objectives. Work is underway to ensure older sites have a retrospective statement of OUV.

Box 2 illustrates how the retrospective statement of OUV for Aldabra Atoll in Seychelles serves as a guiding star for the management of the site.

Figure 2: Correlation between goals and objectives and the link to the OUV.



Source: UNESCO, World Heritage Marine Programme, 2014.

3 This section is based on early work by Jon Day, James Cook University, Australia, that was presented at the second marine World Heritage site managers conference in Scandola, France: http://whc.unesco.org/en/future-marine-world-heritage-2013

4 OUV descriptions and retrospective statements of OUV are available at the World Heritage Centre webpage: http://whc.unesco.org/document/135560

BOX 2:
Using OUV as the guiding star for management in Aldabra Atoll, Seychelles

Aldabra Atoll in Seychelles was inscribed on the UNESCO World Heritage List in 1982 in recognition of its unique marine features, many of which are still largely untouched by human influences. The atoll comprises four large coral islands surrounded by exceptional reef systems. The site also hosts the world's largest population of giant tortoises, serves as a refuge for over 400 endemic species, and is home to one of the world's only two oceanic flamingo populations.

The conservation of the site's OUV has been central to its management. A new management plan is currently being drawn up and will be focused on the site's OUV and the threats posed to its conservation. The retrospective statement of OUV that was officially adopted by the World Heritage Committee in 2010 serves as the basis for this work.

Excerpt Retrospective Statement OUV Aldabra Atoll

Criterion (x): Aldabra provides an outstanding natural laboratory for scientific research and discovery. The atoll constitutes a refuge for over 400 endemic species and subspecies (including vertebrates, invertebrates and plants). These include a population of over 100,000 Aldabra Giant Tortoise. The tortoises are the last survivors of a life form once found on other Indian Ocean islands and Aldabra is now their only remaining habitat. The tortoise population is the largest in the world and is entirely self-sustaining: all the elements of its intricate interrelationship with the natural environment are evident. There are also globally important breeding populations of endangered green turtles, and critically endangered hawksbill turtles are also present. The property is a significant natural habitat for birds, with two recorded endemic species (Aldabra Brush Warbler and Aldabra Drongo)…

Refuge for over 400 endemic species

Over 100,000 Aldabra Giant Tortoise

Globally important breeding populations of endangered green turtles

Excerpts taken directly from the Retrospective Statement of Outstanding Universal Value which can be translated into objectives

Source: UNESCO/World Heritage Marine Programme, 2015.
More information is available at: http://www.sif.sc/index.php?langue=eng&rub=4 or by contacting the Seychelles Islands Foundation: ceo@sif.sc

Aldabra Atoll, Seychelles.
© Imran Ahmad / www.escapeinc.com.sg
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Throughout the MPA literature, characteristics of effective objectives are commonly referred to as 'SMART' (Table 1). This guidance can be used to rephrase the elements of the OUV into specific goals and objectives.

Table 1: SMART objectives.

Specific	Is the objective concrete, detailed, focused, and well defined?	Does the objective define an outcome?
Measurable	Can you measure what you want to do?	Can the objective be expressed as a quantity?
Achievable	Can the objective be attained with a reasonable amount of effort and resources?	Can you get it done? Do you have or can you get the resources to attain the objective?
Relevant	Will this objective lead to a desired goal?	Does sufficient knowledge, authority, and capability exist?
Time-bound	By when will you accomplish the objective?	Are start- and finish-dates clearly defined?

Source: UNESCO, World Heritage Marine Programme, 2014.

One of the key features of the OUV of Aldabra Atoll World Heritage site is the presence of a "globally important breeding population of endangered green turtles *(Chelonia mydas)*". IUCN has identified green turtles as globally endangered. The number of female green turtles nesting annually in 2008 was estimated to be between 3,000-5,000 animals. The continued protection of the 50 nesting beaches around the Aldabra Atoll is thus critical to the long-term survival of the population so that females will return consistently to nest at Aldabra for years to come.

Baseline data have been collected since 1980, before the site was awarded World Heritage status. Due to the strict protection of these nesting beaches over the past 40 years, the reproductive output for the atoll, measured as total number of eggs produced each year, has increased by 500-800%.To continue the recovery of the green turtle population at the Aldabra Atoll World Heritage site, a SMART objective of the management plan could for example be stated as:

"By 2050 all green turtle nesting beaches of the Aldabra Atoll (about 50) continue to be strictly protected so that reproductive output can continue to increase from the 1980 baseline."

✎ REMEMBER!

Putting OUV at the center of your management plan facilitates your World Heritage reporting workload

The statement of OUV is the essential reference point for monitoring and evaluating the State of Conservation of a site. The World Heritage Committee uses it as the benchmark against which they weigh any decision regarding a sites' state of conservation, danger listing or deletion from the World Heritage List. Making OUV the central focus of your management actions from the start will facilitate your World Heritage reporting activities.[5]

5 Further information on OUV, managing natural World Heritage and World Heritage Committee reporting is available at: http://whc.unesco.org/en/managing-natural-world-heritage/

TASK 2: Organize the planning process

Once you have teased apart the OUV into smaller components and have a clear idea of the key features of your site and your management objectives, you are ready to organize the planning process.

To organize the planning process, it is essential to:

1. Define the boundaries for planning;
2. Define the timeframe for planning;
3. Develop a work plan and implementation schedule;
4. Assemble a team with all the essential skills required for the management of your site;
5. Ensure sufficient financial means, at least enough to get started.

2.1 Define Boundaries

The boundaries of your World Heritage marine site are typically defined at the time of inscription on the World Heritage List. For management purposes, however, it is important to recognize two different types of boundaries:

a) Management boundaries;

b) Planning boundaries.

Most of the World Heritage marine sites have clear management boundaries that are specified in the process of inscription on the World Heritage List. These are the administrative boundaries for which a management system with designated authorities and jurisdiction is in place.

However, **the planning boundaries will often not—and do not have to—coincide with the management boundaries.** The boundaries for planning should include all the areas and ecosystem features that contribute to the protection of the OUV of your site. Below are some of the most common reasons for this.

(a) **Ecosystem functioning and processes:** Due to the dynamic nature of the ocean, management boundaries of a World Heritage marine site often do not coincide with the boundaries of a single marine ecosystem. Frequently, a number of ecosystems of varying sizes exist within (and may extend beyond) the designated World Heritage area. It is unlikely that the management boundaries reflect all the influences of natural processes that are external to the designated area, such as larval dispersion, sediment transport, or atmospheric deposition of nutrients, among others. Species might migrate between various sites, or the site might include major spawning grounds for species that travel to other areas after they are born.

Protecting the OUV will not be possible if ecosystem characteristics that are intimately linked to the site are deteriorating or insufficiently protected. In these cases, you should set your planning boundaries broader than your management boundaries. This practice is often referred to as an ecosystem approach to management. Box 3 provides two illustrations of World Heritage marine sites that have planning boundaries that are broader than their management boundaries.

(b) **Human activities:** Human activities that occur outside the boundaries of a World Heritage area often have considerable influence on the exceptional features within the site. For example, coastal runoff from land-based activities often contributes substantially to the deterioration of coral reef systems located within a World Heritage site because of their impact on water quality.

Too often, management efforts are focused exclusively on the activities within the World Heritage area, when in fact a comprehensive, *ecosystem-based approach* is what is required for effective conservation of OUV. You should therefore define the boundaries for planning more broadly than the boundaries for management.

This approach enables you to identify sources of influence that have an effect on your World Heritage site and to identify the related cooperation agreements that you will need to establish with authorities or institutions responsible for those sources of influence.

Banc d'Arguin National Park, Mauritania.
© en Haut! / M. Broquere S. Nancy

BOX 3:
Applying an ecosystem approach when defining boundaries for planning: Two examples

Banc d'Arguin and the Wadden Sea

Banc d'Arguin National Park (BANP), located off the coast of Mauritania in West Africa, and the Wadden Sea, located along the North Sea coasts of the Netherlands, Germany and Denmark, represent two of the most critical points for migratory birds on the East Atlantic Flyway. The Wadden Sea is critical as a staging, molting and wintering area, with on average 10 to 12 million birds passing through it each year. Further south, BANP serves as a resting, feeding and breeding ground.

Both sites understand that their ecosystems are intimately connected and that effective conservation of OUV in the two sites is an interdependent undertaking. Although their management authority is limited to their respective boundaries, their planning must take into account their connectivity. To address this issue strategically, the two sites signed a formal cooperation agreement in early 2014, allowing them to share scientific information and management capacity in a way that can optimize results from their conservation efforts and define joint actions where conditions require it.

Figure 3: Sharing migratory birds among marine World Heritage sites along the East Atlantic Flyway.

Source: Common Wadden Sea Secretariat, Wadden Sea National Parks of Schleswig-Holstein and Lower Saxony, 2014
More information available at: http://www.waddensea-secretariat.org/MoU_Mauritania2014

The Whale Sanctuary of El Vizcaino in Mexico

The Whale Sanctuary of El Vizcaino was listed as World Heritage in 1993 for being the only calving and nursery area for the Eastern Pacific gray whale population. After the whales begin their lives in the lagoons of the World Heritage site, they travel huge distances up north. Conservation of the OUV of El Vizcaino must therefore be considered in relation to conservation success in other areas where the whales travel and reside in the later stages of their lives, and this requires attention when planning for the conservation of OUV in the World Heritage site.

Figure 4: Pacific gray whale migration routes from their calving grounds in Whale Sanctuary of El Vizcaino World Heritage site.

Source: http://visibleearth.nasa.gov/view.php?id=57723.
© NASA Goddard Space Flight Center

2.2 Define a Timeframe

In addition to establishing boundaries, it is essential to define a timeframe for the management of your site. The timeframe should consists of two elements:

1. A **base year** or period to be used as a reference point for identifying "current" conditions of your site;
2. A **target year** or period that defines the period you are planning for and allows you to identify "future" conditions of your site.

Once inscribed on the World Heritage List, a property is required to conserve the features that make up the OUV, so for World Heritage sites, **the base year should correspond with the date of inscription of the site on the World Heritage List**. Step 2 of this guide elaborates further on the target year.

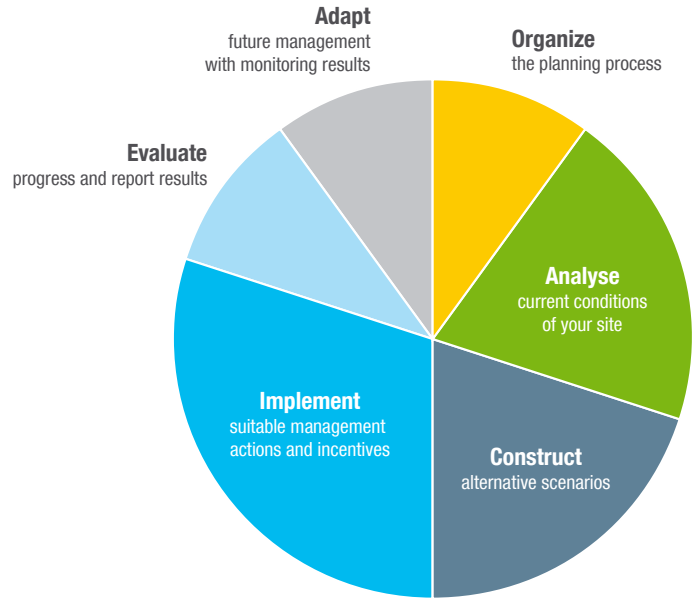
2.3 Develop a work plan and implementation schedule

As is the case with most MPAs around the world, human and financial resources for conservation of World Heritage marine sites are usually limited. Time is also running, so it is important to plan quickly and efficiently and move fairly fast to implementation. Keep in mind, it is only after you have tested a management measure that you will know if it leads to the desired result.

All stages of the management cycle are important, and all require attention to ensure successful conservation of the OUV in your site. You must ensure that your limited budget and human capacity are distributed intelligently across the stages and the various tasks that they require. One way of achieving this is by defining a work plan that specifies which parts of the process should be done by whom, by what time, and at what cost, as well as how the various parts relate to each other.

An important component of the work plan is a schedule that defines the time you want to spend on each step of the management process. Quite often, a considerable amount of time is dedicated to the scientific analysis of current conditions, and little or no time is spent determining what you want your site to look like in the future. And yet, knowing where you are going is as important as knowing where you are right now. Figure 5 is an example of a chart that visualizes the amount of time you might allocate to each step in the management cycle of a World Heritage site. The segments correspond with the sections of this guide. Your time allocation will depend on your specific context.

Figure 5: Illustration of a possible time allocation for the different steps of the planning process.



Source: UNESCO, World Heritage Marine Programme, 2015.

✎ REMEMBER:

Unlike many MPAs, World Heritage marine sites benefit from the fact that typically a considerable amount of time has already been invested in defining the essential characteristics that make up the OUV during the process leading up to the site's inscription on the World Heritage List. This facilitates the task of defining management objectives and setting priorities. In addition, the process has often already revealed basic research needs necessary for adequate decision-making, monitoring, and evaluation of the site. For more recent inscriptions on the World Heritage List, the most urgent management needs are reiterated by the World Heritage Committee at the time of inscription and can assist site managers with prioritizing action where it is most needed.

2.4 Assemble a team with the right skills

The next task in preparing the planning process is to assemble a skilled team. In addition to capacity in science, data, technology, and societal skills, you also need capacity to communicate effectively. Strategic communication raises the visibility of your site and allows you to attract the necessary partners to address the many challenges you face. A clear expression of your site's story and how potential partners might benefit from, as well as contribute to, the site is an important ingredient for establishing successful partnership arrangements with donors and others. Some of the skills you may need to manage your site are summarized in Table 2.

Table 2: Essential skills your team needs to plan and manage your World Heritage marine site

Management steps	Skill types
Where are you today?	Biological/ecological analysis Socio-economic analysis GIS or other spatial analysis Professional stakeholder facilitation Marine spatial planning
Where do you want to be?	Strategic thinking about space/time Trade-off analysis
How will you get there?	Socio-economic analysis Regulatory analysis Strategic communication/education Cumulative impact analysis Negotiation/conflict resolution skills Stakeholder coordination/communication
What are you accomplishing?	Cause-and-effect thinking Effective communication of results

Source: UNESCO, World Heritage Marine Programme, 2014.

Not all of these skills have to be on your payroll. You can obtain some of the skills you need from government agencies or departments or by forming constructive partnerships with the scientific community, non-governmental organizations, the private sector or freelance consultants and experts. A key benefit of World Heritage is that you become part of an active network of sites that hold a reservoir of knowledge and capacity. Box 4 describes the tools available to World Heritage marine site managers.

BOX 4:
Pooling expertise from 47 World Heritage marine sites

Today, 47 marine sites in 36 countries are inscribed on UNESCO's World Heritage List. Despite their varying socio-economic contexts and ecosystem features, they share similar conservation and management challenges, such as climate change, coastal development, fisheries, and marine pollution. Over the past 30 years, many sites have developed solutions to some of these threats, and some of these solutions can be shared and amplified elsewhere.

A central objective of the World Heritage Centre's Marine Programme is to bring together these good management practices and provide the site managers with a platform to communicate with one another, troubleshoot problems, and help each other access the latest knowledge and approaches. This guide is not a stand-alone product but is closely linked to the site managers' network website, bi-monthly newsletters, and daily updates on what is happening in sites across the network.

Figure 6: World Heritage Marine Site managers website and bi-monthly newsletters

More information available at: http://whc.unesco.org/en/marine-programme/ or by contacting the programme at WH-Marine@unesco.org

2.5 Ensure sufficient financing

One of the most common difficulties MPA managers face is insufficient financing for planning, implementation, monitoring/evaluation, and adaptation activities. Despite their prestigious status, World Heritage marine sites are not immune to this problem. World Heritage sites often do attract researchers and generate tourism revenues, but this only rarely translates into sustainable financing to support the long-term management of a site.

While conservation of a World Heritage marine site is ultimately a government responsibility, sites frequently have to rely on alternative financing, including: grants and donations from international and multinational organizations and charitable foundations; partnerships with non-governmental organizations and/or the private sector; or user fees, among others. Each of these financing mechanisms has pros and cons that you must assess, and attracting funds for effective management can be a difficult task.

To some extent, World Heritage sites are in a somewhat advantaged position. Such sites are often the most visible MPAs in national or regional MPA networks and can consequently get prioritized over other areas when funding is allocated. They also often benefit from a higher level of attention from private individuals or charitable foundations. A clear communication strategy that includes a compelling site story and astute use of the World Heritage brand is a prerequisite for success when attracting such funding and partnerships. You will learn more about this in Step 3 of this guide.

Box 5 illustrates how Malpelo Fauna and Flora Sanctuary in Colombia set up a durable financing mechanism through government initiative and matching charitable donations.

BOX 5:

Malpelo Fauna and Flora Endownment Fund: Sustainable funding for over a third of the annual site budget

Malpelo Fauna and Flora Sanctuary, located off the coast of Colombia, achieved World Heritage status in 2006 for being a globally significant area for sharks, giant grouper, and billfish and for providing critical habitat for several threatened marine species.

In 2006, an endowment fund for the site was created, starting with the net revenues accumulated through a United States of America-Colombia agreement in a dept-for-nature swap that was established following the 1992 Rio Earth Summit. An initial capitalization of USD 2.5 million leveraged matching funds from existing charitable foundation funds. In 2009, the first grants were made for the management of Malpelo.

On an annual basis, the site receives on average 36 percent of its management budget from the endowment fund. These revenues cover a substantial part of the core site management costs (including technical and scientific staff to assist with management and scientific expeditions) and are a key factor in leveraging additional resources from other donors. The fund is set up to ensure long-term financial stability and has allowed site managers to move away from having to seek annual financial injections through piece-meal fundraising.

Part of the success for the Malpelo model was initial financial backing from several major charitable foundations, and success would not have been possible without a rigorous method for calculating the real management costs. Estimates were made for structural costs (one-time expenses such as equipment), recurring costs (annual expenses such as maintenance), and future project costs (such as research, surveillance).

Source: Fondo Acción (http://fundacionmalpelo.org/).
For further information contact: José Luis Gomez (joselgomez@fondoaccion.org)

Malpelo Fauna and Flora Sanctuary, Colombia.
© Alex Chernikh / Public Domain

World Heritage marine sites are also often magnets for tourism and regularly host hundreds of thousands of visitors annually who come to enjoy the site on yachts, cruise ships, sail boats, or other means. Box 6 illustrates how World Heritage marine sites have set up successful financing mechanisms through tourism revenues.

For this type of revenue stream to be successful, it is essential to consider the way tourism is managed. The potential for large revenue streams can create pressure on site managers to increase the number of tourism visitors, sometimes exceeding the carrying capacity of the site's OUV. Some World Heritage marine sites have countered this threat by concentrating on attracting high-quality tourism and forming strategic partnerships with "green" tour operators, rather than by simply seeking an overall increase in tourism numbers.

BOX 6:
Financial sustainability through a competitive cruise concession system at Glacier Bay World Heritage site

Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini-Alsek was inscribed on the World Heritage List in 1979. The site spans the border between the United States of America and Canada and encompasses both marine and terrestrial ecosystems.

Most visitors to Glacier Bay arrive aboard cruise ships. To ensure that environmental impacts from tourism are minimized, all vessels – including the cruise ships – that enter Glacier Bay are required to have a permit. The permitting system controls the number and types of vessels, their length of stay, and their activities inside the park.

The number of permits allocated to cruise ships is annually determined by the National Park Service (NPS) and currently is set at 153 permits during the 92-day, June-August season. Permits are generally granted through a competitive bidding system among cruise operators. The NPS issues a concessions 'prospectus' that contains a suite of criteria aimed at preserving the OUV of the site, and includes a dollar fee per passenger. Environmental criteria for prospectors include: (a) air pollution reduction measures such as using gas turbine engines or using low-sulfur fuel while in the park; (b) water quality measures including refraining from discharging wastewater while in the park; and (c) measures to conserve marine mammals, such as a whale avoidance program.

These criteria also include an option to commit to supporting an active Interpretive Program, in which NPS interpreters board the ships and provide lectures and outreach material about the site's natural and cultural history and the World Heritage Value.

A final component of the bidding relates to the amount of the proposed fee-per-passenger and/or other forms of financial consideration to the site's management authorities. The cruise lines with the highest scores on both the environmental criteria and the user fee/financial support commitment to site management receive a concession to enter Glacier Bay for a period of 10 years. The successful system provides about 50 percent of the site's overall management budget while simultaneously enhancing the visibility and conservation of its OUV.

Source: US National Park Service:
http://www.nps.gov/glba/parkmgmt/cruise-ship-prospectus-glba-cs-08.htm

Glacier Bay, United States of America.
© Mark Kelley

✎ REMEMBER:

Sustainable Tourism "How To" Guides

While tourism can lever the necessary financing for a site, it simultaneously is one of the most pressing challenges facing the future of the World Heritage Convention. The World Heritage Centre's Tourism Programme is currently developing a series of "*how to*" guides, based on best-practice approaches to sustainable economic development. They address the following topics:

Guide 1: Understand tourism at your destination

Guide 2: Develop a strategy for progressive change

Guide 3: Develop an effective governance structure

Guide 4: Engage local communities and business

Guide 5: Communicate with visitors

Guide 6: Manage the development of tourism infrastructure

Guide 7: Add value through products, experiences, and services

Guide 8: Manage visitor behavior

Guide 9: Secure funding and investment

Guide 10: Monitor success for sustainable tourism

For more information contact: Peter Debrine, Coordinator, World Heritage Sustainable Tourism Programme: p.debrine@unesco.org

Sites on the World Heritage List also benefit from access to the **World Heritage Fund**, in particular sites that are located in the least developed countries. The World Heritage Fund provides roughly USD 1 million per biennium to support activities in countries that need international assistance for the conservation of their site. The fund assists with three types of requests: (a) conservation and management assistance, which is allocated to works or capacity building activities relevant to the monitoring, conservation, and management of sites; (b) emergency assistance provided to sites in imminent danger due to severe damage from sudden events such as earthquakes, land subsidence, fires, flooding, or man-made disasters; and (c) preparatory assistance to help with the inventories of potential World Heritage sites or the preparation of nomination dossiers. However, the sum is insufficient to cope with the growing needs across sites and a high number of international assistance requests.[6]

Another source of financing is the **Rapid Response Facility**, a small grants programme jointly operated by the UNESCO World Heritage Centre, the United Nations Foundation, and Fauna & Flora International. Its purpose is to mobilizing funds quickly to respond to emergency situations.[7]

Overall, a key to success is having multiple revenue sources and not relying on just one financing mechanism to provide all the funding you need to effectively manage your World Heritage site. Depending on your context, not all types of financing will be equally feasible or relevant. The choice of which financing mechanism(s) to use should be based on a number of considerations, including those that are:[8]

1. *Financial* (Will the revenues generated be worth the cost of setting up a user fee system?);
2. *Legal* (Can the new financing mechanism be established under existing legislation? If not, how feasible is it to create new legislation?);
3. *Administrative* (How difficult will it be to collect, verify, and maintain data upon which a particular user fee or trading system is based?);
4. *Social* (Who will pay? Is there a willingness and capacity to contribute?);
5. *Political* (Is there government support for the alternative financing mechanism and for the purposes it is intended for?);
6. *Environmental* (Will the desire for increases in tourism revenues compromise other site objectives or exceed the carrying capacity of the site?).

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6 For further information: http://whc.unesco.org/en/intassistance/
7 For further information: http://whc.unesco.org/en/activities/578
8 For a list of potential financing mechanisms and revenue sources: Financing Marine Conservation. 2004. Available at: www.panda.org/downloads/marine/fmcnewfinal.pdf and http://depts.washington.edu/mpanews/MPA126.pdf

TASK 3: Understand the spatial and temporal distribution and current condition of key ecological features

Any effective management plan requires that you have an idea of the key features of your site and the activities operating within it. At a minimum, you should be aware of where the key features of your OUV are located and where human activities are taking place. This allows you to identify the compatibilities and conflicts between your OUV features and human activities. For example, it could be that spawning areas critical for the maintenance of the OUV are also areas targeted by recreational or extractive uses. Understanding current conditions of your ecological features as well as their spatial and temporal distribution is the first step toward identifying such conflicts and thus essential in the overall maintenance of your OUV.

The ocean—and by definition World Heritage marine sites—is spatially diverse in terms of patterns of bathymetry, water stratification and movement, living organisms, and effects from human activities. It is also very diverse when time is considered. Some phenomena happen over hours, days or months, while others happen over years, decades or centuries. The complexity of natural processes in World Heritage marine sites and the resulting mosaic patterns in space and time mean that any "one size fits all" management regime that treats the ocean area as uniform is likely to fail. **Successful management of World Heritage marine sites requires that planners and managers understand and work with the sea's diversity in time and space.**[9]

9 Based on conclusions made in: Crowder L. and Norse E. 2008. Essential ecological insights for marine ecosystem-based management and marine spatial planning. Marine Policy. Vol. 32. N. 5. pp. 762-771.

REMEMBER

Keep it simple!

Assessing the current condition of your site can easily become an end in itself – a time-consuming activity that takes attention and resources away from actual implementation. Be strategic and practical. This task and the other tasks discussed in this section do not require expensive research or long timeframes. Make use of the expertise and knowledge already available in your site.

Even though your entire site encompasses the OUV, some areas are more important than others in terms of conservation value. This is true from an environmental perspective as well as from a socio-economic perspective. **Areas within the site will often include places that are ecologically or biologically more important than others because of their:**

1. Uniqueness or rarity;
2. Special importance for the food chain, survival of top predators, nursery and spawning areas;
3. Importance for threatened, endangered or declining species and/or habitats;
4. Vulnerability, fragility, sensitivity or slow recovery;
5. High biological productivity;
6. High ecological or biological diversity;
7. Naturalness or being pristine.

Papahānaumokuākea, United States of America.
© Greg McFall / NOAA

Areas of high ecological or biological importance require special attention because of the high potential for—or more lasting consequences of—harm at that location, as well as for the greater potential for long-term benefits obtained by effective management. More than 50 percent of your World Heritage marine site could be a no-take zone, but if it does not include the most critical areas, it will be of little value to the long-term conservation of your site's OUV.

The most practical way forward is to **map out the various parts of the OUV you teased apart in the previous step**, while paying special attention to the ecosystem features mentioned above. An illustration of how this can be done is taken from Papahānaumokuākea (United States of America) and shown in Box 7.

BOX 7:
Mapping OUV components in Papahānaumokuākea

Papahānaumokuākea (United States of America) was inscribed on the World Heritage List in 2010 for both its natural and cultural values. Much of the site is made up of pelagic and deepwater habitats, with notable features such as seamounts and submerged banks, extensive coral reefs and lagoons, and areas with exceptional high levels of endemism. The area was also recognized for its deep cosmological and traditional significance as an embodiment of the Hawaiian concept of kinship between humans and the natural world.

As part of its *Natural Resources Science Plan 2011-2015*, site managers are mapping out several key components of its OUV and are using these maps to target monitoring and evaluation exercises that over time will provide a comprehensive picture of the trends in the State of Conservation of the site's OUV. Figure 7 and 8 illustrate how the statement of OUV adopted at the time of inscription of the site on the World Heritage List is used to guide and prioritize this work.

Figures 7 and 8: Mapping OUV in Papahānaumokuākea, United States of America.

Description Outstanding Universal Value Papahānaumokuākea (extract)

Criterion (iii): The well preserved heiau shrines on Nihoa and Mokumanamana, and their associated still living traditions are both distinctive to Hawai'i but, positioned within a wider 3,000 year old Pacific/ Polynesian marae-ahu cultural continuum, they can be seen as an exceptional testimony to the strong cultural affiliation between Hawai'i, Tahiti and the Marquesas, resulting from long periods of migration.

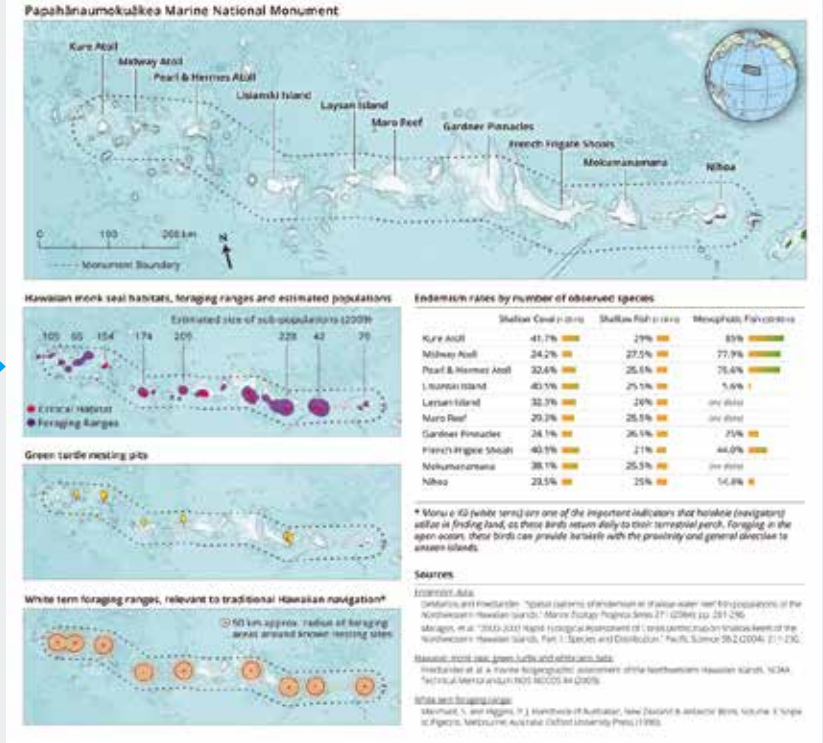
Criterion (vi): The vibrant and persistent beliefs associated with Papahānaumokuākea are of outstanding significance as a key element in Pacific socio-cultural evolutionary patterns of beliefs and provide a profound understanding of the key roles that ancient marae-ahu, such as those found in Raiatea, the 'centre' of Polynesia, once fulfilled. These living traditions of the Hawaiians that celebrate the natural abundance of Papahānaumokuākea and its association with sacred realms of life and death, are directly and tangibly associated with the heiau shrines of Nihoa and Mokumanamana and the pristine islands beyond to the north-west.

Criterion (viii): The property provides an illustrating example of island hotspot progression, formed as a result of a relatively stationary hotspot and stable tectonic plate movement. Comprising a major portion of the world's longest and oldest volcanic chain, the scale, distinctness and linearity of the manifestation of these geological processes in Papahānaumokuākea are unrivalled and have shaped our understanding of plate tectonics and hotspots. The geological values of the property are directly connected to the values in Hawai'i Volcanoes National Park and World Heritage property and jointly present a very significant testimony of hotspot volcanism.

Criterion (ix): The large area of the property encompasses a multitude of habitats, ranging from 4,600 m below sea level to 275 m above sea level, including abyssal areas, seamounts and submerged banks, coral reefs, shallow lagoons, littoral shores, dunes, dry grasslands and shrublands and a hypersaline lake. The size of the archipelago, its biogeographic isolation as well as the distance between islands and atolls has led to distinct and varied habitat types and species assemblages. Papahānaumokuākea constitutes a remarkable example of ongoing evolutionary and bio-geographical processes, as illustrated by its exceptional ecosystems, speciation from single ancestral species, species assemblages and very high degree of marine and terrestrial endemism. For example, a quarter of the nearly 7,000 presently known marine species in the area are endemic. Over a fifth of the fish species are unique to the archipelago while coral species endemism is over 40%. As many species and habitats remain to be studied in detail these numbers are likely to rise. Because of its isolation, scale and high degree of protection the property provides an unrivalled example of reef ecosystems which are still dominated by top predators such as sharks, a feature lost from most other island environments due to human activity.

Criterion (x): The terrestrial and marine habitats of Papahānaumokuākea are crucial for the survival of many endangered or vulnerable species the distributions of which are highly or entirely restricted to the area. This includes the critically endangered Hawaiian Monk Seal, four endemic bird species (Laysan Duck, Laysan Finch, Nihoa Finch and Nihoa Millerbird, and six species of endangered plants such as the Fan Palm. Papahānaumokuākea is a vital feeding, nesting, and nursery habitat for many other species, including seabirds, sea turtles and cetaceans. With 5.5 million sea birds nesting in the monument every year and 14 million residing in it seasonally it is collectively the largest tropical seabird rookery in the world, and includes 99% of the world's Laysan Albatross (vulnerable) and 98% of the world's Black-footed Albatross (endangered). Despite relatively low species diversity compared to many other coral reef environments, the property is thus of very high in situ biodiversity conservation value.

Source: UNESCO, World Heritage Committee, 2010.



Source: Jonathan Geyer / NOAA Office of National Marine Sanctuaries.

Doing a spatial inventory of your OUV allows you to get a more concrete idea of where the critical components that require maintenance are located. It also facilitates your efforts to understand their current condition. Australia's Great Barrier Reef World Heritage area, for example, developed a grading system that allows an understanding of current conditions and trends, benchmarked against the data presented at the time of inscription on the World Heritage List in 1981 (Figures 9 and 10).

Figures 9 and 10: Assessing current conditions of the OUV components (Great Barrier Reef, Australia).

Breakdown SoOUV into small 'components'

No other World Heritage property contains such biodiversity. This diversity, especially the endemic species, means the GBR is of enormous scientific and intrinsic importance, and it also contains a significant number of threatened species. At the time of inscription, the IUCN evaluation stated "… if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen".

Criterion (vii)

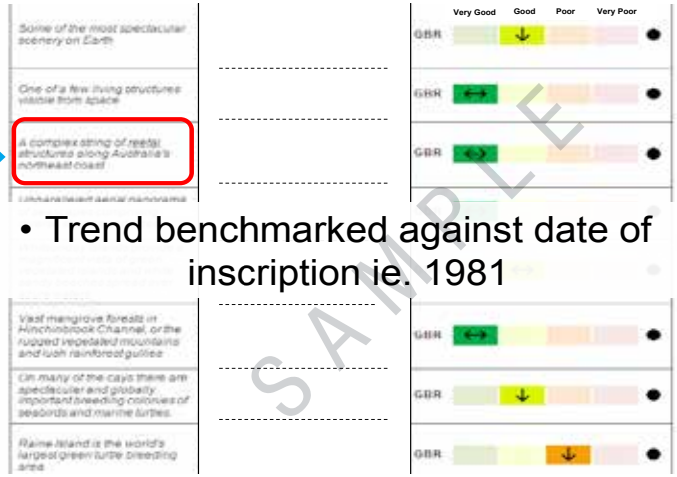
The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast.

From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island.

On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world's largest green turtle breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.

Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes.

Source: UNESCO, World Heritage Centre.



Source: Jon Day, Presentation to the 2nd marine World Heritage Site Managers Conference, Scandola, France (2013).

To keep your spatial inventory and assessment of current conditions doable and within budget limits, it is critical to use information that already exists and then work toward a comprehensive picture incrementally over time. **In most cases, understanding pressures and impacts and identifying priorities is a matter of synthesizing existing information**. Spatial information about the core components and condition of your OUV can come from many sources, including existing scientific literature, direct field measurements, government sources, NGO reports, and local and traditional knowledge. Box 8 gives an example from Tubbataha Reefs Natural Park in the Philippines.

Tubbataha Reefs Natural Park, Philippines.
© T.J. Mueller

BOX 8:
Using local expertise to map location and condition of OUV in Tubbataha Reefs Natural Park (Philippines)

Divers are in a unique position to notice change in underwater environments if they visit the same sites frequently enough. This reality motivated various individuals to initiate, for example, the Saving Philippine Reefs (SPR) diving expeditions – guided tours for divers who want to participate in monitoring changing conditions of coral reefs in the Philippines.

In Tubbataha Reefs Natural Park, one passionate diver regularly visited the World Heritage site with SPR over a 25-year period. During these visits, he made detailed notes of his observations of the top predators and other key species in the site, thereby compiling a reliable record of distribution and trends of some of the site's most important features. Site managers in this World Heritage marine site use this data to understand changing conditions and make adaptive management decisions.

✎ REMEMBER!

Often, databases have already been compiled in the context of university projects or by NGOs who work in your site, but they may be buried in "grey literature" and not readily accessible. World Heritage sites also frequently attract passionate individuals who, through regular visits, have accumulated a wealth of information over time. A rapid, practical approach to collecting information is to bring together scientists, experts, professional photographers, and resource users knowledgeable about your site and ask them to indicate on paper maps where the core features of the site's OUV are located and what condition they are in.

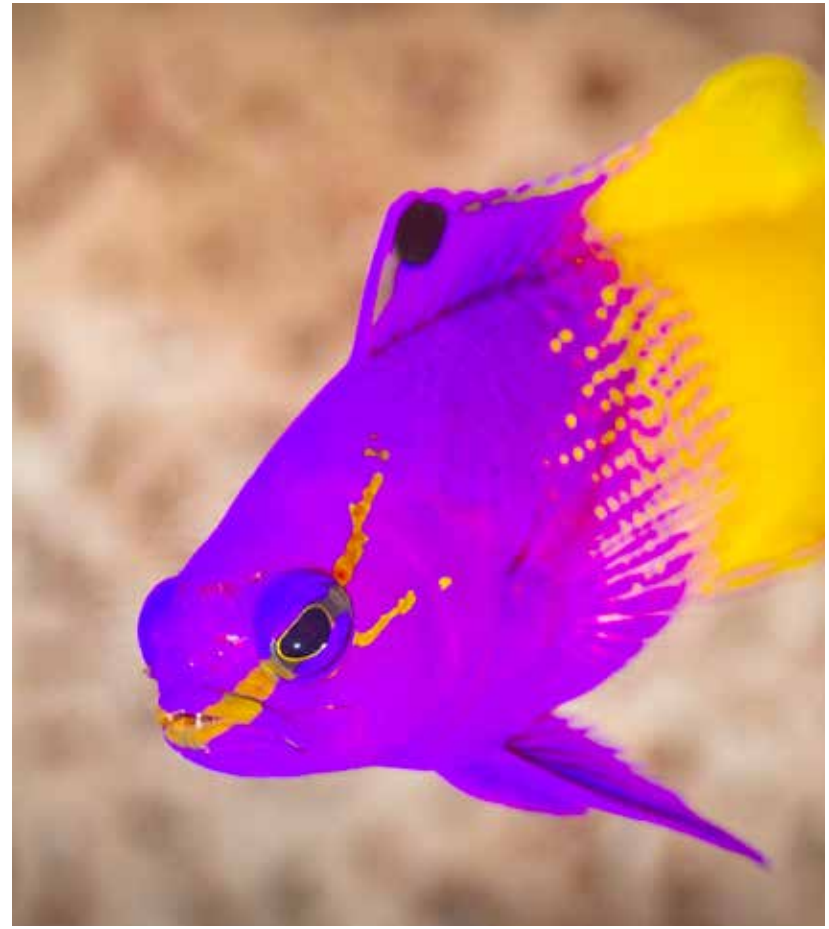
The maps resulting from this process will allow you to determine the locations where your efforts are most needed, and this will pay off in the long run, in particular when it comes to monitoring and evaluating your site's management performance. A general rule is that your spatial map should be up-to-date, objective and reliable. At a minimum, your maps should depict the key features that make up your OUV. Although scientific data assembled in GIS maps are the ideal, keep in mind that other forms of maps can be just as useful.

Glacier Bay, United States of America.
© Mark Kelley

TASK 4: Understand the spatial and temporal distribution of human activities and their possible impacts

Over 70 percent of World Heritage marine sites are multiple use areas and host a range of human activities, including coastal development, fisheries, tourism, and shipping. The frequency and intensity of these activities typically vary over time. For example, tourism or fishing may be limited to just a few months a year. It is imperative to gain an understanding of how such activities impact the site's OUV and in particular its key ecosystem features.

When managed sustainably, human activities can be fully consistent with a site's conservation objectives. Table 3 provides a non-exhaustive overview of some of the most common types of impacts human activities have on the marine environment.



Belize Barrier Reef Reserve System, Belize.

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Table 3: Overview of human activities and their possible impacts on marine ecosystems.

STRESSORS on OUV – Human Activities																							SPATIAL/ TEMPORAL					
Port Construction, including dredging	Port Operations, including dredging	Marine Shipping	Urban Development	Industrial Development	Infrastructure (Cables, Pipelines, etc.)	Artificial Barriers to River Flow (dams)	Coastal Agriculture	Coastal Forestry	Offshore Oil & Gas Operations	Sand & Gravel Mining	Offshore Aquaculture	Commercial Fishing (Bottom Trawling)	Commerical Fishing (Other Gear)	Recreational Fishing	Artisanal Fishing	Hunting	Tourism	Recreation	Military Activities	Climate Change	Ocean Acidification	EFFECTS on OUV	Threat (current/potential)	Trend (increasing, decreasing)	Inside/Outside World Heritage Site	Spatial Scale (small, medium, large)	Temporal Scale (short, mid, long-term)	Impact (low, medium, high)
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Alteration of coastal/marine ecosystems and habitats						
																				■		Altered rainfall/storms						
																				■		Increased flood events						
																				■		Increasing sea and air temperature						
																				■		Increasing weather variability (rainfall/storms)						
																				■		Sea level change						
																	■			■		Changes in salinity						
																				■		Changes in currents/circulation						
									■										■	■		Coastal subsidence						
■	■		■	■	■	■			■	■									■	■		Coastal erosion						
■	■	■	■	■		■	■	■			■								■			Clearing/modifying wetlands, mangroves, seagrasses and other habitats						
■	■	■	■	■			■		■	■	■	■	■	■			■	■	■			Illegal waste disposal						
			■	■													■		■			Coastal point source discharges, including sewage						
			■		■		■	■									■		■			Coastal nonpoint source discharges, including urban and agricultural runoff						
	■		■	■	■	■	■	■									■					Nutrients from watershed/catchment runoff						
	■		■				■	■														Eutrophication and creation of "dead zones"						
																						Sediments from watershed runoff						
							■	■										■				Pesticides and herbicides runoff from watershed/catchment						
							■															Wildlife disturbance, including introduction of domestic animals						
		■										■	■	■	■		■	■	■			Anchoring on corals or other sensitive habitats by vessels						
												■	■	■	■							Discarding of non-target species during fishing						
												■	■	■	■							Extraction of non-target species by fishing, e.g., prawns and sea cucumbers						
												■	■	■	■							Fishing in unprotected fish spawning aggregations						
												■	■	■	■							Extraction of top-order predators by fishing, e.g., sharks						
												■	■	■	■							Illegal fishing or collecting						
												■	■	■	■							Physical impacts of fishing, e.g., by bottom trawling						
												■	■	■	■							Poaching and illegal harvesting of protected species						
																					■	Mortality of shellfish from acidification						
					■	■														■	■	Displacement or migration of fish stocks						
																				■		Increases in fish stocks						
																				■		Collapse of coastal fisheries						
																■		■				Traditional hunting of species of conservation concern						
■	■	■																	■			Chemical spills						
■	■		■	■					■	■									■			Oil Spills						
■	■								■	■									■			Smothering of important habitats, e.g., corals and seagrasses						
		■							■	■								■	■			Noise Pollution						
		■							■	■	■							■	■			Litter/Plastic pollution						
																		■	■			Ingestion or entanglement in marine debris by protected species						
											■											Introduction of exotic species from aquaculture operations						
		■																	■			Introduction of exotic species through vessel ballast water discharges						
		■																	■			Introduction of exotic species through vessel hull fouling						
		■																	■			Waste discharges from vessels. e.g., litter and sewage						
		■																	■			Ship strikes leading to death of species of conservation concern						
		■																	■			Physical damage from grounding of vessels						
																		■				Physical effects of diving and snorkeling						

Source: UNESCO, World Heritage Marine Programme, 2014.

Like the biological phenomena in your site, human activities will vary over space and time. Fishing, for example, will only taken place where fish are present. Port development will typically be located in the most economically viable coastal areas, based on criteria such as cargo load times, maritime transport routes, and port access. Wind energy facilities will only be located in areas with wind.

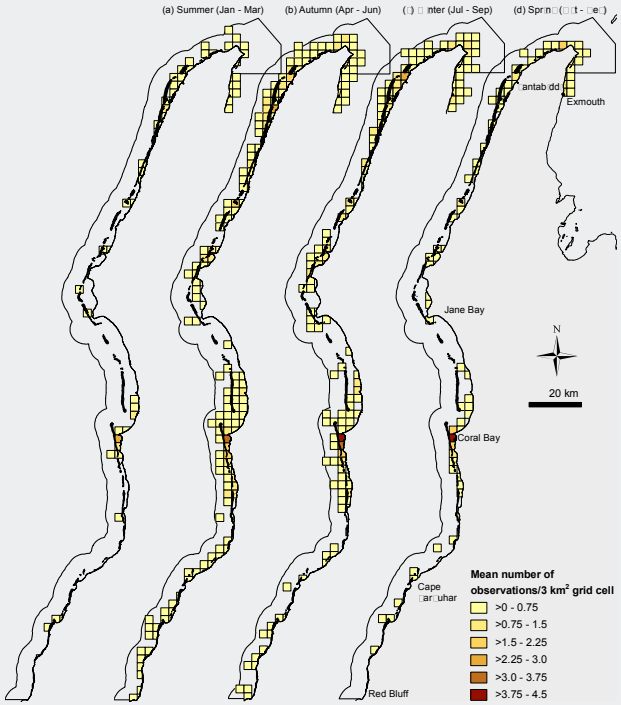
Visualizing the spatial and temporal distribution of human activities occurring in your site is therefore indispensable when setting priorities for conservation of OUV. Box 9 provides an example how human use is mapped in Ningaloo Coast World Heritage site in Australia.

BOX 9:
Mapping human use in Australia's Ningaloo Coast World Heritage site

Ningaloo Coast was inscribed on the World Heritage List in 2011 for its exceptional natural phenomena and biodiversity. The use of Ningaloo Coast is seasonal, with greater numbers of people using the area for recreational activities during the period from April to October. To map this, researchers from Murdoch University developed a set of benchmark data on recreational activities and visitor distribution patterns in Ningaloo over a 12-month period, including regular aerial and shore-based surveys of people and vessels throughout the park.

They also conducted interviews with people engaged in these activities, and researchers identified indicators of use, such as the number of boat-trailers at boat ramps and vehicles adjacent to the site. The initiative resulted in high-resolution maps showing the spatial and temporal distribution of recreational activities in Ningaloo, as well as insights into the demographics of visitors. The data is now being used for conservation planning and will help inform the current revision of the 2005-2015 site management plan.

Figure 11: Spatial and temporal distribution of recreational activities in Ningaloo Coast.



Source: Beckley et al. (2010) Ningaloo Collaboration Cluster: Human use of Ningaloo Marine Park. Ningaloo Collaboration Cluster Final Report No. 2 166 pp.

✎ REMEMBER!

Human activities outside your site can affect the OUV

Not all human activities that might have an impact on your site's OUV occur within the boundaries of your site boundaries. Remember to set your planning boundaries broader than your management boundaries, and compile information about the spatial and temporal distribution of human activities occurring outside your site. This will allow you to identify the institutions – potentially located in other countries or jurisdictions – you need to negotiate and partner with to ensure the long-term conservation of OUV in your site.

International maritime traffic density in the eastern Atlantic, for example, poses potential risks to the conservation of Banc d'Arguin National Park in Mauritania and points to the need for special protection measures under the International Maritime Organization regulation (Figure 12).

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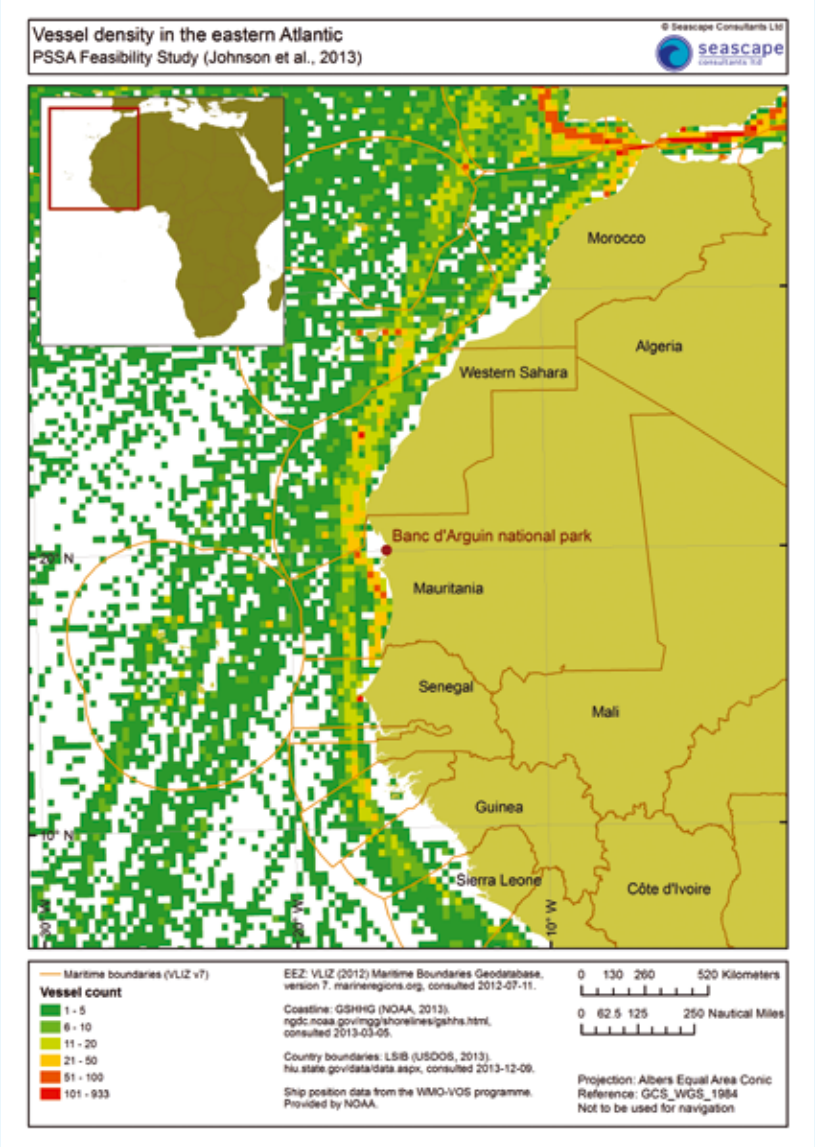
Figure 12: Vessel density in the eastern Atlantic and its possible impacts on Banc d'Arguin National Park.



Source: BANP Feasibility study, Seascape Consultants Ltd, 2013.

In many World Heritage marine sites, local communities are dependent on the resources for their livelihoods. The human dimension of World Heritage sites (and MPAs in general) is therefore important to integrate into decision-making. Ecosystem-based approaches require that we view and manage biophysical resources by understanding processes, connections, spaces, and scales. In the same way, we have to examine the human dimensions through a similar understanding of processes (community and territory), connections (within and across communities and economies), space, time, and scales (local, regional, national, and international). Therefore, an important part of mapping out the spatial and temporal distribution of offshore activities occurring in and around your World Heritage site is their connection to onshore communities.

When socio-economic information is available and integrated, it is often expressed as the presence or absence of particular activities, such as fishing, mineral extraction, dredging, and shipping. Documenting these activities in space and time is important, but you must also document the human dimension. For example, **a human activity map that represents the intensity and distribution of fishing but not the locations and territories of fishing communities misses the socio-economic and legal access dimensions of resource use**. Such a map would also miss the relationship between the location of activity and the onshore communities and economies attached to them. Box 10 illustrates how connections between offshore activities and onshore communities can be visualized and used as a basis for decision-making.

This type of mapping makes it possible to consider who does and does not benefit from various management decisions you make to conserve your site's OUV. Too often, benefits derived from the World Heritage designation do not go to local communities and the institutions that are responsible for, and carry the costs of, the long-term conservation of the site.

Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves, Brazil.

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BOX 10:
Mapping the social landscape of fishers in the Gulf of Maine, United States of America

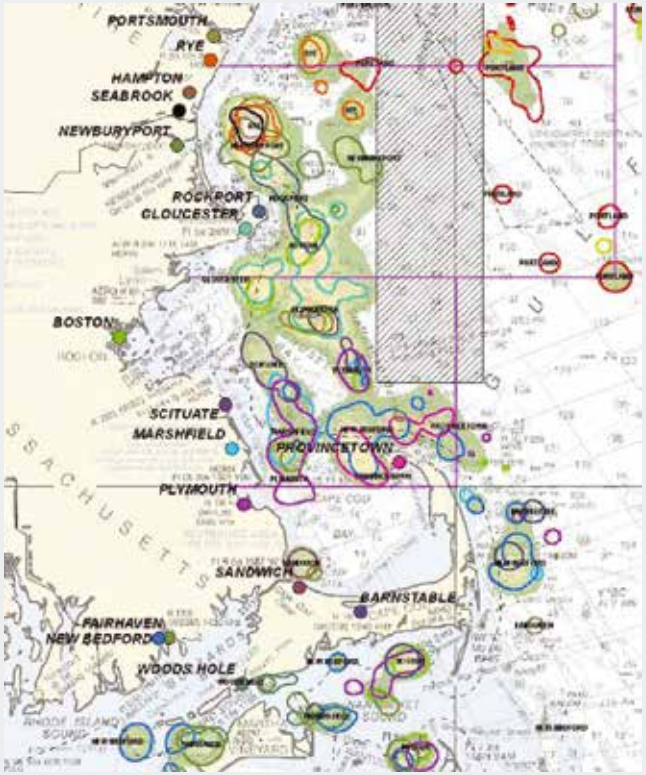
The work of Kevin St Martin, a geographer at Rutgers University in the United States of America, illustrates how the human dimension can be mapped out and used for decision making. Based on local knowledge of fishers in the Gulf of Maine, which is located along the northeastern coast of North America, St. Martin developed maps showing where fishers fish, where they live, who fishes with what gear type, and in which port they land their catch.

The results of this work were reflected in a range of maps that describe the social and economic landscape of the area. These maps improved understanding of the connection between offshore fishing activities and their related human communities and territories and make it possible for site managers to understand which communities would be hit hardest by certain management decisions. The maps also make it possible for political and community leaders to understand the likely impact of proposed management actions on various constituents and enables them to effectively represent their constituents' interests before management decisions are finalized.

A similar initiative has been undertaken in the Islands and Protected Areas of the Gulf of California World Heritage marine site, under the scientific lead of the Scripps Institution.[10]

10 Islands and Protected Areas of the Gulf of California, 2005: http://www.gocmarineprogram.org/index.php/content/Spatio-temporal_Dimensions_of_Fisheries

Figure 13: Mapping the social landscape of fishers in the gulf of Maine (United States of America).



Source: St. Martin, 2008. In Marine spatial planning, UNESCO 2009.

TASK 5: Assess conflicts and decide what matters most

The final task when defining *"where are you today"* is to compare your ecological and human activity maps to determine spatial and temporal overlaps and identify conflicts and compatibilities. If you discover no spatial overlaps, you might not need to adjust management actions.

However, considering that the large majority of World Heritage marine sites are multiple-use areas, even a cursory analysis will indicate potential spatial overlaps between human activities and important ecological features that make up your OUV. In some cases, it can reveal conflicts among different human activities, as well. You may also discover real or potential compatibilities or opportunities, especially when considering that most activities also vary in time. If human uses occur at timings different from the timescales along which ecological process operate, a potential spatial conflict may not arise. A straightforward method for identifying and visualizing conflicts and compatibilities is presented in Box 11.

Economic activities, when managed sustainably, can be compatible with conserving the OUV of a World Heritage marine site. The mapping approaches described above will help you understand which issues must be resolved to achieve this objective. Effective conservation will require that the most important ecological areas be subject to the least human disturbance because of their critical importance to the long-term sustainability of the OUV.

Rock Islands Southern Lagoon, Palau.
© Badi Samaniego / Khaled bin Sultan Living Oceans Foundation

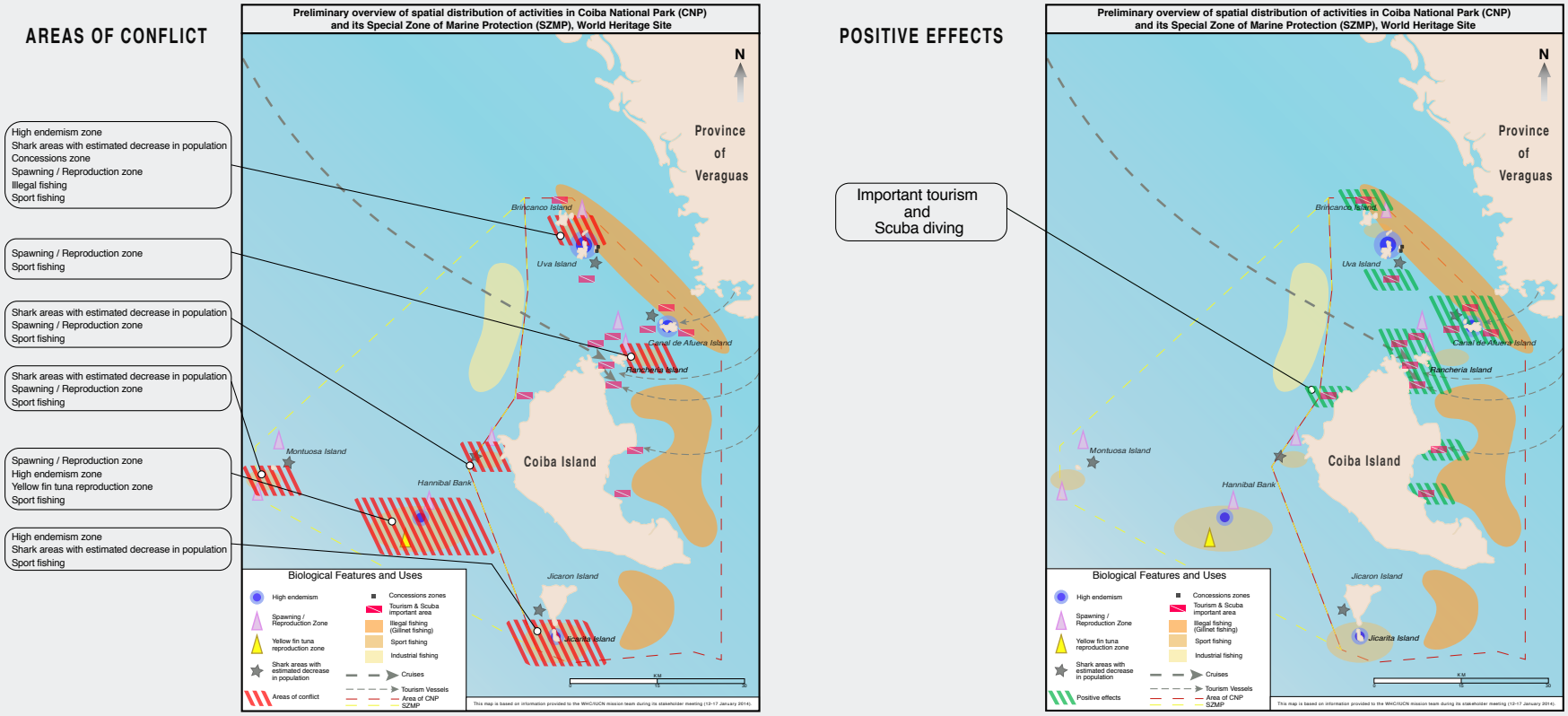
BOX 11:
Identifying conflicts between OUV and human use in Coiba National Park and its Special Zone of Marine Protection

Coiba National Park in Panama was inscribed on UNESCO's World Heritage List in 2005 for its exceptional marine ecosystems and biodiversity. During the reactive monitoring mission in January 2014, IUCN and the World Heritage Centre concluded that illegal fishing and sports fishing threaten some of the site's key ecological areas that make up its OUV.

Environmental data showed that Hannibal Bank, Montuosa Island, and Uva Island are critically important for the spawning and nursing of some of Coiba's top species and are home to some of the highest endemism zones in the World Heritage site. Interviews with stakeholders, however, revealed that Illegal fishing and sports fishing seem to target several of these highly valuable ecological areas, including two of the most important areas for the long-term health of the site's OUV (Figure 14).

Initial reflections on these spatial overlaps enables managers concerned with the site's conservation to focus action on these areas of conflict.

Figure 14: Preliminary overview of spatial distribution of areas of conflicts and positive effects in Coiba National Park and its Special Zone of Marine Protection.



Source: UNESCO/Hugo Blanchet, 2015

An increasingly important aspect of assessing conflicts is the effect of *cumulative impacts*. This term refers to the combined effect on the environment that results from incremental impacts added to other past, present, and future impacts. While a single activity may itself result in a minor impact on your OUV, it may, when combined with other impacts in the same geographic area and over a period of time, result in a significant cumulative impact that could irreversibly alter the composition of your OUV.

The assessment of cumulative impacts in marine environments is still in its early stages. However, it is commonly accepted that rising sea temperatures, acidification, and other effects of climate change might have a "game changing" influence that, especially in heavily degraded or heavily used ecosystems, can irreparably alter the composition and development of ecosystem functioning. Even in World Heritage marine sites with the most advanced and long-standing management capacity, institutions are reportedly not ready to deal with cumulative impacts. A commonly accepted solution is to reduce human activities to secure the resilience of fragile ecosystem features that make up the OUV of a World Heritage site. Box 12 shows Papahānaumokuākea World Heritage site managers' approach to understanding cumulative impacts.

This step has provided practical step-by-step guidance that site managers can use to answer the question, *"Where are you today?"* In the next step, we turn to the question, "Where do you want to be?"

Macquarie Island, Australia.
© Mary Bomford

BOX 12:
Mapping cumulative impacts in Papahānaumokuākea

In 2006, a team of scientists designed a novel index of "ecological vulnerability" that estimated five ways a human activity could adversely impact an ecosystem. These ways included: the area and frequency of impact, the number of species impacted, the biomass lost, and the recovery time following the impact.

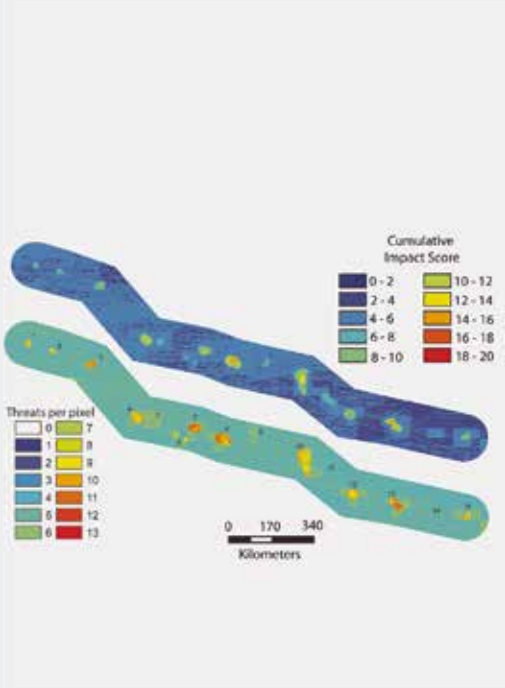
Through interviews with local marine ecology experts who provided estimates for the index for each type of habitat in the World Heritage area (fore reef, pelagic, and soft benthos), it was possible to rank the different threats by their impacts. In a next step, all existing data on the location and intensity of these threats and habitats were collected over a three-month timeframe.

The analysis included spatial data collected over multiple years for alien species occurrences, bottom fishing, lobster trap fishing, ship-based pollution, ship strike risks, marine debris, research diving and equipment installations, research wildlife sacrifice, and several anthropogenic climate change threats such as increases in ultraviolet (UV) radiation, seawater acidification, the number of warm ocean temperature anomalies relevant to disease outbreaks and coral bleaching, and sea level rise. For each pixel on the map, the cumulative impact of human activities was measured. The maps revealed that temperature stress, marine debris, and climate change effects posed the highest risks to the ecosystem and together presented a picture of the cumulative impacts on the site's OUV.

The results of this cumulative impact analysis have informed decisions about granting use permits and have been incorporated into environmental impact assessment processes. The map and associated data are useful tools for comparing threats and habitat sensitivities, for communicating the "big picture" of human influence on marine systems to constituents, and for creating maps for marine spatial planning. When these maps are updated at regular intervals, new uses can be factored in to assess changes in cumulative impacts, so that site managers can set measurable goals to reduce this cumulative impact.

In Figure 15, the top map shows cumulative impact on habitat vulnerability, and the bottom map shows the cumulative human footprint.

Figure 15: Mapping cumulative impacts in Papahānaumokuākea.



Source: University of California, Santa Barbara, 2014.
For further information contact Dr. Kim Selkoe (selkoe@nceas.ucsb.edu)

STEP 2

Where do you want to be?

Cocos Island National Park, Costa Rica.

© Jose Alejandro Alvarez / Fundación Amigos de la Isla del Coco

Introduction

What outputs should be delivered from this step?

1. A trend scenario illustrating what your OUV will look like if present conditions continue without new management interventions;
2. Alternative spatial scenarios illustrating distribution of human activities depending on the objective you prioritize;
3. A desired future for your World Heritage marine site that provides the basis for identifying and selecting management measures.

Moving from reactive to proactive management

Today, the most challenging question posed to World Heritage marine sites is how to balance conservation of the site's irreplaceable values with increasing or shifting demands for socio-economic development and uses. Apart from a few remote sites that are off limits for exploitation due to their geographic location, virtually all World Heritage marine sites around the world are confronted with this challenge.

The large majority of them struggle to respond in a durable and meaningful way. Decisions are often taken ad hoc, frequently in reaction to economic development driven by commercial forces and in a context where governments lack the necessary capacity and understanding to define the so-called "tipping point"—when too much development is just too much—and without a strategic vision of what the site should look like in the future. Given the global significance of World Heritage marine sites, their irreplaceable value for humanity, and the rapid increases in tourism and associated infrastructure developments that often result from such designation, World Heritage marine sites are particularly vulnerable when a clear vision for the future is absent.

For any given site, there are always multiple possible futures. However, few site managers have a pro-active vision of what their site should look like in the future. Typically, a large amount of time and money is invested in understanding the current conditions of the marine environment, but understanding current conditions is just the beginning.

Planning is essentially a future-oriented activity, and creating different possible future scenarios for your site enables you to understand the implications of the decisions you are taking today. Knowing where you are going enables you to steer away from reactive, case-by-case decision making toward an approach in which the sum of all your combined efforts moves you toward your desired future. For all World Heritage marine sites, the desired future reflects a status in which the site's OUV is sustainably conserved and protected.

The purpose of this step is to answer the next important question: *"Where do you want to be?"* The following sequence of tasks can help tailor your initiatives:

Task 1:	Identify current trends and predict the outlook for your site
Task 2:	Develop alternative scenarios for the future of your site
Task 3:	Predict the likely outcomes of each alternative scenario
Task 4:	Select the desired future

TASK 1: Identify current trends and predict the outlook for your site

Forecasting trends of the OUV of your site provides an idea of what is likely to happen if the current set of management actions (or lack thereof) continues. **Projecting trends in the spatial and temporal realms of existing human uses helps you visualize what is likely to happen if you do not intervene in the way your World Heritage marine site is currently being managed.** The product of this work is often referred to as a "trend scenario" and essentially visualizes the question, *"What if you do nothing?"*

Although trend analyses are commonly used to forecast the possible outcomes of corporate business strategies or the effects of demographic changes when designing urban planning policies, it is still in its infancy when it comes to the marine environment. For World Heritage marine sites, a comprehensive trend scenario should include three important components:

1. A trend scenario of the key features that make up the OUV of the site;
2. A trend scenario of the spatial and temporal requirements for new or expanding human demands for space and resources (commercial and non-commercial);
3. A trend scenario of the broad-scale drivers of change that influence the condition of the site's OUV.

To develop a trend scenario, the first thing to do is to determine the timeframe, which should include a base-year and a target year. As indicated in Step 1, for World Heritage marine sites, **the base-year should correspond to the date of inscription of the site on the UNESCO World Heritage List**, as this is the reference point against which the World Heritage Committee examines the State of Conservation of listed sites. It is important to use your selected timeframe consistently for all forecasts so that future human activities can be compared across sectors. It is important to note that because consistent scientific research and monitoring of marine areas started only in the late 1970s, legacies and shifting baselines will need to be taken into account in any trend analysis or forecasting efforts.

1.1 Identify the right parameters

When developing a trend scenario for the key features that make up the OUV of your site, it is crucially important to identify the right parameters. When forecasting trends in biodiversity, for example, you should include both trends in the habitat that support key species and trends in the population of species or groups of species. You should also consider the physical, chemical, and ecological processes with which the health of the ecosystem is intrinsically connected. Depending on the context and history of the site, you might also need to assess trends in the frequency and scale of disease outbreaks or changes in the population and composition of introduced or pest species.

1.2 Predict future human use

Next comes understanding the trends in the future human use of space and resources in your World Heritage marine site. It is fairly rare that the institutions responsible for site management have clear insight into new or mid- to long-term trends in human activities and their attendant spatial and temporal requirements. As a result, managers are frequently caught off guard when new private sector activity appears in their site, and yet these "new" demands for ocean space and resources are often closely linked to the trends in the development of the industries already operating in the site. This means that it is worth taking time during planning to understand where the different industries at work in your site are headed.

For example, technological innovation may make it possible to extract resources from previously inaccessible places, farther offshore and in deeper waters, or to do so more efficiently. Trends in the way human activities develop can also result from changes in legislation and shifts in political or economic priorities or variations in market forces that alter the financial viability for resource users.

Gaining at least a preliminary understanding of the trends in the human use of your site is indispensable if you want to be a pro-active manager. To obtain this information, you can ask representatives of each sector how they see their sector developing during the specific timeframe you have established and what the associated spatial and temporal needs will be to develop these activities.

As an example, when the Government of the Netherlands decided to update its national water plan, it asked each sector what they estimated their future human activity would look like in 2015 and 2020. They asked sectors to consider: (a) maximum level of development; (b) medium level of development, and (c) minimum level of development. The government used this information to create alternative future scenarios for the Dutch marine areas in the North Sea.[11]

✎ REMEMBER!

Legacies and shifting baselines

Systematic research, monitoring and data collection for marine conservation only started in the late 1970s. However, many economic activities date from well before that time and might have already significantly altered the trend of key features of your OUV by the time people began to gather marine data. This can pose a significant challenge when assessing true condition and trends.

There is a tendency among each generation of scientists who study trends in newly researched areas to accept sizes and species composition that occurred at the beginning of their careers as a baseline against which they will evaluate changes. When the next generation of scientists comes along, fish stocks, for example, have further declined, but it is the stocks at this time that serve as their new baseline.

As a result, your forecasts and trend analysis will likely be against a "shifted baseline" and not reflect the full extent of change over time. It is important to take this into account when making forecasts for World Heritage marine sites that have the date of inscription on the UNESCO World Heritage List as reference point.

Modified from: Pauly D. Anecdotes and shifting baseline syndrome of fisheries 1995 and Great Barrier Reef. Outlook Report 2014

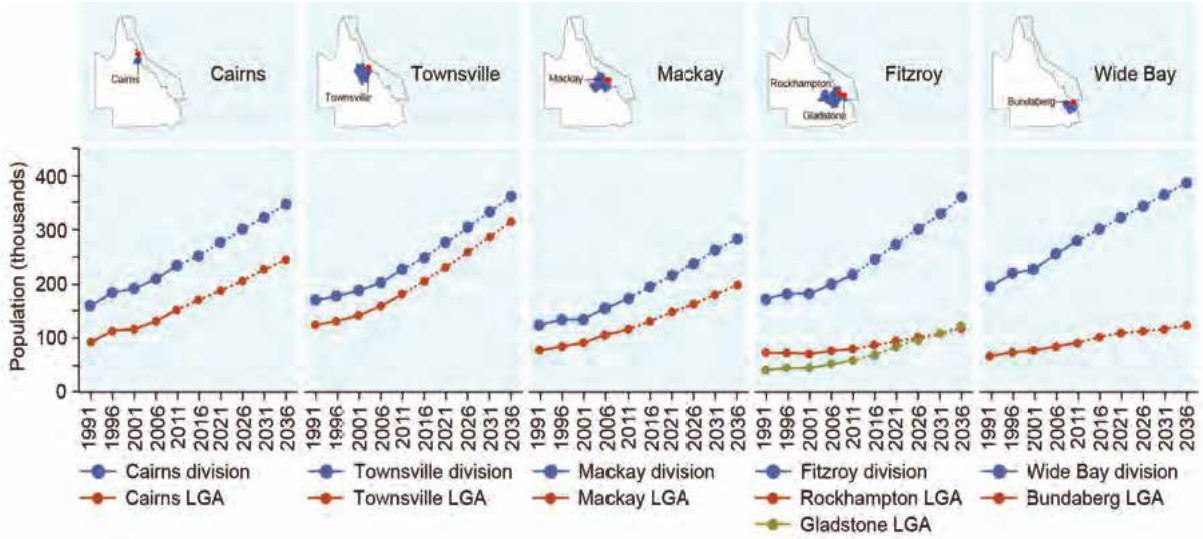
11 Ministerie van Verkeer en Waterstaat. 2008. Pre-policy document on the North Sea. The Netherlands.

1.3 Forecast broader drivers of change

It is also important to forecast some of the broader-scale factors that will drive change in your site. Such factors will typically be wide in scope and include elements such as the country's or region's projections for economic growth, population growth, or changes in societal attitudes, which are all underlying causes of change in the environment (Figure 16). Factors should include future predictions related to climate change variables such as sea level rise, temperature increases, levels of acidity, and/or changes in the frequency and severity of storms or floods.

Box 13 illustrates how the Great Barrier Reef World Heritage site has developed a five-yearly Outlook Report based on forecasts and trend analysis.

Figure 16: Forecast of population increases in the Great Barrier Reef, 1991-2036.



Source: Great Barrier Reef Marine Park Authority, Australia, 2014

BOX 13:
Forecasting OUV trends and future outlook in the Great Barrier Reef World Heritage site

Australia's Great Barrier Reef 2014 Outlook Report is currently the most comprehensive trend analysis of a World Heritage marine site. Its development is embedded in the legislation that created the Great Barrier Reef Marine Park in 1975, along with a requirement that it be updated every five years.

The Outlook Report essentially synthesizes all existing information about the site's values – as well as the threats and risks posed to them – that is already available from universities, government institutions, independent scientists, and a range of stakeholders knowledgeable about the site. This information is distilled and organized into nine individual assessments, each of which concludes with a forecast of the respective trend.

These individual trend assessments include the key features that make up the site's World Heritage designation, factors and risks that influence the region's values, the performance of its protection and management system, and its level of resilience to negative impacts. Grades are assigned for all components examined, using a standardized set of statements and based on a qualitative analysis of the available evidence for the region. The grading is further refined by adding an indication of the level of confidence in the data used.

The nine trend summaries serve as the basis for determining the overall outlook, which is peer reviewed by an independent scientific team and serves as a key input for adapting existing management arrangements to ensure the overall, long-term conservation of the OUV of the World Heritage site.

Figure 17: Trend assessments for the design of a future Outlook for the Great Barrier Reef World Heritage area.

Source: Great Barrier Reef Marine Park Authority, Australia, 2014
More information available at: http://www.gbrmpa.gov.au/managing-the-reef/great-barrier-reef-outlook-report

TASK 2: Construct alternative scenarios for the future use of your site

For every World Heritage marine site—and for MPAs in general—there are always multiple possible futures. It is important to avoid the mistake of focusing on just one possible future. Instead, consider multiple alternative scenarios, so you can pick the one that yields the best win-win for all involved. While scenario planning is still in its infancy for the marine environment, **creating alternative spatial scenarios is a crucial task, because it sets the stage for choosing the direction you want your site to develop and helps you define the management actions you need to take today**.[12]

Scenarios are essentially storylines that can describe possible futures for your World Heritage marine site, and they are most informative when they are reflected in maps that depict how the various components relate in space and time. Scenarios can provide alternative designs for policies, plans, projects, or payment schemes, or they can show how certain events or activities might unfold.

They should result in visions for the future that reflect the desires of stakeholders, communities or organizations that work in or generate resources from your site. Scenarios will enable you to create an optimized set of management actions to meet the goal of conserving your OUV while simultaneously allowing a sustainable socio-economic development.

Scenarios will allow you to:

1. Compare the impact on your site's OUV under plausible alternative futures, reflecting a different focus on one or another set of objectives (economic development, conservation, etc.);
2. Identify and compare the trade-offs under alternative management interventions and policies;
3. Learn about the impacts of alternative spatial plans, reflecting the preferences of different groups that hold a stake in your World Heritage site;
4. Develop consensus around a shared vision for the future of your site, including agreement on the biggest threats and risks to the site's OUV;
5. Craft and communicate compelling stories to attract the necessary support and investment for the long-term conservation of your site and the actions needed to be successful;
6. Involve stakeholders and resource users in a powerful learning process that can have a lasting impact on the long-term conservation of your site.

12 Adapted from: McKenzie E. et all. 2012. Developing scenarios to assess ecosystem service tradeoffs. Guidance and Case Studies for InVEST users. Available at: http://naturalcapitalproject.org/pubs/ScenariosGuide.pdf

A number of elements are critically important to developing successful alternative spatial scenarios that can serve as the basis for decision-making, including:

1. A participatory approach that invites the perspectives of all major stakeholders and groups;
2. A depiction of the scenarios as maps that visualize their implication in space and time;
3. The decision rules that define the constrains for the location and development of human activities;
4. Assumptions about the factors that will drive change in your site.

2.1 Take a participatory approach

Most World Heritage marine sites host multiple stakeholders that are implementing a variety of conservation and income-generating activities, so a participatory approach is essential. Developing alternative future scenarios involves bringing community members and stakeholders together to share and discuss their fears, hopes and dreams for the future of the World Heritage site and to collectively formulate commonly desired scenarios that can ensure the long-term conservation of the site's OUV.

Through the process of discussing the goals and visions for the future, stakeholders can develop shared perceptions, learn about each other's perspectives, create platforms for negotiation, and determine actions required to protect the OUV. You can collect this information through a series of workshops or through interviews with individuals or with groups that share a common interest.

Ask questions like these:

- What are your objectives in the World Heritage area?
- Which futures do you prefer and why?
- What challenges are you facing?
- What are the key drivers of change from your point of view? How might they evolve in the future?
- What policies, projects and plans do you expect to implement?

Stakeholder input greatly increases the accuracy and credibility of alternative future scenarios. It also ensures that scenarios are feasible and relevant to real challenges and conflicts at play in your World Heritage marine site. **The process of scenario development and analysis can have as much—or more—impact on decision makers as the final results**. See Box 14 for the story of how managers in Belize Barrier Reef Reserve System created future scenarios.

BOX 14:
Creating alternative future scenarios for Belize Barrier Reef[13]

Belize Barrier Reef Reserve System, home to the world's second largest coral reef system, was inscribed on the World Heritage List in 1996. Apart from the mythical blue hole, it hosts a range of globally significant habitats for threatened species, as well as hundreds of sand cays, mangroves forests, lagoons and estuaries. Due to management difficulties, the State of Conservation status if its OUV deteriorated, and the site was listed as World Heritage in Danger in 2009.

Belize's Coastal Zone Management Authority was given the mandate to develop a new management plan. In order to produce the plan, the government chose to invest in creating several alternative spatial scenarios that allowed decision makers to investigate the consequences of possible alternative planning policies and conservation strategies. Scenarios were developed over a period of two years, with substantial stakeholder engagement and input.

To begin, a team compiled initial spatial maps of human activities and ecosystems in the area. Local data about locations and intensity of uses was continuously incorporated into the scenario development process through the stakeholder engagement process (Figure 18). To understand stakeholder expectations and goals for the future, a short survey was disseminated across nine coastal planning regions, followed by public consultations.

Respondents identified multiple drivers for future change, including climate change, real estate speculation, expansion of tourism, and declining fisheries. The survey also revealed that many stakeholders wished to limit development, particularly on barrier islands. It confirmed that most stakeholders relied on tourism and fishing for their livelihoods.

Based on this information, the team designed three possible future scenarios to identify tradeoffs among alternative stakeholder visions and values. Given the contrast between stakeholders advocating for increased environmental protection and those pushing for expansive economic and development options, the team developed three visions:

(a) a "conservation heavy" future;

(b) a "development heavy" future;

(c) a "middle of the road" or "informed management" future, which combined elements of (a) and (b).

The result was an initial set of maps and descriptions for each of the nine planning regions, along with three possible future scenarios.

In a second round of stakeholder engagement, including training and public consultations, the team presented the alternative scenarios and requested feedback. This resulted in stakeholders articulating more specific preferences for the future, including for the intensity and location of human uses.

To refine the scenarios and achieve a shared vision, the team encouraged an iterative process, in which initially simplistic *"getting-something-on-paper"* scenarios were refined through additional interviews or field trips. They then tailored the scenarios to more realistic questions about future development and restoration options. Final feedback from stakeholders, gathered during a 60-day public comment period, eventually led to the final set of alternative scenarios.

A complementary element of this process involved understanding the different outcomes of each of these scenarios and the tradeoffs in ecosystem and other values among the scenarios or options being considered. This step is further detailed in box 15 of this guide.

More information about the scenario development process is available at:
http://www.naturalcapitalproject.org/pubs/Belize_InVEST_scenarios_case_study.pdf

Figure 18: Stakeholders drawing on maps during the consultation rounds in Belize.

© Gregg Verutes / Natural Capital Project

13 This section is based on extensive exchanges with Anne Guerry, Chief Strategy Officer and Lead Scientist, The Natural Capital Project

2.2 Depict your alternate scenarios in maps

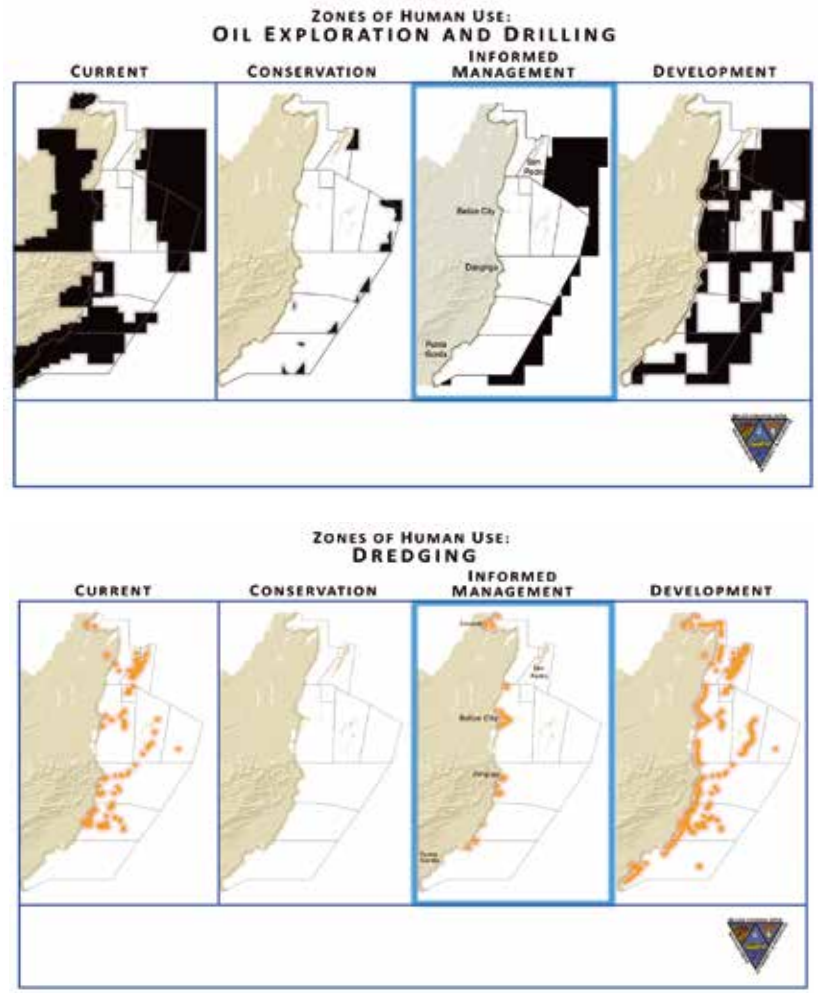
Maps are a powerful tool to use in the visioning process for your site and are vital to aligning the various actors behind a shared goal, such as safeguarding your site's OUV. They allow you to clearly illustrate the spatial and temporal consequences of implementing certain actions and help to estimate the spatial demands that envisioned projects would require. They also allow you to anticipate potential future opportunities, conflicts, and compatibilities that can guide your pro-active decision-making. Perhaps most important, they tell easy-to-understand visual stories about your site's possible futures and will quickly engage stakeholders in decision-making. Figures 19 and 20 show the maps created as part of the scenario-planning activities in Belize Barrier Reef Reserve System.

There are a number of methods for converting scenarios into maps, and they vary in sophistication. The easiest approach is to work with stakeholders to hand-draw maps that show where different human activities would occur under each of the alternative scenarios. Paper maps can be convenient in remote locations and can serve as the basis for digital versions created later with either drawing or GIS software.

Such maps should indicate:

1. Areas that require special protection, as they are key to the future conservation of the OUV;
2. Areas where development is likely to concentrate;
3. Spatial relationships between different areas (user-environment relationships and user-user relationships);
4. Spatial networks (maritime transportation routes or networks of marine protected areas);
5. Places where you will focus management activity.

Figures 19 and 20: Alternative spatial scenarios for oil exploration and drilling and dredging.



Source: Belize Coastal Zone Management Authority and Institute, 2013.

✎ **REMEMBER!**

Developing future scenarios is not an exact science

Defining and analyzing future conditions is not an exact science. The maps developed to visualize future conditions do not need to reflect "exact" locations. Instead, they should indicate patterns, trends and direction. You will typically involve both planners and scientists, but you may rely primarily on drawing programs and other such tools rather than geographic information systems (GIS), depending on your access to technology and software.

Figure 21: From GIS maps to pattern and trends

Source: Maes et al., 2005. In Marine spatial planning, UNESCO 2009.

2.3 Make note of your "decision rules"

It is important to reflect on the "decision rules" that will be relevant for the development of your alternative spatial scenarios. Decision rules are fixed rules or constraints that need to be taken into account when mapping certain human uses or non-uses to particular spaces in your World Heritage marine site. Decision rules can relate to:

1. **International and national regulations that influence space allocation:** For example, international navigation routes are based on international agreements, and changes require following specific procedures through the International Maritime Organization.
2. **Economic and technical requirements to make a particular activity operational:** For example, some human activities are not economically viable when located too far from shore.
3. **Physical and environmental conditions:** For example, the establishment of no-take zones will only lead to satisfying results when they cover the more important areas for the OUV, whereas most extraction activities are dependent on the availability and quality of the targeted resources.
4. **Preferential conditions that are often part of national or regional policies and could relate to environmental, social, or economic conditions:** For example, in the Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves, there is a maximum number of 460 visitors allowed at any given time, and this measure is rigorously complied with to protect the fragile ecosystem and limited water resources.

2.4 Define your assumed drivers of change

Creating alternative scenarios for your World Heritage marine site will require you to make assumptions about the factors that drive future change. Key questions that you want to consider include:

- Which drivers should you consider explicitly when developing scenarios?
- How many drivers and interactions should you consider?
- What scale of drivers should you consider? The common mismatch between the scale at which many drivers are operating and the scales at which management decisions are being made may make it useful to consider drivers at multiple scales.
- Should you consider drivers that are both within and beyond decision makers' control? Even when decision makers cannot directly influence drivers, it can be useful to consider those drivers in scenarios in order to assess how to mitigate or prepare for unforeseen impacts.

Table 4 provides an overview of common drivers of change that you should take into account when creating your alternative future scenarios.

Table 4: Drivers of change that require attention when designing alternative future scenarios

Category	Drivers
Social and demographic	■ Population growth or decline ■ Migration ■ Cultural values ■ Awareness ■ Poverty ■ Diet patterns ■ Education ■ Religious values
Technological	■ Technological innovation ■ Technological choice
Economic	■ Economic growth ■ Trade patterns and barriers ■ Commodity prices ■ Demand and consumption patterns ■ Income and income distribution ■ Market development
Environmental	■ Climate change ■ Air and water pollution ■ Introduction of invasive species
Political	■ Macroeconomic policy ■ Subsidies, incentives, taxes ■ Land-use or marine spatial plans, zoning and management ■ Governance and corruption ■ Property rights and land tenure

Source: McKenzie E. et al., 2012

TASK 3: Predict the likely outcomes of each alternative future scenario

Once you have designed your alternative future scenarios, the next task is to predict the likely outcomes of each one. You will then want to assess the trade-offs between and among key benefits. You will also want to estimate how some of the things that people care about are likely to change under different management choices.

There are a number of ways to explore the likely outcomes of different scenarios. Approaches you can take include:

- **Comparing metrics** across scenarios, for example, using a GIS, or drawing programme, to illustrate the percentage of key habitat types that require no-go status from extractive use;
- **Using expert opinion**, for example, to compare how each scenario might impact important parts of the site and the local communities dependent on the resources;
- **Using modeling tools**, for example, free and open-source software such as InVEST, to explore how changes in human activities may lead to changes in habitats, changes in populations of key species, changes in visitation rates, and changes in levels of natural protection from coastal storms.

Box 15 continues the story of the Belize Barrier Reef Reserve System to demonstrate how the Government of Belize identified the likely outcomes of its different alternative future scenarios.

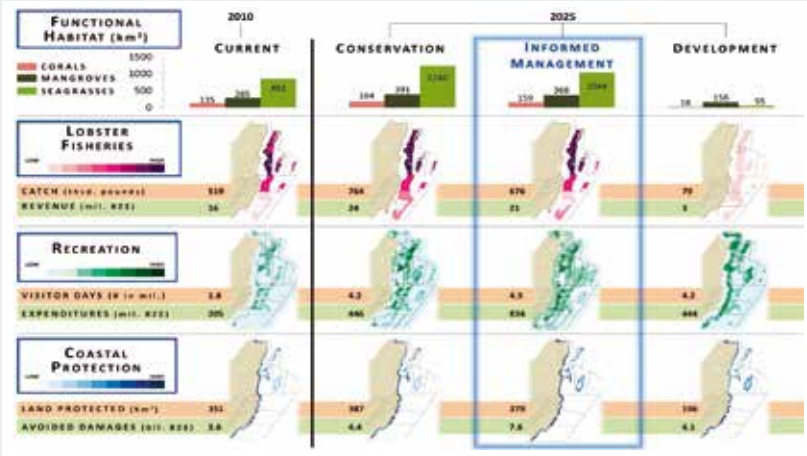
Belize Barrier Reef Reserve System, Belize.
© Elena Osipova

BOX 15:
Defining the likely outcomes of alternative future scenarios for Belize Barrier Reef Reserve System

As described in the previous Box 14, extensive stakeholder consultations informed the development of three spatial scenarios, each illustrating a different possible future for the Belize Barrier Reef through 2025[14]. Each scenario represented a different spatial and temporal distribution of human activities, driven by different conservation and development goals. As part of the process, the government evaluated the various benefits, disadvantages, and risks of the alternative scenarios and used that information to agree on a consensus-based future scenario that meets both socio-economic and environmental sustainability goals.

Analysts compared the amount of functional habitat that would be present under each scenario (using the InVEST habitat risk assessment model). Next, they modeled how those changes in habitat would translate to changes in three benefits prioritized by stakeholders: lobster fisheries (in weight and revenues), tourism (in visitor days and expenditures), and protection from hazards (in area of land protected and damage avoided).

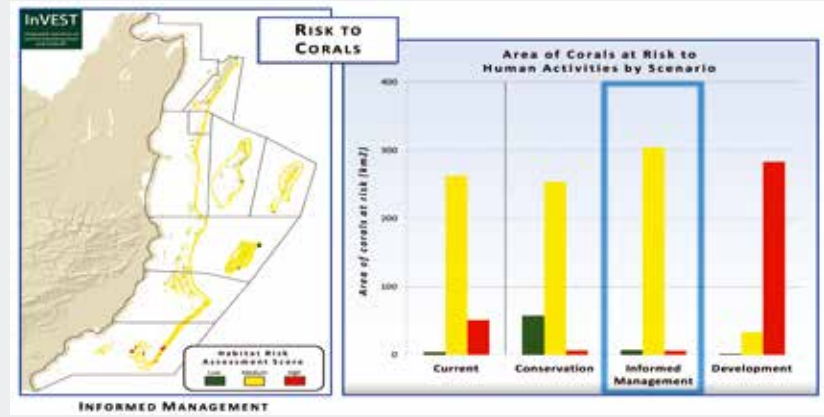
Figure 22: Functional habitats and the delivery of ecosystem services by scenarios.



Source: Belize Coastal Zone Management Authority and Institute, 2013.

The modeling results illuminated the different types of benefits and risks inherent in each scenario. Further stakeholder consultation confirmed broad public support for the "middle-of-the-road" scenario and the benefits it would provide.

Figure 23: Area of mangroves at risk from human activity by scenario.



Source: Belize Coastal Zone Management Authority and Institute, 2013.

The government then used the model estimates to refine the "middle-of-the-road" scenario into an "informed management" scenario that ultimately became the core of the site's proposed national management plan. The "informed management" scenario balances the desire for sustainable development with the need to protect the ecosystems that support both the economic return to the country and the OUV of the site and its surrounding areas.

Further information available at: http://www.coastalzonebelize.org/?p=847 or by contacting Beverly Wade, Belize Focal Point for World Heritage at fisheries_department@fisheries.gov.bz

14 Ministry of Forestry, Fisheries, and Sustainable Development. Belize Integrated Coastal Zone Management Plan. 2013. Final draft pending government approval. Available at: http://www.coastalzonebelize.org/wp-content/uploads/2013/06/DRAFT%20BELIZE%20Integrated%20Coastal%20Zone%20Management%20Plan%20_MAY%2020.pdf

TASK 4: Select the desired future

You now have several alternative spatial scenarios, each providing a vision of what your World Heritage marine site could look like, depending on the weight you give to various objectives and the distribution of human activities in space and time. You should also now have a good view on the benefits, disadvantages, and risks of each scenario, as well as an idea of the trade-offs that you will need to make when you choose certain objectives over others.

Now it is time to select the preferred alternative future scenario and define the management actions you must take to get there. Considering that the overall goal of a World Heritage marine site is conservation of the OUV, the ideal scenario is one that leaves the OUV untouched by any human activities or influences. In reality, however, the large majority of World Heritage marine sites are located in near proximity to densely populated areas, and they have multiple uses occurring in them. The preferred scenario will thus most often be the one that guides the site's management in the direction of sustainable development in all dimensions—environmental, social, and economic.

The selection of the final preferred scenario—the desired future for your site—will be based on several key criteria:

1. **Effectiveness:** Which scenario achieves the overall goal of maintaining the OUV of my World Heritage marine site?
2. **Efficiency:** Which scenario obtains the expected results at the least cost?
3. **Equitability:** Which scenario achieves the results such that the costs and the benefits are distributed as equitably as possible among stakeholders?

The chosen scenario should be the one that achieves the desired goal (effectiveness), at the least cost (efficiency), and in an equitable way (costs and benefits of implementation and results are evenly distributed).

In addition to these core criteria, other considerations may play a role in your selection. These can include:

1. Physical, chemical, biological, and cumulative effects that might occur over time;
2. Economic effects and their distribution, both direct and indirect (who wins, who loses);
3. The time that is required to achieve the results;
4. Political considerations such as the acceptability of a plan to the public and its alignment with national or international political agendas and priorities;
5. Feasibility of financing for implementation, monitoring and evaluation;
6. Other possible effects such as those resulting from climate change.

✎ REMEMBER!

Alternative spatial scenarios should not be seen literally as static maps depicting a fixed future. A key function of such scenarios is to help you and your partners visualize the future effects of different actions on the OUV. This process may reveal that the combined effect of too many incremental developments over time may suddenly result in irreversible changes to the OUV. Mapping out trends in human uses can also provide insight into the question, *"How much development is too much?"* The aim is to envision the future in a rational yet flexible way that permits learning and adjustment as the future unfolds. It allows steering away from a reactive approach to management and toward making decisions strategically.

BOX 16:
Selecting a preferred spatial scenario for the future management of the Belize Barrier Reef Reserve System

In Belize, multiple rounds of stakeholder consultations and reiterations – with each round further refining the costs and benefits of each scenario – led to the selection of the preferred scenario as a consensus plan that would optimize the future use of space in the site. The final plan is referred to as "informed management" and was selected because it presents a long-term vision of sustainable development that ensures minimal environmental impacts, maximization of ecosystem service returns, and future economic benefits for Belizeans.

The preferred scenario was designed to reduce current user conflicts and provided an alternative to the conservation-focused vision, which was not considered to be consistent with national priorities and economic needs. The development scenario was rejected because it further increased conflict among industries and other user groups and eroded the natural assets of the area, including the OUV.

The two-year process led to the production of the first national management plan to ensure the sustainable use of critical marine resources and ecosystems, including the OUV of the World Heritage site. The informed management scenario has now been submitted to the Ministry of Forestry, Fisheries, and Sustainable Development and is expected to be voted into law. The implementation of the plan is part of the Desired State of Conservation for removal of the site from the List of World Heritage in Danger.

As shown in Box 15, the Belize Barrier Reef considers the "informed management" scenario the preferred one because it forecasts reduced user conflicts and is consistent with national priorities and economic needs while simultaneously ensuring long-term conservation of critical areas, including the OUV.

The preferred scenario you have selected will provide the basis for the selection and implementation of management actions. This *process is described in the following step*, "How will you get there?"

Belize Barrier Reef Reserve System, Belize.

© Brandon Rosenblum

STEP 3

How will you get there?

Ningaloo Coast, Australia.

© Ben Fitzpatrick / Oceanwise Australia

Introduction

What outputs should be delivered from this step?

1. A set of management measures that will lead to your site's desired future;
2. A set of incentives that can stimulate implementation of the management measures;
3. A cost-effective and efficient compliance monitoring system;
4. A list of the institutional arrangements, including partnerships, that collectively bring the authority and resources needed to ensure implementation of management actions;
5. A clear "elevator pitch" and plan for using the World Heritage brand to engage partners and attract resources.

Today's actions define tomorrow's outlook

Now that you have determined where you are today and where you want to be in the future, it is time to answer the question, *"How will you get there?"* In this step, you will identify the most suitable management actions that will get your site to the desired future. This will include making explicit decisions about the location and timing of allowable human activities, as well as restrictions on inputs, outputs, and processes. To encourage stakeholders to support and follow the management measures, you will identify a set of incentives that can stimulate and facilitate stakeholder support and compliance. You will also create a practical compliance monitoring system, so you will know if the management measures are being followed and implemented.

As noted earlier in the guide, World Heritage marine site managers rarely have the resources needed to manage the site effectively without help from others. This means that you will have to engage communities, organizations, institutions, and businesses in and around your site as partners in conservation and sustainable development. Ideally, you will form stable relationships and in some cases formal partnerships with a wide range of stakeholders. Doing this requires that you develop strategic communications and storytelling skills, so you can effectively win over different target audiences and get everyone in your site on board with conserving the OUV.

The following sequence of tasks can guide your work:

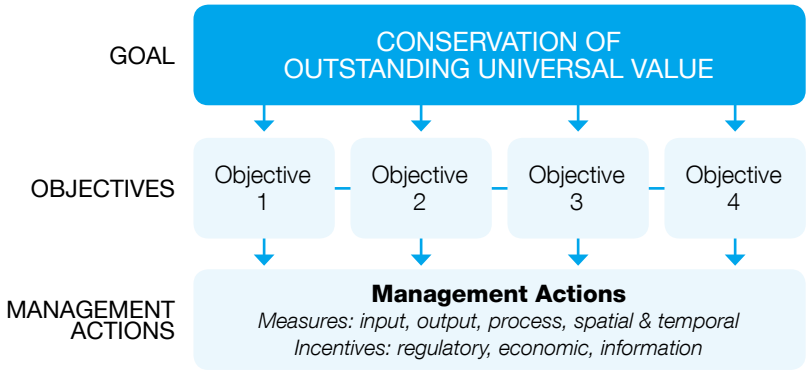
Task 1:	Identify suitable management actions.
Task 2:	Define incentives to stimulate implementation and compliance.
Task 3:	Set up a cost-effective and efficient compliance monitoring system.
Task 4:	Identify potential partners and align institutional arrangements to maximize efficiency and impact.
Task 5:	Craft a compelling story and leverage the World Heritage brand to achieve conservation of the OUV.

TASK 1: Identify suitable management actions

In managing World Heritage marine sites, central concern are human activities and their effects on the OUV of your site, both today and in the future. While scientists are still trying to determine the functioning of most marine ecosystems, **the only components that we can really control, and therefore manage, are the human activities occurring in and around your World Heritage marine site**. We can influence where, when, how, and at what scale these activities occur in order to minimize their effects on critical elements of the OUV. We can even decide not to let them take place within the site at all.

The management actions you take to get to your desired future should collectively work toward the conservation of the OUV. Therefore, management actions in your site should be connected to the goals and objectives you have set and to indicators that will help you measure their effectiveness. Figure 24 illustrates the correlation between management actions and other aspects of the management cycle. Indicators are discussed in depth in Step 4, *"What are you achieving?"*

Figure 24: Correlation between goals, objectives, and management actions and their linkages to the OUV.



Source: UNESCO, World Heritage Marine Programme, 2014.

Typically, you will select a combination of different management actions to achieve the desired future scenario identified in the previous step. In most situations, existing knowledge can provide information about the pros and cons of each possible management action and help you reduce the range of options that are practical and feasible. Figure 25 provides an overview of the different categories of management actions that are available for the management of World Heritage marine sites.

Figure 25: Categories of management actions.

INPUT
MANAGEMENT ACTIONS

Management actions that specify allowable inputs from human activities in a World Heritage marine site:

- **Limitations on fishing activity**, for example, number of vessels allowed to fish within the site or site sub-areas;
- **Limitations on resource extraction capacity**, for example, limits on vessel size and engine horsepower;
- **Limitations on the amount of fertilizer and pesticides** that can be applied to agricultural lands that drain into the site.

PROCESS
MANAGEMENT ACTIONS

Management actions that specify the nature of the production processes of human activities in a World Heritage marine site:

- **Limitations on resource extraction methods**, for example, the prohibition of long line fishing or bottom trawling;
- **Specifications of "best available technology" or "best environmental practice**;"
- **Specification of waste treatment technology** to be applied by industrial, commercial or urban sources.

OUTPUT
MANAGEMENT ACTIONS

Management actions that specify the allowable outputs of human activities in a World Heritage marine site:

- **Limitations on the amount of pollutants** discharged in a site;
- **Limitations on allowable catch and/or by-catch**;
- **Tonnage limitations** on sand and gravel extraction.

SPATIAL AND TEMPORAL
MANAGEMENT ACTIONS

Measures that specify where and when human activities can occur in and around a World Heritage marine site:

- **Seasonal closure areas**, for example, for spawning areas;
- **Designation of precautionary areas or security zones**;
- **Zoning of areas by objective**, for example, development areas, high conservation areas.

Source: UNESCO, World Heritage Marine Programme, 2014.

Since all activities, as well as the functioning of the marine and coastal ecosystem itself, occur in space and time, management actions that specify where and when human activities can or should occur will be an essential part of any management toolbox. Spatial and temporal management measures are typically implemented through a zoning system and aim in particular to minimize conflicts between protection and human use or among the human activities themselves.

Zoning systems have become quite common and are used across the network of World Heritage marine sites, and they come in varying levels of complexity and inclusiveness with a variety of results. Zoning is typically put in practice through a range of permits, and most zoning systems will require surveillance to ensure compliance. Box 17 illustrates how a comprehensive zoning system in Shark Bay, Western Australia, is used to protect the site's OUV.

Natural System of Wrangel Island Reserve, Russian Federation.
© Alexander Gruzdev

BOX 17:
The zoning system in Shark Bay World Heritage site

Shark Bay, Western Australia, was inscribed on the World Heritage List in 1991 for its exceptional stromatolites – among the oldest form of life on Earth – and its steep gradient in salinities, which create sheltering coves and lush seagrass beds that provide a home for many globally threatened species of plants and animals.

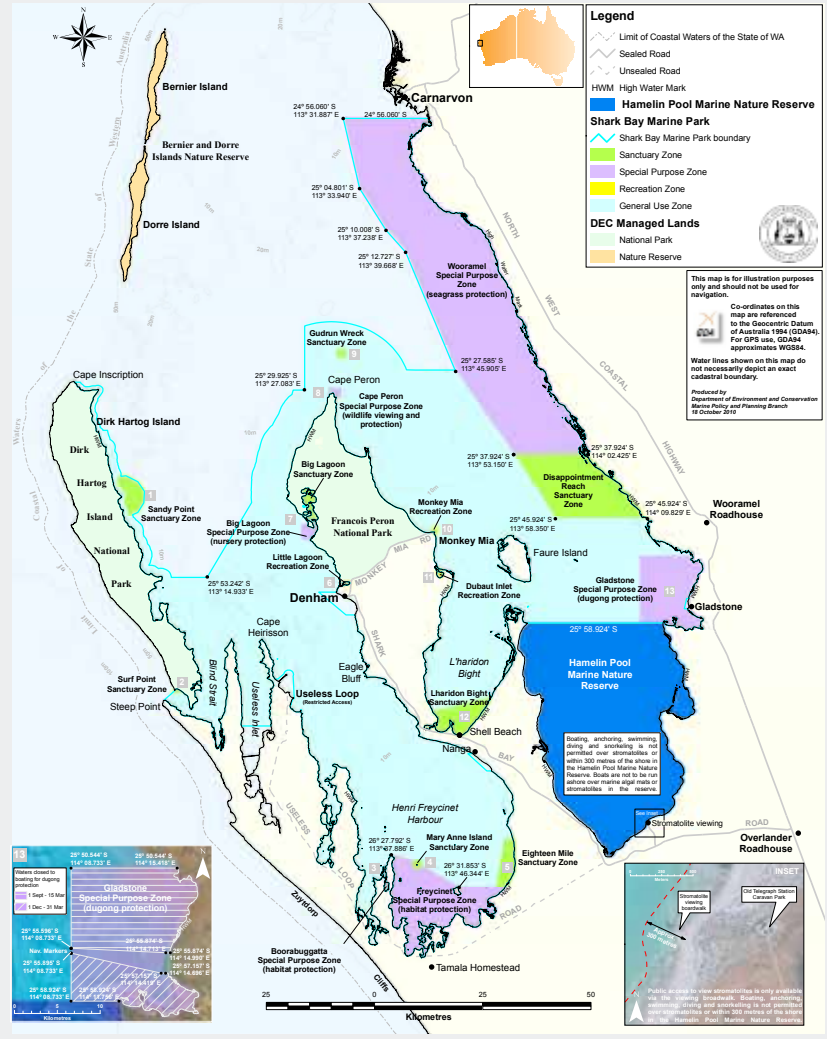
Shark Bay has been zoned to enable different levels of use to occur while ensuring the OUV of the site is conserved and protected. Recreational visitation is the main type of use and thus a key focus for the site's zoning system, which includes nine sanctuary zones, three recreation zones, six special purpose zones, and a large general use zone.

- **Sanctuary zones** are "look but don't take" areas that are managed solely for the conservation of the globally outstanding marine life. Visitors can boat, swim, dive, and do educational activities in these zones, but no extraction is allowed.
- **Recreation zones** are designated solely for recreation. No commercial fishing, aquaculture, or pearling is permitted.
- **Special purpose zones** are in areas where conservation is the top priority and where a high level of protection is provided to the marine life. Only activities that are compatible with the purpose of the zone are permitted.
- **The general use zone** allows a wide range of commercial and recreational activities. It excludes all areas that are highly exceptional and critical to the overall, long-term conservation of the OUV.

The zoning system, which is based on extensive information about the exceptional marine features of the site and their locations, is communicated to the general public through a widely distributed brochure that serves as the principal document that visitors are required to consult, in particular boaters and recreational fishers.

Similar comprehensive zoning systems exist in other World Heritage marine sites, including Kluane/Wrangell-St.Elias/Glacier Bay/Tatshenshini-Alsek (Canada/United States of America) and Great Barrier Reef (Australia), among others. Recent scientific research has verified the positive effects of the 2003 Great Barrier Reef World Heritage site zoning system, which raised the no-take areas from four to 33 percent. The research documented more abundant and larger fish than were previously recorded, before the zoning system was implemented.

Figure 26: The zoning system of Shark Bay, Western Australia.



Source: Government of Western Australia, Australia, 2014.
For more information: http://www.sharkbay.org/default.aspx?WebPageID=112

RECREATION GUIDE	ACTIVITIES	HAMELIN POOL MARINE NATURE RESERVE [3]	SHARK BAY MARINE PARK			
			SANCTUARY ZONE	SPECIAL PURPOSE ZONE	RECREATION ZONE	GENERAL USE ZONE
	Fishing from guided charter vessels [2]	✗	✗	Only at Freycinet SPZ and Wooramel SPZ	✗[2]	✓
	Line fishing	✗	✗	✓	✓[7]	✓
	Crabbing	✗	✗	✓	✗	✓
	Rock lobster fishing	✗	✗	✓	✓	✓
	Netting (Note: Department of Fisheries licence is required for the use of all nets)	✗	✗	See 5	✗	✓
	Spearfishing - breath-hold only (No SCUBA or hookah) [8]	✗	✗	Only at Gladstone SPZ, Freycinet SPZ and Wooramel SPZ	✗	✓
	Coral, shell and specimen collecting (alive and dead)	✗	✗	✗	✗	✗
	Aquarium fish collecting	✗	✗	✗	✗	✗
	Diving	✓[4]	✓	✓	✓[7]	✓
	Snorkelling	✓[4]	✓	✓	✓[7]	✓
	Motorised water sports	✗	✗	✗	✗	✓
	Boating, yachts and non-motorised water sports [9]	✓[4]	✓	See 6	✓[7]	✓

1. This table is for recreational activities only. For information on permissible commercial activities contact the numbers below.

2. Charter vessel fishing is not permitted in recreation zones.

3. Public access to view the stromatolites is only available via a boardwalk at the Hamelin Pool Telegraph Station.

4. Boating, anchoring, swimming, diving and snorkelling is not permitted over stromatolites or within 300 metres of the shore in the Hamelin Pool Marine Nature Reserve. Boats are not to be run ashore over marine algal mats or stromatolites in the reserve.

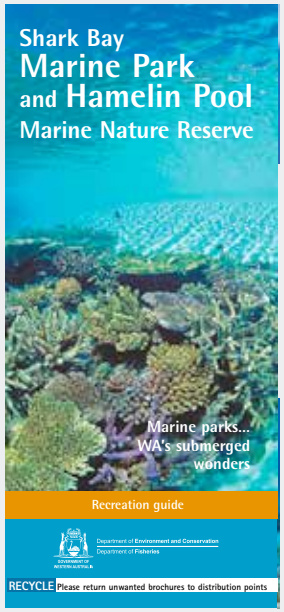
5. Set netting is permitted in Freycinet and Wooramel special purpose zones all year round. Set netting is permitted in Gladstone Special Purpose Zone only when these waters are open to boating (see inset 13 below for closed boating periods). Set netting is not permitted in Big Lagoon, Booraburgatta or Cape Peron special purpose zones. Haul netting is permitted in all special purpose zones, but only in Gladstone Special Purpose Zone when these waters are open to boating.

6. Permitted in all special purpose zones, but only in Gladstone Special Purpose Zone when these waters are open to boating (see inset 13 below for closed boating periods).

7. Except in Monkey Mia dolphin interaction area.

8. No spearfishing using SCUBA or hookah allowed in Hamelin Pool Marine Nature reserve or Shark Bay Marine Park.

9. Contact Department of Transport for further boating details.



Source: Government of Western Australia, Australia, 2014. For more information: http://www.sharkbay.org/default.aspx?WebPageID=112

Shark Bay, Western Australia, Australia.

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TASK 2: Define incentives to stimulate implementation and compliance

While few will disagree that World Heritage marine sites should be well protected, many unsustainable practices continue to exist in and around sites. About a third of all World Heritage marine sites still have unsustainable fishing practices, including some that are illegal and unreported. In most cases, unsustainable practices continue mainly because the short-term benefits for resource users outweigh their current understanding of the long-term benefits of conserving these unique places for future generations.

The lack of tools to enable accurate economic valuations of all the goods and services provided by World Heritage marine sites over time makes it difficult to communicate their long-term value to resource users. It also limits our ability to accurately evaluate trade-offs when making decisions about unsustainable practices. To address this gap, conservation practitioners are developing ways to quantify the economic value of goods and services provided by World Heritage marine sites and MPAs in general, but the field still has some way to go before these tools are proven and in common circulation.

In the absence of this kind of quantifiable evidence, site managers are increasing their use of incentive-based approaches for encouraging resource users to change behaviors that negatively affect biodiversity and natural habitats. Incentives can be positive (encouraging) or negative (discouraging), direct or indirect, prescriptive or proscriptive, pro-active or reactive. Their overall purpose is to induce or stimulate the implementation of a management action. The wide range of incentives can be divided in two categories: economic and non-economic. Non-economic incentives include: regulatory measures, enforcement sanctions, technical assistance, and public education, among others.

The following criteria can help you select suitable incentives:[15]

- Is it simple to administer?
- Do timing considerations make sense, such as the time required to put the incentive into operation and the time required to obtain the desired effect?
- Is it politically practical? Does the general public already accept that there is a particular environmental problem and agree with your management solutions? Is it a priority for politicians and the public when compared to other social and economic problems?

The successful use of incentives requires clear understanding and legal recognition of the rights and responsibilities of different stakeholders who use, manage, and benefit from the World Heritage marine site's resources.[16] You will also need to ensure that incentives adopted at one level (or by one institution) are consistent with those adopted at another.

2.1 Regulatory incentives

Regulatory incentives—known collectively as the *"command and control"* approach—are the most commonly used type of incentives in MPA management. They relate to the establishment and enforcement of relevant laws, regulations, and property and tenure rights, among others, as ways to promote compliance

15 Adapted from: Bower, B., et al. 1977. Incentives for managing the environment. *Environmental Science and Technology*, 11, 3, pp 250-254.
16 Global partnership for oceans. Review of what's working in marine habitat conservation: A toolbox for action. 2013. Available at: https://www.globalpartnershipforoceans.org/sites/oceans/files/images/GPO%20HABITAT-WHAT'S_WORKING_DECEMBER2013.pdf

with management actions. Such incentives are usually based on national and international policies and legal mechanisms.

Examples of regulatory incentives include: fisheries permits, dive operation permits, tourism regulations, commercial licenses, requirements for use and entry, zoning plans and regulations, water quality standards, and requirements for environmental impact assessments for new projects within the World Heritage marine site.

✎ REMEMBER!

Keep incentives simple

Simple regulations work best. Many national regulations are so complex that they confuse the beneficiaries. In general, the simpler the national rules are, the more likely it is that they will be followed at the local level. Local regulations should be as clear as possible and easily understood in local languages. Local buy-in is essential to make them work, and understanding is the first step toward this end. A strict no-fishing rule inside an MPA is much easier to understand than *"prohibition of fishing between May and June, between the high water mark and one mile from the shore."*[17]

2.2 Economic incentives

Even though the global benefits from conserving World Heritage marine sites far outweigh short-term gains from destructive practices, for local resource users the immediate benefits from unsustainable use often exceed those from longer-term, sustainable management. As a consequence, sustainable management in many contexts is either economically unattractive for resource users or unaffordable for local decision-makers, particularly in the short term. Making conservation economically attractive is therefore often a central challenge when establishing effective management.

Economic incentives are increasingly considered important factors in changing behavior toward practices in support of sustainable management. A multitude of economic or financial incentives exist, many of which have become mainstream practices in terrestrial environments. They can take the form of economic support — such as grants, subsidies, and user rights — to encourage sustainable behavior, or financial mechanisms (such as taxes and fines) to discourage resource users from engaging in destructive practices. Some of the most commonly used economic incentives include:[18]

1. **Buyout of resource extraction licenses:** This incentive involves compensation conditional upon relinquishing the right to use a resource (for example, the buyout of fisheries licenses for the implementation of a no-take zone).
2. **Conservation incentive agreements:** This incentive involves compensation conditional on not exercising the right to use a resource.
3. **Alternative livelihoods:** This incentive involves an economic motivation such as subsidies to change local people's source of income to activities that do not involve unsustainable resource extraction or any other form of degradation of the environment.
4. **Market-driven incentives:** This incentive involves the establishment and recognition of sustainable resource-extraction practices through which revenues increase as a result of higher market value for the product. See Box 18 for a best practice example from Sian Ka'an World Heritage marine site.

17 Kelleher, G. 1999. *Guidelines for Marine Protected Areas*. World Commission on Protected Areas. Gland, Switzerland, IUCN. https://portals.iucn.org/library/efiles/documents/PAG-003.pdf

18 Adapted from: Niesten, E. and Gjertsen, H. 2009. *Incentives in marine conservation approaches. Comparing buyouts, incentives agreements, and alternative livelihoods*. Conservation International.

BOX 18:
Successful market-based incentives in Sian Ka'an World Heritage site

Located off the coast of the Yucatan peninsula in Mexico, Sian Ka'an was inscribed on the World Heritage List in 1987 for its rich flora and fauna that cohabit in the diverse environment formed by the site's complex hydrological system.

In 2000, with the support of the Global Environmental Facility (GEF), local fishing communities started to change their lobster fishing techniques toward more sustainable practices, including using lobster field maps and GPS, systematically recording daily catches, and gradually eliminating the use of nets. Building on initial success, seven important locations for fish reproduction were identified and local communities were trained to use the new techniques. Within a decade, a collaborative with almost 300 members was producing between 150 and 200 tonnes of live lobster per year, increasing local fishermen's income by more than 30 percent while simultaneously protecting critical reefs and fish reproduction areas.

In 2012, spiny lobsters from the small-scale, artisanal fishery within Sian Ka'an and the Banco Chinchorro Biosphere Reserve gained the Marine Stewardship Council (MSC) certification, making them eligible to display the blue MSC eco-label on their products. This certification indicates that an enterprise has met a standard for sustainable, well-managed fisheries based on independent assessments by the accredited certifier MRAG Americas. The MSC certification opens the door to obtaining global support and access to international markets, thereby providing increased income benefits and business opportunities while also protecting critical spawning and nursing areas in the site.

The project is currently being expanded to cover over 2,300 lobster fishermen and is anticipated to result in a more than 20 percent increase in no-fishing zones in the region.

Figure 27: Well managed lobster fisheries in Sian Ka'an, Mexico.

Sian Ka'an, Mexico.
© Julio Moure

Another financial mechanism that may indirectly provide an incentive for conservation is the economic valuation of the services provided by World Heritage marine sites and the contribution they can make to mitigating global threats such as climate change. Research on mangroves, tidal marshes and seagrasses, for example, has shown that these ecosystems store and sequester carbon at comparatively higher rates, per unit area, than their terrestrial forest counterparts.

In this context, World Heritage marine sites could play an important role in minimizing the effects of climate change by preserving ecosystems that are becoming increasingly scarce, opening the way for using economic incentives to help protect them. Measuring and valuing the way in which World Heritage marine ecosystems are contributing to local and national economies has the potential to be a powerful incentive to conserve these irreplaceable treasures.

2.3 World Heritage status incentives

World Heritage sites, through their inclusion on the UNESCO World Heritage List, benefit from an extra level of protection under the 1972 World Heritage Convention. Apart from the recognition of a site's OUV, the Convention sets out the duties of States Parties *in identifying potential sites* and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve the OUV of sites under their jurisdiction and expresses a shared commitment to preserving this legacy of universally significant properties for future generations.

The World Heritage Committee is responsible for the implementation of the World Heritage Convention. During annual meetings, it examines the State of Conservation of sites inscribed on the List and asks States Parties to take action when sites are not being managed properly. The Committee has the authority to inscribe sites on the List of World Heritage in Danger when a site's OUV comes under severe pressure. Such listing requires major and immediate action to restore the site's exceptional values. If a site loses the characteristics that won its inscription on the World Heritage List, the Committee may decide to delete the property entirely from the World Heritage List. This practice was applied in 2007 to the Arabian Oryx Sanctuary of Oman and in 2009 to the Dresden Elbe Valley of Germany.

While often perceived as a sanction or dishonor, the listing of a site as World Heritage in Danger is a mechanism established to respond to specific conservation needs in an efficient manner. Inscribing a site on the List of World Heritage in Danger alerts the international community that a site's OUV is endangered and that urgent action is required to ensure it does not get lost all together. The listing of a site as World Heritage in Danger allows the conservation community to respond to specific preservation needs and do so as a matter of priority. The mere prospect of inscribing a site on the Danger List often proves to be effective to leverage rapid improvement in conservation of OUV.

Inscription of a site on the List of World Heritage in Danger requires the development and adoption of a "Desired State of Conservation for removal of the site from the List of World Heritage in Danger" as well as a selection of corrective measures to achieve such state.[19] Box 19 illustrates how the inscription of Everglades National Park in the United States of America serves as an incentive to assure that the necessary financial investments are being made to restore the OUV of this iconic site.

19 World Heritage Info Kit. Available at: http://whc.unesco.org/en/activities/567/

BOX 19:
Everglades National Park: Inscription on the List of World Heritage in Danger as an incentive for increasing protection of the OUV

Everglades National Park, which stretches along the southern tip of Florida (United States of America), was inscribed on the World Heritage List in 1979 for its vast subtropical wetlands that help protect globally significant biodiversity and provide refuge for important species such as the Florida panther and the American crocodile.

The national park forms part of the larger Everglades ecosystem, much of which has been significantly altered through the development of water control systems, agriculture and urban encroachment. The park's location at the very downstream end of the ecosystem exacerbates the problem. As a result of human-induced modifications to the greater Everglades landscape and the use of water resources in south Florida, preservation of the park's ecological integrity became increasingly challenging.

In 2010, at the request of the United States Government, Everglades National Park was inscribed on the List of World Heritage in Danger in an effort to draw attention to the urgent need to implement long-delayed restoration projects that could secure the long-term preservation of the site. Following a joint IUCN/WHC reactive monitoring mission to the site, a Desired State of Conservation statement was developed, including an overview of all necessary corrective measures. A set of indicators was also developed to enable measurement of progress toward the Desired State.

Inclusion of the site on the World Heritage in Danger List has been an important factor in catalyzing efforts to halt and reverse the declining trends of the site's health, which began more than three decades ago. It has encouraged management improvements and commitments both at the state and federal government levels, and the Desired State of Conservation facilitated the integration of existing scientific data and multiple management efforts into a comprehensive plan that has become the central reference point for understanding which management measures cause which effects in the overall complexity of the site's restoration. The Danger Listing has also encouraged the financial investments required to implement major restoration projects that should allow the site to restore its OUV over time and achieve re-inscription on the World Heritage List.

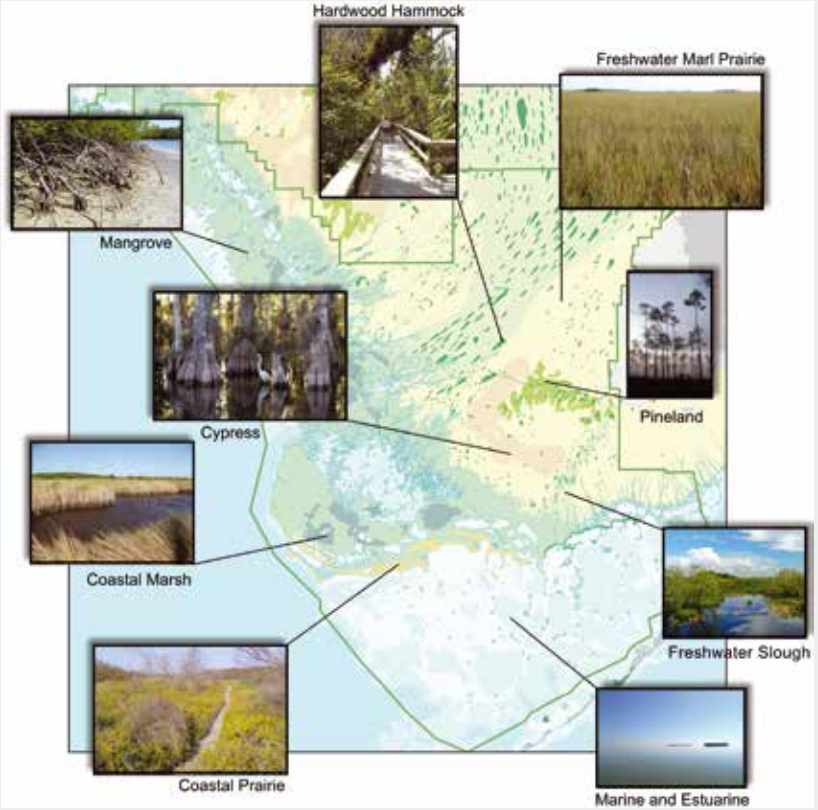
Figure 28: Defining Desired State of Conservation for Everglades National Park: Example linking OUV criteria, measurable objectives, condition and trend. This table facilitates understanding of cause-effect relationships between corrective measures and achieving the Desired State.

Indicator 5. American alligator.

Criteria	Desired State of Conservation	Condition & Trend	Rationale
Positive trend in nesting effort	Increasing trend in nesting effort throughout all freshwater marshes, particularly peripheral marshes historically believed to support the majority of nesting effort. The target is nesting effort consistent with a restored Everglades ecosystem.	↑	Nesting effort has increased significantly since 1985; recent trends show more stability during poor to moderate conditions and record numbers during favorable conditions.
Positive trend in nest success	Increasing trend in nest success and reduced failure due to flooding of egg cavity. The target is nest success levels consistent with a restored Everglades ecosystem.	↔	Nest success continues to be highly erratic due both to extreme natural and managed seasonal hydrologic fluctuation.
Positive trend in nest density/ distribution	Increasing trend in density of nests across hydrologic basins, particularly within shorter hydroperiod peripheral marshes. The target is nest density and distribution consistent with a restored Everglades ecosystem.	↑	Nest density and distribution throughout freshwater hydrologic basins of ENP have demonstrated an increasing trend in recent years.
Positive trend in alligator abundance	Increasing trend in abundance for all size classes of alligators within freshwater wetlands. The target is an abundance of alligators consistent with a restored Everglades ecosystem.	↓	Results of spotlight surveys indicate reduced abundance estimates in all size classes within ENP.

Source: U.S. National Park Service, 2013.
More information available at: http://whc.unesco.org/en/soc/2934 or by contacting Stephen Morris, Chief Officer International Affairs, US National Park Service at Stephen_Morris@nps.gov

Figure 29: The Everglades ecosystem is comprised of habitats from the upland pinelands to the marine environment of Florida Bay, the Florida Keys and the Gulf Coast.



Source: U.S. National Park Service, 2014.

Everglades National Park, United States of America.

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2.4 Educational incentives

Educational incentives, sometimes referred to as "moral suasion," have the objective of changing the ethics and values of people in such a way as to move them toward taking action in ways that protect the values of a World Heritage marine site and ensure that its use remains sustainable. Education incentives include public education and information campaigns. Box 20 provides an illustration from the Area de Conservación Guanacaste World Heritage site in Costa Rica.

Because of their globally recognized status and visibility, World Heritage sites are well positioned to achieve successful results using educational incentives. In most cases, the OUV is easily recognizable, and site managers can tap into pride of place and most people's innate interest in learning to educate local people and visitors alike and influence shifts in behavior.

BOX 20:
Educational incentives in Area de Conservación Guanacaste, Costa Rica

Area de Conservación Guanacaste was inscribed on UNESCO's World Heritage List in 1999. The site contains important natural habitats for the conservation of biological diversity, including the best dry forest habitats from Central America to northern Mexico and key habitats for endangered or rare plant and animal species. The site demonstrates significant ecological processes in both its terrestrial and marine-coastal environments.

Following extensive research on fisheries practices in the World Heritage site, actions were undertaken to expand the site's youth education program that until then had been limited to the terrestrial part of the site. Overcoming initial safety concerns, the experiential program started in 2006 and now takes groups of local children boating, diving and whale watching during the summer. These trips are a family affair, with parents tagging along for the daylong outings, which familiarize them with the site's rich biodiversity.

Until this initiative, most children had only seen fish on their dinner plate, but now they can identify roughly 20 different species in El Hachal reef. Local residents now know and love the treasures in their backyard, and children are persuading their parents to appreciate the reefs as "fish nurseries." This program has contributed to a shift in local behavior, from intentional poaching to strong community support for conservation policies. The new conservation ethic has been apparent in grassroots campaigns against the proposed re-authorization of trawl fishing for shrimp in Costa Rica.

Figure 30: Children learning about the marine ecosystem of Guanacaste.

Area de Conservación Guanacaste, Costa Rica.
© Maria Chavarria

TASK 3: Set up a cost-effective and efficient compliance monitoring system[20]

You can have the best management actions and incentives in the world, but if the site's rules and regulations are not followed, you will not achieve the desired outcomes. It is therefore crucially important to have a compliance system in place to ensure that resource users comply correctly with the management regulations you establish to protect the OUV of your site.

While zoning measures are common among World Heritage marine sites, a central question is how to build a cost-effective and efficient compliance monitoring system that adequately ensures resource users follow the zoning regulations. Especially larger World Heritage marine sites—such as Phoenix Islands Protected Area (Kiribati), Galápagos Islands (Ecuador), Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems (France), and the Great Barrier Reef (Australia)—face huge costs for compliance monitoring.

The key to managing costs is having an "intelligence system" that allows you to identify priority biodiversity areas that are at greatest risk for non-compliance. Such a system allows you to spot trends in the behavior of non-complying resource users but also to limit the costs associated with monitoring large marine World Heritage sites. Figure 31 illustrates how the Great Barrier Reef Marine Park Authority in Australia maps out high-risk hotspot locations for surveillance planning.

Galápagos Islands, Ecuador.
© Alan Davis

20 This section is based on the expertise provided during the working meeting "Protected Area Compliance Management: A structured approach" organized by the Great Barrier Reef Marine Park Authority, Townsville, Australia, 7-11 November 2014.

Figure 31: Spatial analysis of high-risk hotspot locations for surveillance planning in the Great Barrier Reef World Heritage Area, Australia.

Source: Great Barrier Reef Marine Park Authority, Australia, 2014.

The hotspots reflect high-priority fisheries compliance locations and drive the organization of surveillance activities, including flyovers, boat patrolling, trailing of unmanned aerial vehicles, deployment of remote surveillance cameras, and commercial fishing vessel tracking mechanisms, among others. The hotspot areas are identified through annual risk assessments that rate risk activities by factoring in their likelihood of occurrence, their probable frequency and intensity, and their likely impact. This risk assessment is based on information such as:

- Incident statistics and trends from previous years;
- Seasonal fishing patterns across the area;
- Behavior and social networks of frequent non-complying resource users;
- Market trends such as demand, supply and prices of species;
- Strategic risk and threat assessments.

Figure 32: Compliance monitoring room at the Great Barrier Reef World Heritage area.

Great Barrier Reef, Australia.
© Great Barrier Reef Marine Park Authority

Through regular monthly and annual reviews of the data gathered through such an intelligence system, you can fine-tune and target surveillance operations for maximum efficiency and impact. It also enables you to use the most appropriate resources and technology in the most cost-effective way.

Note that enforcement is just one component of an integrated compliance system. Today, **the most successful compliance management programs use a wide range of compliance and enforcement tools, including on-the-ground surveillance and targeted education and awareness campaigns**. Awareness campaigns are often the best way at the least cost to encourage compliance with legislation and management actions. Table 5 provides an overview of the various tools that can be used for compliance, ranging from information and raising awareness to court warnings and prosecution.

Table 5: Overview of the different tools available for compliance management.

Compliance Management		
Outcome	Ref	Strategy
Awareness	1	Information
	2	Education
Compliance assessment	3	Surveillance
	4	Audit (field, desk, financial, systems)
	5	Investigation
Adjusted behaviour	6	Cautions
	7	Warnings
	8	Infringement notices
	9	Direction/Orders
	10	Administrative action
	11	Prosecution

Source: Great Barrier Reef Marine Park Authority, Australia, 2014.

The type of compliance system you create will depend on the resources, data sets, and technology tools available to you and your site. Box 21 describes the compliance monitoring system in the Galápagos Islands World Heritage site.

Great Barrier Reef, Australia.

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BOX 21:
Compliance monitoring in the Galápagos Islands World Heritage marine site[21]

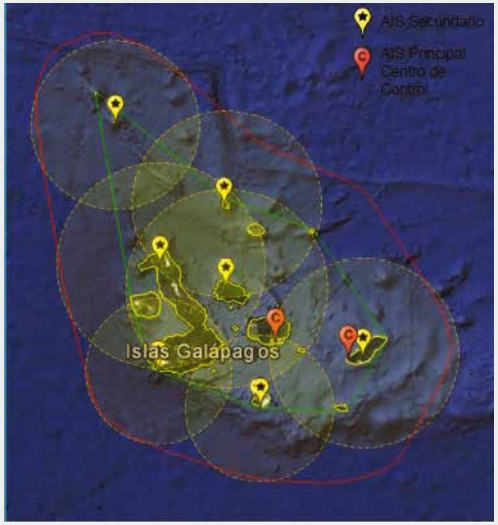
The Galápagos Islands in Ecuador was the first site to be listed as World Heritage. It was first inscribed on the World Heritage List in 1978 (and extended in 2001) for its globally unique features and is often referred to as one of the most significant "living museums" to showcase the natural evolution of our planet. Located at the confluence of three ocean currents, the Galápagos are a melting pot of marine species and unusual animal life.

The result is a unique marine ecosystem that contains a concentration of marine life, some of which is highly valuable to fishers. Although local fishers have the right to sustainably harvest these resources, the abundance of life attracts vessels from elsewhere that fish in the region illegally. These operations frequently target sharks, all species of which are protected within the reserve.

Surveillance for compliance of this large World Heritage site is a costly and complex task. The Ecuadorian Navy and the Galápagos National Park carry out patrols using technology such as a Vessel Monitoring System (VMS) and an Automatic Identification System (AIS). VMS and AIS broadcast Global Position System (GPS) locations via satellite (for VMS) and VHF radio (for AIS) to the park's central compliance station. These technologies keep a remote "eye" on vessel activity in the World Heritage site and also offer a safety mechanism to fishers and others, since "emergency buttons" are embedded in these systems. Efforts are now underway to underpin the existing compliance network with a detailed intelligence system that will be developed through the exchange of best management practices with experts from the Great Barrier Reef World Heritage area.

All tourist and fishing vessels within the World Heritage area are required to carry one of the tracking systems. Vessels over 20 gross tons employ VMS. Those under 20 gross tons use AIS. Equipment costs and annual running fees for VMS are borne by the operators of the vessels. Vessels using AIS receive donated equipment, and Galápagos National Park runs the AIS antenna system. The use of VMS has produced satisfactory results, with more that 20 vessels located and detained so far. The site's clear conservation and sustainability objectives are strongly supported through the use of these technologies, and safety of life at sea is enhanced.

Figure 33: Coverage of the AIS system in Galápagos Islands World Heritage area.



Source: Galápagos National Park/Wilson Aracil, 2013.

21 The content for the article was written by Godfrey Merlen, Charles Darwin Foundation

TASK 4: Identify partners and align institutional arrangements to maximize efficiency and impact

Across the 47 World Heritage marine sites, it is rare that just one institution working alone achieves successful conservation of the OUV. The job is just too big. Fortunately, World Heritage marine sites typically attract an array of stakeholders who implement a variety of conservation actions or income-generating activities. In most cases, at least two government agencies are involved—one that is responsible for conservation of the OUV, and another with authority over one or more of the human activities that operate in and around the site. Add to that the work of NGOs, research institutions, businesses, and communities, and you have a lot of activity going on in your site.

Although these efforts are often uncoordinated, if you add them up, you may discover that they amount to substantial financial and human investments that far exceed the resources allocated for site management and staffing. **With a bit of coordination and education about the critical importance of the OUV, you can align activities and maximize efficiency and impact.**

✎ REMEMBER!

Today, the most successfully managed World Heritage marine sites are those that have identified the most important institutions and partners and aligned them around the common goal of long-term conservation of the site's OUV. To bring the OUV to life for your partners, you can use the tablet and smartphone applications, available at the iTunes and Google Play stores, to share videos and scientific data for each World Heritage marine site. The apps also include all World Heritage Committee decisions and reports for the 47 World Heritage marine sites assembled over the past 40 years.

More information at: http://whc.unesco.org/en/marine-programme/

The first thing you would need to do is to make a list of who is doing what in your site. It is very likely that NGOs operate a range of projects in your site, while universities may hold a wealth of data and scientific information about the conservation status of key species there and may send student researchers to your area. When coordinated well and aligned with the goals of your site, these initiatives, as well as the products derived from them, can make substantial contributions to the conservation of the OUV.

Additionally, the private sector—in particular tourism-related entities such as hotels, restaurants, tour operators, and cruise lines—have much to gain from a healthy, well-managed World Heritage site. For example, clean water that is free of dredged sediments is essential to both the ecological health of coral reef systems and the economic sustainability of a snorkeling or diving tour operator. While the amounts generated from tourism operations differ from site to site, these businesses in general benefit greatly from the international recognition that comes with the World Heritage designation—a fact that should provide a return to nature conservation.

Considering the limited budgets and finite human resources available for the conservation of most World Heritage marine sites, forming collaborative partnerships and aligning everyone's work around conservation of the OUV is crucial to effective management. The characteristics that make up the OUV of your site should serve to focus your discussions with current and potential partners. More broadly, aligning the conservation of the OUV of your site with national and international priorities and agendas can be a powerful way toward achieving effective, lasting results for your site. See Box 22 and 23 for examples of how marine World Heritage marine sites are doing this in practice.

BOX 22:
Aligning conservation goals and business opportunities in West Norwegian Fjords World Heritage site

The West Norwegian Fjords – Geirangerfjord and Nærøyfjord in Norway were inscribed on the World Heritage List in 2005 in recognition of their superbly developed fjords, which are considered among the largest, deepest, and most scenic remaining on our planet.

One of the site's biggest ongoing challenges is the sustainable management of more than 800,000 annual visitors. The narrow entry strip, the small towns surrounding the landscape, and the limited number of months in which visits are possible all add to the challenge of keeping the site and its water quality. Like many other World Heritage marine sites, this site is required to attract a substantial portion of the management budget from sources other than government revenues.

Since its inscription on the World Heritage List, the site has become an example of how alignment of conservation goals and business interests can create a win-win situation for all. Instead of developing ad-hoc activities, the site's managers chose to develop a common vision with the private sector, called *Green Dream 2020*.

Instead of focusing on increasing the number of visitors to the site, the partnership gradually ensures that only the "greenest" operators can access the site. These operators agree to market and brand a high-quality experience, commensurate with a World Heritage designation, and a percentage of the profits from their tours provides the necessary financial support for long-term conservation of the site. Under the Green Dream 2020 vision, all actors and partners operating in and around the site are mobilized and join forces in a strategic effort toward the long-term conservation of the site's OUV.

For more information, contact: Ms. Katrin Blomvik, manager of West Norwegian Fjords: katrin@verdsarvfjord.no

BOX 23:

Aligning national priorities and conservation in South Africa's iSimangaliso World Heritage site

iSimangaliso Wetland Park was inscribed on the World Heritage List in 1999 in recognition of its globally significant range of habitats and breathtaking scenic beauty. The site includes an extensive *reed of papyrus* wetlands on the bridge between subtropical and tropical Africa and is home to some of the world's largest marine and terrestrial mammals and the world's oldest fish.

The site was inscribed in 1994, at the dawn of South Africa's democracy, when poverty and socio-economic inequality stood out in sharp contrast to the region's natural wealth. At that time, over 80 percent of households lived below the poverty line and the formal employment rate was less than 15 percent. The national law that established the World Heritage site's management system created the unique obligation to combine the conservation of the site's OUV with sustainable economic development activities that created jobs for local people.

Land care and infrastructure development activities, established to ensure the conservation of the site's OUV, brought life-changing benefits to local communities by creating more than 45,000 temporary jobs over an 11-year period. By 2012, 45 local youth were pursuing higher education in the fields of conservation and tourism to develop skills to bring back to their communities. The site's World Heritage status and its newly developed branding and marketing strategy support steady growth into the future for sustainable income-generating activities, such as eco-tourism.

iSimangaliso's success in delivering long-term conservation and economic benefits is a result of its strategic alignment with the South African Government's macro-economic policies. By being part of nature's drive to deliver jobs and alleviate poverty, the World Heritage iSimangaliso site has enjoyed strong political support, and this has enabled site managers to protect the site against external conservation threats such as mining on the site's periphery.

More information is available at: http://isimangaliso.com/ or by contacting iSimangaliso site manager Andrew Zaloumis (apz@worldonline.co.za)

© iSimangaliso Wetland Park Authority

TASK 5: Craft a compelling story and leverage the World Heritage brand to achieve conservation of the OUV[22]

Many people around the world recognize the UNESCO World Heritage brand, but this brand recognition alone does not make your site immune to threats and their impacts. Neither is it an automatic guarantee for securing sufficient human and financial resources to manage your site. Your daily routine is often filled with negotiations with a variety of stakeholders. Whether your efforts are focused on attracting funding, changing resource-users' behavior, or convincing decision makers to establish new regulations, you will need effective communication and persuasion skills.

The best way to attract partners and engage audiences is to tell a consistent, compelling story about your site, the benefits it brings to people, and what they can do to help maintain the characteristics that earned the site its place on the World Heritage List. Your site's core story will help you advocate effectively for your site and persuade people to join you in your work to conserve the OUV.

While the OUV of your site might be very clearly described in your management plan, it may be described in terms that other people may not easily understand or even care about. Therefore, you should begin the task of crafting your core story by translating your OUV out of the technical language used in your inscription dossier and into a brief story of your site's ecological and cultural value that will resonate with your audiences.

Stories are important because they touch people's emotions and stick in their minds much better than facts alone do. A successful story about your site will emphasize why your site is special to people and how your site is unique on earth. Depending on who you are telling the story to, you should be ready to have a main character or two to bring it all to life. Your main character could be a person who uses, protects, or manages the resources in your site. It could also be a sea creature that is part of the OUV.

Next, take a look at the list of institutions and potential partners that you made in the preceding Task 4. This list is likely to include some combination of government agencies, businesses, NGOs, research institutions, policy makers, developers, journalists, communities and other resource users. Each entity on this list is one of your potential target audiences. Your time and resources available to devote to communicating and persuading are probably finite, so you should weigh the relative importance of what each audience can do for your site and rank them in order of the value they can add.

Now take a moment to think about what each priority audience cares about and how your site's OUV and the World Heritage brand might benefit them in a way that relates to one or more of their main concerns. You should also decide how each audience could help you achieve the conservation goals in your site and write down a clear and simple sentence about it.

At this point, you have all the information you need to create an "elevator pitch" tailored to each audience. It is called an elevator pitch because it should be short enough to tell in the course of a typical elevator ride and engaging enough to get a person's attention in that time span. Your pitch should tell the core story of your site and tie it in to the interests of the person you are talking to, so they

22 This section is based on the extensive expertise of strategic communications consultancy firms OceanWork and Resource Media

will ask to hear a bit more. Before you try a version of your elevator pitch with a real audience, make sure to practice it in front of a mirror, and role-play it with a colleague or friend.

The goal is to start a conversation, not give a speech. You want to engage your audience in a dialogue that will lead to a win-win for them and for conservation of OUV. As the conversation unfolds, listen carefully to what your audience is saying to you, because with every sentence they are revealing important information about their values, their needs, their constraints, and the parts of the story that resonate the most for them. All of this information can help you refine your elevator pitch going forward. Make sure to highlight how the World Heritage brand can help them achieve their goals, and tell them how they can help you achieve conservation of the OUV. This last piece is your call to action.

By adopting these strategic communications best practices, you can better advocate for the resources and partnerships you require to effectively manage your site. Adopting and practicing these skills will help you advocate effectively for your site with policy-makers, donors, potential partners, and visitors alike, educating them about the importance of your World Heritage marine site, the value it can bring to them, and the benefits of defending it against inappropriate development, among other things.

Cocos Island National Park, Costa Rica.
© Barry Peters / Public Domain

✎ REMEMBER

Communicate strategically to attract partners and resources

Communications is no longer just about websites, newsletters, and press releases. These things are still important, but on their own they will not help you achieve conservation of your World Heritage marine site's OUV. What will help you is using communications strategically to persuade others to join you in working toward your conservation goals. The basic components of any strategic communications action planning effort should include:

- **Prioritized List of Audiences:** Who can help you most with the things that matter most?
- **Core Site Story:** Bring your site and your OUV to life, in three sentences or less.
- **Audience:** Whom are you talking to?
- **Motivation:** What does your audience care about?
- **Benefit:** How can the site and its OUV benefit your audience and tap into what motivates them?
- **Problem:** What particular problem can the audience help you solve in your site and how?
- **Call to Action:** Here's what the site can do for you, and here's what you can do for the site.

Remember, the goal is to start a conversation, not give a speech. You want to engage your audience in a dialogue that will lead to a win-win for them and for conservation of the OUV.

Based on expertise from Tory Read, strategic communication expert. OceanWork Consulting: http://oceanwork.com/

Gulf of Porto: Calanche of Piana, Gulf of Girolata, Scandola Reserve, France.
© Agne Bartkute

You can also use your site story and its World Heritage status to unite everyone at work in and around your site behind a simple, coherent narrative. This can be an effective technique for ensuring that partners stay focused on the primary importance of maintaining the site's OUV and can serve as a constant reminder to all that the World Heritage brand brings certain responsibilities along with the benefits. This is extremely important when day-to-day realities bring competing pressures to bear on your site and partners. In New Caledonia, for example, the inscription of the site on the World Heritage List in 2005 allowed the site to unite all representatives of the 13 local management committees around the common and shared goal of preserving the OUV of the site. The successful first national conference that brought all managers together (managers are for the most part First Nations) illustrated the importance of this common goal in safeguarding the integrity of all six components of the site scattered across the country that make up the OUV[23].

Lastly, a coherent story and brand narrative will help you and your partners work together effectively to raise your site's profile and bring more resources to the table. See Box 24 for an example from the Wadden Sea World Heritage marine site.

23 More information at: http://whc.unesco.org/en/news/1059/

BOX 24:
Branding and Marketing of OUV values in the Wadden Sea World Heritage area

Recognized as UNESCO World Heritage in 2010, the Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world. It spans 500km along the coastline of three North Sea countries: Germany, the Netherlands, and Denmark.

Since its inscription on the World Heritage List, branding and marketing the OUV of the Wadden Sea has become an intrinsic part of successful site management and is shared by key partners who protect and benefit from the World Heritage site. Site managers here consider branding an opportunity to reinforce their understanding of where they are now and where they want to be in the future, and it helps raise awareness for the site as a unified entity – a place that is part of a network of the world's most iconic ocean places – worth protecting, exploring, and enjoying by all for years to come.

To communicate the site's core story and leverage the World Heritage brand, site managers in the Wadden Sea created a brand manual and toolkit to inspire government agencies, resource users, business operators, conservationists, and tour guides to embrace and communicate a common message that reflects the Wadden Sea's World Heritage status. The manual presents a set of standards for communicating the Wadden Sea brand through common graphic elements and clear messages on the core characteristics that earned the site its World Heritage status, as well as the benefits the World Heritage brand brings to the different stakeholders involved in the site.

The manual and toolkit are part of a comprehensive brand package that also includes a common logo, a common road sign, and an official World Heritage website, as well a short video and an information flyer. In addition, more than 65 information kiosks (see Figure 35) have been set up throughout the site, and residents and visitors can tell their own Wadden Sea stories via an interactive project called, "Being part of the World Heritage family."

Together, these tools help stakeholders across the three countries tell a unified story and use the World Heritage brand to raise the profile of their site and support intelligent, coordinated marketing. The end result is that Wadden Sea partners can reap greater benefits together than they could if each stakeholder acted independently and piecemeal.

More information available at: http://www.waddensea-secretariat.org/ or by contacting Harald Marencic, Common Wadden Sea Secretariat: marencic@waddensea-secretariat.org

Figure 34: Wadden Sea World Heritage Brand Paper.

Source: Common Wadden Sea Secretariat, Wadden Sea National Parks of Schleswig-Holstein and Lower Saxony, 2014.

Figure 35: Information kiosks throughout the Wadden Sea World Heritage site are part of marketing the site's OUV.

© Common Wadden Sea Secretariat, Wadden Sea National Parks of Schleswig-Holstein and Lower Saxony

As a site manager, you need to develop strong communication skills, but communication is an area of professional expertise in its own right. One way you might want to use the information in this section is to identify a communications consulting firm or mainstream media provider and use the skills described here to persuade them to partner with your World Heritage site. In exchange for providing you with training and professional assistance, their own status will be elevated through their association with the prestigious World Heritage brand. The same counts for other skills your management team requires.

This step has outlined the tasks you would need to complete to answer the question, "How will you get there?" Now we turn to the final step in effective management of your World Heritage marine site—answering the question, *"What are you achieving?"*

Surtsey, Iceland.
© Andreas Trepte / Public Domain

STEP 4

What are you achieving?

St Kilda, United Kingdom of Great Britain and Northern Ireland.

© SNH / MNCR

Introduction

What outputs should be delivered from this step?

1. An effective monitoring and evaluation system;
2. An understanding of whether you are achieving your objectives or are at least moving in the right direction;
3. A set of priorities that define the adaptations you need to make to your management actions;
4. A short list of research needed to inform future management.

Embrace change, and learn and adapt as you go

Because change is inevitable, the planning and management of your World Heritage marine site should be conducted as an iterative and ongoing process called "adaptive management." If your management system is sufficiently robust and adaptive, it can help ensure that your site's OUV endures through changing circumstances.

Change influences both the state of your site's OUV and the impact of the actions you take to protect it. Change can take many forms, including environmental change, shifting political priorities, or new economic realities. For example, climate change might influence the location of important species in your site over the coming decades. Technological change might make the exploitation of previously inaccessible resources possible in your site. New development projects might influence the amount of pollutants discharged from land-based sources and subsequently alter the environmental quality of certain locations in your site or features that make up your OUV.

On the positive side, new tools and techniques—such as remote sensing, GIS, GPS, and underwater autonomous systems—are rapidly making spatial and temporal data about ecosystem features and functions more accessible. The availability of this new information may change your understanding of your site's OUV, and this may lead you to adjust your management actions.

All of these changes, while usually external to the management process, are likely to affect the desired outcomes you have identified for the conservation of the OUV. It is therefore essential that you regularly monitor the State of Conservation of your site, the impact of your management actions, and changes in conditions in and around your site. Based on the results, you are likely to adapt your goals, objectives, and management actions accordingly.

The purpose of this step is to provide some essential basic guidance that can produce reliable, timely and relevant information about the performance of your management actions toward protecting the OUV of your site. This step will enable you to answer the final important question: *"What are you achieving?"* The following sequence of tasks will guide your work:

Task 1:	Develop a performance monitoring system.
Task 2:	Evaluate progress and report your results.
Task 3:	Use the monitoring results to adapt future management.

TASK 1: Develop a performance monitoring system

An adaptive approach to managing your World Heritage marine site allows you to understand whether the management actions implemented to achieve your desired future are moving you in the right direction. It might be, for example, that a fish closure is not achieving its anticipated outcome because external factors are influencing it, or because a measure such as the size of the no-take zone was not specified appropriately from the onset.

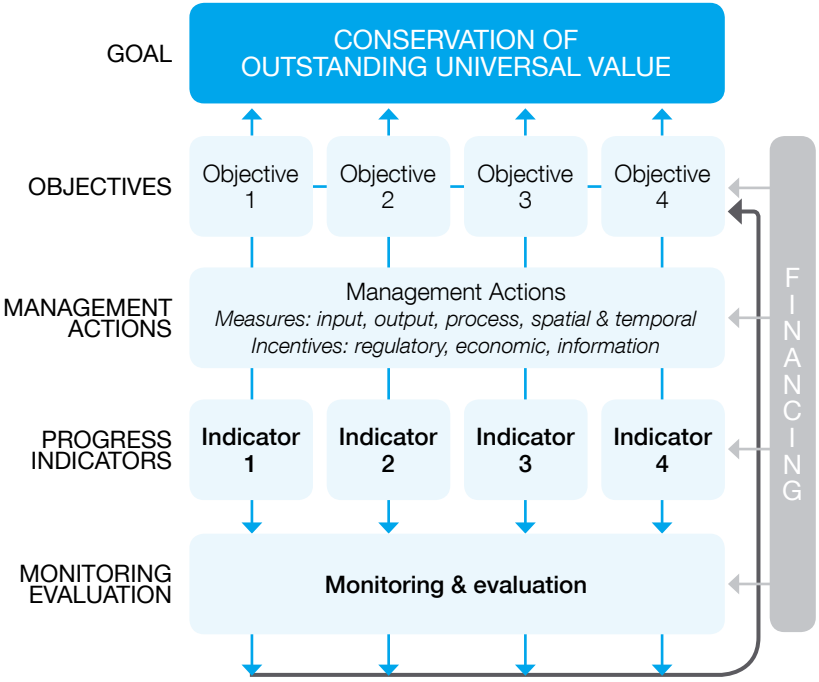
Although external factors of change are mostly uncontrollable, an adaptive approach to management will allow you to:

a. Identify more effective management actions to achieve the desired objectives;
b. Increase your understanding of how objectives should be modified in the context of changing conditions.

Adaptive management requires that you have some kind of monitoring and evaluation system in place. While this may sound like common sense, for many World Heritage marine sites, monitoring is still done on an ad hoc basis. Typically, a handful of indicators will be selected to monitor the state of the environment, but they will not enable you to tell whether progress (or lack thereof) is due to the management measures you took or due to luck or external circumstances.

Designing an effective monitoring programme starts with setting clear and measurable objectives, because without a clear idea of what it is you want to achieve, it is impossible to monitor whether or not you are moving in the right direction. **Setting up an effective monitoring system is thus intimately linked to the work you did in Step 1 of this guide, where you defined your goals and objectives based on the OUV of your site.** Figure 36 illustrates the connection between monitoring and evaluation and the other steps in the management process.

Figure 36: Correlation between goals, objectives, management measures, and indicators and their linkages to the OUV.



Source: UNESCO, World Heritage Marine Programme, 2014.

As with all steps of the management process for World Heritage marine sites, the OUV is the essential reference point for your monitoring and evaluation system, and the data recorded at the time of your site's inscription on the World Heritage List is the benchmark against which you should monitor and evaluate the State of Conservation of the site and its OUV.

The OUV served as the basis for setting the management objectives for your site, and it will also serve to help you identify the indicators that you will use to measure whether or not you are reaching your objectives. **Making the OUV the center of your monitoring programme will focus your monitoring where it is most essential and can have the most impact, and it will facilitate your work when you are asked to provide a State of Conservation report to the World Heritage Committee**.

Before designing your monitoring system, it is essential to understand the different types of monitoring:

1. **Compliance monitoring** refers to the verification of whether human activities are in compliance with the management actions and regulations you set in place to protect the OUV of the site. This type of monitoring was described in Step 3.

2. **Performance monitoring** refers to assessing accomplishments, particularly the progress (or lack thereof) toward pre-established goals and objectives and the desired outcomes of specific management actions.[24]

3. **State-of-the-environment monitoring** focuses on assessing the State of Conservation of your site's OUV in relation to its baseline state as described at the time of inscription of the site on the World Heritage List. It provides information on factors such as the status of biodiversity, the quality of the marine waters, and the overall health of the marine ecosystem. The results of this type of monitoring are typically documented in scientific papers or in quarterly or annual reports.

✎ **REMEMBER!**

Start with a modest monitoring programme

It is better to start with a relatively modest monitoring programme that features a few key indicators that relate to your OUV and then expand the programme based on your unfolding experience. You should give priority to a monitoring programme that provides information about:

- The condition of the most signficant aspects of the OUV of your site;
- The extent to which key objectives are or are not being achieved;
- Your site's most important management and conservation issues and how you can resolve them.

Remember that other sites in the World Heritage marine network might have more expertise on this subject and could assist you when setting up the monitoring programme. Tubbataha Reefs Natural Park in the Philippines, for example, revised its management plan and monitoring indicators through the exchange of expertise with the Great Barrier Reef World Heritage area.

24 Useful guides on performance monitoring of MPAs and World Heritage sites are: IUCN's publication « *How is your MPA doing? A guidebook of natural and social indicators for evaluating MPA management effectiveness*," and the World Heritage Centre's *Enhancing our Heritage Toolkit: Assessing management effectiveness of natural World Heritage sites*" (http://whc.unesco.org/documents/publi_wh_papers_23_en.pdf)

BOX 25:

Monitoring and evaluation of World Heritage marine sites: *What is different from other MPAs*?

To ensure that the characteristics that make up a site's World Heritage status will endure through government transitions, all sites inscribed on the World Heritage List are subject to systematic monitoring and evaluation cycles embedded in the official procedures of the 1972 World Heritage Convention. Along with the inscription process itself, the State of Conservation process is a key "value add" to World Heritage managers and their partners.

At the time of inscription, states assume the responsibility to protect their site so future generations can continue to enjoy it. States also assume the obligation to report regularly on the site's State of Conservation. At its annual meetings, the World Heritage Committee uses these reports to assess the conditions of a site and to make decisions on specific management requirements to resolve recurring conservation problems. The World Heritage Committee reviews sites on the World Heritage List through two different mechanisms:

A. Six-yearly periodic reporting

The State of Conservation of sites inscribed on the World Heritage List is reviewed in tranches so that every site is reviewed every six years. The periodic reporting monitors the actual State of Conservation of each site's OUV and the threats posed to it, and the legal and policy framework put in place to protect each site's OUV and to implement the provisions of the World Heritage Convention. This periodic reporting provides the Committee with regular information updates about each site and records the changing circumstances taking place there. It uses a consistent and formally adopted template and is organized by region in view of strengthening regional cooperation and exchange of information and experience among countries. The results from the most recent evaluation, conducted in the Europe/North America region, are available at: http://whc.unesco.org/archive/2014/whc14-38com-10A-en.pdf

B. Reactive monitoring reporting

Sites typically become subject to reactive monitoring when the OUV is under serious threat. Reactive monitoring is complementary to periodic reporting and can be initiated at any time.

Sites are selected for reactive monitoring through different mechanisms, including: official government information about intentions for major restorations or new development projects that may affect the OUV of the site; missions to a site to review the State of Conservation of the site's OUV and the threats posed to it; or information from third parties (such as NGOs, universities, research institutions, or the public at large) about deteriorations and serious impacts and threats to a site.

States whose sites are under threat are requested to provide a report on the State of Conservation in the site. This report provides the basis for the assessment undertaken by IUCN/World Heritage Centre and the resulting recommendations to the World Heritage Committee.

Possible actions by the World Heritage Committee

When a site is faced with specific and proven imminent danger, the World Heritage Committee can decide to inscribe the site on the List of World Heritage in Danger. Sites that are inscribed on the List of World Heritage in Danger are subject to a mandatory annual review to assess progress in remedying the issues identified. In cooperation with the respective country, the Committee develops a set of corrective measures and a Desired State of Conservation that, if achieved, will lead to removal of the site from the List of World Heritage in Danger. The Desired State defines the necessary targets the site needs to reach to avoid the irreversible loss of its OUV. Guidance for the design of a Desired State is available at: http://whc.unesco.org/document/123577

If a site's OUV deteriorates to the point where the site loses those characteristics that originally earned its inclusion on the World Heritage List, or where the necessary corrective measures were not taken within the proposed time, the World Heritage Committee can decide to delete the site entirely from the World Heritage List.

Your monitoring programme should use a set of core indicators, which can take the form of quantitative and qualitative statements or parameters that describe existing conditions and against which you can measure changes or trends over time. The three main functions of indicators are simplification, quantification (to the maximum extent possible), and communication. Table 6 provides a summary of characteristics inherent to good and reliable indicators.

Table 6: General characteristics of good and reliable indicators

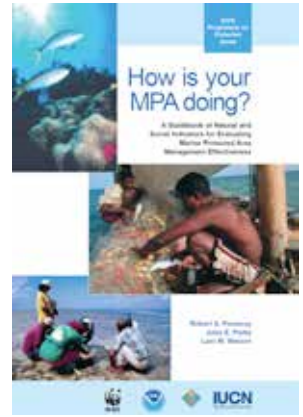
Characteristic	Description
Readily measurable	Indicators should be measurable on the time scales needed to support management and take advantage of existing instruments, monitoring programs, and available analytical tools
Cost effective	Indicators should be cost-effective, since monitoring resources are usually limited
Concrete	Indicators that are directly observable and measurable are more readily interpretable and more likely to be accepted by diverse stakeholder groups
Interpretable	Indicators should reflect areas of concern to stakeholders, and their meaning should be understood by as wide a range of stakeholders as possible
Grounded in scientific theory	Indicators should be based on well-accepted scientific theory, rather than on inadequately defined or poorly validated perceptions
Sensitive	Indicators should be sensitive to changes in the aspects being monitored and should be able to detect trends or impacts on those aspects
Responsive	Indicators should be able to measure the effects of management in view of providing rapid and reliable feedback on the consequences of management actions
Specific	Indicators should respond to the aspects they are intended to measure and have the ability to distinguish the effects of other factors from the observed responses

Source: M. Hockings. Enhancing our Heritage Toolkit. World Heritage Papers 23, 2008.

It is critically important to distinguish between indicators that measure the state of the environment and indicators that determine the effectiveness of your management actions. **The purpose of performance monitoring is to measure the results of specific management actions you are taking to conserve the OUV of your site**. It answers such questions as:

- Is the management action to designate a network of no-take areas resulting in the desired improvement in fish stocks?
- Are management actions taken to combat illegal fishing actually reducing the practice?
- Are stakeholders supportive of the process that led to the designation of a closed area, and do they respect the rules?

Each management action should have at least one indicator. The following two guides can help you define the most relevant indicators for monitoring the performance of your management actions:



Source: Pomeroy et al. IUCN, 2004.

Source: M. Hockings. Enhancing our Heritage Toolkit. World Heritage Papers 23, 2008.

The purpose of state of the environment monitoring is to look at trends in environmental conditions that are likely to affect the health of the OUV of your site. It answers such questions as:

- Are concentrations of marine pollutants going up or down?
- Are populations of key species of OUV going up or down?
- Is coral cover increasing or decreasing?
- Are areas of 'dead zones' (eutrophication or low-oxygen areas) increasing or decreasing?

Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves, Brazil.
© Jean-Philippe Hussenet

TASK 2: Evaluate your progress and report your results

Monitoring provides the means to understand how your site is doing. Evaluating and communicating the results ensures that the information will be used to inform future decision-making. **Even if you have limited amounts of money and very little reliable data, it is better to make a start with what you have than to report nothing at all.**

For all World Heritage sites, your evaluation of the information you get from monitoring activities should focus on elements that are critical to the OUV of your site. For example, when iconic species are part of what makes up your site's OUV, these should be a central focus when evaluating and communicating progress (or the lack thereof). In Everglades National Park, for instance, the American alligator is part of the OUV, and the species and its supporting ecosystem are important elements in the site's annual evaluations and the results that site managers communicate to stakeholders and decision-makers. (See Figure 37)

Figure 37: Annual evaluation of the American alligator, which forms part of the OUV in Everglades National Park (United States of America).

Criteria	Desired State of Conservation	Condition & Trend	Rationale
Positive trend in nesting effort	Increasing trend in nesting effort throughout all freshwater marshes, particularly peripheral marshes historically believed to support the majority of nesting effort. The target is nesting effort consistent with a restored Everglades ecosystem.		Nesting effort has increased significantly since 1985, recent trends show more stability during poor to moderate conditions and record numbers during favorable conditions.
Positive trend in nest success	Increasing trend in nest success and reduced failure due to flooding of egg cavity. The target is nest success levels consistent with a restored Everglades ecosystem.		Nest success continues to be highly erratic due both to extreme natural and managed seasonal hydrologic fluctuation.
Positive trend in nest density/ distribution	Increasing trend in density of nests across hydrologic basins, particularly within shorter hydroperiod peripheral marshes. The target is nest density and distribution consistent with a restored Everglades ecosystem.		Nest density and distribution throughout freshwater hydrologic basins of ENP have demonstrated an increasing trend in recent years.
Positive trend in alligator abundance	Increasing trend in abundance for all size classes of alligators within freshwater wetlands. The target is an abundance of alligators consistent with a restored Everglades ecosystem.		Results of spotlight surveys indicate reduced abundance estimates in all size classes within ENP.

Source: U.S. National Park Service, 2013.

✎ REMEMBER!

You have much more data than you think!

A common complaint in setting up monitoring programmes is a lack of scientific data. Certainly in the marine environment, where the systems are dynamic and complex and where research can be quite costly, data and information that allow you to understand the state of the environment of your area is never complete.

What is often overlooked is the weatlth of data that is available from third parties such as universities, think thanks, NGOs, and citizen science efforts, among others. Compiling all of the information that is available from various stakeholders and organizing it along indicators that correspond to the OUV of your site can be both powerful and cost-effective.

When no recorded data or information exists, you can bring together knowledgable people to discuss the state of your site. By putting this information together in one document, you can start to identify gaps you need to fill in order to efficiently monitor the status of your site's OUV, and this can help you determine key topics for researchers and students who wish to do field work in your site.

Once you gather and analyze your monitoring and evaluation data, it is important to share your results with all of your partners and discuss your recommendations for adapting management actions.

The creation of an evaluation report can be a challenging task, but the following tips can help you focus and keep it all doable:

1. Keep your purpose and audience in mind as you write the report. Learn as much as possible about the audience, and write the report in a way that is best suited to reach it. You will use different language if you are writing for scientists than you will of you are writing for policymakers.
2. If you have limited resources, focus the evaluation on information that is absolutely necessary, such as the central elements that make up the OUV of your site.
3. Use words that are simple, active, positive, familiar, and culturally sensitive.
4. Do not hesitate to indicate when the information is not 100-percent reliable or is incomplete. This will help to identify core research needs.
5. Limit background information to that which is needed to introduce the report and to make its context clear. Additional context can be included as an annex, if necessary.
6. Ensure stakeholder and community buy-in for the evaluation. There should be adequate assurance that all relevant stakeholders have been consulted and involved in the evaluation effort.
7. Include a set of recommendations.

Box 26 illustrates a good example of a state of the environment monitoring and evaluation process in the Wadden Sea World Heritage area. The report provides an evaluation of some of the most important elements of the OUV, based on scientifically supported indicators.

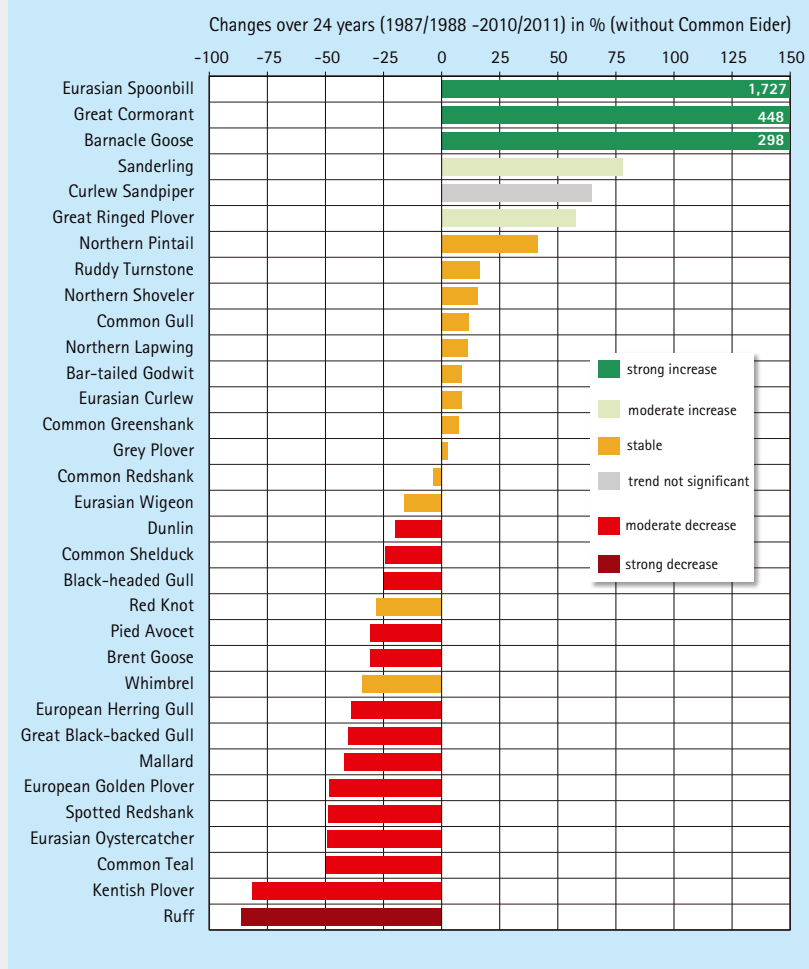
BOX 26:
Quality Status Report of the Wadden Sea World Heritage site

At regular intervals (typically every five years) the Wadden Sea World Heritage site produces a Quality Status Report that provides an evaluation of the State of Conservation of the World Heritage site. The report describes and evaluates the current ecological status of the Wadden Sea; identifies changes in the State of Conservation and their possible causes; identifies issues of concern and indicates possible measures of redress, including evaluation of the likely effectiveness of these measures; and identifies gaps in knowledge.

The latest evaluation was done in 2010 and is based on a range of indicators that clearly reflect the core components of the OUV of the site, such as migratory birds (Figure 38).

Wadden Sea, Denmark/Germany/Netherlands.
© Jan van de Kam / Common Wadden Sea Secretariat

Figure 38: Changes in numbers of 34 migratory waterbird species in the Wadden Sea World Heritage site over 24 years.



Source: Common Wadden Sea Secretariat, Wadden Sea National Parks of Schleswig-Holstein and Lower Saxony, 2014.
The report is available at: http://www.waddensea-secretariat.org/management/publications/the-wadden-sea-quality-status-report-synthesis-report-2010
For more information contact Gerold Luerssen, Expert, Common Wadden Sea secretariat: luerssen@waddensea-secretariat.org

As noted above, a good evaluation report will include a set of recommendations. Recommendations are powerful, because they indicate what needs to be done to ensure the World Heritage site is well maintained and can inspire targeted action. The most useful recommendations are clear and specific enough so that everyone understands what needs to be done, which organization or unit needs to take action, and when the action should occur. Ideally, recommendations are limited in number, to highlight the highest priority actions needed. It is essential that they be linked back to the goals and objectives you have set and are based on the OUV of your site.

✎ REMEMBER!

The power of evaluating progress

- If you do not evaluate your progress, you cannot tell success from failure.
- If you cannot see success, you cannot reward it.
- If you cannot recognize failure, you cannot correct it.
- If you can demonstrate results, you can win public support.

Source: Osborne & Gaebler, 1992, American management consultants

TASK 3: Use the monitoring results to adapt future management

Monitoring and evaluation results are worthless if you do not use them to reconsider the management actions, goals and objectives for your site. The results from monitoring and evaluation are "lessons learned" and should be used to adapt the management of your site so that the collective work you and your team and partners undertake can lead to the desired outcomes. **This is the essence of adaptive management—learning by doing and adapting what you do next based on what you learn.**

Despite the fact that an adaptive approach to management is accepted as a best practice, it is rarely implemented. To practice adaptive management, you should answer three important questions:

1. **What has been accomplished** through the management actions taken to conserve the World Heritage area, and what can be learned from successes or failures?
2. **How has the context changed** since the programme was initiated, and how should you refocus planning and management to address these changes? Consider changes in governance, technology, the environment, the economy, and others.
3. **What are the key information gaps for the site** that require attention from researchers and scientists? An adaptive approach to management, even when based on a very modest monitoring and evaluation programme, is likely to reveal gaps in knowledge about aspects of your OUV that require priority attention in future research efforts.

You can adapt your management by:

1. **Modifying the goals and objectives** that you derived from your OUV, if monitoring and evaluation results show that the costs of achieving them outweigh the benefits to society and to the environment;
2. **Modifying the desired outcomes**, if monitoring and evaluation results show that the ones you set were too ambitious given the reality of factors that are beyond your control;
3. **Modifying the management actions** if monitoring and evaluation results show that initial strategies are deemed ineffective, inequitable, or too expensive.

The outcomes of your evaluation and monitoring programme will inform future management, and your next round of planning will likely include a revised set of goals, objectives and management actions. These will take into account what you have learned from your monitoring results, as well as political, economic, and technological changes that have occurred that are having or will have an impact on the conservation of the OUV in your World Heritage marine site.

✎ REMEMBER!

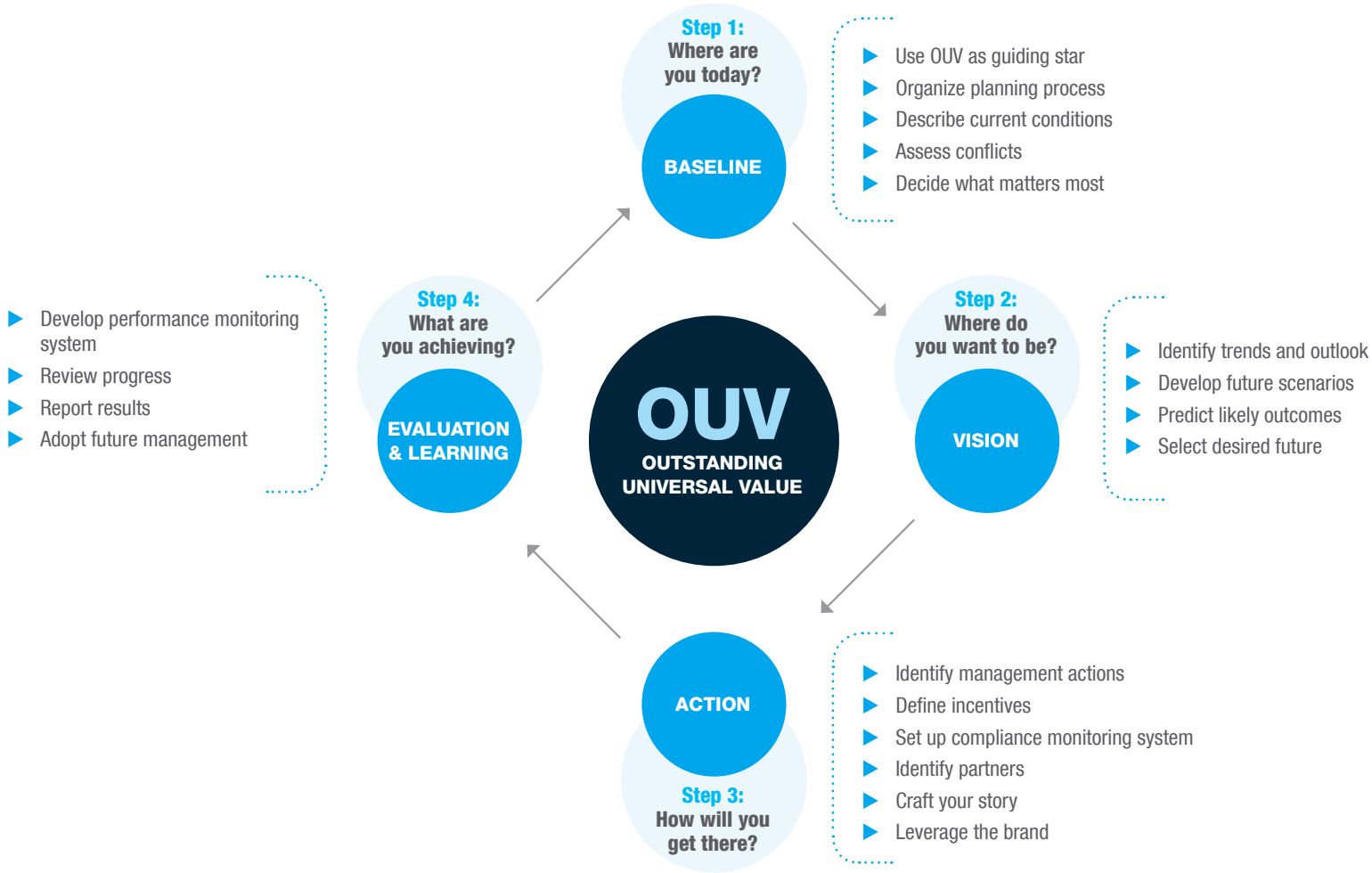
Because they are so unique, many World Heritage marine sites are important for scientific research into the evolution of ecological processes and habitats. They also often serve as critical places for monitoring long-term change, such as effects associated with climate change. Glacier Bay (United States of America), for instance, has a water-quality monitoring system that has enabled site managers to collect consistent data for the past 20 years. These data, which are publicly available through the National Oceanic and Atmospheric Administration (NOAA), serve as the benchmark for evaluating long-term change in other comparable marine areas around the world. The Tubbataha Reefs Natural Park is currently in good condition and serves as a reference point in the wider coral triangle region when assessing resilience of marine ecosystems against climate change effects such as coral bleaching.

This step has outlined the tasks you need to complete to answer the question, *"What are you achieving?"* On the following page, you will find a concluding graphic that summarizes the various parts of this guide and encapsulates the entire management cycle. The graphic can be used for easy reference when developing or fine-tuning the management system for your site.

The Sundarbans, Bangladesh.
© UNESCO/Nicky de Battista

Management Cycle Graphic

Figure 39: Management cycle graphic summarizing sections of this guide.



Source: UNESCO, World Heritage Marine Programme, 2015.

PART 2

Annexes and References

ANNEX 1: List of World Heritage Marine Sites

Argentina

Península Valdés, 1999
Link: http://whc.unesco.org/en/list/937

Australia

Great Barrier Reef, 1981
Link: http://whc.unesco.org/en/list/154

Heard and McDonald Islands, 1997
Link: http://whc.unesco.org/en/list/577

Lord Howe Island Group, 1982
Link: http://whc.unesco.org/en/list/186

Macquarie Island, 1997
Link: http://whc.unesco.org/en/list/629

Ningaloo Coast, 2011
Link: http://whc.unesco.org/en/list/1369

Shark Bay, Western Australia, 1991
Link: http://whc.unesco.org/en/list/578

Bangladesh

The Sundarbans, 1997
Link: http://whc.unesco.org/en/list/798

Belize

Belize Barrier Reef Reserve System, 1996
Link: http://whc.unesco.org/en/list/764

Brazil

Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves, 2001
Link: http://whc.unesco.org/en/list/1000

Canada/USA

Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini-Alsek, 1979
Link: http://whc.unesco.org/en/list/72

Colombia

Malpelo Fauna and Flora Sanctuary, 2006
Link: http://whc.unesco.org/en/list/1216

Costa Rica

Area de Conservación Guanacaste, 1999
Link: http://whc.unesco.org/en/list/928

Cocos Island National Park, 1997
Link: http://whc.unesco.org/en/list/820

Denmark/Germany/Netherlands

The Wadden Sea, 2009
Link: http://whc.unesco.org/en/list/1314

Ecuador

Galápagos Islands, 1978
Link: http://whc.unesco.org/en/list/1

Finland/Sweden

High Coast / Kvarken Archipelago, 2000
Link: http://whc.unesco.org/en/list/898

France

Gulf of Porto: Calanche of Piana, Gulf of Girolata, Scandola Reserve, 1983
Link: http://whc.unesco.org/en/list/258

Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems, 2008
Link: http://whc.unesco.org/en/list/1115

Iceland

Surtsey, 2008
Link: http://whc.unesco.org/en/list/1267

India

Sundarbans National Park, 1987
Link: http://whc.unesco.org/en/list/452

Indonesia

Komodo National Park, 1991
Link: http://whc.unesco.org/en/list/609

Ujung Kulon National Park, 1991
Link: http://whc.unesco.org/en/list/608

Japan

Ogasawara Islands, 2011
Link: http://whc.unesco.org/en/list/1362

Shiretoko, 2005
Link: http://whc.unesco.org/en/list/1193/

Kiribati

Phoenix Islands Protected Area, 2010
Link: http://whc.unesco.org/en/list/1325

Mauritania

Banc d'Arguin National Park, 1989
Link: http://whc.unesco.org/en/list/506

Mexico

Islands and Protected Areas of the Gulf of California, 2005
Link: http://whc.unesco.org/en/list/1182

Sian Ka'an, 1987
Link: http://whc.unesco.org/en/list/410

Whale Sanctuary of El Vizcaino, 1993
Link: http://whc.unesco.org/en/list/554

New Zealand

New Zealand Sub-Antarctic Islands, 1998
Link: http://whc.unesco.org/en/list/877

Norway

West Norwegian Fjords – Geirangerfjord and Nærøyfjord, 2005
Link: http://whc.unesco.org/en/list/1195

Palau

Rock Islands Southern Lagoon, 2012
Link: http://whc.unesco.org/en/list/1386

Panama

Coiba National Park and its Special Zone of Marine Protection, 2005
Link: http://whc.unesco.org/en/list/1138

Philippines

Puerto Princesa Subterranean River National Park, 1999
Link: http://whc.unesco.org/en/list/652

Tubbataha Reefs Natural Park, 1993
Link: http://whc.unesco.org/en/list/653

Russian Federation

Natural System of Wrangel Island Reserve, 2004
Link: http://whc.unesco.org/en/list/1023

Seychelles

Aldabra Atoll, 1982
Link: http://whc.unesco.org/en/list/185

Solomon Islands

East Rennell, 1998
Link: http://whc.unesco.org/en/list/854

South Africa

iSimangaliso Wetland Park, 1999
Link: http://whc.unesco.org/en/list/914

Spain

Ibiza, Biodiversity and Culture, 1999
Link: http://whc.unesco.org/en/list/417

United Kingdom of Great Britain and Northern Ireland

Gough and Inaccessible Islands, 1995
Link: http://whc.unesco.org/en/list/740

St. Kilda, 1986
Link: http://whc.unesco.org/en/list/387

United States of America

Everglades National Park, 1979
Link: http://whc.unesco.org/en/list/76

Papahānaumokuākea, 2010
Link: http://whc.unesco.org/en/list/1326

Viet Nam

Ha Long Bay, 1994
Link: http://whc.unesco.org/en/list/672

Yemen

Socotra Archipelago, 2008
Link: http://whc.unesco.org/en/list/1263

ANNEX 2: Map of World Heritage Marine Sites

World Heritage site in Danger natural World Heritage site mixed cultural and natural World Heritage site

ANNEX 3: Participants at the Vilm Working Meetings

Jon Day
Director Great Barrier Reef Marine Park Authority
Great Barrier Reef, Australia

Maria Marta Chavarria Diaz
Marine Coordinator
Area de Conservación Guanacaste, Costa Rica

Fernando Quiros-Brenes
Director, ACMIC
Cocos Island National Park, Costa Rica

Harald Marencic
Deputy site manager of the Common Wadden Sea Secretariat
The Wadden Sea, Denmark/Germany/Netherlands

Susanna Ollqvist
World Heritage Coordinator (Finland)
High Coast/Kvarken Archipelago, Finland/Sweden

Charles Ehler
Ocean Visions, France

Carole Martinez
French MPA Agency, France

Gunnar Finke
Deutsche Gesellschaft für Internationale ZUnited States of Americammenarbeit (GIZ) GmbH, Germany

Ingo Narberhaus
Marine and Coastal Conservation Department
Federal Agency for Nature Conservation
Germany

Gisela Stolpe
Head, International Academy for Nature Conservation Isle of Vilm, Federal Agency for Nature Conservation
Germany

Andrea Strauss
International Academy for Nature Conservation Isle of Vilm, Federal Agency for Nature Conservation
Germany

Diagana Mohamadou Youssouf
Director, Banc d'Arguin National Park
Mauritania

María Pía Gallina Tessaro
National Commission of Natural Protected Areas,
Mexico

Cecilia Garcia Chavelas
National Commission of Natural Protected Areas,
Islands and Protected Areas of the Gulf of California, Mexico

Carlos Ramon Godines Reyes
National Commission of Natural Protected Areas,
Director, Islands and Protected Areas of the Gulf of California, Mexico

Irma González López
National Commission of Natural Protected Areas
Whale Sanctuary of El Vizcaino, Mexico

Celerino Montes
National Commission of Natural Protected Areas
Director, Whale Sanctuary of El Vizcaino, Mexico

Felipe Angel Omar Ortiz Moreno
National Commission of Natural Protected Areas
Sian Ka'an Biosphere Reserve, Mexico

Katrin Blomvik
Director – Site Coordinator
West Norwegian Fjords - Geirangerfjord and Nærøyfjord, Norway

Tundi Agardy
Executive Director
Sound Seas, United States of America

David Swatland
Deputy Superintendent NOAA
Papahānaumokuākea, United States of America

Aulani Wilhelm
Superintendant NOAA
Papahānaumokuākea, United States of America

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