



## MPA Short Course – Module notes

These notes are provided to allow students to have the Presentation and the notes from the presentation available to read simultaneously. Slides numbers are provided throughout to help with orientation.

### Module 1: Introduction to Marine Protected Areas (MPAs)

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#### Slide 2 - MPA Course Overview

This is the first of eight modules in this course on Marine Protected Areas.

The aim of this course is to introduce you to the key concepts behind the use of marine protected areas, provide an overview of marine protection in Ghana, and run through the various stages of the MPA cycle.

The course is made up of eight modules. Each module consists of a presentation and module notes. A reading list is provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

#### Slide 3 - Learning Objectives

In this module we will be providing a general introduction to marine protected areas. Please note that throughout the course we are referring to 'Marine Protected Areas' as a general term. PCA (or Protected and Conserved Areas) is another term that is widely used and can also be used as a general term.


#### Slide 4 - The Marine Environment

The marine environment is vital for life on Earth. Marine biodiversity, the variety of life in the ocean and seas, is a critical aspect of all three pillars of sustainable development - economic, social and environmental - supporting the healthy functioning of the planet and providing services that underpin the health, wellbeing and prosperity of humanity.

The ocean is one of the main repositories of the world's biodiversity. It constitutes over 90 per cent of the habitable space on the planet and contains some 250,000 known species, with many more remaining to be discovered - at least two thirds of the world's marine species are still unidentified.

The ocean, and the life therein, are critical to the healthy functioning of the planet, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns, and supplies half of the oxygen we breathe while absorbing about 26 per cent of the anthropogenic carbon dioxide emitted into the atmosphere annually (Pasca Palmer, 2017).

Marine organisms are the foundation of Food Webs: From microscopic plankton to large predators. Food webs are central entities mediating major processes as well as pressures in



marine ecosystems, providing a functional link between individuals and populations, ecosystem functioning and resilience, and ultimately, ecosystem services (Eero et al., 2021).

### Slide 5 - Marine Ecosystem Services

The Millennium Ecosystem Assessment describes ecosystem services as the range of benefits people obtain from ecosystems, including provisioning, regulating, cultural and supporting services (Millennium Ecosystem Assessment, 2005). Indeed, over 3 billion people across the world rely directly on marine ecosystems for the provision of livelihoods, and food security (FAO, 2020), with billions more relying on the oceans indirectly for services such as climate regulation, and biogeochemical cycling (Barbier, 2017).

The Millennium Ecosystem Assessment defines ecosystem services as the provisioning (e.g., water resources), regulating (e.g., climate regulation, water quality), cultural (e.g., aesthetic), and supporting (e.g., soil formation) benefits that people obtain from ecosystems (Millennium Ecosystem Assessment, 2005). The table on the slide provides an overview of some of these ecosystem services, all of which have different value - some are more important in specific areas than others, and some are more spiritual in value, while others are vital for health, security, livelihoods and economy.

Some key services that marine ecosystems provide include:

- **Food:** One of the main services provided by the oceans to human societies is the provisioning service of food from capture fisheries and culturing operations. This includes fish, invertebrates, plants, and for some cultures, marine mammals and seabirds for direct consumption or as feed for aquaculture or agriculture.
- **Transportation:** Maritime shipping is the backbone of world trade; it is estimated that some 80 percent of all goods are carried by sea. In 2021, about 1.95 billion metric tons of cargo were shipped globally across the world's oceans (Statista Research Department, 2025).
- **Cultural significance:** Many cultures across the globe hold a strong sense of stewardship, pride and spiritual link to the sea. Indigenous communities of the Pacific Northwest and Polynesian cultures across the South Pacific share a sacred connection to the sea and its creatures, upon which they rely to fulfil their cultural and spiritual heritage.
- **Recreation:** Coastal tourism and recreation have dramatically increased over the past decades becoming a primary contributor to the gross domestic product (GDP) of several countries and well-being of large coastal populations (Ghermandi and Nunes, 2011).
- **Economic benefits:** In 2015 the WWF published a report estimating that the world's oceans could be conservatively valued at \$24 trillion USD (Hoegh-Guldberg, 2015). A more recent study in 2024 estimates that for the oceans 'the economic value ranges for provisioning services are between \$99 to \$1535 per hectare per year, cultural services are between \$45 to \$2170 per hectare per year, and recreation and tourism services range from \$185 to \$895 per individual per year (Lopez-Rivas and Cardenas, 2024).



## **Slide 6 - Ghana's Marine Environment**

Ghana has a coastline of approximately 550 km, with an exclusive economic zone (EEZ) area of 228,000 km<sup>2</sup>. These regions are comprised of many ecologically and socio-economically important habitats including wetlands, mangroves, sandy and rocky beaches, as well as shelf and deep seas.

These habitats host a diverse range of resources, including fisheries, nesting and feeding grounds for birds and turtles, oil and gas reserves, sand and gravels, salt, lagoons, estuaries, and beaches (Ocean Country Partnership Programme, 2025a).

Please note that further detail will be delivered in module 3 and will cover Ghana's marine environment, the threats it faces, the drivers of marine conservation, and the current situation of MPAs in Ghana.

## **Slide 7 - Threats to our Global Marine Environment**

*Play video - <https://www.youtube.com/watch?v=uXIIPe7DAxw>*

The marine environment provides a wide range of critical ecosystem services, including:

- generating around half of the world's oxygen;
- regulating climate and weather patterns;
- providing a vitally important source of protein for many communities worldwide; and
- supporting some of the highest levels of biodiversity on the planet, which underpin ecological functions relied upon by coastal and wider communities.

(IPBES, 2019; Millennium Ecosystem Assessment, 2005)


Since the industrial revolution, emissions of greenhouse gases have increased global surface temperatures (GST) and driven changes to the marine environment including ocean acidification (OA) (Caldeira and Wickett, 2003; Doney et al., 2012) and increased ocean temperatures worldwide (IPCC, 2019). Coupled with rapid increases in land and ocean use, and unsustainable exploitation of resources, these changes are causing widespread habitat and biodiversity loss, threatening the ability of species to mediate ecosystem processes and functions such as nutrient cycling, carbon capture, primary and secondary production, and climate regulation (Cardinale et al., 2012; IPCC, 2019; Millennium Ecosystem Assessment, 2005).

## **Slide 8 - Changes to land and sea use**

We will now go through each of the 5 key threats in a bit more detail. NOTE - Threats are not listed in any particular order.

Land-use change is a major human influence on habitats and can include the conversion of land cover (e.g. deforestation or mining), changes in the management of the ecosystem or agro-ecosystem (e.g. through the intensification of agricultural management or forest harvesting) or changes in the spatial configuration of the landscape (e.g. fragmentation of habitats).

In the marine environment human activities have altered at least 87% of the ocean, destroying habitats and impacting biodiversity (Luyppaert et al., 2020).

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- Land use directly impacts marine environments as clearing land for agriculture can lead to runoff from pesticides and fertilisers leading to nutrient loading in coastal regions and resulting in eutrophication.
  - Shipping: Intensifying shipping can destroy habitats and affect marine species through the introduction of invasive and non-native species, chemical pollution, noise pollution, and physical damage to fragile benthic habitats.
  - Infrastructure: Coastal and underwater infrastructure development, such as subsea communication cables, can negatively impact marine ecosystems.

These and other threats to the marine environment will be covered in greater detail in the next few slides.

Discussion topic: What changes have the students noticed in a) land use and b) marine and coastal use over their lifetimes? What Impacts do they think these changes have had?

### **Slide 9 - Overexploitation of living resources**

Unsustainable fishing occurs when fish are removed faster than populations can recover, leading to stock depletion and, in many cases, cascading effects throughout the marine food web. Such practices include illegal, unreported and unregulated fishing, destructive fishing methods, habitat damage and the depletion of non-target species. These pressures threaten both marine biodiversity and the livelihoods of coastal communities that depend on fisheries for food and income.

(FAO, 2022, 2010; IPBES, 2019; Pauly et al., 1998; Scheffer et al., 2005)

### **Slide 10 - Climate change: the “deadly trio”**


The world’s oceans have absorbed 91% of the heat generated by increased greenhouse gas emissions to the atmosphere, and around 30% of carbon emissions (IPCC, 2019; UNFCC, 2021). Carbon dioxide and increasing temperatures contribute to creating climate change’s ‘deadly trio’ of 1. ocean acidification, 2. increased temperature of seawater and 3. deoxygenation (where the concentration of dissolved oxygen in seawater is reduced).

When these 3 factors (or stressors) occur at the same time, the synergistic effects can have devastating effects on marine biodiversity, and ecosystem structure and functions (Barnosky et al., 2011; Erwin, 2015; Veron, 2008)

#### **Ocean Warming**

Due to the uptake of excess heat caused by global warming, seas have constantly warmed since the 1970s (Figure 1). This trend is expected to continue with the average temperature 0.88°C higher in 2011-2020 compared to 1850-1900 (IPCC, 2023). The world’s average sea surface temperature reached a new record of 21.1°C in April 2023 (Climate Reanalyzer, n.d.)

Warmer water alters organisms’ metabolisms. For example, warmer water can increase oxygen demand. It can cause mobile species to move and change their distribution range, leading to changes in food webs and ecosystem dynamics, as seen for many fish species (EEA, 2025).



Marine heat waves are extreme events that can outright kill native species, especially if they happen during the summer months. Such an event happened in the Western Mediterranean Sea in 2003 (Von Schuckmann et al., 2019).

### **Ocean deoxygenation**

Deoxygenation (the loss of oxygen in seawater) is a result of ocean warming. It occurs as warmer waters hold less dissolved oxygen. This occurs alongside increased oxygen consumption by various organisms and increased stratification and changes in ventilation (IPCC, 2019).

Coupled with a rising nutrient concentration that can occur due to more precipitation or runoff from intense farming, deoxygenation can lead to an expansion of hypoxic or anoxic conditions. These conditions will be lethal to many species, especially sessile (non-mobile) marine organisms.

Coastal areas influenced by hypoxia have increased four-fold since the 1950s (Breitburg et al., 2018). It is projected that the global ocean will lose 3-4% of its oxygen by 2100 (Bopp et al., 2013).

### **Ocean acidification**


Ocean acidification, primarily caused by carbon dioxide emissions, reduces calcium carbonate availability for organisms. This makes it more difficult for organisms such as corals, molluscs and some plankton to build and maintain their structural integrity i.e. shells and skeletons. Ocean acidification has been increasing rapidly with pH dropping by approximately 30% since the pre-industrial era (IPCC, 2023); Figure 1). When ocean acidification starts impacting organisms, its effects cascade throughout the food web - affecting ecosystem services such as fisheries.

### **Slide 11 - Pollution**

Pollution of the oceans is widespread, worsening, and in most countries poorly controlled. Human activities result in a complex mixture of substances entering the aquatic environment. It reaches the oceans through rivers, runoff, atmospheric deposition and direct discharges. Ocean pollution has multiple negative impacts on ecosystems and human health, particularly in vulnerable populations.

Refer to OCEAN POLLUTION Figure.

1. **PLASTIC WASTE:** An estimated 11 million metric tonnes of plastic enter the seas each year (UNEP, 2026). Plastic pollution threatens marine species from marine mammals, fish and seabirds to invertebrates. It breaks down into microplastics and nanoplastic particles that can enter the human food chain.
2. **OIL SPILLS:** Oil spills kill beneficial microorganisms that produce oxygen. They also lead to disruption of food sources and destruction of fragile habitats such as estuaries and coral reefs.
3. **MERCURY:** Mercury is also released from 2 main sources – coal combustion and small-scale gold mining. Exposure of infants in-utero when pregnant mothers eat contaminated seafood can cause IQ loss and developmental disorders. In adults,



mercury increases risks for dementia and cardiovascular disease (Bose-O'Reilly et al., 2010).

4. **MANUFACTURED CHEMICALS:** Manufactured chemicals such as phthalates, bisphenol A, flame retardants, perfluorinated chemicals, and pharmaceutical waste cause multiple diseases. They can also reduce fertility and damage fragile ecosystems such as coral reefs (Landrigan et al., 2020).
5. **PESTICIDES:** Pesticides sprayed on crops can end up in the ocean via rivers and watercourses. They contribute to global declines in fish stocks and can also reduce human fertility (Landrigan et al., 2020).

Discussion topic: Pollution in Ghana. Ridge to reef – consider how land and marine systems are linked and how pollutants generated in one environment can end up in another. E.g. nutrient run off causing coastal eutrophication. What pollution does Ghana suffer from?

Additional note on marine noise:

- Marine noise pollution is predominately generated from human activities (for example, shipping, drilling, sonar use)
- Noise pollution in the ocean can have negative impacts to localisation, feeding, communication, and migration patterns of multiple marine species from invertebrates such as crabs to marine mammals.


### Slide 12 - Invasive, Non-Native Species (INNS)

Invasive, non-native species are exacerbated by climate change.

Non-native species are plants, animals or fungi that have been introduced to a new area, either intentionally or accidentally, by human activity. Most non-native species are harmless, but 10-15% become invasive (NNSS, n.d.).

Invasive species are those non-native species that have spread rapidly and are damaging the environment, economy, or human health. They can:

- Cause extinctions of native plants and animals
- Reduce biodiversity
- Compete with native organisms for resources such as food, habitat and space which can lead to displacement of native species and, INNS may lack natural predators within introduced environments, altering food webs and further affecting trophic dynamics
- Alter habitats - INNS can modify and degrade habitat (physical structures, nutrient cycling, sediment patterns)
- Spread disease to native populations without previous exposure or immunity
- Consume native species directly
- Parasitise native species
- Hybridise with native species



INNS can have significant economic impacts too ranging from loss of harvests, damaged infrastructure, and additional production costs to the loss of livelihoods and ecosystem services. In the UK a recent assessment of the impacts of INNS estimated that the annual cost of INNS (terrestrial and aquatic) on the UK in 2021 was £4,014 million (Eschen et al., 2023). In the marine and coastal sectors, INNS can have significant impacts on multiple industries such as fisheries, aquaculture, and tourism activities.

Examples of invasive species include Green crab (*Carcinus maenas*), Killer algae (*Caulerpa taxifolia*), Sea walnut (*Mnemiopsis sp.*), Lionfish (*Pterois sp.*) and Pacific oysters (*Crassostrea gigas*).

### **Slide 13 – Effects on Coastal Ecosystems & Communities**

Wearing away of coastal land has significant negative effects on coastal ecosystems and communities. The main effects can be seen in the slide.

The wearing away of coastal land can be:

- Due to natural process (wave action, storms, rising sea levels)
- Exacerbated by human activities (urbanisation, climate change)

### **Slide 14 - Marine Protected Areas (MPAs)**

What are MPAs?

MPAs can be defined broadly as spatially defined marine areas that are managed through legal or other effective means to support the long-term conservation of biodiversity, ecosystem services and cultural values (N. (Editor) Dudley, 2008)

CBD = Convention on biological Diversity

IUCN = International Union for the Conservation of Nature

WWF = World Wildlife Fund

The term MPA includes marine reserves, fully protected marine areas, no-take zones, marine sanctuaries, ocean sanctuaries, marine parks, locally managed marine areas, to name just a few.

Many of these have quite different levels of protection, and the range of activities allowed or prohibited within their boundaries varies considerably too.

### **Slide 15 - MPA characteristics**

Key features of MPAs that are recognised across the definitions are:

- Conservation purpose - All MPAs are established with the primary goal of conserving marine ecosystems, biodiversity, and/or habitats. They serve as areas where human activities are managed to ensure the long-term protection of marine resources and natural processes.
- Spatial designation - MPAs are defined by specific geographic boundaries, distinguishing them from surrounding marine areas. These boundaries can be based on scientific criteria, ecological significance, or socio-economic considerations.

- Active management - They serve as areas where human activities are managed to ensure the long-term protection of marine resources and natural processes.
- Sustainable use - While some MPAs might have strict no-take zones, many are designed to accommodate sustainable use. This involves balancing conservation goals with controlled human activities such as fishing, tourism, research, and recreational pursuits.
- Objectives – MPA objectives are commonly used to set target and goals. These can be ecological, economical, or even social.
- Legal framework - Some MPAs are designated and managed a under legal or regulatory framework. However, they do not have to be, for example there could be a voluntary agreement in place.
- Global significance - Many MPAs contribute to international conservation goals, such as those set by the Convention on Biological Diversity (CBD) or the International Union for Conservation of Nature (IUCN).


In summary, MPAs are a tool of ecosystem conservation and management of human activities.

### Slide 16 - MPAs: How do they work?

Once implemented, established MPAs function through a combination of regulatory measures, zoning, and active management to achieve conservation and sustainable use objectives.

Key Mechanisms of MPAs:

1. **Regulation of Activities:** MPAs implement specific rules that limit or prohibit activities detrimental to marine ecosystems, such as overfishing, drilling, or unregulated tourism. These regulations are tailored to the conservation goals of each MPA and may vary in strictness.
2. **Zoning:** Within MPAs, different zones are designated for various uses, including no-take zones where all extractive activities are prohibited, and areas where sustainable fishing or tourism is permitted. This zoning helps balance conservation efforts with economic and recreational activities.
3. **Monitoring and Enforcement:** Effective management of MPAs requires regular monitoring of ecological health and human activities, along with enforcement of regulations to ensure compliance. This may involve patrolling, surveillance technologies, and community engagement.
4. **Community Involvement:** Engaging local communities and stakeholders in the planning and management of MPAs is crucial for their success. This involvement ensures that conservation measures are culturally appropriate and economically viable, fostering local support and compliance.
5. **Adaptive Management:** MPAs often employ adaptive management strategies, adjusting regulations and management practices based on ongoing scientific research and monitoring outcomes to respond effectively to changing environmental conditions and new information.



By integrating these mechanisms, MPAs aim to protect marine biodiversity, restore fish populations, preserve cultural heritage sites, and enhance the resilience of marine ecosystems to environmental changes, including climate change.

### **Slide 17 - MPAs: Environmental benefits**

The environmental benefits of MPAs depends on what the MPA is identified for, for example, whether it's for megafauna such as manta rays, or for a coral site, or perhaps for grouper aggregations. When appropriately identified and effectively managed, MPAs can:

- Provide safe havens for habitats and species to grow and reproduce (protect key nursery areas)
- Protect, conserve and restore rare, threatened, endemic and unique species and habitats
- Protect internationally recognised important populations, contributing to global protections e.g., manta ray
- Allow for the restoration of ecosystems

### **Slide 18 - MPAs: Economic benefits (Fisheries)**

Economically, MPAs can help support sustainable fisheries and other marine resources by helping species to recover. When appropriately identified, they can provide spillover and seeding effects (Halpern et al., 2009). In doing so MPAs may sustain or increase yields of nearby fisheries.

### **Slide 19 - MPAs: Economic benefits (Tourism)**

Economically, MPAs can help:

- High biodiversity and healthy coral reefs support ecotourism such as scuba diving, snorkelling, recreational fishing, boat safaris.
- Internationally recognised protected areas increased tourism opportunities.

(Spalding et al., 2017; UNEP-WCMC and IUCN, 2016)

### **Slide 20 - MPAs: Social benefits**

MPAs can provide communities with a focus for their marine conservation, helping to raise awareness about their local coastal environment.

They can provide focus for Protecting and promoting cultural heritage, as well as providing a focus for outreach, education, research and monitoring opportunities.


### **Slide 21 - MPAs: Climate Change & Habitat Resilience**

MPAs have a role to play in building resilience to the effects of climate change.

For example, they can help to protect 'blue carbon' habitats such as seagrass, mangrove and saltmarsh – these are habitats that capture and store carbon themselves.

They can also help to protect habitats such as wetlands and coral reefs, which can help buffer against the impacts from extreme weather.

MPAs can provide important corridors of protection for species and habitats that are shifting due to the changing climate, whilst also to enhance the ecological resilience of marine



ecosystems to impacts of climate change, and therefore their ability to be able to handle the effects of climate change (McLeod et al., 2009).

### **Slide 22 - Challenges of MPAs: Socio-economic**

It is important to note that not all ocean-based activities are compatible with the objectives of MPAs, and there can be some costs to society. This is why it is critical that MPAs are designed and implemented with the engagement of local sea users to take steps wherever possible to minimise impacts to society.

Impacts can include loss of livelihoods due to restrictions on human activities in the MPA, or increases in operating costs (e.g., extra travel costs for fishers when displaced from their original fishing grounds).

They can result in restricted or loss of access to marine resources and culturally significant places, Loss of social opportunities and inequitable distribution of benefits,

This can increase social conflict and the undermining of social and cultural practices.

### **Slide 23 - Challenges of MPAs: Effectiveness**

Procedural challenges: relate to the official system which is run to manage the MPA which are budget capacity, staff capacity/presence, implementation of planned management activities, degree of monitoring of management, users, and/or resource condition, level of enforcement, delineation of protected area boundaries, appropriateness of regulations controlling use and level of legislative support (Gill et al., 2017).

We will come back to some of these points in further modules.

### **Slide 24 - In Summary**

In summary, we have talked about the marine environment more broadly, and some of the threats that are faced in coastal and marine ecosystems.

We introduced MPAs, giving their definition, and their benefits and costs, from an environmental, social and economic perspective.

The next session will start to look at the regulatory drivers for MPAs and the different types of designation in more detail.



## Module 2: Marine Protected Areas Around the World

### Slide 1

Module 2 - Marine Protected Areas around the world.

### Slide 2 - MPA Course Overview

This is the second of eight presentations in this course on Marine Protected Areas.

The aim of this course is to introduce you to the key concepts behind the use of marine protected areas, provide a brief overview of marine protection in Ghana (we will expand on this in the next module), and run through the various stages of the MPA implementation cycle.

As mentioned before, the course is made up of eight modules. Each module is made up of a presentation and modules notes. A reading list is provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

### Slide 3 - Learning Objectives

For the purpose of the MPA short course, we are referring to Marine Protected Areas as an umbrella term. PCA (or Protected and Conserved Areas) are another term that is widely used and can also be used as an umbrella term.

### Slide 4 - MPAs: a cornerstone for ocean recovery

This slide is to remind us of what was covered in the last module; MPAs and MPA networks act as a cornerstone of ocean recovery.

### Slide 5 - MPAs: International & Regional Drivers

Ghana has numerous drivers to designate its first MPA and develop an MPA network for the future, these include domestic plans, which will be covered further in the next module, as well as various international conventions and agreements.

Some of these include:

1. Regional alliances / strategies: WAA (West African Alliance) and Convention d'Abidjan
2. International: CBD, RAMSAR, CMS, GOA, CITES and UNSDG (see following slides for more details)

These conventions and agreements reflect commitment to international collaboration for the conservation and sustainable management of marine ecosystems, including the establishment and effective management of MPAs.

Each agreement has different requirements with regards to environmental, economic and social information that needs reporting.



## Slide 6 - MPA Drivers: CBD

The Convention on Biological Diversity (CBD) (UNEP. Environmental Law and Institutions Programme Activity Centre, 1992) is a multilateral treaty that entered into force on December 29, 1993.

It has three primary objectives:

1. Conservation of biological diversity: This involves preserving the variety of life on Earth, including ecosystems, species, and genetic resources.
2. Sustainable use of its components: Ensuring that the utilization of biodiversity components, such as plants, animals, and microorganisms, is conducted in a way that does not lead to their long-term decline.
3. Fair and equitable sharing of benefits arising from genetic resources: This aims to ensure that benefits derived from the use of genetic resources are shared fairly, particularly with countries and communities that provide these resources.

The CBD was opened for signature at the Earth Summit in Rio de Janeiro on June 5, 1992, and has been ratified by 196 parties, making it a near-universal agreement. Notably, the United States is the only UN member state that has not ratified the Convention.

Two supplementary agreements enhance the CBD's framework:

- Cartagena Protocol on Biosafety: Adopted on January 29, 2000, and effective from September 11, 2003, this protocol governs the transboundary movements of living modified organisms (LMOs) resulting from modern biotechnology, aiming to protect biological diversity from potential risks.
- Nagoya Protocol on Access and Benefit-Sharing: Adopted on October 29, 2010, and effective from October 12, 2014, this protocol provides a legal framework for the fair and equitable sharing of benefits arising from the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity.

The CBD addresses various issues, including:

- Incentives for conservation and sustainable use of biodiversity.
- Regulated access to genetic resources and traditional knowledge, ensuring prior informed consent.
- Sharing of research results and benefits from the utilization of genetic resources.
- Access to and transfer of relevant technologies.
- Technical and scientific cooperation among parties.
- Education and public awareness initiatives.
- Provision of financial resources to support implementation.
- National reporting on efforts to meet treaty commitments.

The governing body of the CBD is the Conference of the Parties (COP), which meets biennially to review progress, set priorities, and adopt work plans. The most recent meeting, COP 16, was held in 2024 in Cali, Colombia.



## **Slide 7 - MPA Drivers: GBF, 30x30**

The Kunming-Montreal Global Biodiversity Framework (GBF) (<https://www.cbd.int/gbf>), adopted in December 2022, is a landmark international agreement aimed at halting and reversing biodiversity loss by 2030. It sets out four overarching goals for 2050 and 23 action-oriented targets for 2030, focusing on areas such as habitat conservation, sustainable use of biodiversity, and equitable sharing of benefits.

A central component of the GBF is Target 3, commonly known as the 30x30 initiative (<https://www.30x30.org.uk/the-30by30-goal>). This target commits countries to conserve at least 30% of the Earth's land and marine areas by 2030 through ecologically representative, well-connected, and equitably governed systems of protected areas and other effective area-based conservation measures.

Key Aspects of the 30x30 Initiative:

- Ecologically Representative Areas: Ensuring that conserved areas reflect the full range of ecosystems and species diversity.
- Connectivity: Establishing ecological corridors to facilitate species movement and gene flow, enhancing resilience to climate change.
- Equitable Governance: Involving Indigenous peoples and local communities in decision-making processes, respecting their rights and traditional knowledge.
- Effective Management: Implementing robust management plans to maintain the ecological integrity of protected areas.


The 30x30 target is recognized as a critical strategy to halt biodiversity loss, mitigate climate change, and support sustainable development. Achieving this goal requires coordinated global efforts, substantial financial investments, and the active participation of all stakeholders, including governments, Indigenous peoples, local communities, and the private sector.

The Global Ocean Alliance (<https://www.gov.uk/government/topical-events/global-ocean-alliance-30by30-initiative/about>) is a 77-country strong alliance, led by the UK. The GOA champions ocean action within the Convention on Biological Diversity (CBD), including the 30by30 ocean target and other targets in the Kunming-Montreal Global Biodiversity Framework (GBF).

The framework sets a global mission to halt and reverse biodiversity loss by 2030, and all parties to the CBD must now take domestic action to fully and effectively implement the GBF.

## **Slide 8 - MPA Drivers: SDGs**

The Sustainable Development Goals (SDGs) (<https://unric.org/en/united-nations-sustainable-development-goals/>) are a set of 17 interconnected objectives established by the United Nations in 2015, aiming to address global challenges and achieve a better and more sustainable future by 2030. These goals encompass a broad range of issues, including poverty eradication, quality education, gender equality, clean energy, economic growth, reduced inequalities, climate action, and peace and justice.



The SDGs are designed to be universal, applying to all countries regardless of their development status, and emphasize the interconnectedness of social, economic, and environmental sustainability.

Each goal includes specific targets and indicators to monitor progress, with a total of 169 targets and 232 indicators across all goals.

The SDGs build upon the successes of the Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty.

Achieving these goals requires collaboration among governments, international organizations, the private sector, and civil society, with a focus on inclusivity to ensure that no one is left behind.

### **Slide 9 - MPA Drivers: CITES**

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) (<https://cites.org/eng/disc/text.php>) is a global agreement between governments that regulates international trade in wild plants and animals. Its purpose is to ensure that trade does not place species at risk by driving population declines or extinction.

International trade in wildlife is extensive and economically significant, involving large volumes of plant and animal specimens and a wide range of products. These include live specimens as well as goods such as food products, timber, musical instruments, leather items, medicines and tourist souvenirs. In some cases, high levels of exploitation, combined with pressures such as habitat loss, can severely reduce wild populations and threaten species survival. While not all species in trade are currently endangered, international cooperation is important to ensure that use remains sustainable over the long-term.


Because wildlife trade routinely crosses national boundaries, it cannot be effectively managed by individual countries acting alone. CITES provides a coordinated international framework to control trade and reduce the risk of over-exploitation.

Species covered by CITES are listed in three Appendices, reflecting the level of protection they require:

- Appendix I includes species that are at the greatest risk of extinction. Commercial international trade in these species is generally prohibited, with limited exceptions such as non-commercial scientific research.
- Appendix II covers species that are not currently threatened with extinction but could become so if trade is not strictly regulated. International trade is permitted under a system of export (or re-export) permits.
- Appendix III includes species that a country has chosen to list unilaterally and for which it seeks assistance from other Parties to control trade. Trade in these species is allowed only with the appropriate documentation.

In total, CITES regulates international trade in around 25,000 plant species and over 5,000 animal species. The exact numbers are approximate, as some entire groups are listed despite incomplete global species inventories.

### **Slide 10 - MPA Drivers: RAMSAR Convention**



The Ramsar Convention on Wetlands (<https://www.ramsar.org/>), adopted in 1971 in Ramsar, Iran, is an international treaty dedicated to the conservation and wise use of wetlands and their resources. It came into force in 1975 and has since been ratified by 172 countries, covering over 2,500 designated wetlands of international importance.

The Convention's mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world."

The Ramsar Convention operates through three main pillars:

1. Wise Use of Wetlands: Promoting sustainable utilization to maintain their ecological character.
2. Designation of Wetlands of International Importance: Encouraging member countries to identify and manage significant wetlands.
3. International Cooperation: Fostering collaboration among nations for wetland conservation.

Wetlands are vital ecosystems that provide numerous services, including water purification, flood control, carbon storage, and habitats for diverse species. The Ramsar Convention plays a crucial role in halting the global loss of wetlands and ensuring their conservation through sustainable management practices.

### **Slide 11 - MPA Drivers: CMS**

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) (<https://www.cms.int/legalinstrument/cms>), also known as the Bonn Convention, is an international treaty established under the United Nations Environment Programme. Signed in 1979 and effective from 1983, CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. CMS currently has 133 parties.


The Convention focuses on:

1. Conservation of Migratory Species: Protecting species that cyclically and predictably cross-national boundaries.
2. Habitat Preservation: Ensuring the maintenance and restoration of habitats essential for migratory species.
3. International Cooperation: Facilitating coordinated actions among range states—the countries through which migratory species pass.

Species covered by CMS are listed in two appendices:

- Appendix I: Includes migratory species threatened with extinction. Parties strive to protect these species, conserve or restore their habitats, mitigate obstacles to migration, and control factors endangering them.
- Appendix II: Contains migratory species that need or would significantly benefit from international cooperation. For these species, CMS encourages the development of regional or global agreements to ensure their conservation and management.

CMS has led to the development of various specialized agreements and memoranda of understanding targeting specific species or groups, such as the Agreement on the



Conservation of African-Eurasian Migratory Waterbirds (AEWA) and the Agreement on the Conservation of Populations of European Bats (EUROBATS).

### **Slide 12 - MPA Drivers: Convention d'Abidjan**

The Convention for Cooperation in the Protection, Management, and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central, and Southern Africa Region, commonly known as the Abidjan Convention (<https://www.unep.org/abidjan-convention>), is a comprehensive legal framework established to promote regional collaboration in safeguarding marine and coastal ecosystems along the Atlantic coast of Africa. Adopted in 1981 in Abidjan, Côte d'Ivoire, the Convention entered into force in 1984 and encompasses 22 coastal countries from Mauritania to South Africa.


Key Objectives:

1. **Protection of the Marine Environment:** Preventing, reducing, and controlling pollution and degradation of the marine and coastal environment from various sources, including land-based activities, shipping, and offshore exploration.
2. **Sustainable Management:** Promoting the sustainable use and management of marine and coastal resources to ensure long-term ecological balance and economic benefits for the region.
3. **Regional Cooperation:** Facilitating collaboration among member states in research, monitoring, and the implementation of policies and strategies for environmental protection and sustainable development.

Legal Instruments:

The Convention is supplemented by several protocols that address specific environmental concerns:

- **Protocol Concerning Cooperation in Combating Pollution in Cases of Emergency:** Focuses on joint actions to respond to marine pollution incidents.
- **Protocol on Integrated Coastal Zone Management:** Aims to harmonize policies for the sustainable development of coastal zones.
- **Protocol on Sustainable Mangrove Management:** Seeks to protect and manage mangrove ecosystems vital to coastal resilience.
- **Protocol on Environmental Norms and Standards for Offshore Oil and Gas Exploration and Exploitation Activities:** Establishes guidelines to minimise environmental impacts from offshore oil and gas operations.
- **Areas of Work:**
  - The Abidjan Convention's work program focuses on:
    - **Assessments:** Conducting evaluations of ecosystems, pollution levels, and socio-economic factors affecting the marine and coastal environment.
    - **Management:** Implementing initiatives to prevent environmental degradation and promote the sustainable use of resources.

- 
- Coordination and Legal Frameworks: Updating legal instruments, enhancing coordination among member states, and strengthening institutional capacities.
  - Communication and Capacity Building: Promoting information exchange, raising public awareness, and building stakeholder capacities.

### **Slide 13 - MPA Drivers: WAA**

The West African Alliance on Carbon Markets and Climate Finance is a collaborative platform established in 2017 to enhance the participation of West African countries in international carbon markets and to facilitate access to climate finance mechanisms. The Alliance comprises 16 member countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Objectives:


1. Capacity Building: Strengthen institutional and technical capacities of member countries to effectively engage in carbon markets and utilize climate finance for implementing Nationally Determined Contributions (NDCs).
2. Policy Development: Support the formulation of policies and strategies that enable member states to participate in international carbon markets, particularly under Article 6 of the Paris Agreement.
3. Regional Cooperation: Foster sub-regional collaboration to share knowledge, experiences, and best practices related to carbon markets and climate finance.
4. Access to Finance: Facilitate access to result-based climate finance, ensuring that financial resources are mobilized for climate mitigation and adaptation projects within the region.

Activities:

- Workshops and Training: Organizing regional workshops to build understanding of carbon pricing, Article 6 mechanisms, and the voluntary carbon market.
- Partnerships: Collaborating with international organizations, such as the Global Carbon Council and the Voluntary Carbon Markets Integrity Initiative (VCMI), to accelerate climate action and ensure environmental integrity in carbon market activities.
- Technical Assistance: Providing support to member countries in developing carbon market frameworks, including the establishment of Designated National Authorities (DNAs) and the creation of monitoring, reporting, and verification (MRV) systems.
- Advocacy: Representing the interests of West African countries in international climate negotiations to ensure that the region's perspectives are considered in the development of global carbon market mechanisms.

Through these efforts, the West African Alliance aims to position the region as an active participant in global carbon markets, leveraging climate finance to achieve sustainable development and contribute to global climate mitigation efforts.

### **Slide 14 - Types of MPAs: IUCN Protected Areas categories**



In 1994 IUCN published a system to categorise protected areas based specifically on management objectives with the aim of providing:

- A tool for promoting the development of a representative system of protected areas;
- A framework for collecting data;
- International standards for comparison across countries; and
- A means of promoting international understanding (a 'common language').

The IUCN system comprises six categories, all of which have equal importance (*see table on slide, and below for details on each category*). Categories Ia-III cover the stricter forms of protected area. Categories IV and V are for protected areas where cultural values and sustainable resource use are important additional management objectives. Category VI allows for many uses, although two thirds of the area should remain in its natural state. Countries are responsible for assigning categories for their protected areas, using the IUCN guidelines.

#### Category Ia: Strict Nature Reserve

- Definition: Areas strictly protected for biodiversity and geological/geomorphological features. Human access is highly restricted, limited to scientific research and monitoring.
- Example Activities: Scientific study, monitoring ecosystems.

#### Category Ib: Wilderness Area

- Definition: Large, unmodified areas retaining their natural character. Human activity is minimal, primarily for preserving wilderness and enabling low-impact recreation.
- Example Activities: Wilderness experiences, ecotourism.

#### Category II: National Park

- Definition: Large natural or near-natural areas set aside to protect ecological processes and provide opportunities for education, recreation, and public enjoyment.
- Example Activities: Recreational tourism, environmental education.


#### Category III: Natural Monument or Feature

- Definition: Areas focused on protecting specific natural features like caves, rock formations, or unique habitats. They often have cultural or spiritual significance.
- Example Activities: Limited tourism, cultural practices.

#### Category IV: Habitat/Species Management Area

- Definition: Areas designated to protect specific species or habitats. Active management may include habitat restoration or predator control.
- Example Activities: Conservation programs, habitat restoration.

#### Category V: Protected Landscape/Seascape

- 
- Definition: Areas where interaction between people and nature has shaped the landscape, supporting biodiversity while preserving cultural, ecological, and scenic values.
  - Example Activities: Sustainable tourism, community-led conservation.

#### Category VI: Protected Area with Sustainable Use of Natural Resources

- Definition: Areas aiming to conserve ecosystems and habitats while allowing sustainable, low-impact use of natural resources.
- Example Activities: Sustainable fishing, forest harvesting.

MPAs can be difficult to categorise. They may be administered by a different agency from terrestrial protected areas, which may not be familiar with IUCN procedures (for example if it is a Fisheries Department). Furthermore, MPAs do not always appear to fit comfortably into the existing categories system, particularly multiple use MPAs and no-take areas. In some cases (e.g. Australian marine reserves) different categories are applied to different zones. The current international guidance on protected area categories is set out in the IUCN guidelines published in 2008 (N. (Editor) Dudley, 2008).

#### **Slide 15 - Types of MPAs: Protection & Impact**

While the IUCN framework categorises protected areas by their management objectives and governance, MPAs can also be differentiated by the level of environmental protection they provide. The MPA Guide (Gorud-Colvert et al., 2021a) identifies four levels of protection, based on the types of activities allowed and their overall ecological impact.

#### **Fully Protected**

Fully protected MPAs prohibit all extractive and destructive activities, with all manageable human pressures minimised. Although some external impacts, such as climate change or land-based pollution, cannot be prevented, fully protected areas can enhance ecosystem resistance and resilience, supporting recovery after disturbance.


#### **Highly Protected**

Highly protected MPAs allow only limited, low-impact extractive uses, while minimising all other manageable pressures. These may include small-scale or subsistence fishing by a limited number of users using selective, low-impact gear. Low-impact tourism and low-density, unfed aquaculture may also be permitted. In some contexts, culturally important traditional practices, such as Indigenous fishing, are allowed where strong local governance and rights systems are in place.

#### **Lightly Protected**

Lightly protected MPAs provide some biodiversity benefits but allow moderate to substantial extraction and disturbance. A wider range of fishing gears may be used, including less selective methods, and tourism may occur at levels that cause habitat or species impacts. These MPAs often seek to balance conservation objectives with broader resource-use and development goals and represent the majority of MPAs globally.

#### **Minimally Protected**



Minimally protected MPAs permit extensive extraction and other impacts, while still meeting the minimum IUCN definition of an MPA (for example, by excluding industrial fishing). Although these areas may deliver limited conservation benefits, they are unlikely to achieve substantial biodiversity outcomes. High numbers of fishing gear types, intensive aquaculture, anchoring, or infrastructure are commonly allowed.

### **Assessing impact**

The ecological impact of activities within MPAs depends on their type, intensity, scale, frequency, and duration, as well as the size and characteristics of the protected area. Activities may be considered to have no, low, moderate, high, or incompatible impacts on biodiversity. Some activities—such as industrial fishing, oil and gas extraction, mining, or the use of poisons or explosives—are incompatible with biodiversity conservation.

#### **Slide 16 - Impact to marine environment based on levels of protection**

By IUCN's definition, an MPA's primary goal is the conservation of nature. MPAs, or specific MPA zones, effectively protect biodiversity if they adequately prohibit extractive and destructive uses. Refer to image.

#### **Slide 17 - Zonation within MPAs**

Within an MPA it's possible to have multiple areas, or ZONES set aside for specific uses such as protection of key habitats or nursery areas and breeding sites, research, education, anchoring, fishing and tourism. Zoning helps to reduce or eliminate conflict between different users of the MPA, to improve the quality of activities such as tourism, and to facilitate compliance. A zoning scheme generally includes areas under strict protection and areas with increasingly fewer restrictions.

There may also be sub-zones, which might be modified on a seasonal or temporal basis, e.g. for boat access or because of breeding cycles of organisms. The aim is to provide a balance between conservation and use.


#### **Slide 18 - Other Effective Area-based Conservation Measures (OECMs)**

Other Effective Area-based Conservation Measures or OECMs are another type of site recognised for its conservation of biodiversity.

Under the CBD, an OECM is defined as “a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socio-economic, and other locally relevant values” (CBD, 2018a).

#### **Slide 19 - Other Effective Area-based Conservation Measures (OECMs) continued...**

The main difference between an OECM and MPA is that an MPA is designated and managed to achieve a primary conservation objective such as preserving an endangered species, whereas OECMs deliver effective conservation of biodiversity within a given area, regardless of whether that is the goal. For example, a sacred cultural site or an area with restricted access due to military operations.



OECMs offer the opportunity to increase conservation recognition and support other means of protection outside of MPAs under a range of governance and management measures whilst working alongside local communities and other private sector entities.

Together, MPAs and OECMs may be collectively referred to as Protected and Conserved Areas or (PCAs).

The diagram in the slide provides a flow chart showing the positive impacts for nature and people of recognizing areas as an OECM. In the study (Alves-Pinto et al., 2021) OECM recognition was suggested to lead to positive outcomes at site level, such as increased feeling of responsibility and empowerment, as well as at the system level, such as the maintenance of more diverse systems and recoupling of natural and social systems.

The study also noted potential challenges that OECMs might face. These included:

- Area identification – ensuring the OECM has characteristics that meet the IUCN OECM guidelines.
- Lack of monitoring tools
- Variation in governance
- Lack of funding

#### **Slide 20 - MPA Networks: More is more!**

MPA networks fulfil ecological aims more effectively than individual sites could alone. They:

- Provide protection of whole ecosystem or specific feature threatened
- Help restore fish stocks (sanctuary or protect ecologically important areas).
- Protect functioning of ecosystem services
- Increase resilience to climate change

(Gaines et al., 2010; IUCN-WCPA, 2008)

#### **Slide 21 - Why do we need MPA networks?**

Why is an effective network of MPAs so much more beneficial than individual sites?

The main benefit of a network is the capacity to effectively deliver a conservation benefit that is greater than the sum of its parts.

Other advantages include:

- **Enhanced Conservation Impact:** The cumulative effect of multiple MPAs in the network equals greater conservation of marine biodiversity, for example an effective MPA network has the potential to protect critical breeding grounds, migration routes, and feeding areas, helping to improve the chances of preserving endangered species / habitats as well as highly mobile migratory species, e.g. birds or marine mammals.
- **Ecological Resilience:** Connectivity between MPA sites can enhance ecosystem functioning and resilience by facilitating species movement, genetic exchange, and the flow of nutrients. When faced with various threats and stressors, the combined effect of multiple MPAs in the network can mitigate local disturbances and provide shelter for species and habitats. They can act as stepping stones for species to navigate changing conditions.

- **Collaboration and Knowledge Sharing:** An MPA network can promote collaboration among different stakeholders, including government agencies, local communities, scientists, and NGOs. The network provides a platform for sharing knowledge and best practices in MPA management and conservation. It also allows for the exchange of scientific research, monitoring data, and management strategies, leading to improved decision-making and adaptive management approaches.
- **Social and Economic Benefits:** Finally, an MPA network can offer social and economic benefits to local communities. It can support sustainable fisheries, ecotourism, and recreational activities, providing livelihood opportunities and promoting economic development. A network can also enhance the cultural value and sense of stewardship among communities, fostering pride and engagement in marine conservation efforts.

By combining the strengths of individual MPAs and leveraging their collective impact, an MPA network delivers a more comprehensive and effective approach to marine conservation and the sustainable management of marine resources.

(Gaines et al., 2010; IUCN-WCPA, 2008)

### **Slide 22 - How do MPAs and MPA networks fit into wider marine conservation?**

How do MPAs and MPA networks fit into wider marine conservation efforts?


- This toolbox groups different marine conservation methods into 3 broad categories of tools, species protection, sites protection, and wider policies and measures.
- Different marine conservation tools fit into 1, 2 or even all 3 of the categories.
- For example – fisheries stock management measures e.g. seasonal closures, would fall into the species protection category.
- Regulations and legislation brought in to control the release of pollutants from land into the sea sits under the wider policies and measures section.
- MPAs are just one tool in the toolbox and come under site protection and species protection.
- Many countries have wider ambitions for reducing pressures on marine ecosystems and species outside of MPAs.
- Worldwide this is achieved by developing Ocean Plans, or in some cases more detailed Marine Spatial Plans (which will be covered in more detail in a later module).
- Spatial designations such as MPAs are an integral part of these plans.

### **Slide 23 - Transboundary MPAs (TBMPAs)**

Transboundary protected areas (TBPAs) are regions that span across the boundaries of multiple countries and are collaboratively managed to conserve biodiversity and promote sustainable use of natural resources. When these areas encompass marine environments, they are referred to as transboundary marine protected areas (TBMPAs).

CMAR example – Overview:

The Eastern Tropical Pacific Marine Corridor is a regional conservation and sustainable use initiative aimed at ecosystem-based biodiversity and marine and coastal resource



management. The overall purpose of the corridor is to establish a joint management system (including stakeholder countries' governments) for the marine protected areas in Coco, Coiba, Malpelo, Gorgona and Galápagos Islands. The management system focuses on sustainable conservation and use of biodiversity and marine and coastal resources in the Eastern Tropical Pacific region.

More locally in Ghana, there is ongoing cooperation which is being enhanced for conservation between Côte d'Ivoire and Ghana to create a transboundary MPA between Assinie (Côte d'Ivoire) and Half Assini (Ghana) to support integrated ocean management along the Atlantic coast of West Africa. Ghana-specific examples will be further discussed in module 3.

### **Slide 24 - Transboundary MPAs continued...**


Transboundary protected areas (TBPAs) are regions that span across the boundaries of multiple countries and are collaboratively managed to conserve biodiversity and promote sustainable use of natural resources. When these areas encompass marine environments, they are referred to as transboundary marine protected areas (TBMPAs).

Benefits of Transboundary Marine Protected Areas:

1. **Enhanced Biodiversity Conservation:** Marine species often migrate across national boundaries. TBMPAs facilitate the protection of these migratory routes and habitats, ensuring comprehensive conservation efforts.
2. **Improved Ecological Connectivity:** By linking multiple marine protected areas (MPAs) across borders, TBMPAs create ecological corridors that support species movement and genetic exchange, enhancing ecosystem resilience.
3. **Shared Resources and Expertise:** Collaborative management allows countries to pool resources, knowledge, and expertise, leading to more effective conservation strategies and efficient use of funds.
4. **Strengthened Political and Cultural Relations:** Joint management of TBMPAs can foster diplomatic relations and cultural exchange between neighbouring nations, promoting peace and cooperation.

Challenges of Transboundary Marine Protected Areas:

1. **Legal and Jurisdictional Complexities:** Differences in national laws, regulations, and enforcement mechanisms can complicate the establishment and management of TBMPAs.
2. **Coordination and Governance Issues:** Effective management requires harmonized policies and coordinated actions among countries, which can be challenging due to varying priorities and administrative structures.
3. **Resource Allocation Disparities:** Neighbouring countries may have unequal capacities in terms of funding, infrastructure, and expertise, potentially leading to imbalances in management effectiveness.
4. **Socio-political Tensions:** Historical conflicts or political disagreements between countries can hinder collaboration and the successful implementation of TBMPAs.



Despite these challenges, TBMPAs represent a progressive approach to marine conservation, recognizing that ecological processes transcend political boundaries and necessitate cooperative international efforts.

### **Slide 25 - UNEP Regional Seas Programme**

Further reading: UNEP Regional Seas Programme – <https://www.unep.org/topics/ocean-seas-and-coasts/regional-seas-programme/about-unep-regional-seas-programme>

For the West African Region, please refer back to slide 12 which talks about the Convention d'Abidjan.

The UNEP Regional Seas Programme was established in 1974.

To date, there are 18 Conventions and action plans, covering more than 143 countries:

- Seven are administered by UN Environment Programme – Caribbean, East Asian Seas, Eastern Africa, Mediterranean, North-West Pacific, Western Africa, Caspian Sea.
- Seven are non-UN Environment Programme administered – Black Sea, North-East Pacific, Red Sea and Gulf of Aden, ROPME Sea Area, South Asian Seas, South-East Pacific, Pacific.
- Four are independent programmes – Arctic, Antarctic, Baltic Sea, North-East Atlantic.

The programme was set up to address accelerating environmental degradation of the world's shared marine and coastal areas including management of the natural resources through a “shared seas” approach.

The aim is to strengthen the capacity within the region to enable countries to implement the action plans and work programmes, through education, training, communication and institution-building.

Regional Seas Conventions and Action Plans (RSCAPs):

The Regional Seas Conventions and Action Plans provide inter-governmental frameworks to address the degradation of the oceans and seas at a regional level, initially focusing on pollution at sea, such as oil spills and movement of hazardous waste, as well as land-based sources of pollution, for example plastics, wastewater and excess nutrients.

Now, many have embraced the ecosystems approach to managing marine resources and have protocols on protected areas, marine litter, combating oil spills, pollution from ships, transboundary movement of waste including their disposal, integrated coastal zone management (ICZM) and land-based sources of pollution (LBS) through which disaster risk reduction, climate change adaptation, biodiversity loss, pollution reduction and sustainable consumption and production issues are being addressed.

The focus is on promoting regional oceans governance to deliver the global oceans agenda and respond to emerging issues, new policies and initiatives such BBNJ (UN biodiversity beyond national jurisdiction agreement), GBF (Global Biodiversity Framework), Plastics, Offshore wind farms, Sustainable Port development and Blue Economy.



## Slide 26 - MPAs in West Africa

While classified forests with mangroves have been protected for many years (1923 for the Dassioko forest in Côte d'Ivoire, for example), the first nationally designated marine protected areas in West Africa date from the 1970s (1970 for Lower Casamance, 1976 for the Saloum Delta, the Madeleine Islands and the Langue de Barbarie in Senegal). The region now has ~139 marine and coastal protected areas, including 84 all or part marine areas, for a total area of 6 million ha. (Merceron et al., 2024).

Mauritania has five MPAs, but they are the largest (1,242,492 ha) and represent, to the best of our knowledge, 40% of the total MPA surface area of all the countries considered in the EdAMP. These areas are all recognized as being of international interest: World Heritage, Ramsar and biosphere reserves. A new national strategy for MPAs is being developed in the country (Merceron et al., 2024).

Senegal is the first country to have created marine protected areas. It currently has 23, covering 677,243 ha, including 20 marine ones. Six sites are of national interest, with 6 Ramsar sites and the Saloum delta which, moreover, is World Heritage and a biosphere reserve. Out of the 23 MPAs, 16 are IUCN category VI community areas), including 2 APACs (Merceron et al., 2024).

The Gambia: There are 15 marine and coastal areas in The Gambia, including 7 marine areas. Twelve MPAs are IUCN category VI and 3 are national parks (category II) (Merceron et al., 2024).


Guinea-Bissau has 6 MPAs (over 559,035 ha), including three IUCN II category national parks – the others are not categorized. The immense AMO of the Bolama Bijagós archipelago covers 1,046,950 ha and is both a Ramsar site and a biosphere reserve and contains MPAs of various statuses which alone have been counted. Added to this is the reserved fishing area (OECS) of Rio Grande de Buba, not considered by the IUCN as an MPA (but present in WDPA) (Merceron et al., 2024).

Sierra Leone has 5 MPAs (135,173 ha), one of which is also a Ramsar site (Merceron et al., 2024).

Liberia has a single MPA identified (109,381 ha) plus two other coastal Ramsar sites. Three other coastal sites are proposed as national parks (Merceron et al., 2024).

Côte d'Ivoire has just declared, in 2022, its first marine protected area (Grand-Béréby, for a total surface area of 272,375 ha; the marine area is not known). There are also 12 protected coastal areas (without marine part) but containing mangroves. Among these 12 zones, four were proposed in 2020 as marine protected areas (the national parks of Azagny and the Iles Ehotilé-Essouman, the classified forest of Dassioko), to which is added the proposal for classification as a marine protected area of mouth of the Cavally River, which should eventually bring the number of marine protected areas to five. In addition to the two national parks already mentioned, the country has a nature reserve, the other 9 sites being designated as classified forests. Internationally there are 6 Ramsar sites (Merceron et al., 2024).

Ghana has no MPAs but 6 coastal sites with mangroves are protected as forest reserves or as Ramsar sites (168,964 ha); the country has 5 Ramsar sites and a biosphere reserve



(Songor lagoon). The Keta Lagoon complex has the largest distribution of mangroves among the five Ramsar sites (Merceron et al., 2024).

Togo does not officially have any MPAs. The entire coast, over 55 linear km, is a Ramsar site “Zones Humides du Littoral du Togo” characterized by natural and artificial mangroves, rivers, lakes, lagoons, marshes, ponds and above all a very long beach of sand. The country also has the Mono biosphere reserve, which crosses the border with Benin (Merceron et al., 2024).

Benin has 6 marine areas, three of which have just been designated (2022), two MPAs and one community area (all IUCN category VI). Two Ramsar sites, the only ones mentioned in the WDPA, the “Basse Vallée de l’Ouémé, Lagune de Porto-Novo, Lac Nokoué” site and the site “Basse Vallée du Couffo, Lagune Côtière, Chenal Aho, Lac Ahémé” cover two of the entire coastline of Benin with marine parts whose total surface area is not known. Newly designated MPAs fall within these sites (Merceron et al., 2024).

Nigeria has 24 coastal protected areas, of which 2 are marine parks and 22 are reserves, including 19 forest reserves. Among them, 4 have marine parts, namely Stubbs Creek, Andoni, Olague and Uremure Yokri, and the others are considered as such because they have mangroves and some marine intrusion (Merceron et al., 2024).

2003: The first regional strategy for MPAs in 2003, the first regional strategy was launched under the impetus of a group of NGOs and organisations (PRCM, SRFC, IUCN, WWF, FIBA and UNESCO). At the time, this document was signed by all the Ministers in charge of the Environment and Fisheries for a subset of six PRCM countries: Cabo Verde, Gambia, Guinea, Guinea-Bissau, Mauritania and Senegal. This was a major step forward for the coherence between the two sectors and for the definition of major regional objectives in terms of marine and coastal conservation. The ‘vision’ for this network is to create: An effective network of marine protected areas (MPAs) in West Africa with participatory management, led by strong institutions contributing to the sustainable development of the region by enhancing natural and cultural diversity (Merceron et al., 2024).

2007: Creation of RAMPAs as part of this regional strategy, the regional network of MPAs in West Africa (RAMPAs) was formally launched in April 2007 by 15 founding member MPAs. One of the goals of the RAMPAs is to “network a set of MPAs representative of ecosystems and critical habitats necessary for the renewal of fishery resources, the regeneration and restoration of critical habitats and the preservation of biodiversity” (Merceron et al., 2024).


### **Slide 27 - MPAs in West Africa - RAMPAs**

Further reading: Rampao - <https://rampao.org> and (Selkani, 2022)

The Regional Network of Marine Protected Areas in West Africa (RAMPAs) was officially established in 2007 as the result of a common will expressed by the States, the managers of protected areas and various actors of the conservation, in the face of the many pressures and threats on the marine and coastal ecosystems of the West African region.

The objective of the RAMPAs is, among other things, to:

- Maintain a coherent set of critical habitats necessary for the dynamic operation of the ecological processes essential to the regeneration of marine natural resources.

- 
- Conserve biodiversity for the well-being of local communities, through a functioning regional network of MPAs.

More specifically, the RAMPAO aims to:

- Network a set of representative MPAs;
- Rehabilitate and restore critical habitats;
- Promote exchange and mutual learning between members;
- Create synergies between MPAs on topics of common interest;
- Make functional and operational MPAs of the region;
- Strengthen mutual capabilities in advocacy, defence of interests and representation of MPAs in the region in the international framework.

RAMPAO has the status of a regional organization and enjoys official recognition from the services in charge of the environment and/or fisheries of the Member States. RAMPAO's general assembly, which is the network's supreme body, brings together:

- The Board of Directors, made up of 3 colleges: the college of States, the college of managers and the college of local communities;
- The Executive Secretariat responsible for operating and coordinating the network and support bodies, which are the Scientific and Technical Council;
- The various thematic task forces made up of experts in the various fields related to the effectiveness of MPA management.

### **Slide 28 – In Summary**

1. The importance of marine ecosystems is recognised globally which has led to multiple international and regional drivers for marine protection.
2. MPAs are designated and managed to achieve a primary conservation objective.
3. There are many different types of MPA, based on the levels of protection and types of impacts allowed.
4. OECMs deliver effective conservation of biodiversity regardless of whether that is their primary goal.
5. MPA networks fulfil ecological aims more effectively than individual sites could alone.
6. Regional collaboration e.g. RAMPAO is key to strengthen conservation capacity.



## Module 3 - MPAs in Ghana

### Slide 1

Module 3 - MPAs in Ghana.

### Slide 2 - MPA Course Overview

This is the 3rd of 8 presentations in this course on Marine Protected Areas.

The aim of this course is to introduce you to the key concepts behind the use of marine protected areas, provide an overview of marine protection in Ghana, and run through the various stages of the MPA cycle.

The course is made up of 8 modules. Each module consists of a presentation and a reading list is provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

### Slide 3 - Learning Objectives

In this module, you will learn about:

- Ghana's marine environment & its:
  - contribution to national development;
  - threats that it faces; and
  - Marine conservation requirements
- The status of MPAs and other types of marine protection in Ghana

### Slide 4 - Ghana's Marine Environment

As we briefly covered in module 1, Ghana has a coastline of approximately 550 km, with an exclusive economic zone (EEZ) of 228,000 km<sup>2</sup>. The continental shelf of Ghana covers 20,900 km<sup>2</sup>.

Ghana has a population in the region of 33.8 million, which currently has a forecasted increase rate of 1.9% annually. While the coastal zone represents only approximately 6.5% of the total area of the country, it houses around 25 % of the population. High population densities (>500 inhabitants/km<sup>2</sup>) are present at the major cities along the coast, such as Accra – Tema area, Cape Coast and Sekondi-Takoradi area.

(United Nations, 2024; World Health Organization, 2026)

### Slides 5, 6, 7 & 8 - Ghana's Marine Ecosystems

The coastal and marine regions of Ghana are comprised of many ecologically and socio-economically important habitats including wetlands, lagoons, estuaries, mangroves, sandy and rocky beaches (see slide), as well as shelf and deep seas (not pictured).

#### **Mangroves:**

Mangroves are trees or large shrubs which grow within the intertidal zone in tropical and subtropical regions and have special adaptations to survive in this saline environment. The term mangrove is applied to both the individual plant and the ecosystem. Mangroves are highly productive ecosystems providing food and shelter for a large number of species. They are important breeding and nursery areas for fish and crustaceans, and they are essential habitats for numerous birds.



## **Wetlands, lagoons and estuaries:**

### **Lagoons:**

Lagoons can be open, or semi-open.

- Open lagoons are defined as coastal water bodies with clear and permanent openings to the marine environment. They are fringed by large intertidal areas of mud flats, marsh or mangrove. Lagoons are sheltered from exposure to wave energy or strong tidal currents. The substrate is flat and dominated by mud.
- Semi-closed lagoons are defined as coastal water bodies separated from the marine environment by sandbars. In the rainy season, some of the closed lagoons open to the sea as a result of floodwaters breaching the sand barrier. This occurs mainly as a result of freshwater seeping through the sandbar which makes it more susceptible to erosion by the sea. Storm surges may also erode sandbars and open up closed lagoons to the sea. Under other circumstances, the sandbar may be opened during the rainy season to reduce the risk of flooding where this is considered a threat.

### **Estuaries:**

Estuaries are semi-enclosed areas of water that are openly connected to the ocean and have a combination of freshwater and saltwater features (Potter et al., 2010; Ujjania and Dubey, 2015). These ecosystems, being among the world's most productive, play a crucial role in supporting diverse life forms, including fish, shellfish, migratory birds, benthic organisms, and aquatic plants. Estuaries of note in Ghana include the Ankobra, Kakum, Volta, Pra, Nyan and Whin estuaries (Lukhabi et al., 2024).

### **Rocky beaches:**


Rocky beaches can be categorised as:

- Exposed Rocky Flats with Abundant Crevices. On such flats, tide pools form where pools of water collect in hollows and depressions of the rocks at low tide. Tide pools may also form above the zone not normally influenced by the tide. The water in such pools is replenished by wave spray, wave splash or by rainwater. The tide pools house a quite rich vegetation of algae and a diverse fauna of invertebrates and fish.
- Exposed Rock with Low to Moderate Slope which is characterised by regular exposure to high wave energy and strong wave-reflection patterns. The lower slope results in a wider intertidal zone compared to vertical rocks. The intertidal zone can be up to hundreds of meters wide.
- Intertidal Rocks with Algae Exposed at Low Tide. In some areas intertidal rocks covered by abundant algal growth, which is exposed at low tide, are encountered in a quite wide zone along the coast. This habitat is very important as nursery area for fish.
- Steep Exposed Rock which are characterised by regular exposure to high wave energy and tidal currents. The waves are strongly reflected. The slope of the intertidal zone is 30 degrees or greater, resulting in a narrow intertidal and splash zone

### **Sandy beaches:**

Sandy shores which are the most prominent coast type in Ghana. They can be categorised into either:

- Sandy Beach with Coarse Sand, Often Mobile Eroding Sandy beaches with coarse sand are characterised by sand particles ranging from 1-2 mm, intermediate slope of



the beach (between 5 and 15 degrees) and relatively high rate of sediment mobility due to coastal sediment transport (i.e., erosion or accretion).

- Sandy Beach with Fine-grained Sand and Low Slope Sandy beaches with fine grained sand and low slope are characterised by sand particles ranging in size from 0.06-1 mm, well-sorted and compacted (hard) sediments and a very low slope of the beach (less than five degrees).

### **Slide 9 - Biodiversity & Ecological Functioning**

Ghana's coastal and marine environment forms part of the Guinea Current Large Marine Ecosystem (GCLME) and part of the Ghana-Cote d'Ivoire upwelling system. This area is highly productive, particularly the marine waters of the Western Region of Ghana. The major upwelling period is characterised by low temperature, high dissolved oxygen content and high salinity. This period also favours high biological production including fish and plankton. In addition, the upwelling events sustain the small pelagic species which results in seasonal and annual fluctuations in their abundance and the appearance of migratory species that may feed upon them (EPA, 2021; Ukwe et al., 2006).

Additionally, the coastal and marine habitats of Ghana host a diverse range of species, providing settlement sites for commonly harvested shellfish such as those depicted in the top left image (left to right on top row—The West African mangrove oyster (*Crassostrea tulipa*), periwinkles (*Tympanotonus fuscatus*), bloody cockle (*Senilia senilis*), and whelks (*Pugilina morio*). Left to right on bottom row of image - razor clams (*Tagelus adansonii*), freshwater/Volta clam (*Galatea paradoxa*), shrimps (Penaeids), and the brown mussel (*Perna perna*) (Chuku et al., 2022).

And nesting, nursery and feeding grounds for:

- migrating birds (e.g., Sanderling (*Calidris alba*), Curlew sand pipers (*Calidris ferruginea*), Common sand piper (*Actitis hypoleucos*), Common ringed plover (*Charadrius hiaticula*)); (Ntiamoa-Baidu et al., 2000)
- Turtles (e.g., Olive Ridley turtle (*Lepidochelys olivacea*), Green turtle (*Chelonia mydas*), and Leatherback turtle (*Dermochelys coriacea*); (Tanner, 2013)
- Commercially important fish species (e.g. Round sardinella (*Sardinella aurita*), Anchovy (*Engraulis encrasicolus*) (Doku et al., 2018),
- Large pelagic fish such as sharks (including the Scalloped Hammerhead, *Sphyrna lewini*) (Amponsah et al., 2023), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) (Ghana Tuna Association, n.d.); PLUS
- Multiple species of cetaceans such as the short-finned pilot whale (*Globicephala macrorhynchus*), Humpback whale (*Megaptera novaeangliae*), and spinner dolphin (*Stenella longirostris longirostris*) (Van Waerebeek et al., 2009).

Ghana's coastal and marine ecosystems and the biodiversity within them perform vital ecological functions including (Barbier, 2017; Millennium Ecosystem Assessment, 2005):

- Maintenance of a high biological productivity
- Nutrient cycling or mineralization
- Serve as sinks for pollutants, filtering and detoxifying pollutants such as sewage, fertilizer runoff, and heavy metals from industrial waste. They are therefore effective in cleaning polluted water. This is achieved by the plants and soils which clean the water before it goes into groundwater or into rivers.
- Act as buffers to reduce shoreline erosion from floods and wave action

- Shelter against storms

## **Slide 10 - Ecosystem Services**

Goods and services provided by Ghana's marine and coastal ecosystems include the following:

- Subsistence and commercial fisheries
- Sites for urban development
- Timber and fuel wood through mangrove exploitation
- Materials for basketry, thatching, fencing, etc.
- Sites for recreation such as sport fishing, bird watching, tourism and water sport
- Salt production
- Sand winning
- Water transport routes

As such, the main economic activities in the coastal zone are oil and gas extraction, fishing, salt production, tourism, farming, and manufacturing.

Ghana's marine resources are a significant source of revenue for the country, comprising foreign exchange earnings through trade and income generation from commercial and artisanal fisheries (Ocean Country Partnership Programme, 2025b).

### **Oil & Gas**

Historically, the petroleum industry in Ghana consisted mainly of oil trading based on the importation of refined petroleum products under contractual agreements with multinational companies such as Shell Plc and Total Plc (EPA, 2020a).

These groups were later joined by the national refinery company, Tema Oil Refinery (TOR), which commenced its own crude processing around 1960. To augment power generation in the country, the government, through its national power producer, Volta River Authority, built a power enclave at Aboadze, near Sekondi-Takoradi. The facility receives light crude through its Single Point Mooring (SPM) (EPA, 2020a).


Apart from imports of crude oil for the domestic refining at TOR and power generation at Aboadze, the Gulf of Guinea adjoining Ghana serves as a super-highway for crude oil tankers (EPA, 2020a).

In 2007, after the discovery of the Jubilee Field, the interest in the country's petroleum industry heightened. The heightened interest, together with the regulatory reforms, led to the discovery of three additional oil fields, with two in production, to the Jubilee Field. These two are Tweneboa-Enyera-Ntomme (TEN) Field and Sankofa-Gye Nyame Field (Skaten, 2018).

### **Fisheries**

The fisheries sector accounted for 1% of Ghana's Gross Domestic Product (GDP) in 2023 (GSS, 2023). However, these official GDP statistics are known to underestimate the contribution of the sector to the national economy by approximately 5% as they do not reflect the full value of artisanal fishing and subsequent value chains (Sarpong et al., 2005). The fisheries sector contributes significantly to the economic and social development of the country; it provides jobs for approximately 20% of the active labour force (2.7 million people), including women who engage solely in processing and distribution (Akpalu et al., 2018).

Fish is the main source of animal protein consumed in Ghana, accounting for 60-70% of all protein rich foods (FAO, 2016; Hasselberg et al., 2020). However, this proportion and the per-capita consumption of fish, are declining; partly due to the reduced productivity of marine



fisheries. Maritime trade and transport have increased over the past decade, with data from the ports indicating a significant increase in maritime traffic, with rising vessel calls largely due to oil and gas activities (Ocean Country Partnership Programme, 2025b).

There is an active offshore hydrocarbon industry encompassing several oil and gas production fields, with ongoing exploration activities contributing to 4.8% of the national GDP in 2023 (GSS, 2023). Marine-related tourism and recreation, including turtle watching and birdwatching, have also increased over the past decade (Ocean Country Partnership Programme, 2025b).

### **Salt production**

The Observatory of Economic Complexity indicates that in 2022, Ghana exported US\$4.36 million worth of salt making up~ 0.022% of Ghana's total export earnings of \$20 billion for the same period (IMANI, n.d.)

Salt production in Ghana occurs primarily at five regions, i.e. four coastal regions (Greater Accra, Central, Western and Volta regions) and one non-coastal region (Northern region). The geographical location, climatic and meteorological conditions in Ghana are suitable for solar salt production, thus, amongst artisanal salt producers in Ghana, solar evaporation is the common and predominantly method used. For mining, this method has been practiced and involves collection and introduction of salty water either from sea, marine lagoons or dugout wells into series of concentration pans for continual evaporation, and finally into crystallization pans, where salt crystallizes out and is harvested (Tutu et al., 2024).

### **Tourism**

Tourism is a major pillar of Ghana's economy, contributing significant revenue, foreign exchange earnings, and employment while supporting cultural heritage and community development. The sector has shown strong recovery and growth in recent years, driven by rising international arrivals, increasing domestic tourism, and high-profile cultural and heritage initiatives such as December in GH and Beyond the Return. In 2024, tourism generated record revenues and reinforced its role as a catalyst for inclusive economic development, investment, and Ghana's global profile as a leading heritage tourism destination in Africa (Ghana Tourism Authority, 2024).

### **Sand winning / mining**


Sand winning is the process by which sand is removed from beaches, dunes or riverbeds for use in construction. Despite being made an illegal practice in Ghana, sand winning is known to be continuing across the country. As such, sand miners use unapproved means to extract the material in a manner that threatens the sustainability of the product and the environment from which it is extracted. We will discuss the impacts of sand mining, and the other activities mentioned in the next slides where we consider the pressures facing Ghana's coastal and marine environments.

### **Slides 11, 12, 13, 14 &15 - Pressures on Ghana's Marine Environment**

Despite the foregoing benefits, Ghana's marine resources and environment are threatened by a variety of factors resulting in the loss of marine biodiversity and ecosystem services.

Key factors include (Ocean Country Partnership Programme, 2025b; Trisos et al., 2022):

- Overexploitation,
- Climate change,
- Urbanisation caused by migration and high rates of population growth, industrialisation and heightened economic activities, as well as siting of two main seaports at Tema and Takoradi which handle most of Ghana's imports and exports respectively,

- 
- Coastal erosion,
  - Habitat destruction due to increased infrastructure along the coast, and provision of transportation facilities including extensive road networks, rail, air and water,
  - Pollution.

### **Slides 16 & 17 - Overexploitation: Fisheries**

Ghana's marine fisheries have experienced a sustained decline over recent decades, driven primarily by chronic overfishing, excessive fishing effort, and ineffective management systems. Weak enforcement of fisheries regulations, combined with inadequate monitoring and reporting of catches, has allowed Illegal, Unreported and Unregulated (IUU) fishing to become widespread, placing additional pressure on already stressed fish stocks (Akpalu et al., 2018; Asiedu et al., 2021; MoFA, 2022; Ocean Country Partnership Programme, 2025b). Small pelagic species, which form the backbone of Ghana's artisanal fisheries, are now at serious risk, with current exploitation levels exceeding biologically sustainable limits (Lazar et al., 2020). At the same time, destructive fishing methods, including the use of explosives, alongside pollution from coastal and offshore sources, have caused severe and often irreversible damage to critical habitats such as rocky reefs, mangroves, estuaries, lagoons and sandy seabed systems.


The first graph illustrates a pronounced decline in catch per unit effort between 1975 and 2015, despite increases in fishing activity over this period. Although environmental variability, particularly for small pelagic fish, can explain short-term fluctuations in catches, the long-term reduction in landings alongside rising effort suggests that Ghana's marine fisheries are approaching, or have already exceeded, their productive limits. This trend indicates limited potential for further increases in catches without significant changes to management and effort levels (Asiedu et al., 2021; Ocean Country Partnership Programme, 2025b).

In response to mounting ecological and socio-economic pressures, coastal fishing communities have adopted a range of coping and adaptation strategies aimed at reducing vulnerability and sustaining livelihoods. Across Ghana and the wider West African region, these have included shifting fishing grounds through seasonal or longer-term migration, modifying fishing gear, targeting alternative species, and intensifying fishing effort by spending longer periods at sea or traveling greater distances (Adelekan, 2010; Allison and Ellis, 2001; Davies-Vollum et al., 2019; Freduah et al., 2018; Koomson et al., 2021; Lam et al., 2012; Perry and Sumaila, 2007)

The accompanying map shows the proportion of threatened fish species captured between 2012 and 2022 relative to overall fishing effort. During this period, an estimated 2.5–5% of species caught in Ghanaian waters were classified as endangered, highlighting growing conservation concerns alongside fisheries exploitation pressures (Merceron et al., 2024).

### **Slide 18 - Exploitation: Oil & Gas**

Oil and gas development has contributed to Ghana's economy through revenue generation and increased export earnings (Akabzaa, 2014). However, its broader developmental benefits remain contested. Critics argue that hydrocarbons have primarily reinforced Ghana's reliance on natural resource extraction rather than driving structural economic transformation, while many associated social and environmental challenges remain unresolved (Akabzaa, 2014; Siakwah, 2017). These unresolved issues risk undermining the perceived gains from petroleum development, particularly in coastal regions where oil and gas activities are concentrated. Restrictions on fishing around offshore installations, most notably exclusion zones of up to 500 metres around oil rigs, have further constrained access to traditional fishing grounds, contributing to tensions between fishing communities and oil companies (Badgley, 2011; Quist and Nygren, 2015). Some authors have also noted the use of compensatory or regulatory mechanisms by companies to manage local populations,



which in certain cases has exacerbated conflict rather than resolving it (Boohene and Peprah, 2011).

Oil and gas operations have also generated environmental risks through accidental spills, discharge of drilling waste, chemical pollution, seabed disturbance from pipelines and infrastructure, atmospheric emissions and underwater noise (Sakyi et al., 2012). Onshore and nearshore agricultural systems have been affected as well, with evidence suggesting damage to coastal crops such as coconut plantations due to the absorption of harmful substances that interfere with plant growth processes (Amarfio, 2010).

Collectively, these impacts have contributed to declining livelihood security in communities surrounding the Jubilee Oil Field and other production areas, where household incomes often fall below Ghana's daily minimum wage threshold (Vinorkor, 2019). More recent studies have also identified petroleum-related contamination, including hydrocarbons, synthetic chemicals and heavy metals, as a persistent threat to marine ecosystems within active extraction zones (Purdy et al., 2019). Despite these findings, comparatively few studies have comprehensively assessed both the benefits and costs of oil and gas development for coastal communities along Ghana's western shoreline.

### **Slide 19 - Climate change: Sea Level Rise**

As described in (Appeaning Addo et al., 2011) – “As sea level rises, material on sandy shorelines is eroded from the upper beach and deposited on the near-shore ocean bottom. Consequently, the ocean moves landwards, or the shoreline recedes. It is generally accepted that the coastline will retreat horizontally 50 to 100 times the vertical sea level rise. Hence, the predicted global sea-level rise would cause a coastal recession of sandy beaches of 4.5 to 88 m by 2100 in many places around the world. The most obvious outcome of sea level rise is the permanent inundation of coastal areas. Over time inundation changes the position of the coastline and drowns natural habitats and human structures. Inundation can also exacerbate coastal erosion by transporting submerged sediment offshore and extend the effects of coastal flooding by allowing storm waves to act further inland.”

The increasing rates of sea level rise caused by global warming within the 21st century are expected to exacerbate inundation and episodic flooding tide in low-lying coastal environments. This development threatens both human development and natural habitats within coastal communities such as those along the coastline of Ghana, with sea level rise increasing coastal erosion and flooding mangroves and wetlands (Appeaning Addo et al., 2011).


A study by (Appeaning Addo et al., 2011) assessed the expected impacts of sea level rise in three communities in the Dansoman coastal area of Accra, predicted that the Dansoman coastline could recede by about 202 m by the year 2100 with baseline from 1970 to 1990. The study revealed that about 84% of people living in the areas are aware of the rising sea level in the coastal area but have poor measures of adapting to the effects of flood disasters. Analysis of the likely impacts of coastal inundation revealed that about 650,000 people, 926 buildings and a total area of about 0.80 km<sup>2</sup> of land are vulnerable to permanent inundation by the year 2100.

### **Slide 20 - Climate Change: Coastal Erosion**

*Play video - [https://youtu.be/w7Y\\_-DUGful](https://youtu.be/w7Y_-DUGful)*

### **Slide 21 - Urbanisation**

The continent of Africa, represented by its different countries, remains one of the fastest urbanizing regions in the world. At current pace of urbanization, the general expectation is that urban populations in Africa could see an exponential surge from 395 million in 2010 to around 1.339 billion in 2050. In Sub-Saharan Africa (SSA) increased migration, population



expansion and surge urbanization processes have become a defining character of most cities in ways that have brought most governments and their city planning authorities under tremendous pressures (Damte et al., 2023).

### **Slide 22 - Pollution**

Play video - <https://youtu.be/PBx7KFKwsmw>

### **Slide 23 - Habitat Destruction: Mangroves**

Play video - <https://youtu.be/kikuzOoN0n8>

“Between 1980 and 2006, Ghana’s mangrove cover was reduced from 181 km<sup>2</sup> to 137 km<sup>2</sup>. This has resulted in the reduction and loss of some associated fauna and flora” - (Nunoo and Agyekumhene, 2022).

Mangroves are a group of tropical plants or shrubs that grow in dense thickets or forests along tidal estuaries with exposed roots that serve as a buffer between marine and terrestrial communities, thereby protecting shorelines from damaging winds, waves and floods. Mangroves, aside from helping to regenerate the fisheries stock, also serve as a source of livelihood for the residents of communities where they are present. There are six predominant mangrove species in Ghana with red and black mangrove being the most common (Hall et al., 2024).

### **Slides 24 & 25 - The people dimension of Ghana’s marine environment**

As discussed in (Ocean Country Partnership Programme, 2025b) – “There are four coastal administrative regions in Ghana that encompass the Western, Central, Greater Accra, and Volta regions (see map on slide). While the coastal zone makes up nearly 6% of the country’s total land area, it is vitally important for national development as it is occupied by 30% of Ghana’s 33.8 million population (NDPC, 2021).” Populations residing along the coasts of Ghana depend for at least 50% on the services provided by coastal habitats (Hagedoorn et al., 2021). Fishing is the most important source of income (Danquah et al., 2021).

There are multiple stakeholder groups with a vested interest and/or influence in relation to Ghana’s marine environment. These range from those that actively reside within and utilise coastal and marine zones for their livelihoods, to those that have influence and interest with respect to their own particular interests e.g. NGOs, Cooperatives, Committees and Associations (e.g. those associated with fishing activity) and even traditional authorities (Ocean Country Partnership Programme, 2025b).


This stakeholder influence-interest matrix is based on the work of Hen Mpaono to map out interest and influence with respect to the marine environment in Ghana. Stakeholders with high interest and high influence appear at the top right of the matrix, whereas those with lower influence or low interest appear in the bottom left side of the matrix (Ocean Country Partnership Programme, 2025b).

### **Slide 26 - MPA Drivers in Ghana**

Ghana has numerous drivers to develop an MPA network, these include domestic plans, as well as various regional and international conventions and agreements. Some of these include:

1. Sub-regional networks: RAMPAO identified key issues and a sub-regional strategy for the establishment of an MPA network.
2. International: CBD, RAMSAR, CMS, GOA and UNSDG (see below for more details)

In 1994, Ghana ratified the United Nations’ Convention on Biological Diversity (CBD) and in 2022, negotiations between the parties culminated in the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF). Known as the ‘30x30 target’, Target 3 of the GBF



contains an ambitious commitment to conserve 30% of terrestrial, inland water, coastal, and marine areas by 2030. Ghana has established 313 protected areas covering an area of approximately 15% of the terrestrial and inland waters (UNEP-WCMC, 2026).

Additional regional commitments include the Africa Union Agenda 2063, the Africa Integrated Maritime Strategy (AIMS) 2050, and the Africa Blue Economy Strategy (ABES) all of which solidify Ghana's and other African countries' commitments to protecting aquatic resources for economic transformation in the continent.

These conventions and agreements reflect Ghana's commitment to international collaboration for the conservation and sustainable management of marine ecosystems, including the establishment and effective management of MPAs. As described in (Ocean Country Partnership Programme, 2025b) – “However, these instruments are not automatically applicable under Ghanaian law until they are implemented as domestic legislation under Article 75 of Ghana's Constitution. Consequently, international instruments applicable to marine conservation and management have been implemented through national policies, legislation, plans, and strategies. Key among these are contained in:

- The Fisheries Act, 2002 (Act 625),
- Fisheries (Amendment) Act, 2014 (Act 880),
- Fisheries Regulation, 2010 (L.I. 1968),
- Environmental Assessment Regulations, 1999 (L.I. 1652),
- Land Use and Spatial Planning Act, 2016 (Act 925),
- Wildlife Preservation Act, 1961(Act 43),
- Wetland Management (Ramsar Sites) Regulations, 1999 (LI 1659),
- Petroleum (Exploration and Production) Act, 2016 (Act 919);
- Environmental Protection Agency Act, 1999 (Act 490);
- Land Use and Spatial Planning Act of 2016 (Act 925)
- The Wildlife Resources Management Act, 2023 (Act 1115).

Other relevant policies and plans are:


- The Fisheries and Aquaculture Policy,
- Fisheries Co-Management Policy,
- Marine Fisheries Management Plan (2022-2026),
- National Biodiversity Policy, Strategy, and Action Plan.”

### **Slide 27 – Key Stakeholders for MPA Implementation in Ghana**

Various stakeholders play integral roles in implementing MPAs, each with different levels of influence and interests. These stakeholders can be broadly categorized as government agencies, local communities, traditional authorities, non-governmental organizations (NGOs), cooperatives, committees and associations, the private sector, international organizations, the media, universities, and research institutions.

#### **Government agencies**

In Ghana are the primary regulatory bodies responsible for the legal establishment, oversight, and enforcement of MPAs. Their efforts are key to MPA implementation and sustainable marine resource management in Ghana. The government agencies include (Ocean Country Partnership Programme, 2025b):


- 
- Ministry of Fisheries and Aquaculture Development (MOFAD) – with explicit responsibility for MPA identification and designation using powers contained in the Fisheries Act
  - Fisheries Commission (FC) under MOFAD
  - Ministry of Environment, Science, and Technology (MEST)
  - Environmental Protection Agency (EPA) under MEST
  - Ministry of Lands and Natural Resources (MLNR)
  - Wildlife Division (WD) of the Forestry Commission, under MNLR
  - Ghana Maritime Authority (GMA)
  - Ghana Navy (GN)
  - Ghana Police Service Marine Unit (GPSMU)
  - Metropolitan, Municipal and District Assemblies (MMDAs)
  - Ghana National Petroleum Corporation (GNPC)
  - Ghana Tourism Authority (GTA)
  - Land Use and Spatial Planning Authority (LUPSA)
  - Ghana Ports and Harbors Authority (GPHA)
  - Ministry of Justice and Attorney-General's Department (MoJAGD)
  - Ministry of Local Government and Rural Development (MLGRD)

This list highlights the diverse agencies that would be involved in MPA governance, policymaking, and enforcement in Ghana, focusing on maintaining sustainable use of marine resources while ensuring legal compliance with international and national frameworks. Of these agencies, MOFAD and the Wildlife Division (WD) have explicit policies and laws on the establishment of MPAs. Other agencies will be active in areas of enforcement once MPAs are established, such as the Ghana Navy and Police service. However, it is crucial that all agencies are involved in early discussions surrounding MPA establishment if they are expected to be involved in later phases of the MPA implementation cycle.

### **Local Communities**

As described in (Ocean Country Partnership Programme, 2025c) – “Coastal communities, including indigenous groups and fishers, are integral to the effective establishment and management of MPAs in Ghana, given their long-standing knowledge of marine ecosystems and their reliance on these resources for livelihoods; whether through fishing, tourism, or other activities. Within traditional coastal fishing communities in Ghana, there exist local institutional community-based organisational structures which revere highly ranked individuals such as the Chief Fishermen and Konkohemaa’s (Queen fish mongers or mummies) to represent the interests of fishers and fish mongers.

Estuarine communities along the Volta River (Volta region), Ankobra river (Western region), and Densu Delta (Greater Accra) are also key stakeholders in marine conservation by virtue of their traditional fishing culture and local norms regulating access to marine resources. Along the Volta estuary and Densu Delta, clam and oyster fishers implement closed fishing seasons through long-standing traditional norms for sustainable management of marine resources (Gomey et al., 2018). Similarly, community-based arrangements exist within the Ankobra river estuarine communities for protection and management of mangroves resources (Ghana Ministry of Fisheries and Aquaculture Development and Fisheries Commission., 2020). These communities directly depend on fish, shellfish, and mangrove



resources for their livelihoods. The sustainability of their resource use practices is critical to both conservation goals and well-being.

Although local communities in Ghana are most likely to be affected by MPA policies, their formal power in decision-making processes can be limited. However, their informal power is significant, as their cooperation or resistance to MPA policies can impact marine conservation outcomes such as low or high voluntary compliance with no-take regulations. Often, their traditional knowledge of marine ecosystems and long-standing relationships with marine resources are assets that can enhance conservation efforts when appropriately integrated into management plans.”

### **Traditional Authorities**

As described in (Ocean Country Partnership Programme, 2025c) – “Traditional authorities comprise chiefs, elders, and local customary leaders, that have historically held significant power and influence over the management of natural resources in coastal communities in Ghana. Traditional authorities enforce customary laws that govern the use of marine and coastal resources and have been instrumental in resolving conflicts over marine resources, particularly disputes between fishers or between fishing communities. Customary laws applied by traditional authorities include regulations on fishing seasons, types of gear used, fishing areas and rights. Local communities often follow these practices to protect fish stocks and other marine resources.”

### **Non-Governmental Organizations (NGOs)**

As described in (Ocean Country Partnership Programme, 2025c) – “NGOs are crucial actors in MPA implementation, especially in terms of advocacy, research, capacity building, and monitoring. International and local NGOs in Ghana often focus on nature conservation, sustainability, and human rights, providing critical support in areas where governments lack capacity or resources. In Ghana, NGOs can influence policy by advocating for evidence-based conservation measures, promoting community-based management approaches, and ensuring that environmental and social safeguards are in place. While they do not typically hold formal power, their influence can be significant due to their ability to mobilize resources, provide technical expertise, and raise awareness of marine conservation issues. NGOs in Ghana often act as intermediaries between governments and local communities, facilitating dialogue and ensuring that stakeholder voices are heard. Key local NGOs working in the context of marine conservation in Ghana include Friends of the Nation (FoN), Hen Mpoano (HM), Environmental Justice Foundation (EJF), Ghana Wildlife Society (GWS) and Nature Conservation Research Centre (NCRC).”

### **Cooperatives, Committees and Associations**

As described in (Ocean Country Partnership Programme, 2025c) – “Cooperatives, committees and associations are small non-profit organizations critical in managing marine resources as they provide a wide range of social services to the community and contribute to creating a sustainable future (Nordin et al., 2024). Although they have always been more than just interest groups, their established relationships with the public and public sector organizations, have increasingly more ramifications for organizing their constituents to participate in marine resource management at all levels. Examples of these stakeholders in Ghana include:

- Central and Western Fishmongers Improvement Association (CEWEFIA)
- National Fish Processors and Traders Association (NAFPTA)
- Densu Estuary Women’s Cooperative
- Women in Law and Development in Africa (WiLDAF)
- Ghana National Canoe Fishermen Council (GNCFC)

- Small Pelagic Co-Management Committees
- Marine Protected Area Technical Advisory Committee (MPA-TAC)
- Landing Beach Enforcement Committees (LaBEC)
- Science and Technical Committee
- MPA Management Executive Committee
- MPA Community Cluster Committees
- Fisheries Management Operational Committee

### **Private Sector**

As described in (Ocean Country Partnership Programme, 2025c) – “The private sector in Ghana, particularly businesses involved in fisheries, tourism, oil and gas, and aquaculture, have a major stake in MPA implementation. Companies operating in the marine and coastal sectors may benefit from the conservation of marine ecosystems (e.g., through ecotourism) or may see their activities restricted by MPA regulations (e.g., fisheries and extractive industries). Their interests often centre on maximizing profits while maintaining access to marine resources, which can sometimes conflict with conservation goals. However, the private sector’s engagement is crucial for ensuring sustainable practices, and their investments in eco-friendly business models can align with MPA objectives.

Private companies such as Pioneer Food Cannery (PFC), Cosmo Seafood’s, and the tourism industry (hotels, tour operators, and businesses in coastal areas), Tullow Oil and Ente nazionale idrocarburi (ENI) Ghana often wield significant power due to their financial resources and political connections, which can either support or hinder MPA implementation depending on how their interests are addressed.”

### **International Organizations**

As described in (Ocean Country Partnership Programme, 2025c) – “Bilateral, multilateral, and intergovernmental organizations such as the United Nations (UN), International Union for Conservation of Nature (IUCN), World Bank (WB), the UK Joint Nature Conservation Committee (JNCC) through the UK Government Ocean Country Partnership Programme (OCP), United States Agency for International Development (USAID), Global Environment Facility (GEF), and various regional marine organizations such as the Fisheries Committee for the West-Central Gulf of Guinea (FCWC) often play a supporting role in MPA implementation .

These organizations provide funding, technical expertise, and policy guidance that help governments and other stakeholders meet global conservation targets, such as the 30x30 target of the Kunming Montreal Global Biodiversity Framework. They hold significant influence, particularly through funding mechanisms and global partnerships that encourage countries to establish and maintain MPAs. International organizations also help monitor compliance with international agreements and ensure that MPAs are managed according to best practices.”

### **Media**

As described in (Ocean Country Partnership Programme, 2025c) – “Media supports awareness raising to shape public opinions about MPAs and to foster broader community support, which is crucial for successful MPA implementation. Media upholds accountability principles in MPA implementation, ensuring that stakeholders adhere to commitments to establishing and enforcing MPAs. Through campaigns, the media brings pressure to bear on governments to prioritize MPAs in conservation policies and allocate resources for implementation. Furthermore, the media provides the platform for stakeholder engagement and consideration of diverse interests in MPA planning and management. Print and



electronic media, as well as community radios, are key media outlets utilized in Ghana for information dissemination on marine conservation.”

### **Universities and Research Institutions**

As described in (Ocean Country Partnership Programme, 2025c) – “Universities support research, capacity building, and knowledge exchange associated with MPA implementation. Their role includes data generation for MPA research and science. Universities also create the platforms for integration of different sources of knowledge in MPA planning and management. One example of university involvement was the Coastal and Marine Conservation Drive Project (COMADRIP) administered by the University of Cape Coast which prioritised the Cape Three Points area for the design and development of an MPA management strategy (Jonah et al., 2022b)”.

### **Slide 28 - Timeline of MPAs & other designations in Ghana 2003 - 2018**

As described in (Ocean Country Partnership Programme, 2025b) – “While Ghana does not currently have any MPAs, there has long been interest in the establishment of MPAs in Ghana:


The first attempt at official gazettement (designation) of coastal and adjacent marine areas occurred under the Wetland Management (Ramsar Sites) Regulations in 1999 with the designation of the Densu Delta, Sakumo, Songor Lagoon, and Keta Lagoon Complex, Muni-Pomadzi and Owabi Wildlife Sanctuary Ramsar Sites. The Coastal Resources Center at the University of Rhode Island developed an Integrated Coastal and Fisheries Governance (ICFG) initiative for the western region of Ghana, which aimed to establish an MPA based on recommendations of biodiversity threats and critical habitat assessments conducted in the Western region (Ateweberhan et al., 2012)

In 2010, the Fisheries Commission with the support of the United States Agency for International Development (USAID)-funded ICFG established and chaired an *ad hoc* MPA inter-ministerial committee, which was charged with the elaboration of a roadmap to guide MPA establishment. However, this process was truncated at the completion of the ICFG project.

In 2018, the Fisheries Commission with funding support from the West Africa Regional Fisheries Programme (WARFP) commissioned an assessment on MPAs in Ghana: Strategies, Action Plan, and Implementation Framework (Nunoo, 2018). This report stated the goal of establishing and managing MPAs in Ghana shall be to “protect and conserve the coastal and marine ecosystems of the nation and its associated biological diversity and fisheries for the benefit of humanity.” This report identified 20 sites that were proposed as potential MPAs using a four-point criterion for site selection (socio-economic, educational, ecological, and feasibility). The report identified that decision making should be based on Best Available Scientific and Technological (BAST) information following a process of scientific assessment.”

### **Slide 29 - Timeline of MPAs & other designations in Ghana 2018 - Present**

As described in (Ocean Country Partnership Programme, 2025b) – “Between 2018 and 2021, the Environmental Protection Agency (EPA) led the implementation of the *Mami Wata* project in the Western Region of Ghana. This was focused on the analysis and allocation of spatial and temporal space for economic activities, ecosystem services, and conservation values in Ghana’s maritime space in order to achieve the economic objectives of the medium-term economic policy of Ghana. This included a State of the Marine Environment report for the four western coastal districts in Ghana and the identification and description of Ecological and/or Biologically Significant Areas (EBSAs) in the marine area off Cape Three Points (EPA, 2021, 2020b).



In 2022, the Feed the Future Ghana Fisheries Recovery Activity (GFRA) organised a workshop regarding the strategy for supporting the establishment and operation of MPAs in Ghana. The workshop focused primarily on the work of two main Government of Ghana agencies (EPA and the Fisheries Commission (FC)), because they have played active roles in previous attempts at marine spatial planning and MPA work in Ghana. During a stakeholder consultation workshop that involved the EPA, the Land Use and Spatial Planning Authority (LUSPA), the Wildlife Division (WD) of the Forestry Commission, and civil society organisations, three potential MPA sites of small pelagic fisheries importance were selected in consultation with the Ministry of Fisheries and Aquaculture Development (MoFAD) and the Fisheries Commission (FC) for which the Cape Three Points area was identified as a candidate site for establishing an MPA. It is noteworthy that a study on fisheries related coastal and marine ecosystem services (Sagoe et al., 2021) and a follow up project, the Coastal and Marine Conservation Drive Project (COMADRIP), launched by the Centre for Coastal Management at the University of Cape Coast (CCM-UCC), also prioritised the Cape Three Points area for the design and development of an MPA management strategy (Jonah et al., 2022b).

The initiative from GFRA also supported the FC to establish an MPA Technical Advisory Committee (MPA-TAC) who meets regularly and offers technical guidance including defining the purpose and objectives for establishing the Cape Three Points MPA while ensuring diverse stakeholder perspectives are integrated into decision-making associated with this process. The MPA-TAC comprises representatives of FC, EPA, LUSPA, MoFAD, Wildlife Division (WD), traditional authorities, fishermen, Ahanta West Municipal Assembly, non-governmental organization (NGOs) and Academia.

### **Slide 30 - Map of potential MPAs & other designations in Ghana**

While Ghana has no officially designated MPAs it does have 6 protected coastal mangrove sites (168,964 ha) comprised of 5 Ramsar sites and a biosphere reserve (Songor lagoon). The Keta Lagoon complex has the largest distribution of mangroves among the five Ramsar sites (Merceron et al., 2024).

Due to the current threats to Ghana's marine environment that we outlined earlier, the Government of Ghana has identified the need to create and manage MPAs to protect fish nursery areas and spawning grounds as a strategic measure to sustainably develop Ghana's declining fisheries resources as outlined in the Fisheries Management Plan (2015–2019) (MOFA, 2015).

Scientific assessments have been conducted across the four coastal regions in Ghana, from which various coastal areas have been recommended for conservation. In 2011 the Inter-Institutional Working Group (locally known as Hen Mpoano) identified 11 potential locations for MPAs in Ghana (marked in red on map). In 2021 Coastal and Marine Conservation Drive Project (COMADRIP) was developed as a science-based pilot initiative to develop an MPA management strategy for the Greater Cape Three Points area that can feed into national development processes for coastal and marine conservation in Ghana. The project employed a mix of methods to obtain both scientific and indigenous information to enhance the identification and analysis of issues related to the governance structure for management of aquatic resources in the communities, stressors of the aquatic ecosystems, state of the aquatic ecosystems; livelihood profile of the coastal communities, and the communities' perception about the establishment of MPA (Jonah et al., 2022a).

### **Slide 31 - Greater Cape Three Points Area (GCTPA)**

The Cape Three Points marine and coastal wetlands are located in the Ahanta West district of Ghana, and encompass the Cape Three Points, Princess Town and Miemia areas. The GCTPA is important for fish productivity and production, an axis for biodiversity and conservation as well as tourism, and as such was categorized by the Coastal Resources



Centre (CRC) and Friends of the Nation (FON) as a 'critical management or conservation site' in their 2011 report (Coastal Resources Center, 2011).

The area hosts a suite of critical ecosystems consisting of estuaries, lagoons, mangroves, sandy beaches and headlands that provide nurseries for many species that support Ghana's fisheries sector (Coastal Resources Center, 2011). The area further provides the critical oceanographic conditions (temperature and food) for the post spawning life cycle of the round sardinella (*S. aurita*), an importance species in Ghana's artisanal fishery (Castro et al., 2017), and serves as a migratory route of this fish species to their spawning grounds and other countries within the sub- region (Brainerd, 1991). The stretch of sandy beach is a major nursing ground for marine turtles from August to March. Dolphins and whales inhabit the area as well, between October and December. The area also provides feeding grounds and habitat for many birds (Coastal Resources Center, 2011)

Fishing and farming are the main traditional occupations in the area, which has resulted in high levels of overfishing due to the near-complete removal of top predatory fish, leading to the release of prey species and high dominance of a few abundant species as observed in scientific research (Ateweberhan et al., 2012). The continuous decline in fish catch has influenced many fishermen to either branch completely or combine their occupation with farming, intensifying the need for people to acquire huge areas of land for oil palm or rubber plantations (Coastal Resources Center, 2011).


The area has become more popular with the discovery of offshore oil in Ghana, as the first location for the commercial exploration of oil in the country. This has increased the potential for industrial and other related development, as prospective investors aggressively purchase lands, escalating the pressure exerted on the coastline in the near future (Coastal Resources Center, 2011) Exploitation of the offshore oil and gas fields in the area also poses threats of oil pollution that could affect biodiversity. Other major issues of concern in this coastal area as identified by Coastal Resources Center (2011) include, incidence of sand winning and sea erosion, destruction of mangroves, poor sanitary facilities and lack of basic amenities and rising social problems due to emerging oil and gas sector.

In April 2024, it was announced that the Government of Ghana is committed to establishing an MPA in the Greater Cape Three Points Area (GCTPA) by 2026. This MPA establishment is proposed to be done through a co-management approach where local communities will assume a central role in the development and implementation of management plans and protective measures. It is also envisaged that other stakeholders, agencies, organisations and various groups in Ghana with an interest or expertise in protected area establishment will play key roles in future management of the MPA.

### **Slide 32 - Ghana's Institutional Framework**

From (Ocean Country Partnership Programme, 2025c) - The establishment and management of MPAs is multi-sectoral in nature, requiring different forms and levels of rulemaking, interaction, coordination and collaboration among various Ministries, agencies and local government authorities. Furthermore, partnerships and collaborations between government institutions and resource users underpin MPA management in a manner that fosters inclusive and participatory management of coastal and marine resources. The diagram of Ghana's institutional framework shows the inter-connectedness of government bodies, resource users, and stakeholders in managing MPAs, ensuring a collaborative approach to marine conservation. The diagram shows where each party inputs into each stage of the MPA implementation cycle and emphasizes institutional roles within each part of the cycle.

**Ministry of Fisheries and Aquaculture (MoFA – was MoFAD)** - plays a pivotal role in the establishment and management of MPAs in Ghana, working within its mandate to develop and sustainably manage the fisheries sector. MoFA's responsibilities include formulating



policies, providing financial oversight, and promoting institutional capacity-building. The Fisheries Act of 2002 (Act 625) empowers the Minister responsible for fisheries to declare marine reserves and make regulations concerning fisheries management, conservation, and quota systems, supporting the sustainable use of marine resources. MoFA acts as a central coordinating body, serving as a policy-making and rule-enforcing institution in MPA implementation. Its role extends to securing budgetary allocations in collaboration with the Ministry of Finance and Economic Planning and working with the Attorney-General's Department to convert MPA policies into legal instruments. MoFA also serves as an intermediary between the FC, Cabinet, and Parliament to ensure policies are approved, funded, and legally formalised.

**Fisheries Commission (FC)** – under MoFA, plays a key role in the establishment and management of MPAs in Ghana, including advisory, regulatory, management, policy coordination, rulemaking, and enforcement functions. It advises the Minister responsible for fisheries on declaring marine reserves and making regulations related to MPAs. The Commission also oversees the use of fishery resources, coordinating multi-sectoral activities for MPA implementation.


**Ministry of Environment, Science, Technology and Innovation (MESTI)** - plays a consultative role in the establishment of MPAs in Ghana, particularly when the Minister of Fisheries declares a marine reserve. Although not explicitly involved in creating fisheries regulations, MESTI's agencies, like the EPA, must be consulted as part of the broader process.

**Environmental Protection Agency (EPA)** - under MESTI, is responsible for protecting and enhancing the environment, including the marine ecosystem. It uses environmental assessments to regulate activities that could impact the environment, including MPAs. The EPA's functions include advising on environmental policies, coordinating with other bodies to control pollution, conducting research, and raising public awareness. The EPA also plays a critical role in environmental and social impact assessments of MPAs, ensuring their suitability and monitoring their effects on marine ecosystems. Additionally, the EPA will promote ecological and biological studies, disseminate information to local authorities, and support ongoing research to ensure the success and sustainability of MPAs.

**Wildlife Division (WD)** – under the Forestry Commission of the Ministry of Lands and Natural Resources (MLNR), plays a role in MPA implementation under the broader framework of the Wildlife Preservation Act, 1961 (Act 43) and the recent Wildlife Resources Management Act, 2023 (Act 1115). Its mandate is to conserve wildlife in Ghana in general and manage wildlife protected areas in particular within representative ecological zones of the country. Key responsibilities include the establishment of closed seasons to protect marine and wildlife species, protect and develop Ghana's permanent estate of Wildlife-Protected Areas (PAs), promote management and development of wildlife outside Wildlife-Protected Areas, and the integration of wetland management in collaboration with local District Assemblies to regulate activities and integrate customary conservation practices compatible with Ramsar guidelines.

**Land Use and Spatial Planning Authority (LUSPA)** - play three key roles: 1) planning marine spaces for MPA establishment, both in Ghana's internal waters and EEZ; (2) preventing encroachments and ensuring compliance with zoning regulations in MPAs; and (3) controlling development in sensitive ecosystems, such as coastal wetlands and nature reserves, to protect areas where MPAs are established.

**Ghana Maritime Authority (GMA)** - established under the Ghana Maritime Authority Act of 2002 (Act 630), is responsible for regulating, monitoring, and coordinating activities within the maritime industry. Its core functions include ensuring safe navigation and fulfilling both flag state and port state responsibilities in line with international maritime conventions and codes. In the context of MPAs, the GMA must be consulted to ensure that the mapping of



marine reserves or zones for fishery conservation does not compromise maritime transportation. The GMA is also responsible for designating these areas as Particularly Sensitive Sea Areas (PSSAs) under IMO rules or as Special Areas under MARPOL regulations.


**Metropolitan, Municipal, and District Assemblies (MMDAs)** - play a crucial role in the establishment and operation of MPAs, particularly for those located in inland waters. MMDAs, under the Local Governance Act of 2016, are responsible for managing human settlements and the environment within their districts, and they coordinate development plans with other government bodies. Therefore, their involvement is essential to integrate MPA conservation measures into local development plans and ensure the success of MPAs through daily management and enforcement. The consultation, participation, and understanding of MMDAs are key factors for the effective establishment and long-term success of MPAs.

**Ghana Police Service Marine Unit (GPSMU) and Ghana Navy (GN)** - the Marine Police and the Navy are members of the Fisheries Enforcement Unit (FEU) of the FC. The FEU is an inter-agency entity made up of the Monitoring, Control and Surveillance Division (MCSD) of the FC, the GPSMU and the Ghana Navy. The FEU is tasked with the responsibility of enforcement of fisheries regulations, and in relation to the establishment and operation of MPAs, it will be at the forefront in enforcing compliance.

**Ministry of Justice and Attorney-General's Department (MoJAGD)**- play crucial roles in the establishment and operation of MPAs. First, when the Minister responsible for fisheries decides to establish an MPA as part of fisheries conservation and management measures under Section 139 of Act 625, the Attorney-General's Department, particularly the Drafting Division, is tasked with converting Cabinet-approved policies into draft regulations. Second, if the Minister decides to declare marine reserves as MPAs under Section 91 of Act 625, the Drafting Division ensures that the language and form of the declaration are vetted before submission to the Government Printer for publication in the Gazette. Third, the Attorney-General advises the President, government, and relevant ministries on the constitutionality of MPA declarations, especially considering the impact on the rights and socio-economic livelihoods of other marine and coastal resource users. Additionally, the Attorney-General's Department must ensure that Ghana's steps toward establishing MPAs align with its international obligations, particularly in cases involving transboundary, highly migratory, or straddling fish stocks. The Department is also responsible for prosecuting individuals who violate fisheries conservation laws, regulations related to MPAs, or closed season regulations set by the FC and the MoFA. Lastly, the Attorney-General will represent the state in any legal challenges to the constitutionality or legality of MPA-related conservation functions.

**Marine Protected Area Technical Advisory Committee (MPA-TAC)** - serves as a sub-committee of the Fisheries Management Operational Committee (FMOC), in light of the considerations by MoFAD and the FC to develop and implement a strategy for the establishment and operationalization of MPAs in Ghana in collaboration with relevant stakeholders. The six members of the Technical Advisory Committee (TAC) are drawn from the FC, EPA, LUSPA, GNCFC, the Department of Marine and Fisheries Sciences of the University of Ghana and Hen Mpoano (an NGO).

The functions of the TAC include providing technical advisory support services for planning, establishment, and implementation of MPAs, particularly for small pelagic fisheries management and recovery, reviewing of fisheries management and MPA strategies and making recommendations on the implementation of MPA strategies to the FC and other relevant institutions. Additional functions of TAC include the engagement of policymakers and regulators to advocate for political will and commitment for the establishment of MPAs; providing support during stakeholder consultations and validation processes to inform



decision-making on the establishment and operation of MPAs; support capacity building activities for the planning, establishment, and implementation of MPAs; reviewing MPA management plan(s); and making recommendations for approval as specified by the Fisheries Act, 2002, and the relevant regulations.

### **Slide 33 - Requirements for MPA implementation in Ghana**

This diagram shows the requirements for MPA implementation in Ghana at different levels – local, regional and national.

### **Slides 34, 35 & 36 - Ghana's Policy Framework For MPA Designation**

At the national level, it is recommended that MPAs should be strategically networked to include significant representation of all key habitats, species, and ecological processes (Burns et al., 2023; N. Dudley, 2008; Gaines et al., 2010). To ensure coherence, a national framework with clear goals, strategy, and governance is essential (Grorud-Colvert et al., 2021b).

The framework should provide high-level coordination without being overly restrictive, allowing for the development of MPAs to meet local needs while at the same time ensuring protection of nationally important ecological and socio-economic assets. The network should consist of different types of MPAs with objectives additional to biodiversity conservation, including fisheries management, tourism development, cultural protection and education. Establishing a network (as compared to having several isolated MPAs) requires two levels of governance: national/network coordination to establish the framework and overarching principles for MPA establishment, management, and funding, and other site-specific governance setting up local management committees and management plans.

The slide presents selected policies, strategies, plans, and legislations and their associations with key institutions and priorities for MPA assessment, management, and monitoring criteria for MPA implementation in Ghana.

### **Slide 37 - Summary**

1. Ghana's various marine habitats are a key source of food and livelihoods for coastal communities.
2. Human activities such as resource exploitation and climate change are negatively impacting Ghana's marine ecosystems.
3. While Ghana does not yet have any formally designated MPAs, it does have 5 Ramsar sites and a biosphere reserve.
4. Due to the current threats to Ghana's marine environment, the Government of Ghana has identified the need to create and manage MPAs to protect fish nursery areas and spawning grounds as a strategic measure to sustainably develop Ghana's declining fisheries resources as outlined in the Fisheries Management Plan (2015–2019).
5. In April 2024, it was announced that the Government of Ghana is committed to establishing an MPA in the Greater Cape Three Points Area (GCTPA) by 2026.



# Module 4: MPAs Identification and regulation

## Slide 1

Title: Module 4 - MPAs Identification and regulation.

## Slide 2 – MPA Course Overview

This is the fourth of eight presentations in this short course on Marine Protected Areas. So far, we have covered MPAs around the world and those specific to Ghana. We have discussed the drivers for marine protection and the different types of MPA designations that can be used. In this module we will look at the broad principles for MPA identification and designation.

The course is made up of 8 modules. Each module consists of a presentation and accompanying module notes. A reading list is also provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

## Slide 3 – Learning Objectives

In this module you will:


- Become familiar with the MPA Implementation cycle
- Recognise the importance of stakeholder engagement
- Consider steps for MPA identification and selection
- Develop a further understanding of the benefits and principles of MPA networks

## Slide 4 – MPA Implementation Cycle

Typically, MPAs follow a cyclical process, with each stage feeding into the next (CBD, 2004; IUCN-WCPA, 2008; JNCC, 2024).

The cycle begins with the identification and designation of a site. The best-available evidence is collated and used to provide advice to a country's Government on the identification and designation of MPAs. This identification can be based on principles (such as presence of a key habitat and species features) and can also include socio-economic considerations. Designation is the process by which the MPAs are recognised by law through the planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation and its laws and policies (please refer to module 2 for types of MPA designation).

Once a site has been identified, it is important to fully understand its threats and impacts as existing and potential future use of the marine environment may threaten the achievement of the MPAs' conservation objectives and must be considered. Relevant threats and impacts on the protected features within MPAs are identified and appropriate conservation advice developed which in turn supports advice on the management of human activities within these MPAs. (Please see previous modules for details of general and Ghana-specific threats and impacts to the marine environment).



This understanding then feeds into the development of MPA management whereby MPA managers provide advice to regulators on the impacts of marine industries on the conservation status of MPAs in the country. It may involve the creation of a management plan, the setting of responsibilities, timeline, and enforcement strategy.

MPA managers also provide scientific data and advice on the monitoring of the MPAs. The aim of MPA monitoring is to collect information to inform assessments of an MPA's progress towards achieving its conservation objectives and determine if management is effective or needs to be adapted.

Assessment of the condition of the protected features within MPAs can inform whether further management is required for sites to meet their conservation objectives. Information gathered from monitoring surveys is used to inform these assessments and draw conclusions on feature condition, whether conservation objectives are being met and management measures effectiveness. The outcomes of these assessments may result in a conservation objective or management approach being modified (please note that MPA management, monitoring and assessment will be covered in subsequent sessions of this course).

Once completed, the cycle repeats to ensure the MPA is still successfully meeting its objectives and any new information (such as data, legislation and stakeholder opinions) are taken into account and inform each stage of the implementation cycle.

Throughout all stages of the MPA cycle there are a number of important elements that should be considered, such as legislation, stakeholder consultation, and resourcing.


We will now discuss the importance of legislation and stakeholder engagement for all stages of the MPA cycle.

### Slide 5 – Legislation

As mentioned previously, a comprehensive legal framework is vital for MPA establishment, management, and long-term sustainability (Borrini-Feyerabend et al., 2012; CBD, 2018b).

Before an MPA can be established and managed, there are some key legislative elements that need to be in place to support each stage of the MPA cycle.

1. **MPA Designation:** Legislation should provide the legal authority to designate and establish MPAs. It should specify the process for identifying and designating areas as MPAs based on ecological criteria, scientific evidence, and stakeholder consultation.
2. **MPA Objectives and Purpose:** Legislation should clearly define the objectives and purpose of MPAs, which may include biodiversity conservation, habitat protection, sustainable fisheries, and ecosystem restoration. The legislation should articulate the specific goals and outcomes that MPAs are intended to achieve.
3. **MPA Zoning and Regulations:** Legislation should authorise the creation of specific zones within MPAs, each with its own set of regulations and restrictions. These regulations may include fishing restrictions, limitations on extractive activities, and guidelines for recreational and tourism activities. The legislation should define the boundaries and characteristics of each zone, taking into account ecological considerations and the needs of local communities.

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4. **Enforcement and Compliance:** Legislation should establish provisions for enforcement and penalties to ensure compliance with MPA regulations. It should specify the roles and responsibilities of enforcement agencies, outline monitoring and surveillance requirements, and provide mechanisms for reporting violations and prosecuting offenders.
  5. **Stakeholder Engagement and Participation:** Legislation should facilitate the engagement and participation of relevant stakeholders, including local communities, fishers, NGOs, and scientists, in the management and decision-making processes of MPAs. It should provide mechanisms for stakeholder consultation, representation, and involvement in MPA planning, monitoring, and adaptive management.
  6. **Funding and Resources:** Legislation should address the allocation of financial resources and mechanisms for funding the establishment, management, and monitoring of MPAs. It may include provisions for government funding, revenue generation through user fees or sustainable financing mechanisms, and partnerships with private entities or philanthropic organizations.
  7. **Monitoring and Evaluation:** Legislation should require regular monitoring and evaluation of MPAs to assess their effectiveness in achieving their objectives. It should outline reporting requirements, data collection protocols, and mechanisms for adaptive management based on scientific research and monitoring outcomes.

### Slide 6 – Stakeholder Engagement

Effective stakeholder engagement is widely recognised as essential to improving the legitimacy, acceptance, and effectiveness of MPAs, particularly where management capacity and enforcement resources are limited (Christie et al., 2003; Reed, 2008)

Why is it important to engage with stakeholders?

- Management of MPAs has consequences for a wide range of stakeholders, with environmental, social and economic impacts.
- It also usually requires the management authority to try to change the behaviours of marine resource users to minimise human impacts to marine habitats and species; this might be, for example, trying to encourage fishers to use different fishing methods or educating tourists not to get too close to marine wildlife.
- In places where resources for MPA management are limited, effective stakeholder buy-in and support is fundamental in the potential success of the site

Through effective engagement managers can:

- raise awareness and build understanding of the need for management,
- use the knowledge of stakeholders to collect information about the site to inform designation as previously mentioned or develop management,
- help managers to consider different views in the process,
- improve transparency in decision-making, helping to build trust in the MPA management authorities,
- Reduce conflict and mistrust amongst different stakeholder groups, and

- create a sense of ownership over outcomes.

### **Slide 7 – Who Are The Stakeholders?**

Inclusive stakeholder identification is essential to ensure that diverse interests, values, and potential conflicts are recognised and addressed during MPA planning and management (Reed, 2008)

It is important to consider all groups and individuals who use and depend on an MPA, whose activities affect it and/or who have a direct or indirect interest in it. This could include:

- Multiple government ministries, departments and associated authorities such as statutory nature conservation bodies,
- Representatives of marine industries such as commercial fisheries, tourism industry, and shipping,
- Sea users who utilise the area including artisanal or subsistence fishers and ocean hobbyists such as divers and the surfing community,
- Non-profit organisations (NGOs) and research institutes such as universities may have specific expertise related to an area or particular habitat or species that could support the monitoring and management of a site,
- The local community, such as local councils or schools, will have varied levels of interest and influence over the MPA,
- And the wider general public will also sometimes need to be considered depending on the motive for engagement.

When engaging with stakeholders it is also important to include a wide range of stakeholders who represent different views and perspectives, including those who may oppose MPA management activities and those who may be hard to reach

An analysis of stakeholders specific to Ghana can be found in Module 3 of this MPA short course.

### **Slide 8 - Example of Stakeholder Engagement in Ghana**

*Play video (Stakeholder engagement to co-design inclusive Landscape Management Plan) - <https://youtu.be/hmBj-2sWQ7M?si=AhqutlINmQDR5xWX>.*

This video provides an example of stakeholder engagement in Ghana


**Discussion point** – *Have you been involved in any kind of stakeholder engagement in the past, either as a facilitator looking to get information, or as a stakeholder? How was your experience?*

### **Slide 9 - Principles of MPA Design**

#### **Define objectives & goals of the site**

Identifying new MPAs depends on the rationale for why new sites are required.

- Thinking back to the drivers of MPAs the overarching goal could be to meet international commitments such as increasing the percentage of a country's waters under some form of protection to reach 30 by 30 targets or could be to protect an



artisanal fishery from collapsing and leaving communities without livelihoods or a source of food. There might be multiple drivers for why an MPA is needed.

To help with the site selection process, clearly defined objectives and goals for the individual sites are needed (IUCN-WCPA, 2008; Roberts et al., 2003), for example:

- is the objective of the MPA to protect a particular threatened species or critical habitat (this could be guided by CITES or local legislation on protected species)?
- is the need to protect an ecosystem and its ecosystem services such as protecting fish stocks by protecting important breeding or nursery grounds or by supporting sustainable tourism practice such as low-impact diving and snorkeling?

MPAs can also be designed to protect additional cultural values e.g., to protect historic sites or areas of recreation (coastal forts for example).

It is also important to consider whether the purpose is to maintain and conserve the site as it is or to restore it. For example, you could protect a degraded area of habitat to support its recovery, or protect a resilient habitat such as a coral reef that has survived bleaching

An MPA can be designed to cover a combination of purposes, but they normally have one overarching conservation objective.

## **Slide 10 - Principles of MPA Design**

### ***Scientific basis***

It is vital that site selection is based on scientific research and data using the best information currently available. A lack of full scientific certainty should not be a reason for postponing proportionate decisions on site selection.

Data collection could include biodiversity surveys, ecological assessments, and habitat mapping, and will help to identify key conservation priorities and inform the best location for the site (CBD, 2004; IUCN-WCPA, 2008).

### ***Ecological representation***


Ecological representation should be considered throughout MPA design:

- MPAs should aim to protect a representative sample of the region's biodiversity, including different habitats, species, and ecological processes (CBD, 2004; IUCN-WCPA, 2008).
- Differences in habitat quality, rarity, and species distribution should be taken into account.

### ***Connectivity***

The effectiveness of a single MPA can be vastly improved if the connectivity of the site with other MPAs and ecologically important areas is fully considered at the design stage (IUCN-WCPA, 2008; Palumbi, 2003).

- Ideally an MPA needs to be part of a network of sites that takes account of the movements of species, dispersal of larvae, and exchange of nutrients and other matter between ecosystems.

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- Connectivity will also allow species to migrate or adapt in response to changing conditions caused by factors such as climate change.

## **Slide 11- Principles of MPA Design**

### ***Climate change***

Integrating climate change considerations into MPA design is becoming increasingly crucial for enhancing the resilience of these areas and the ecosystems they protect (Green et al., 2014; McLeod et al., 2009; Wenzel et al., 2025). Climate change can be incorporated into site design by:

- Assessing the areas' vulnerability to climate change impacts e.g., sea-level rise, ocean acidification, temperature increases and changing weather patterns
- Identifying the specific climate change threats an MPA is likely to face. This could include coral bleaching, habitat loss, altered species distribution or increased storm intensity.
- Selecting areas that are likely to be more resilient to climate change impacts. Such areas may have features like naturally occurring refugia, robust habitats or strong currents that can help protect against some climate-related stressors.

### ***Boundary***

- The size and shape of the MPA should be determined based on the conservation goals of the site e.g., the size of an MPA designed to protect a sessile habitat that is fixed in one place such as a coral reef could be a lot smaller than an MPA designed to protect mobile species such as whale sharks or tuna (Grorud-Colvert et al., 2021a; Natural England, 2010).
- Practical factors should also be taken into consideration such as whether there are natural geographical features which may help to delineate the site, or if there is a need to divide the site into different zones to balance the conservation of marine biodiversity with the sustainable use of resources and human activities.

We will learn more about zoning as a management tool in future modules.

## **Slide 12 - Principles of MPA Design**

### ***Stakeholder engagement***

As discussed, stakeholder engagement from the outset of site identification and design is critical to build support for the site and to utilise local knowledge. Not only can stakeholders help provide additional anecdotal data on biodiversity, but they can help MPA planners understand how the site is currently used e.g., is it a busy site with lots of anthropogenic activities occurring. This is critical – considering the impacts of protecting a site could help consider the feasibility of success.

It is also vital to understand what the sources of threats are within the site and whether these can be reasonably managed:

- There is little value in designating a site in an area where it is difficult to introduce effective management.
- Engaging with local communities and users of the potential site will also help planners to understand the social and economic impacts the site may have. This can be explored through a socio-economic impact assessment to evaluate potential positive and negative effects on livelihoods, income, employment and cultural practices (Christie et al., 2003; Reed, 2008).

### **Legislation**

The final consideration is the need for a comprehensive legal framework to provide a solid foundation for MPA establishment, management and long-term sustainability.

- The regulation that a site can be designated under will influence the type of management available to support the success of the site.
- And whether there is any existing management or designations overlapping the proposed site is important as they may interact / impact the proposed site.

### **Slide 13 – Why Set MPA Objectives?**

Designation of MPA boundaries isn't enough to achieve effective marine conservation. An MPA needs targets, or objectives, to aim for. These can be ecological, or socio-economic objectives (CBD, 2004; Grorud-Colvert et al., 2021a).


Such targets are often referred to as Conservation Objectives and are defined as “a trajectory (either to conserve/maintain or restore/recover) of desired condition to work towards for each protected feature of an MPA”.

Conservation objectives play a crucial role in guiding the design, management, and evaluation of MPAs (CBD, 2004; IUCN-WCPA, 2008). Some of the benefits include:

- 1. Biodiversity Conservation:** Conservation objectives can guide the design and management of MPAs, providing a clear focus on which key marine species, habitats, and ecological processes need safeguarding.
- 2. Ecosystem Functioning:** MPAs with well-defined conservation objectives contribute to the maintenance of ecosystem functions and services, such as nutrient cycling, carbon sequestration, and coastal protection, benefiting both marine life and human communities.
- 3. Threat mitigation and management:** Conservation objectives provide a framework to mitigate threats, such as overfishing, habitat degradation, pollution, and climate change impacts. The implementation of management strategies that utilise conservation objectives help to reduce the impact of these stressors and promote ecosystem resilience.

### **Slide 14 - Why Set MPA Objectives? Continued...**

- 4. Sustainable Resource Use:** Conservation objectives in MPAs often include sustainable resource use as a goal, supporting the livelihoods of local communities while ensuring the long-term viability of marine resources (IUCN-WCPA, 2008).

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- 5. Monitoring and Evaluation:** Conservation objectives provide a basis for monitoring and evaluating the effectiveness of MPAs. By clearly defining the desired conservation outcomes, objectives help determine relevant indicators and metrics to assess progress. Regular monitoring and evaluation enable adaptive management, allowing MPAs to refine management strategies, adjust boundaries, and improve conservation outcomes based on scientific evidence and feedback (Hockings, 2006). MPA assessments, such as protected areas management effectiveness (PAME) evaluations, consider the degree to which the conservation objectives have (or have not) been achieved.
  - 6. Stakeholder Engagement:** Conservation objectives serve as a tool for stakeholder engagement and communication. Clear objectives help communicate the purpose and value of MPAs to different stakeholders, including local communities, industries, policymakers, and the public. Well-defined conservation objectives facilitate meaningful participation, collaboration, and support for MPA initiatives.

### Slide 15 - SMART Objectives

When setting the conservation objectives for a new MPA, it's important to consider whether the objective is S.M.A.R.T, i.e., whether it satisfies the following 5 key attributes (Gorud-Colvert et al., 2021a; Hockings, 2006):

**Specific, Measurable, Achievable, Relevant and Time-Based**

The value of using SMART objectives in the establishment of MPAs lies in their effectiveness in guiding the planning, implementation, and evaluation processes:


**S** – Specific objectives provide clarity and precision in defining the desired outcome of MPA establishment. They help identify the specific conservation targets, such as protecting a certain habitat or species, or achieving a specific ecological or socio-economic goal.

**M** - Measurable objectives allow for the use of quantifiable indicators and metrics to assess progress and success. By establishing measurable targets, such as percentage of habitat protection or population recovery rates, it becomes easier to track and evaluate the effectiveness of MPA implementation over time.

**A** – Achievable objectives help ensure that the goals and conservation objectives set for MPA establishment are realistic and achievable. They consider available resources, scientific knowledge, and socio-economic constraints. Realistic objectives increase the likelihood of successful MPA implementation and stakeholder support.

**R** – Relevant objectives ensure that the conservation objectives of the MPA align with broader conservation strategies, policies, and priorities. They take into account ecological significance, the needs of target species or habitats, and the potential benefits for local communities. Relevant objectives help create a strong rationale for MPA establishment and enhance its overall value.

**T** – Finally, time-based objectives set a clear timeline for achieving the desired outcomes. They establish deadlines and milestones, promoting accountability and enabling effective monitoring and adaptive management. Time-bound objectives provide a sense of urgency and help maintain focus during the planning and implementation phases.



Note, however, that objectives *don't always* need to satisfy *all* aspects of SMART, as some aspects may be included in the wider management plan. For example, there may be legislation that sets the timeline for achieving a site or network's conservation objectives and/or the length of the management plan.

### **Slide 16 - MPA Conservation Objectives: Trajectories**

As we've discussed, conservation objectives outline a trajectory of desired condition to work towards for each protected feature of an MPA. They set out broad ecological aims for a site and help achieve the targets and vision for the protected area. Defining the conservation objectives is a crucial step in the design of any MPAs, as it will inform the measures in place for the MPAs, and ultimately its conservation effectiveness.

A site can have multiple objectives, or an overarching objective supported by underpinning, smaller targets. Overarching targets or objectives can be part of a national, regional, or international framework (e.g. the protection of an internationally important species). However, it is important for each MPA to have its own conservation objectives, depending on the vision for the MPA, the feature to protect and the surrounding pressures.

In terms of steps involved in establishing conservation objectives there are a few things that need to be taken into consideration. The first is whether you have a restore/recover or a conserve/maintain objective

**Restore/Recover:** Where protected features have experienced deterioration and are in an 'unfavourable' condition the Conservation Objectives will seek to restore/recover the protected feature. Where restoring/recovering the protected feature is not possible at a site level, the objective might seek to ensure the conditions within the site are appropriate to support recovery.

### **Slide 17 - MPA Conservation Objectives: Trajectories**

**Conserve / Maintain:** Where evidence indicates that a feature within the MPA is unimpacted or in favourable condition, the conservation objective might be to conserve / maintain this feature at its current state. Management action is still likely to be required to keep this status, however it will be more focused on preventing damage and degradation to the site.

### **Slide 18 - Designation Process Summary**

In summary the key steps to designation look like this:

1. Determine what to protect, influenced by national and international drivers
2. Establish where, what you want to protect occurs – considering the key design principles discussed
3. Assess options for the site including boundaries and socio-economics related to the area
4. Consult with local communities and stakeholders of the site
5. This is an iterative process which may involve some back and forth to ensure all stakeholders are listened to and the end result is supported by the majority
6. And the final step to designate the site under the relevant legislation



## Slide 19 - Challenges to Designation

- Designating MPAs can be a challenge due to the potential impacts protecting areas can have on site users.
- Potential challenges to consider in the designation process include but are not limited to:
  - Available resources such as staff requirements to complete the steps involved in designating a site and associated costs such as undertaking ecological surveys and stakeholder workshops
  - Uncertainty – Understanding what are the most effective management measures? And how to measure progress?
  - Lack of evidence - Knowledge and data gaps. And sometimes even recognising data and evidence limitations can be a challenge.
  - Stakeholder attitudes – For example public support or objection to plans influencing their success.
  - Socio-economic factors – Such as conflicting policies or requirements that need to be addressed by government

## Slide 20 - MPA Networks: Key Principles

As we discussed in module 2 an MPA network is a “collection of individual MPAs operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels, in order to fulfil ecological aims more effectively and comprehensively than individual sites could alone” (McLeod et al., 2009; White et al., 2005). Additionally, social, economic and fisheries benefits should be realised over time from the scaling up of individual sites to networks of MPAs.


Creating an effective marine protected area (MPA) network involves the consideration of several key principles to ensure its functionality and success. These are very similar to those discussed for the identification and designation of a single MPA, but with additional consideration to scaling up and ensuring connectivity between sites. The key principles of MPA networks can be broken down into 6 ecological principles: Representativity, Replication, Viability, Adequacy, Connectivity and Protection. These principles are all underpinned and supported by: Appropriate legislation, best available evidence and stakeholder consultation and engagement.

## Slide 21 - Ecological Principles

Source: <https://data.jncc.gov.uk/data/dd0721b3-5653-44fe-819f-88790ea8d332/JNCC-Report-439-FINAL-WEB.pdf>

Here are some examples of principles to think of for your network of MPAs –

**Representativity** - To be representative an MPA network needs to protect the range of marine biodiversity found within the region. This can be achieved by grouping species and habitats into broad-scale habitat types and protecting examples of these across the MPA network. The representativity principle also includes protecting those features of conservation importance (FOCI) that are known to be rare, threatened, or declining.



The broad-scale habitats must be biologically meaningful (i.e. represent true differences in marine communities) and use a 'common language' (i.e. a recognised classification scheme). Broad-scale habitats are also easier to identify than fine-scale habitats as supporting spatial information is likely to be more readily available.

Particular attention should be given to the protection of threatened, rare or declining species and habitats, termed features of conservation importance (FOCI). By considering FOCI independently it is possible to identify where urgent action is required for their conservation within the broad-scale habitats.

**Replication** - Replication is the protection of the same feature across multiple sites within the MPA network, taking biogeographic variation into account. All major habitats should be replicated within the MPA network and replicates should be spatially separate. The amount of replication will depend on the extent and distribution of features within the marine area. Replication of all features within the MPA network is required:

- To spread the risk of damaging events and long-term change negatively affecting the features of MPAs,
- To safeguard against unexpected disasters or collapse of species populations in one location (CBD, 2004; IUCN-WCPA, 2008),
- To ensure that natural variation within habitats is captured.

**Viability** - For an individual MPA to be viable it must be able to maintain the integrity of its features (i.e. population of the species or condition and extent of the habitat) and be self-sustaining throughout natural cycles of variation. Viability is determined by the size and shape of individual MPAs in conjunction with their effective management. MPAs of viable size and shape will provide most benefit to species with low and intermediate mobility and should therefore span the typical movements of those species including adults, juveniles, and larvae (IUCN-WCPA, 2008). A viable MPA will also encompass an area of habitat large enough to support populations of species that live attached to the seabed.


### Slide 22 - Ecological Principles (continued...)

**Adequacy** - Adequacy refers to both the overall size of an MPA network and the proportion of each feature protected within the MPA network. To be considered adequate an MPA network needs to be of sufficient size and include a large enough proportion of features, in order to:

- Deliver the network's ecological objectives;
- Enable the feature's long-term protection and recovery.

Guidelines for adequacy should be based on the biological needs of individual species, communities, and ecosystems so they are scientifically credible and robust (Rondinini, 2010)

Both best practice and scientific research recommend that the amount of each feature to be protected in an MPA network should be described numerically (Rondinini, 2010). Setting numerical guidelines makes network design more transparent and open to stakeholder involvement. It also provides a clear purpose for conservation decisions, lending them accountability and defensibility (Pressey et al., 2003).



**Connectivity** - Connectivity is the extent to which populations in different parts of a species' range are linked by the movement of eggs, larvae or other propagules, juveniles or adults (Palumbi, 2003). Marine habitats are ecologically connected through movements of species, nutrients and energy. This connectivity between habitats is one of the key principles of ecological coherence (OSPAR, 2006). Linkages may include:

- Connections between similar habitats;
- Connections through larvae or spores dispersing between and within MPAs;
- Regular settlement of larvae from one MPA to another;
- Movements of adults and young from one site to another;
- Other ecosystem linkages such as the transfer of nutrients.


Seeking to maximise connectivity between MPAs using the best science available, will improve the ecological coherence of the network and may be crucial for effective conservation and persistence of features within MPAs. For certain species this will mean that sites should be distributed in a way to ensure protection at different stages in their life cycles e.g. breeding, feeding and nursery grounds.

**Protection** - To achieve network aims and site conservation objectives the MPA network is likely to include a range of protection levels. Ranging from highly protected sites or parts of sites where no extractive, or other damaging activities are allowed, to areas with only minimal restrictions on activities that are needed to protect the features. Conservation objectives should ensure that MPAs collectively contribute to the protection and recovery of the marine environment, by determining the protection levels which support the favourable condition of all MPA features. The conservation objectives of MPAs will depend on the features for which they are designated (taking account of their condition and sensitivity) and the role those features will play in achieving the overall network objective of ecological coherence. Differing levels of restriction on human activities will therefore be required to achieve different site objectives.

### **Slide 23 - Supporting Principles**

The supporting MPA network principles include:

- **Appropriate legislation** – A comprehensive legal framework is essential to provide a solid foundation for MPA establishment, management, and long-term sustainability. With that in mind, legislation plays a crucial role in ensuring the functionality and effectiveness of MPAs. Refer to module 3 for Ghana specific legislation and frameworks.
- **Best available evidence** - A vital element of building an ecologically coherent MPA network is ensuring that best available evidence is used. Uncertainties in knowledge should be recognised and taken into account throughout the process. However, decisions will need to be taken based on the best available evidence and lack of full scientific certainty should not be a reason for postponing proportionate decisions on site selection. To meet the aims of an ecologically coherent MPA network it is important to gather and use a wide range of ecological and socio-economic information in a form that is useful for planning and decision-making (IUCN-WCPA, 2008).

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- Stakeholder consultation and engagement –Stakeholder engagement is an ongoing process of involving interested parties in assessing, planning, and implementing the MPA network. Involving stakeholders at every stage of the planning process ensures that their perspectives, knowledge, and support are included. Please refer to module 3 for details of key stakeholders in Ghana.

### **Slide 24 - Summary**

In summary, conservation objectives play a crucial role in guiding the design, management, and evaluation of MPAs. They ensure the protection of biodiversity, support ecosystem functioning, address threats, promote sustainable resource use, and facilitate stakeholder engagement. By setting clear conservation goals, MPAs can effectively contribute to the conservation and sustainable management of marine ecosystems.

By ensuring objectives or the wider management plans demonstrate SMART characteristics, it makes it easier to:

- Define what actions / measures are needed to achieve the objectives,
- Implement management plans to support the required actions / measure,
- Select appropriate indicators or metrics to monitor the effectiveness of actions / measures, and
- Consider what changes are needed to make improvements to the MPA (or MPAs within a network).



# Module 5: MPA Management and Management Planning

## Slide 1

Module 5 - MPA Management and Management Planning.

## Slide 2 - MPA Course Overview

This is the fifth of eight presentations in this course on Marine Protected Areas (MPA).

The aim of this course is to introduce you to the key concepts behind the use of MPAs, provide an overview of marine protection in Ghana, and run through the various stages of the MPA cycle.

The course is made up of 8 modules. Each module consists of a presentation and accompanying module notes. A reading list is also provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

## Slide 3 - Learning Objectives

During this module we will introduce you to MPA management – what it is and how this can be achieved in an effective (and efficient) way. This module will look to:

- Explain the different activities that an MPA manager might carry out to ensure that an MPA is effectively managed,
- Demonstrate the benefits of managing an MPA effectively and the importance of factoring in resources for this at an early stage,
- Explain the different phases of MPA management and how this can form into a process which can be used multiple times in a consistent way. This is often referred to as a management framework.


## Slide 4 - MPA Management

The Convention on Biological Diversity defines Protected Areas as “a geographically defined area, which is designated or regulated and then importantly managed to achieve specific conservation objectives” (United Nations, 1992).

The MPA management stage of the MPA implementation cycle determines what needs to be done to achieve the objectives of the MPA once it has been designated, to prevent it becoming a ‘paper park’ meaning they exist on a map but in practice there is little, or no management and destructive activities are not restricted or banned i.e. development or illegal fishing (Pieraccini et al., 2017).

Management planning sets out how an MPA is going to be managed. It involves deciding on a future desired condition and the course of action needed to get there (Pomeroy et al., 2004). To do this, it's vital to understand:

- a) the present condition of the MPA or chosen site; and

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- b) the desired future condition of the MPA and what is needed to achieve this whilst taking into account changing internal and external factors.

NOTE: It is vital that planning for MPAs considers both the health of the marine resources but also the needs of the people who are dependent on these resources.

Actions set out for a management plan will vary depending on many factors, such as the designation type for the MPA, local resourcing and the involvement of community and stakeholders. We will discuss these in further detail later.

### **Slide 5 - Why manage MPAs?**

As considered earlier in the course, MPAs can be designated with a range of conservation objectives in mind. These objectives are not limited to ecological considerations (such as the protection of key species, habitats, or ecological processes), but can also explicitly incorporate socio-economic objectives, including the recovery and sustainability of fisheries stocks, interactions with local businesses and tourism, and the maintenance or enhancement of sustainable livelihood opportunities for coastal communities (Bryce and Hunter, 2024; Pegorelli et al., 2024).

In some cases, ecological and socio-economic objectives can align, for example, where well-managed MPAs lead to increases in fish biomass that support both biodiversity conservation and fishery yields or tourism benefits. However, such alignment is not guaranteed, and trade-offs between conservation and socio-economic objectives can arise depending on the design of the MPA, the level of protection applied, and local social-ecological contexts (Meehan et al., 2023; Pegorelli et al., 2024).

Cultural objectives associated with connections to the protected area and wider marine spaces are also important considerations in MPA design and management. These may relate to traditional practices, customary marine use, Indigenous knowledge systems, or sites of cultural, spiritual, or religious significance that are intrinsically linked to marine and coastal environments (Barianaki et al., 2024).

Stakeholder engagement throughout both the designation and management planning processes is essential, as local communities' lives, identities, and livelihoods are often deeply intertwined with the marine areas being protected. Inclusive and participatory approaches can improve the social legitimacy, governance quality, and long-term effectiveness of MPAs by ensuring that management objectives reflect local priorities and knowledge, and by fostering compliance and stewardship (Brun et al., 2024; Bryce and Hunter, 2024).

While ensuring that MPA objectives are met, people will continue to rely on MPAs for livelihoods and resources. MPA management therefore seeks to balance conservation outcomes with sustainable use, enabling human activities to continue in ways that do not undermine ecosystem health and that remain viable for future generations (IUCN-WCPA, 2018). For example, in mangrove ecosystems, sustainable harvesting of firewood may be possible when extraction is carefully managed to avoid over-harvesting and is combined with measures that enhance ecosystem health, such as pollution prevention, active restoration, and replanting efforts. Such approaches can allow mangrove resources to regenerate, supporting both long-term livelihood security and the continued provision of critical ecosystem services (Das et al., 2022; Nature-based Solutions Initiative, n.d.).



## **Slide 6 - What do we manage?**

In order to achieve the objectives of a Marine Protected Area (MPA), or to maintain the MPA in favourable or good condition over time, it is necessary to manage human activities that may exert pressures capable of damaging protected features or undermining conservation outcomes (Brun et al., 2024).

A “pressure” refers to the mechanism through which a human activity affects components of the ecosystem, such as species, habitats, or ecological processes. The type and severity of a pressure are determined by the nature of the activity, its intensity, frequency, spatial extent, and duration (Knights et al., 2013).

When considering marine activities that impact, or have the potential to impact, conservation objectives, management therefore focuses on identifying the specific pressures being exerted and assessing the threats or impacts that these pressures may pose to protected features.

Marine activities can be categorised into direct human actions, such as fishing, oil and gas activities, tourism and recreation, aggregate and sand extraction, and waste disposal. Each of these activities can generate a distinct suite of pressures, and the significance of those pressures varies depending on the conservation objectives and sensitivities of the features being protected.

For example, pressures associated with shipping are often most relevant to highly mobile species such as cetaceans and other migratory fauna. These pressures can include underwater noise, vessel collision (ship strike), and accidental pollution events. In contrast, shipping activity is unlikely to affect fish stocks, benthic habitats, or coral features in the same manner as activities that involve physical interaction with the seabed, such as bottom-contact fishing gears or extraction activities (Erbe et al., 2020).

Other pressures that may require management include diffuse and large-scale pressures such as climate change, as well as pollution from land-based or sea-based sources, including waste disposal, chemical contamination, and marine litter. Plastics are increasingly recognised as a pervasive form of pollution that can affect species and habitats across multiple pathways and spatial scales, and therefore need to be considered within MPA management frameworks (Grorud-Colvert et al., 2021a).


The specific activities that should be managed within an MPA, and the degree and form of management required, should be set out clearly in the MPA’s management plan. Management plans provide the mechanism for linking conservation objectives to pressures, activities, and management measures, and for ensuring that management is proportionate, evidence-based, and adaptable over time.

## **Slide 7 - Considerations for effective management**

When considering the threats and pressures to an MPA, and how these may need to be managed to ensure objectives (ecological, socio economic, or cultural) are met or maintained, a range of constraints and considerations must be taken into account.

### **For management activities**

Are the ecological, socio-economic and cultural objectives of the MPA being addressed?



**What are the threats and pressures?** Do management actions consider and address these fully? Are there threats that have not been considered- including future risks?

**What resources are available to manage and enforce these actions?**

Who would be responsible for managing these activities? Is there legal jurisdiction to ensure activities can be managed?


**What do the local stakeholders think?**

Is the activity employing many of the local community? What sustainable alternatives are possible, can pressures of the activity be managed or minimised so they can continue in the area and still allow the MPA conservation objectives to be met? Would management result in creating new jobs and employment in the local community? Have stakeholders been involved in the process surrounding creating an MPA so far or will management be a new and relatively unknown idea for them?

### Slide 8 - Methods for management

Management of an activity can take many forms for an MPA, depending on the activity type, intensity and spatial distribution. Some potential management options include (Day et al., 2012):

- **Targeted activity management**, whereby the most damaging activities are identified and management measures are focused on limiting, mitigating or preventing the harm they cause.
- **Zonation of the protected area**, with activities permissible in some zones but restricted or prohibited in others. This approach allows more sensitive features, such as fisheries spawning grounds, to receive higher levels of protection than less sensitive areas.
- **Seasonal or temporal closures**, which may be applied to activity-based pressures where there are cyclical periods of sensitivity. For example, closures may align with migration and calving periods of marine mammals and turtles, spawning seasons for lobster and shellfish, or breeding and nesting periods for bird species.
- **Permit and licensing systems**, where activities are only permissible upon obtaining a licence. This enables activities to be monitored, limited and managed more effectively, and permit fees can contribute to the costs of conservation and management. In many MPAs, permits are required for commercial and recreational diving, with limits placed on the number of divers per day to reduce pressure on protected features.
- **Total prohibition of certain activities**, including fully protected or no-take measures, where no extractive activities are permitted except for scientific research. Although restrictive, such measures are associated with strong ecological outcomes, including improvements in ecosystem health and recovery of commercial species.
- **Best-practice measures and codes of conduct**, which can operate alongside regulatory controls and apply across a range of activities, such as fisheries practices or tourism. These may also link to wider regulatory requirements, for example relating to pollution control from agriculture or wastewater treatment.

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- **Monitoring-only or ‘do nothing’ approaches**, recognising that not all activities or pressures can be actively managed. Monitoring remains important in these cases, for example where eradication of established invasive species is not feasible and prevention through protocols and codes of conduct is the most appropriate response.
  - **Outreach, education and community engagement**, which are central to effective MPA management. Community-based initiatives, such as programmes to report and remove ghost fishing gear, can support MPA objectives while delivering direct benefits to local communities by reducing equipment losses.

### **Slide 9 - Developing a Management Plan**

Beyond reviews of management of activities, a comprehensive management planning process has many steps.

Management planning is a continuous process whereby each component informs the next. We will take you through these processes step by step, describing what needs to be considered when developing your management plan, and the tools to implement it effectively.


As an overview of the steps:

1. The first process is to define the current status of your site and team, and decide what you want to achieve for the site including both long-term visions for the site, and goal and targets,
2. From those initial scoping phases, a management plan is developed including building out objectives and practical strategies, while engaging stakeholders and local communities. This also leads towards development of operational plans and business plans,
3. Once a management plan goes out, then to meet the objectives, methods of monitoring and tracking progress must be in place, to ensure actions continue to align with the site vision,
4. Throughout the process plans and actions can be adapted, based on monitoring and evaluation of outcomes and targets.

### **Slide 10 - Good Management Planning**

With regards to planning and preparation for management plans:


1. Good management planning creates a process – it does not just end with development of a Management Plan but continues through implementation and beyond.
2. Management planning provides a mechanism for thinking about the threats and opportunities and other difficult issues i.e. it’s about solving problems and promoting discussion between involved parties.
3. It considers the future and identifies concerns and suggests alternative future actions.

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4. Management planning is systematic and follows a series of logical steps to help ensure that decisions are knowledge-based and the rationale for proposed actions are easy to understand.
  5. It should be open and inclusive and consider a wide range of issues, views and opinions (i.e. *it should be carried out in consultation with local marine resource users*).
  6. It needs to be flexible, adaptive and responsive so that it can adjust to changing conditions in the future. It uses the results of monitoring and evaluation programmes to inform future decision-making.

### **Slide 11 - Benefits of Management Planning**

There are a number of benefits of management planning:

- Good planning ensures an effective MPA by (Rizk et al., 2011):
  - Ensuring decisions are based on a clear understanding of the MPA, its purpose, and the important resources and values associated with it,
  - Providing guidance for managers in the form of a framework for day-to-day operations and long-term management,
  - Providing continuity of management – i.e. providing a useful briefing document for new staff and helps them to maintain the direction and momentum of management,
  - It helps to identify and define management ‘effectiveness’ – the plan can be used as a basis for determining whether management of the MPA is effective or whether changes in management are required.
- Management planning enables improved use of financial and staff resources:
  - By prioritising the management actions required to achieve the MPA’s objectives, this helps managers to allocate the staff, funding and materials required,
  - Where additional resources are required, it can act as a fundraising tool, although the plan does still need to be realistic rather than a ‘wish list’.
- Management planning can provide a mechanism for increasing the accountability of:
  - MPA manager - The Plan can be used to identify targets to reach and performance standards to attain and can also be used by managers to draw up work plans for staff and assign duties,
  - Managing organisations - The plan can act as a sort of public contract between the manager, local communities and other stakeholders on how the protected area will be managed in the future.
- Improved communication:
  - The management planning process can provide a useful link between the MPA manager and those with an interest in the area, its management and future. It can identify key audiences, provide a means of communication to the public and promote and publicise the MPA to a wide range of stakeholders.



In short, good management planning improves the chances of long-term success of the MPA.

### **Slide 12 - Defining the process**

The stage in which a management plan is developed may differ depending on the type of Protected area, for some countries the management plan will be developed with the creation of the site, for other sites which may have been created as part of a network of sites, management plans may require a longer time period post – designation to be developed. Irrespective of this, the following steps should be followed. Management plans tend to last anywhere from 5 to 10 years before being reviewed. These long-term plans for a site are accompanied by annual or biennial operations planning which focuses on ground-action level for carrying out actions in the site (Conservation Measures Partnership, 2020; Middleton and Thomas, 2003).

The first component of management planning is to clearly define the scope i.e. thinking about what the current situation is and what it is you want to achieve. This involves different steps:

#### **Step 1: Pre-planning**

- Clearly identifying the purpose, the features and the area of the MPA
- Define the management planning process to be used, what procedures are already in place that can be followed? For example, are there legal guidance documents, or Marine Spatial Plan outcomes that can be utilised?
- Determine the audience for the plan...for example, who will be interacting with the plan and who will be implementing it
- Identify the process for involving local communities and other stakeholders in writing the plan – it's really important to involve people with an interest in an MPA in the management planning process. The success of a plan will depend on their support and local communities will feel a far greater commitment to MPA management if they have the opportunity to be involved in its planning. It will be important to think about who to involve - Who are your stakeholders? Community councils? Fishing associations? Resorts? - and the best way to do that: so, whether the plan is developed through a participatory process or whether it's more focused on consultation.


### **Slide 13 - Data and information collection**

#### **Step 2: Gap Analysis**

Planning and management should be informed by reliable data. So, the first thing to do is to collate information about the current status of the area and the trends affecting it. This information can come from many sources, peer reviewed scientific papers, previous work done in the area, but also stakeholders are a valuable source of knowledge.

#### **Data collection includes information on:**

- Status of the biological features: ecosystems, habitats and species

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- Physical characteristics: coastal landforms, bathymetry, tides, currents, climate, geology and geomorphology
  - Cultural features: archaeological, historical and religious
  - Resource use patterns: recreational, commercial, research and education and traditional uses – consider uses and activities both occurring within the MPA as well as those near to the site that may still affect its values and resources.
  - Legal status and any relevant legislation including both national legislation and international obligations
  - Governance setting and organisational relationships

For many MPAs, there may be little background information. Where this is the case, gaps in information should be highlighted within the description.

### Slide 14 - Defining the Scope

#### **Step 3: Evaluating the information**

- The purpose of this step is to identify and understand why the MPA is important. It helps to describe the 'values' and identifies why it is important, both to local communities and our broader society. The outcome is that important features that must be protected and preserved to maintain the MPA's significance and are highlighted and described fully.
- For example, does the MPA contain outstanding examples of natural, scientific or ecological values; areas that are essential for protecting the ecological integrity of the wider ecosystem and community; is there an occurrence of rare and endemic or sensitive, threatened or endangered wildlife and habitats?


### Slide 15 - Defining the Scope

#### **Step 4: Identification of constraints, opportunities and threats**

The constraints on management should be identified, as should any major threats to the area's values.

Constraints are things that are outside of your control that could affect your ability to effectively manage the MPA.

- Some constraints are a function of the natural environment, for example the ecological processes which exist in the area or the relative rarity of the resource. Constraints may however also take other forms, such as legal obligations, health and safety considerations, gaps in the evidence base or essential services and operations that must be maintained. One other critical constraint to note concerns known resource constraints related to equipment, staffing and operations, expertise, capacity limitations of staff should also be noted and expanded to understand where knowledge and experience gaps exist and can be improved.
- Threats to, or pressures on the MPA may be human-induced or natural, and they may originate from within the MPA itself or from beyond its boundaries. Threats may include, for example, vessel traffic, excessive fishing, visitor use of areas, invasive species or pollution. It is important to consider why these threats are occurring and



what impact they are having on the key habitats and species within and adjacent the site. Migratory routes and time spent outside the MPA mean that some threats cannot always be managed, but can be considered/logged.

- Since planning is about the future, the factors which can affect the future of the MPA should also be identified and evaluated wherever possible, for example the impacts of new resource use activities or climate change. Predictions also help to identify opportunities for beneficial change as a result of the MPA, such as ecotourism development, improved cross-sectoral partnerships, greater access to learning and training or improved community participation and awareness.

Once identified, the threats and opportunities should be clearly referred to in the management plan. Management objectives and actions should focus on reducing the threats, overcoming or dealing with the constraints and maximising the opportunities.

### **Slide 16 - Defining the Scope**

#### **Step 5: Developing a Management Plan Vision**

- It is really important for everyone to be clear on what it is the MPA is actually seeking to achieve in the long-term. Many management plans set this out through a vision or a set of goals which describes what it's hoped the area will be like in the future. The vision is a long-term, statement which is unlikely to change significantly over time. This vision then provides the focus or direction for the management objectives.
- The vision is often used in public engagement and so it should ideally be short, simple and easily remembered by everyone, but it also needs to clearly demonstrate the value of the MPA to the wider world. Importantly a vision should be aspirational.
- It is really important to develop the vision through a participatory process that involves all of the key marine resource users. That way, you can ensure that the vision reflects what it is that everyone wants the MPA to achieve in the long-term.
- Mission Statements and Goals can also be included in a management plan – they are optional but a good way to breakdown the overarching vision into more achievable chunks and help guide the route through the lifetime of the Plan.

To provide a quick run-down of these different statement types:


- The mission statement focuses on today and what the “organisation” does to achieve it, and is supplemented with goals or milestones. The vision statement focuses on tomorrow and what the “organisation” wants to become.

### **Slide 17 - Prepare the Management Plan**

Once you have defined the scope, you can then move onto preparing your MPA management plan. This first stage focuses on thinking about how you are going to achieve your vision.

#### **Step 6: Developing Management Plan Objectives**

- Management Objectives follow on from the vision and mission statements. They are operational within the time scale of the plan (although they may be renewed). They are specific statements of intent that are linked to the overarching vision and provide



the framework for the more detailed management strategies and actions. So, they are statements of 'outcomes' rather than how to achieve them. Well-stated objectives are critical in determining whether a management plan is effective. Managers must be able to tell whether management actions are achieving the desired results - this is only possible if objectives are referred to as an outcome that can in some way be measured.

- There is no set rule on the number of management objectives a site should have but each objective should support the achievement of the overall vision. Typically, objectives would be designed to cover governance, ecological, social, cultural, and economic aspects of the site.
- The management objectives should ideally be SMART (Click to next slide for explanation of SMART)

### Slide 18 - SMART Objectives

SMART stands for Specific, Measurable, Achievable, Relevant and Time-Based.

The value of using SMART objectives for MPAs lies in their effectiveness in guiding the planning, implementation, and evaluation processes:

**S – Specific objectives** provide **clarity and precision** in defining the desired outcome of MPA establishment. They help identify the specific conservation targets, such as protecting a certain habitat or species, or achieving a specific ecological or socio-economic goal.

**M - Measurable objectives** allow for the use of **quantifiable indicators and metrics** to assess progress and success. By establishing **measurable targets**, such as percentage of habitat protection or population recovery rates, it becomes easier to track and evaluate the effectiveness of MPA implementation over time.

**A – Achievable objectives** help ensure that the goals and conservation objectives set for MPA management are **realistic and achievable**. They consider available resources, scientific knowledge, and socio-economic constraints. Realistic objectives increase the likelihood of successful MPA implementation and stakeholder support.


**R – Relevant objectives** ensure that the conservation objectives of the MPA align with **broader conservation strategies**, policies, and priorities. They take into account ecological significance, the needs of target species or habitats, and the potential benefits for local communities. They also help create a **strong rationale** for MPA establishment and enhance its overall value.

**T – Finally, time-based objectives** set a **clear timeline** for achieving the desired outcomes. They establish deadlines and milestones, promoting accountability and enable effective monitoring. Time-bound objectives provide a sense of urgency and can help maintain focus.

### Slide 19 - Identify actions that will achieve the Objectives

#### **Step 7: Identify actions that will achieve the vision and objectives**

Once you've agreed your Vision and Objectives, the next step is to work out how each of the objectives will be achieved. This is arguably the most important part of your management plan.



A range of options for management actions should be identified, and the most appropriate ones chosen. The management actions should be realistic and necessary for management of the MPA, so when thinking about the best option, it's important to consider:

- Whether the proposed actions will contribute to achieving your objectives
- Are they realistic given the constraints identified
- What are the implications of each action
- How acceptable the options are to politicians and the wider public
- Which institutions or key stakeholders will hold responsibility for carrying out the actions and how accountability is maintained.

There is no set way in which different management objectives and their associated actions should be grouped together; some management plans, for example, group management objectives into themes or programmes or group them to address specific management needs. Typically, within management plans, management actions are set-out in a table format showing how they link to the relevant management objectives.

### **Slide 20 - Develop Management Actions**


Using the Vision and Objectives as a guide, the management actions usually include the following general topics:

#### **Ecological**

- Management actions should include specific activities that will protect key species and habitats in the MPA. This could include direct conservation actions such as: protection of nesting seabirds and turtles through removal of invasive species or habitat restoration activities.
- Management actions should also cover topics such as: development of a monitoring and research plan; implementation of specific research projects to address key evidence gaps; dissemination of scientific results; data management and implementation of long-term monitoring programmes to feed into the assessment of management effectiveness.

#### **Socio-economic**

- It is also vital to include actions in the management plan that consider how the MPA interacts with the local communities that live within it – this will be important to ensure success. If people are gaining some form of benefit from the MPA, then they will be much more likely to support it.
- This could include actions that ensure improved availability of locally-caught seafood through sustainable fisheries management or the development of new livelihood opportunities, for example ecotourism.
- It is important to include management actions to ensure that these benefits are equitably distributed amongst the community so that it is not just a few people who benefit, but everyone.

- 
- It will also be important to include management actions to ensure that the MPA doesn't cause conflicts between different user groups e.g. between fishers and tour operators.
  - Finally, management plans should include actions around education and awareness-raising.

### Governance

For MPAs to be effective they must have good governance to influence human behaviour and thereby reduce some of the impacts. It is important that the governance approach is inclusive and promotes a sense of stewardship through engaging local communities

- So, management plans should all include actions to ensure that the correct processes and structures are in place to effectively manage the MPA; this could include things like ensuring that the appropriate legislation or policies are in place; or the development of fee and permit systems.
- It is also important to ensure there are mechanisms in place to enable local communities and other interest groups to participate in and influence MPA decision-making; this could include things like the setting-up a management committee, developing partnerships with other organisations and effective engagement with local communities.
- There should also be management actions around ensuring that the appropriate resources and capacity are in place to be able to effectively manage the MPA, for example buying any required equipment or providing training to staff.
- And finally, there should be management actions around surveillance and enforcement to ensure that the MPA regulations are complied with by all users.

### Slide 21 - Prepare the Management Plan


#### **Step 8: Preparation of a draft Management Plan**

- By the systematic completion of steps 1 – 7, all the information will be now available to start writing your management plan.
- The integration of this information into a single document will result in a draft management plan.
- There is no single ideal model for a management plan - each MPA is unique, and its management plan must be designed specifically to address its management needs

### Slide 22 - Contents of a Management Plan

The format of the management plan will depend on the legislation that established the MPA, the size of the MPA, the levels of human activities that need managing, and the capacity and resources of the management organisation.

It could be a single document addressing all aspects of management or, as can be the case for large, multi-use MPAs, it might be more of an 'umbrella' document with secondary plans such as business plans, zoning plans, monitoring and research plans or visitor plans sitting underneath it.



Regardless of the format of the management plan, its presentation, style and content can have a large influence on whether it is supported and understood by users and the public.

A management plan should be:

- *Clear and accessible*: it should be easy to read and understand, jargon free and well presented;
- *Concise and comprehensive*: it should be no longer than is absolutely necessary, but with enough information to fulfil its functions;
- *Accurate and objective*: using the best available evidence and with the criteria for all judgements clearly explained;
- *Systematic and logical*: Management policies and strategies should be derived from an assessment of the evidence and with a clear rationale given for all proposals;
- *Acceptable and motivating*: for all those with interests in the MPA;
- *Precise and practical*: with clear, measurable objectives and realistic methods for achieving them, resulting in progress towards desired outcomes which can be monitored;
- *Focused and effective*: fulfilling its purpose as a tool for MPA management, meeting the needs of its users and satisfying any legal or other obligations;
- *Flexible*: it should be reviewed sufficiently regularly to ensure that management can adapt to changing situations.

### **Slide 23 - Prepare the Management Plan**

#### **Step 10: Revision of draft Management Plan**


- This step involves revision of the draft, taking into account the comments received from stakeholders and the public.
- Good practice requires that all comments received should be recorded and considered, even if they are not incorporated into the final version.
- It may be helpful to prepare a report on the public consultation to accompany the final plan. This details how the comments received have been taken into account and indicates why some comments have not been used. It will help the public and stakeholders to understand the final version of the plan and appreciate how the management actions included in it have been arrived at.

#### **Step 11: Approval of the Management Plan**

- This is a procedural step involving submission of the final plan for approval by the competent authority.
- Once the final version of the management plan has been approved and adopted, it should be made publicly available online and advertised to ensure stakeholders are aware and engaged with it.

### **Slide 24 - Implement the Management Plan**

#### **Step 12: Implementation of the Management Plan**

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- The management plan sets out actions to be implemented. This will require the allocation of appropriate staff, equipment and infrastructure to undertake the management actions and work towards the objectives and vision.

#### Understanding the resourcing requirements: People:

- Effective human resource management ensures that the right people are in the right positions at the right time and MPA Managers need to ensure that their MPA has an appropriately sized and skilled workforce.
- MPAs can require large and long-term investment in human resources and the complexity of MPA management needs professionals with competencies in a wide range of different fields.
- Trying to minimise staff turnover is important. This stability provides benefits: relationships built over time increase levels of stakeholder trust and staff will develop greater in-depth knowledge of the site.
- Staff skills need to be periodically reviewed and on-going training for staff is essential to refresh skills and learn new ones. Where staff resources aren't available, partners can sometimes provide specialised human resources for example for ecological monitoring.

#### Understanding the resourcing requirements: Equipment/infrastructure


- Effective MPA management also relies on a range of assets such as specialised equipment for monitoring, bespoke technology, boats, and infrastructure such as offices, labs and visitor centres.
- MPA management should ensure that any infrastructure is operational and appropriately located and that any required equipment is well maintained and operational.

#### Operational Plans

- Operational plans, which outline day-to-day requirements of site management for a 12–24-month period, need to be developed which ensure that resources are mobilised to progress elements of the management plan. They need clear targets and understanding of responsibilities, including planning enforcement, licencing, monitoring and reporting. As part of operational plan development, budgeting and financial planning is required ensure that plans and resources are costed and can be fully accounted for.
- Effective MPAs need financial resource, which is normally at least partially funded through government resource. Additional are being increasingly used to generate revenues for MPA management, through both grant and more sustainably developed methods that also benefit the local community.

#### **Slide 25 - Stakeholder Engagement When Implementing Management Plans**

- A review of 27 MPAs from around the world in 2018 found that stakeholder engagement was considered to be the most important factor affecting MPA success (Giakoumi et al., 2018). Effective engagement is therefore critical across all phases



of MPA management, from development of the management plan through to implementation.

- Effective engagement provides a mechanism for all stakeholders to influence the decision-making process in a manner that is transparent and accountable. This will ensure that stakeholders understand the reason for the MPA designation and associated management and are therefore more likely to be supportive of it, resulting in a higher level of compliance. Understanding the potential concerns that stakeholders may have with any proposed new management is important to address early in the process so that these can be factored into decisions made.
- Local stakeholders and NGOs are also likely to have significant levels of local ecological knowledge, and this can provide a valuable source of evidence to inform MPA management.
- Engagement methods could include establishment of local marine advisory boards, public meetings, workshops, talks or presentations, printed information such as newsletters or the use of social media. There is no one engagement methodology that fits all stakeholders and all MPA management processes. The development of site-specific stakeholder engagement plans helps to ensure that engagement methods are tailored to the local situation and achieve the desired outcomes.

## **Slide 26 - Monitor And Evaluating Management Against Outcomes**


### **Step 13: Monitoring and Evaluating**

- With implementation under way, monitoring and evaluation will provide the feedback loop to ensure that actions continue to align with meeting conservation objectives set out in management planning.
- Monitoring is important to establish baseline data setting out the conditions at the time of MPA designation, to then assess trends over time - so whether the values are getting better or worse and whether MPA objectives are being met - and to therefore assess whether management is effective and then to enable adaptive management to take place.
- Monitoring should include both ecological and socio-economic aspects. Ecological monitoring provides information on the marine resources and socio-economic monitoring will provide information on the people and how they benefit or are affected by the establishment of MPAs.
- Monitoring provides the evidence which MPA managers need to inform their decision-making and policy development, helping them to improve the management effectiveness of the MPA.

## **Slide 27 - Management Plan Revision**

### **Step 14: Update the Management Plan – adaptive management**

- Monitoring and evaluation of the management plan may identify the need to revise the management in order to achieve the vision and conservation objectives. This may be a result of trialled actions not working, or external factors which have not been taken into account.

- 
- Revisions and adaptive management strategies can be implemented through a revision of operational plan mechanisms. The decision needs to be made in good time to allow the new plan to be in place before the expiry of the old one. This demonstrates the need to be measuring outcomes and performance to ensure actions are resulting in positive outcomes.
    - Some examples of adaptive approaches might come in the wake of a fishery conservation measure not working to enhance fish stocks, or perhaps due to the influx of a new protected or rare species.
  - Most management plans are reviewed approximately every 5 to 10 years, based on capacity and objectives, but if required can be re-done ahead of expiry. Remembering that while the management plan gives long-term high-level aims and objectives, intermediate planning can take place to provide the stepping stones for meeting these long-term ambitions.

### **Slide 28 - Recap**

You should now:

- Understand what we mean by MPA management planning
- Understand why MPA management planning is important
- Know the different phases of MPA management planning and what each one involves

### **Slide 29 - Summary**

What we have covered in this Module:

- What we mean by MPA Management,
- What activities and methods might be used to implement management,
- Steps involved in the development of management plans.



# Module 6: Introduction to the Principles of MPA Monitoring

## Slide 1

Module 6 - Introduction to the Principles of MPA Monitoring.

## Slide 2

This is the sixth of 8 modules in this course on Marine Protected Areas. This module covers the 4<sup>th</sup> stage in the MPA cycle – MPA monitoring.

The course is made up of 8 modules. Each module consists of a presentation, and a reading list is provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

## Slide 3

Learning Objectives:

- Introduce MPA Monitoring and why it is important
- Present the concept of MPA Research and Monitoring Plans (RMPs)
- Describe the main elements of MPA monitoring design
- Explain the importance of MPA monitoring data and research in MPA assessments
- Introduce data management principles and practice

## Slide 4

So, what is monitoring and why do we need to do it?

Monitoring is the gathering of data and information on MPA ecosystems and their users on a regular basis, preferably for an extended period of time. Monitoring is essentially repeating the initial surveys, which gathered data and information on the ecosystem and its users on one occasion (normally referred to as baseline data). The key point that distinguishes monitoring from MPA verification or characterisation activities, is that monitoring requires an ongoing and systematic effort, as opposed to one-off events.

In Module 5 we learned about the principles of good management planning, and that management objectives should be SMART (Specific, Measurable, Achievable, Realistic and Time-Bound). From a monitoring perspective, we will focus on the 'M' – is management effectiveness 'Measurable'?

Monitoring is the process by which we gather information to allow us to measure the impact of management. It serves two main functions in the context of MPAs:

1. It helps us understand whether MPAs are achieving what they set out to – both in terms of environmental and social benefits. i.e. has the management resulted in achievement of the MPA's objectives and vision?
2. And if the answer is no.... Monitoring helps us understand how the management may need to change in the future.



## Slide 5

MPA monitoring is the 4<sup>th</sup> step in the MPA implementation cycle, following MPA management. Monitoring is key to obtaining the science-based evidence that MPA managers need to justify MPA management measures to stakeholders. Monitoring is also used to provide feedback to inform adaptive management, the process by which management is regularly reviewed and adapted as necessary to enable positive conservation outcomes.

Adaptive management is akin to the hypothetical-deductive model of natural science through the conduct of experiments. Just as scientific experimentation demands a clear (falsifiable) statement of the hypothesis and a rigorous system of measurements (monitoring) to test it, so adaptive management requires a clear statement of the means to a desired outcome, and a rigorous method of monitoring the outcome to determine how well it is achieved. Adaptive management is proactive because alternative management options are evaluated even in the absence of management failure.


It is important to note however that monitoring the status and trends of performance indicators and reactively changing management when targets are not met is not the same as adaptive management.

(Mesoamerican Barrier Reef Systems Project, 2003; Roupheal, 2020)

## Slide 6

There are multiple reasons for monitoring within an MPA. These include:

1. Assessing conservation aims
  - Helps to determine if MPA objectives are being met
  - Feedback into the MPA as adaptive management by identifying necessary adjustments to management strategies, objectives, etc.
2. Evaluate ecological health and resilience
  - Assess the status of key indicators.
  - Tracking changes can help identify long-term trends and potential threats or pressures on marine ecosystems.
  - Leads to more effective conservation and management actions.
3. Measure socio-economic benefits and costs
  - Helps understand the interactions and impacts of MPAs on local communities and economies.
  - Can include a cost/benefit analysis, ecosystem service valuation or stakeholder and local community engagement.
  - Feeds into MPA planning and management to ensure a balanced approach:
    - ecological conservation, economic sustainability, and social well-being.
    - Promotes inclusive decision-making processes and strengthens support.
4. Enhancing management and policy decisions
  - Supports evidence-based decision-making and policy development.
  - Can highlight success or failure of specific management strategies.
  - Adaptive management.
  - Monitor management effectiveness.



As we noted on the previous slide, monitoring is vital for informing adaptive management as the data obtained through monitoring identify the current situation within the MPA. This enables assessment of the progress / achievement of the MPA's conservation objectives, which leads to adaptations being made to address any short falls. (This cyclical process is highlighted in the feedback for adaptive management diagram, to the right on the slide).

A well-designed monitoring programme provides direct and targeted evidence on the environmental and social outcomes of management, allowing managers to conduct fully informed assessments and evaluations, to understand whether and how management objectives and actions need to change.

### Slides 7 & 8

MPAs are unlikely to succeed unless they are carefully managed, and their performance evaluated. Monitoring (where information is regularly collected through time) is a critical part of this evaluation process to help scientists understand whether management is leading to positive environmental outcomes. This is in part because MPAs are relatively 'young,' for example when compared to terrestrial protected areas where best monitoring practices and guidelines are more well established. Also, the costs and challenges associated with monitoring MPAs can also be greater as they need to cover vast areas and a variety of different species, features and habitats.

There are two main categories of monitoring: ecological monitoring and socio-economic monitoring. Ecological and socio-economic parameters are often closely linked, therefore ecological monitoring and socio-economic monitoring should be done in the same place at the same time. For example, monitoring of fish populations should be directly linked to surveys of fish markets, fishermen and their catch. Similarly ecological parameters reflect the natural state of the MPA, which will have impacts on socio-economic factors such as income and employment.

To ensure monitoring is as efficient as possible it can be useful to break the marine system down into manageable components. An example of this can be seen in the UK where the marine environment is broken down into the categories you can see on the slide. By doing this it helps to focus monitoring efforts so that they effectively address each of the drivers of monitoring across the different levels.


*Discussion topic: what categories would be useful in developing a monitoring strategy for the marine environment in Ghana?*

(Wilkinson et al., 2003)

### Slide 9

Marine protected area monitoring involves the systematic collection of data to assess the condition of marine ecosystems and the effectiveness of MPA management. To understand what monitoring is needed to assess both the ecosystem condition and the effectiveness of the MPA management, there are 5 key steps to follow:

- 1. Define Monitoring Objectives:** Identify clear goals for the monitoring program (e.g., tracking biodiversity, assessing the effectiveness of management measures, or evaluating habitat restoration efforts) and work out what parameters will be used to answer these goals (indicators, variables).
- 2. Define the statistical power and significance levels:** Understand how many samples you will need to obtain robust results and identify the magnitude of change in the parameters being investigated.
- 3. Review existing monitoring:** Has any monitoring of the parameters been conducted before? Monitoring is a costly process, both in terms of time and resources, so it's important to ensure effort is not duplicated. Thus, is there any baseline data that you can refer to which



will help you to understand if any changes in parameters have occurred? Ideally, a detailed baseline survey will be performed during the MPA implementation phase that includes many measures or parameters that may or may not change over time, and which can be referred back to when comparing the results of current/future monitoring. E.g.,

- Mapping the extent and location of major habitats
- Measuring the size and structure of the human population using these resources
- Understanding government rules and regulations on the specific ecosystems (e.g. seagrass or coral reefs) and conservation
- Determining the decision-making process in local communities
- Understanding the status of coral communities, fish populations and fishing practices

**4. Determine what the gap is between what monitoring exists and what monitoring may be required:** Based on the data available, what else is needed to understand the current state of the chosen parameters?

**5. Develop a structured plan for how you're going to collect the data needed to fill the gap between the data you have and the data you need, considering aspects such as what will be monitored (species, habitat, water quality), how often, and by whom:** Determine what the most suitable monitoring methods are based on the objectives, scale of monitoring, available resources, and types of ecosystems involved (e.g., coral reefs, seagrass meadows, fish populations).

#### Slide 10

Once you know what you need to monitor, there are various types of monitoring that can be used, each serving different purposes:

##### **Sentinel Monitoring:**

**Purpose:** To detect significant changes in the condition of the MPA, often focusing on long-term trends and early warning signs of ecological stress.

**Characteristics:** Sentinel monitoring involves the tracking of specific "sentinel" species or ecological components that are sensitive to environmental changes, such as coral reefs or key fish species. It provides early signals of changes in ecosystem health.

**Example:** Monitoring coral bleaching events or changes in fish population densities.

##### **Operational Monitoring:**

**Purpose:** To evaluate the effectiveness of management actions and operational activities within an MPA.


**Characteristics:** This type of monitoring tracks compliance with regulations (e.g., no-fishing zones), assesses management interventions (e.g., restoration efforts), and measures operational aspects like patrol frequency.

**Example:** Monitoring illegal fishing activities, effectiveness of mooring buoys, or the condition of restored habitats.

##### **Investigative Monitoring:**

**Purpose:** To explore specific issues or answer particular research questions related to an MPA's ecological dynamics.

**Characteristics:** Investigative monitoring is more targeted, often focused on investigating specific problems (e.g., the impacts of a particular stressor like pollution or invasive species).



Example: Studying the impacts of a new marine pollutant on water quality or coral health in the MPA.

### Slide 11

The selection of monitoring types depends on several factors:

1. Management objectives:

- What are the key aims of the MPA (e.g., conservation of biodiversity, sustainable fishing practices, or restoration of specific habitats)? For example, if the aim is to monitor biodiversity, sentinel monitoring might be appropriate.

2. Resource availability:

- Consider the available budget, technology, and personnel. If resources are limited, operational monitoring might focus more on regulatory enforcement rather than ecological assessment.

3. Timeframe:

- Sentinel monitoring tends to be long-term, while investigative monitoring may focus on immediate or short-term research. The available timeframe will influence your choice.

4. Ecological complexity:

- Complex ecosystems (like coral reefs) may require a combination of monitoring types to assess both ecological health and management effectiveness.

### Slide 12

Next, we need to consider which monitoring types are feasible. Basic considerations include:

1. Logistics and Accessibility:

Can the site be easily accessed for regular data collection? For example, remote areas or deep-sea MPAs may limit the feasibility of certain monitoring techniques (e.g., visual surveys, especially for large areas).

2. Data Collection Methods:

What tools or methods are available for monitoring? Some monitoring techniques, such as using drones or remote sensors, may not be feasible in all locations due to equipment costs or environmental factors.

3. Personnel Capacity:

Is there sufficient trained staff or local capacity to undertake the monitoring? If not, alternative low-tech monitoring (e.g., community-based monitoring) may be considered.

4. Financial Constraints:

What is the budget available for the monitoring program? Some monitoring methods (e.g., satellite imagery) can be expensive, while others (e.g., community surveys) may be more cost-effective.

5. Data Management:

Are there systems in place to manage and analyse the data effectively? Data storage, analysis, and reporting tools are crucial for any MPA monitoring program to succeed.

Additionally, operational and investigative monitoring may not be feasible for all MPAs.



For operational and/or investigative monitoring consider:

- Mobile and ephemeral (short-lived) habitats – difficult to attribute change to a cause
- Confidence in habitat data – habitat mapping may be required
- Confidence in pressure data – need high confidence
- Sufficiency of pressure-state gradient – need sufficient gradient
- Suitability of control site – need a control site with similar conditions

### Slide 13

As mentioned, a key point is not to duplicate effort, so it's always important to know what existing data are available and how they can contribute to your monitoring plan. Additional considerations to ensure an efficient, robust monitoring plan include:

We have already discussed what existing data are available in the first part of this module but there are other factors to consider including:

- **What indicators are you going to use?** Monitoring reports aim to make recommendations about indicators and metrics for future monitoring. Indicators are tools to run data through and assess hypotheses. E.g. to show improved health you might want to look at key species.
- **How often are you going to monitor?** The frequency of monitoring will depend on *what* it is you're monitoring. Best time of year for sampling – consider ecological parameters / species of importance, and previous data availability.
- **What is the 'power' of your planned monitoring?** Both frequency and power are about understanding the effect management is having on the conservation status and the system as a whole.

We will now discuss each in greater detail.

### Slide 14

Ecological or Environmental Indicators are specific variables used to assess the health and status of ecosystems. They act as proxies for broader environmental conditions, offering insights into ecosystem function, biodiversity, and overall ecological integrity. Thus, indicators are a tool to help assess a wide range of questions that you may be facing for your MPA and can help streamline monitoring.

Indicators can be broadly classified into:

- **Pressure Indicators:** Track human activities impacting ecosystems (e.g., pollution levels, fishing intensity). They refer to the cause of an environmental change or condition (e.g., emission of harmful substances, the release of nonindigenous or genetically modified organisms).
- **State Indicators:** Reflect the condition of the ecosystem (e.g., species diversity, habitat quality).
- **Response Indicators:** Measure the system's reaction to environmental changes (e.g., recovery rates, growth rates of key species).

(Heink and Kowarik, 2010)



### Slide 15

It is important for the indicator to relate to the conservation objective and to have an associated target.

### Slide 16

There are a number of considerations when it comes to the frequency of monitoring required. If you are monitoring ecological or biological variables, then seasonality may be a key factor. For example, fish may spawn at specific times of year, so if you're monitoring abundance in nursery grounds then you will need to monitor when you know juveniles will be present. If you're investigating physio-chemical indicators such as water temperature, regular monitoring on a monthly or quarterly basis may be needed so you can see temperature trends throughout the year and how these change year on year.

If you're looking at how well an area is recovering, then you will need to consider how fast the recovery rate is likely to be. For example, a coral reef might take many years to recover, while soft sediment environments may recover much faster. You will also need to consider the activities and pressures still occurring in your study area. For example, if you want to monitor fishing quotas to be able to inform the start and close of a fishing season, then monitoring before, during and after the season might be best.

Logistics are also a key factor to consider for monitoring, especially in marine environments which are often difficult to get to and may require boat time, specialist sampling equipment to obtain samples, or analysis techniques to obtain key data.

### Slide 17

- Formulate null and alternative hypotheses
- Specify effect size – this is the magnitude of the effect to be detected (e.g. % change in a metric), often selected using expert judgement.
  - Evidence is lacking on the level of change which would signify entering or leaving Favourable Condition (i.e. achieving/failing Conservation Objectives).
  - Proxy metrics, such as total abundance, number of taxa and diversity from previous data are currently used.
  - Precautionary approach generally taken, keeping the detectable effect size as low as possible (within limits).
  - Generally, aim for an effect size of 20% or 30% change.
- Conduct power analysis (using existing data if possible) to assess how many samples you need to detect change.
  - If minimum values of power and significance cannot be achieved using available resources, the sampling should not go ahead.

### Slide 18

The right monitoring approach will depend on the conservation objectives, indicator and associated metric, as well as resources.

#### **Field Surveys:**

Benefits:

- Provides detailed information on species composition, abundance, and distribution.
- Allows for the assessment of habitat quality, including coral cover, seagrass extent, and mangrove health.



Uses:

- Evaluating the effectiveness of conservation measures in protecting key species and habitats.
- Monitoring changes in biodiversity over time and assessing the overall health of the ecosystem.

### **Remote sensing**

Earth Observation: Gathering information about the earth's physical, chemical and biological systems via remote sensing technologies (without making physical contact)

Benefits:

- Enables large-scale and frequent monitoring of vast marine areas.
- Provides data on sea surface temperature, chlorophyll concentration, and other environmental parameters.

Uses:

- Detecting changes in oceanographic conditions and identifying areas prone to coral bleaching or harmful algal blooms.
- Assessing the spatial extent and health of marine habitats, such as seagrass beds and coral reefs.

### **Citizen Science and stakeholder engagement:**

Benefits:

- Enhances community participation and ownership in MPA monitoring.
- Increases the amount of data collected and expands the spatial coverage, often at minimal cost

Uses:

- Gathering traditional ecological knowledge and incorporating local perspectives into monitoring efforts
- Promoting social awareness and involvement in conservation, leading to improved compliance and support for MPA management measures.

### **Genetic and Molecular tools:**

Benefits:

- Provides insights into genetic diversity, connectivity, and resilience of marine species.
- Helps identify species or populations at risk and assess the impact of human activities.

Uses:

- Understanding population dynamics and informing conservation strategies, such as designing effective networks of MPAs.
- Investigating the effectiveness of MPA zoning and management strategies in protecting genetic diversity and preventing overfishing.



## Slide 19

Remote sensing technologies, including the use of satellites (often called Earth Observation) are used as an innovative and cost-effective monitoring approach. Examples of how satellite imagery has been used in the region are covered in the following slides.

## Slide 20

As described in (Copernicus, 2021) – “The Marine and Coastal Areas Management in Western Africa project is implemented by the Regional Marine Centre (RMC) at the University of Ghana, which also provides EO-based services to 12 of the Economic Community of West African States (ECOWAS) coastal countries. Five operational services are provided which make use of EO tools: potential fishing zone charts overlaid with vessel traffic; monitoring and forecasting oceanographic variables; coastal vulnerability indices; mapping of coastal ecosystems and habitats; and ocean condition forecasts disseminated as SMS alerts.

Launched in May 2020, the SMS forecast tool is based on Copernicus satellite data (Copernicus, 2021), to which the western Africa consortium creates added value to create a forecast service especially for fishermen. Historically, fishing exhibitions in African waters have been dangerous, but Copernicus Marine data have helped make it possible to avert some of the hazards; undoubtedly saving lives as well as property.

*Fishing is a massive industry in Africa. In Ghana, for example, we have about 12,000 fishing canoes, which are dugouts boats with no communications systems. On average, each goes to sea with 25 people on board. We offer a three-day forecast which is sent to them by SMS or via a dedicated app. It is a very simple system which provides just a number: 1 for calm, 3 for rough, and 2 for conditions that are in between. We offer this for fishermen along the entire coast of west Africa, explains George Wiafe, Professor of Oceanography and Director of the Regional Marine Centre at the University of Ghana.*

The consortium also trains those living and working in coastal communities to plant colour-coded flags at landing sites as an additional early warning system for those without access to mobile phones. Together, the SMS and flag system allows fishermen to understand when they should stay close to land and when conditions are safe for them to undertake longer expeditions.”

## Slide 21

See articles:

<https://marine.copernicus.eu/news/copernicus-data-supports-ecosystem-monitoring-and-maritime-safety-africa>

<https://marine.copernicus.eu/news/tracking-wakashio-oil-spill-indian-ocean>

## Slide 22

### **Resource constraints:**

- Limited funding, staff, technical expertise
- Insufficient monitoring infrastructure and equipment

### **Data quality and standardisation:**

- Accurate, consistent data collection
- Standardise protocols

### **Long-term monitoring:**

- Maintain efforts to capture trends



## Slide 23

Flow process contextualises what to think about when monitoring.

- Once governance and stakeholder contributions have been settled, monitoring programme design can begin.
- Various different design elements need to be considered, as summarised in the flowchart on the slide.
- This stepwise chart was developed as part of national guidance for the UK MPA monitoring, specifically for seabed habitats, but the general design principles can be applied for any country or feature.
- The main things to consider at this stage, are: to demonstrate management effectiveness, what are you going to monitor, and how are you going to monitor it? (i.e. Step 1 and 2, highlighted in red – defining monitoring objectives and selecting indicator metrics)
  - This might sound very basic but can in fact be challenging to define.
- So where does the Research and Monitoring Plan (RMP) sit within the wider cycle of adaptive management I mentioned earlier?
- The flow process on the right of the screen illustrates how monitoring and research flow directly from the management vision, objectives and actions for the MPA.
- Just recap the full process:
  - MPAs are designated for ‘features’ – usually species, habitats or elements of the environment which are deemed of conservation importance and need to be protected.
  - An MPA vision is then developed, describing the kind of MPA to be achieved in the long-term.
  - The vision provides the direction for the development of SMART management objectives.
  - Monitoring objectives are then designed to measure the impact of the management actions, in terms of both ecological and socio-economic outcomes. This stage will highlight research gaps which need to be filled to enable a better understanding of the MPA and its features.
  - The outputs of the ecological monitoring and research are then combined to conduct a condition assessment, which essentially asks – ‘How healthy are the ecological features of the MPA’?
  - The results of this assessment are then combined with socio-economic monitoring data and a wide range of MPA information to perform a Protected Area Management Effectiveness (or PAME) evaluation.
  - The recommendations will then be used to refine the management objectives and actions, and the whole cycle begins again.
  - Using this process, we ensure the best possible management by making iterative improvements based on up-to-date, empirical evidence.



## Slide 24

So how would we go about determining how to monitor an MPA?

The best place to start is by generating a Research and Monitoring Plan (RMP). This is a really important document which collates all the information needed to plan a coherent monitoring programme, based on MPA management objectives and actions, and also allows research gaps to be identified and prioritised. The RMP is a detailed 'blueprint' for how to conduct monitoring at each individual MPA, specifying what should be monitored and by which methods, where the monitoring should occur, who should do it and when. This facilitates co-ordination and collaboration between scientists and managers, thus streamlining activities and maximising the available resources. National guidance for the Maldives is currently being developed, which provides a framework by which to develop MPA-specific RMPs, and the following slides cover some of the main topics addressed in this national guidance.

## Slide 25

Challenges of monitoring can be:

- Baseline data limitations:
  - May not be available,
  - Use of approximations,
  - Longer to identify a trend.
- Accessibility and environmental conditions:
  - Time and safety constraints.
- Cost and resource constraints:
  - Research vessels, equipment maintenance, personnel, and data analysis. Frequency of monitoring efforts.
- Technical expertise requirements:
  - Often requires specialised technical expertise in deep-sea research, e.g. operation of remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), submersibles.

## Slide 26

Benefits:

- Allows for the identification of trends, patterns, and potential threats to the MPA.
- Facilitates evidence-based decision-making and adaptive management.


Uses:

- Assessing the effectiveness of management strategies and informing adjustments to management plans.
- Sharing monitoring findings with policymakers, scientists, and the public to raise awareness and support for MPA conservation.

## Slide 27

Benefits of good data management can be:

- Help organisations to optimise the use of data within the policy in place
- Increased confidence and trust in datasets

- 
- Value for money: collect once, use many times
  - Better quality and consistency of data
  - Support effective decision-making and protection of the environment
  - Effective care of data and control over data access
  - Avoid duplication
  - Improved knowledge

### Slide 28

#### **Data:**

- Facts and statistics gathered for reference or analysis,
- Facts relating an event without providing context,
- Valuable assets for organisations to make effective decisions.

#### **Metadata:**

- A set of data that describes and gives information about other data,
- They provide the context on the data to make it meaningful,
- The same metadata can be brought through from survey to analysis.

### Slide 29

Metadata can include:

- Date the data was collected
- Site name
- GPS longitude and latitude
- Relevant feature names
- A site description
- Method used to obtain data
- Licence for how data can be used and by whom
- Attribution statements and copyright information to be used with the data.

### Slide 30

Data storage considerations:

- The cost of collecting data versus the cost of storing the data (and how long for)
- Survey logs – how are these stored?
- Multiple locations
- Multiple copies
- Fireproof storage – are there multiple backups? Is the data well protected? Who has access to make any changes?

### Slide 31

Cost of collection vs cost of storage. How much is the data worth?



### Slide 32

Once collected, data needs to be analysed in a way that is repeatable using agreed metadata standards and ensuring it is properly quality controlled.

Need to know how data was collected, processed, analysed and stored.

### Slide 33

There is an urgent need to improve the infrastructure supporting the reuse of scholarly data. A diverse set of stakeholders - representing academia, industry, funding agencies, and scholarly publishers - have come together to design and jointly endorse a concise and measurable set of principles that we refer to as the FAIR Data Principles:

**F** – Findable

**A** – Accessible

**I** – Interoperable

**R** – Reusable

The intent is that these may act as a guideline for those wishing to enhance the reusability of their data holdings. Distinct from peer initiatives that focus on the human scholar, the FAIR Principles put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals. This Comment is the first formal publication of the FAIR Principles, and includes the rationale behind them, and some exemplar implementations in the community.

More information: <https://www.go-fair.org/fair-principles/>

### Slide 34

The key features of data quality include:

- Accuracy: The correctness of the data.
- Consistency: standardising the data entries.
- Completeness: Missing values can lead to misleading analysis.
- Uniqueness: data are unique if they appear only once.
- Timeliness: data are available when expected and needed.
- Validity: data matches the required format for use.

### Slide 35

You should now:

- Understand MPA monitoring and why it's important,
- Recognise the utility of MPA Research and Monitoring Plans (RMP),
- Have an overview of the main elements of MPA monitoring design,
- Understand the importance of MPA monitoring data and research in MPA assessments.



# Module 7: MPAs and Marine Spatial Planning

## Slide 1

Module 7- MPAs and Marine Spatial Planning.

## Slide 2 – MPA Course Overview

This is the seventh of eight modules in this course on Marine Protected Areas.

The aim of this course is to introduce you to the key concepts behind the use of MPAs, provide an overview of marine protection in Ghana, and run through the various stages of the MPA cycle.

The course is made up of 8 modules. Each module consists of a presentation and accompanying module notes. A reading list is also provided to support additional learning.

It is recommended that at least an hour or two of additional study per module, including additional reading or associated activities is undertaken in order to get the most from the course.

## Slide 3 - Learning Objectives

### **Key message:**

The module provides high-level learning as an introduction to Marine Spatial Planning (MSP) and its role in supporting sustainable use and development of the marine area.

### **Supporting points:**

- The marine area is complex with a wide range of users seeking to undertake activities that can be conflicting.
- MSP, over its identified time horizon, has a key role in managing those uses and conflicts and facilitates sustainable development.
- MSP contributes to the achievement of SDG 14 (Life below Water) through recognising Marine conservation, through MPAs, as a key “use” of the marine area.
- There is considerable international experience in MSP and growing experience within Africa and Ghana.
- A generalised overview is provided of the various steps in MSP, based primarily on experience in England and Ghana.

## Slide 4 - Why do we need marine spatial planning?

### **Key message:**

Marine planning makes sure the right activities happen in the right place, at the right time and in the right way, in the marine area placing sustainable development at the centre of all decisions (Ehler and Douvère, 2009; UNESCO-IOC/European Commission, 2021; World Bank, 2022).

### **Supporting points:**

- The marine area is becoming increasingly busy and there is a need to manage the increasing and competing uses of the marine space and its resources.

- 
- Marine planning provides a strategic approach to managing those increasing demands on space and resources and so achieve regional, national and international legislative and policy commitments (e.g. Abidjan Convention).
  - Marine plans enable sustainable economic growth while protecting the environment by providing a stronger understanding of local marine resources and activities. They help to alleviate both conflict between human uses, and conflict between human uses and the environment.
  - Marine plans aim to guide both developers and decision-makers to ensure marine activities happen in a sustainable way. Fundamentally, marine plans deliver sustainable change in the marine environment.
  - Marine plans promote coexistence of activities and allow for multiple activities to happen in the same place, potentially even at the same time. For example, the spatial area of each marine plan consists of the seabed, the water column and the sea surface. Therefore, you could have multiple activities happening at the same time in different dimensions. Alternatively, you could have multiple activities happening in the same location and dimension, but at different times of the year.
  - A joined-up, proactive and plan-led approach to making decisions that affect the marine area reduces the burden on applicants by providing clarity that enables proposals to move more quickly from concept to consent.
  - Decisions that take account of marine plans have a reduced risk of legal challenge as they are supported by the plans and the legislation that supports them.
  - Decisions will also be informed by the best available evidence and are considered against wider context, both on land and at sea, placing stakeholder views at the heart of the process.

### **Slide 5 - What is marine spatial planning (MSP)?**


#### **Key message:**

MSP is a process to deliver government economic, environmental and social priorities in the marine area (Ehler and Douvère, 2009; UNESCO-IOC/European Commission, 2021).

#### **Supporting points:**

When effectively put into practice, MSP can be used to:

- Set priorities - it provides a rational basis for setting a long-term vision for a marine area (what is desirable, but what is possible) and policy objectives for how the vision will be achieved in an equitable way.
- Create and stimulate opportunities for new users of marine areas, by accounting for the needs and requirements of new activities (e.g. renewable ocean energy).
- By accounting for new activities, MSP can be used to coordinate actions and investment and ensure positive returns from those investments, for the benefit of both public and private sectors.
- Achieve higher quality of service at all levels of government in MSP-related activities, by bringing together a wide range of government stakeholders in planning,



monitoring and authorisations, and supporting knowledge exchange which can help to avoid duplication of effort, streamline consenting activities, and ensure that consistent decisions are being made across government

- Protect nature - which has its own requirements that should be respected if long-term sustainable development is to be achieved. MSP supports the delivery of conservation objectives by ensuring that they are fully considered in decision-making processes and that efforts are made to avoid or minimise environmental degradation.
- Reduce fragmentation of marine habitats, i.e., when ecosystems are split up due to human activities and therefore prevented from functioning properly.

On the slide: Green text represents benefits, and red text represents challenges/opportunities

### Slide 6 - Spectrum of MSP

#### **Key message:**

There is a spectrum of international approaches to MSP ranging from high-level strategic to fully zoned.

#### **Supporting points:**

- Different countries have chosen different MSP approaches to deliver their government priorities for the marine environment.
- On the slide is a scale, with the left side being full zoning, a process that involves identifying, allocating and zoning certain areas of the marine space for certain activities, with hard restrictions on the types of activities that can and cannot happen within those zones. China is an example of a country that decided this was how they wanted to carry out MSP (Huang, 2019). Fully zoned marine plans provide more certainty to industries, but, have less flexibility.
- As you move to the right, you find more prescriptive marine plans, like those in the Netherlands. These prescriptive marine plans provide specific, enforceable regulations and guidelines for the use, conservation, and development of marine resources within a designated area (Vrees, 2018). Prescriptive marine plan includes detailed instructions on how marine spaces should be used, what activities are permitted, and under what conditions.
- Further to the right you get strategic marine plans, which is where England's sit. Strategic plans offer a high-level, forward-looking framework that guides the sustainable use, conservation, and development of marine and coastal areas. Unlike prescriptive marine plans, which impose strict, enforceable regulations, strategic marine plans focus on setting broad policy objectives, priorities, and long-term visions for marine space management (Defra, 2021).
- The further to the right of this scale you get, the more flexible the marine plans are, but the less certainty you have as a result.



## Slide 7 - Global examples of MSP

### **Key message:**

MSP is underway throughout the world. Many African countries have initiated MSP for their marine area and some have approved plans that are being implemented.

The countries highlighted in green are the most advanced with their MSP and have plans that are complete and being implemented. Those highlighted yellow do not have an approved marine spatial plan document, but have made significant progress through their MSP process.

### **Supporting points:**

- MSP varies widely across countries in terms of what constitutes their marine area.
- In the USA, state authorities usually manage waters out to 3 nautical miles, like Rhode Island (Office for Coastal Management, 2026). In Germany, regional authorities oversee up to 12 nautical miles, while the federal government manages beyond that (UNESCO-IOC/European Commission, 2021). In South Africa, the national government governs out to the Exclusive Economic Zone, or EEZ, which extends up to 200 nautical miles (Republic of South Africa, 2017).
- Across Africa, South Africa, Angola, and Namibia collaborate on marine planning through the Benguela Current Convention. Many countries are signatories to the Abidjan Convention including Ghana.
- MSPGlobal's Africa MSP webpage provides up to date information on coastal African countries' progress with their MSP.

## Slide 8 - Seychelles Marine Spatial Plan

### **Key message:**

Seychelles, a large ocean state in the Western Indian Ocean, has implemented MSP to protect its rich marine biodiversity, leveraging a debt conversion initiative to expand marine protection (Government of Seychelles, 2025).

### **Supporting points:**

#### 1. Geographical & Ecological Importance

- Seychelles has an Exclusive Economic Zone (EEZ) of 1.35 million km<sup>2</sup>.
- It hosts two UNESCO World Heritage Sites (Aldabra Atoll & Vallee de Mai).
- The ocean contains diverse marine species and habitats, from tiny corals to deep-sea canyons.

#### 2. Marine Spatial Planning (MSP) Initiative

- Started in 2014 to build on existing marine protection efforts.
- Aims to balance marine conservation, economic activities, and sustainable use of ocean resources.

#### 3. Debt Conversion for Conservation

- 
- Seychelles committed to protecting 30% of its EEZ by 2020 as part of the initiative.
  - The debt conversion deal was signed in 2016 between the Government of Seychelles and The Nature Conservancy.
  - This innovative financial mechanism redirects debt repayments toward marine conservation.

### **Slide 9 - Seychelles Marine Spatial Plan continued...**

#### **Key message:**

The Marine Spatial Plan (MSP) of Seychelles, developed with the support of The Nature Conservancy, aims to expand marine protection, support the blue economy, and enhance climate adaptation, covering the entire EEZ and Territorial Sea (Government of Seychelles, 2025).

#### **Supporting points:**

##### 1. Goals of the Marine Spatial Plan (MSP):

- Increase Marine Protection Areas (MPAs) to 30% of Seychelles' waters.
- Support the Blue Economy Agenda by balancing conservation with sustainable ocean use.
- Enhance Climate Change Adaptation through ecosystem protection and resilience-building.

##### 2. Scope of the MSP:

- Covers 1,351,000 km<sup>2</sup>, including both the Territorial Sea and Exclusive Economic Zone (EEZ).
- Ensures comprehensive planning for marine resources and biodiversity conservation.

##### 3. Progress & Government Involvement:

- The MSP was finalised and published following a phased, multi-year development process led by the Government of Seychelles.
- The government has a structured approach to implementing and overseeing the MSP.

### **Slide 10 - South Africa Marine Spatial Planning**


#### **Key message:**

South Africa has established Marine Planning Areas (MPAs) and a governance framework to implement MSP, balancing economic activities with marine conservation and sustainable use (DFFE, 2021; Government of South Africa, 2018).

#### **Supporting points:**

##### 1. Institutional Framework for MSP:

- Lead Authority: The Department for Environment, Forestry and Fisheries (DEFF) oversees MSP.

- 
- National Working Group: Comprised of officials from key government departments (e.g., defence, energy, fisheries, tourism, transport, and land affairs).

## 2. Legal and Policy Framework:

- Marine Spatial Planning Act (Act No. 16 of 2018) provides the legal foundation.
- National Framework on Marine Spatial Planning outlines MSP objectives and processes.
- National Data and Information Report (NDIR) supports MSP by compiling spatial data for planning.

## 3. Marine Planning Areas (MPAs):

- Four MPAs: Three along the mainland and one around the Prince Edward Islands.
- Bordering Countries: Western and Eastern MPAs share boundaries with Namibia and Mozambique, while the Prince Edward Islands MPA borders France (Crozet Islands).
- Zoning Based on Marine Bioregions: Boundaries adjusted to accommodate human activities while protecting high-value biodiversity areas.

### Slide 11 - Marine Protected Areas- South Africa

#### **Key message:**


South Africa has significantly improved marine ecosystem protection, reducing unprotected areas from 47% in 2018 to 13% today, while increasing well and moderately protected ecosystems. However, large offshore areas and vulnerable marine species still require enhanced conservation efforts to ensure long-term ecological sustainability (South African National Biodiversity Institute (SANBI), 2019).

#### **Supporting points:**

##### **Classification of Marine Ecosystem Conditions**

- Natural/Near-Natural Areas: These regions exhibit minimal human impact, maintaining intact biodiversity patterns and processes. They are predominantly found in deep waters beyond the shelf edge, the west coast shelf north of St. Helena Bay, offshore of the Wild Coast, and near St. Lucia in the Delagoa ecoregion.
- Moderately Modified Areas: Characterised by fair ecological condition, these areas often experience single or multiple moderate-intensity pressures leading to some habitat degradation. They are commonly located on the inner shelf, shelf, and shelf edge.
- Severely/Critically Modified Areas: These regions are in poor ecological condition due to high-intensity pressures, often from activities like trawling. Notable areas include coastal zones near metropolitan regions, sections of the shelf edge from Cape Town to the Agulhas Bank, offshore areas of Port Elizabeth, and parts of the KwaZulu-Natal Bight.

Understanding these classifications aids in prioritising conservation and restoration efforts across South Africa's marine environments.



These insights are derived from South Africa's National Biodiversity Assessment 2018, which provides a comprehensive evaluation of the country's marine ecosystems and their protection statuses.

### **Slide 12 - Marine planning stages at the MMO**

#### **Key message:**

In England the Marine Management Organisation (MMO) develops marine plans using the “marine planning cycle”. This is similar to the process used in developing land-use plans in Ghana (“Marine planning and development,” 2021).

#### **Supporting points:**

- The aim of both marine and land-use planning systems is the same: enabling sustainable development. The general outline of this marine planning process is also mentioned by MSP Global in their international guide on marine/maritime spatial planning. On the right of the screen is a simplified version of the marine planning process. The MMO's marine planning wheel is just one example of how to address those simplified questions in MSP.
- Evidence and stakeholder engagement are central to each step in the plan-making process to ensure that the marine plans are as best informed and understood as possible throughout their development.
- Steps 2-5 were carried out iteratively in England with each step building on the outputs from the previous step.
- At each step there would be engagement with local and national stakeholders to gather stakeholder opinion, feedback and evidence to inform outputs. This engagement ensures also helps to reduce the amount of challenge that occurs at the public consultation phase as stakeholders have been included in the process from the beginning of development. Stakeholder engagement also facilitates a focus on locally identified issues and opportunities.
- Eventually the resulting marine plans must be signed off by the relevant government authority to be adopted as the statutory guidance informing marine development.
- Any nation must make choices in how it undertakes the marine planning process, some of which are dictated by local legislative requirements. The main principles, as shown in the Simplified process, remain key.


### **Slide 13 - Statement of Public Participation**

#### **Key message:**

It is good practice to have a public statement that sets out how and when the MSP authority will engage with stakeholders during the marine planning process.

#### **Supporting points:**

- In England a Statement of Public Participation (SPP) is a statutory requirement, and published, for each marine plan under the Marine and Coastal Access Act 2009. It helps ensure that the marine planning process is transparent, and that stakeholders understand how they can be involved and can influence a marine plan's



development. The publication of an SPP formally commences the start of the marine planning process in the relevant marine plan area.

- The SPP follows these principles of engagement:
  - involve people early on in the marine planning process within the national policy framework, but using plain English and avoiding jargon and acronyms as much as possible
  - engage with interested people and organisations at the appropriate time using effective engagement methods and allowing sufficient time for meaningful consultation
  - be adaptable, recognising that different consultation methods work for different people and that a “one size fits all” approach will not work
  - respect the diversity of people and their lifestyles and give people a fair chance to have their voice heard regardless of gender, age, race, abilities, sexual orientation, circumstances or where they live
  - be clear in the purpose, timing and means of any engagement
  - let people know how their views have been taken into account within agreed timescales
  - make documents publicly available.

#### **Slide 14 - Issues & Evidence Gathering**

##### **Key message:**

Marine planning involves addressing issues within marine plan areas during the plans’ lifecycle. These issues are understood and addressed by gathering evidence on the current status of the marine area, and that supports decision-making.

##### **Supporting points:**

- Evidence can be environmental, economic and social data, information, or knowledge, including:
  - Research,
  - Legislation,
  - National policy,
  - Plans and strategies,
  - Spatial information, and
  - Stakeholder opinions.
- It’s critical that all evidence is stored appropriately and quality-assured to ensure reliability.
- Systematically addressing the five questions shown, ensures that marine planning is both evidence-based and forward-looking



## **Slide 15 - Visions, Objectives & Options**

### **Key message:**

In the (MMO) marine planning cycle, the stages of visions, objectives, and goals are critical to setting a clear direction for sustainable marine use (“Marine planning and development,” 2021).

### **Supporting points:**

- A Vision is a statement of the overarching ambition for the marine plan area: what will characterise the area at a given point in the future. It describes the long-term, high-level outcomes we want to achieve. For example, ensuring healthy marine ecosystems, supporting sustainable industries, and promoting social and economic benefits for coastal communities.
- Objectives break down the vision into specific, measurable aims. Objectives identify where marine plans can “add value” in terms of initiating or complementing responses to core issues. They act as stepping stones, focusing on key priorities like conserving biodiversity, balancing competing uses, and addressing climate change impacts.
- As far as is practicable, Objectives should be SMART: Specific, measurable, achievable, relevant and time-bound.
- Once issues and evidence have been gathered and a vision, goals and objectives have been developed the work begins to develop a plan that will get us from where we are now to where we want to be. The options stage focuses on exploring and evaluating potential solutions or scenarios to address identified planning issues. Key elements of this stage include:
  - Developing Options: Creating a range of possible actions or approaches to resolve issues, balancing environmental, economic, and social factors.
  - Stakeholder Engagement: Collaborating with stakeholders, such as industry representatives, local communities, and environmental groups, to ensure options are practical and widely supported.
  - Evidence-Based Analysis: Using data and evidence to assess the feasibility, benefits, and trade-offs of each option.
  - Selection of Preferred Options: Identifying the most suitable options that align with the marine plan’s vision, objectives, and goals, while addressing current and future challenges.
- The options stage ensures that decisions are well-informed, transparent, and tailored to the specific needs of the marine plan areas.

## **Slide 16 - Policy Development & Plan Drafting**

### **Key message:**

Policies are the core of marine plans. They provide practical guidance for decision-making and set out clear requirements for activities within marine plan areas (“Marine plan - user guide,” 2015).



## Supporting points:

- Policies are developed to:
  - Address identified issues,
  - Align with national and international legislation and policy, and
  - Balance environmental, economic, and social priorities.
- Stakeholders are involved throughout, ensuring policies are feasible and tailored to local needs.
- When designing a policy, there are four important criteria to consider:
  1. That the policy is positively prepared. Does the policy provide a mechanism to address the identified issue? Is the intent of the policy clear? Does the policy lead a decision in the right way, does it offer a clear route for decision-making?
  2. That the up-to-date evidence behind the policy justifies its existence. Has there been a change in scientific knowledge/evidence since the policy was first drafted? Is it proportional to the issue, does it consider any other alternatives? How much steer/flexibility does the policy have? Is it a policy which supports other strategic policies or is it a supporting policy? Is policy use explained in the policy implementation text?
  3. The policy is effective. Can it be delivered, or enforced? Can it be monitored and measured against plan objectives? Is there a clear route (strong policy), or can the policy be used to argue equally opposite viewpoints (weak, ineffective policy)? Is the marine plan as a whole effective?
  4. The policy is consistent with national and international legislation and policy. Does the policy fit with underpinning legislation? Is the policy compatible with other plans and strategies? Does it meet stakeholder demands/expectations? Has a change in national policy or legislation weakened the policy to make it unworkable or unenforceable?
- Marine plan Drafting: At this stage, all the information, evidence, and feedback from earlier stages are synthesised to create a draft marine plan. This draft outlines the vision, objectives, and proposed policies to guide sustainable use and development of marine areas. The draft is designed to be clear, comprehensive, and reflective of stakeholder input. Together, these stages ensure the marine plan is robust, actionable, and capable of achieving its long-term vision.


## Slide 17 - Consultation, Review and Publication

### Key message:

The consultation, review, and publication stages are critical to finalising the marine planning process ensuring marine plans are inclusive, effective, and ready for implementation (“Marine planning and development,” 2021; UNESCO-IOC/European Commission, 2021).

### Supporting points:

- During consultation, the draft marine plan is shared with stakeholders, including local communities, industries, environmental groups, and regulators. This ensures



transparency and allows for valuable feedback. Stakeholders provide input on the plan's clarity, practicality, and alignment with their needs and priorities. There are a number of formats through which consultation can take place: workshops, webinars, implementation training sessions for example.

- Feedback from the consultation is analysed and used to refine the plan. This analysis ensures the marine plan is robust, addresses stakeholder concerns, and aligns with legal and policy requirements. It may involve adjusting policies, clarifying objectives, or incorporating new evidence.
- Once finalised, subjected to internal checks, approval and sign-off, the marine plan is published as an official document and adopted ready for implementation (i.e. used). This provides clear guidance for decision-making in the marine area and becomes a statutory framework for managing activities sustainably.

### **Slide 18 - Implementation – Using the Marine Plans**

#### **Key message:**

Successful implementation of the marine plans will help to shape the sustainable development and prosperity of the region for now and into the future (“Marine planning and development,” 2021; UNESCO-IOC/European Commission, 2021).

#### **Supporting points:**

- The primary objective of implementation is to ensure decision-makers and applicants are using marine plan policies, objectives and vision.
- If decisions take account of the marine plans, the marine area will be managed sustainably, and time and money can be saved by all parties.
- Use of the marine plans reduces the burden on marine licence applicants, providing clarity by enabling proposals to move more quickly from concept to consent.
- Decisions (and proposals) that take account of the marine plans have a reduced risk of legal challenge as they are supported by the marine plans and thereby the legislation and evidence that underpins them.
- Alongside this, using the marine plans will also allow us to understand the effectiveness of the marine plans (in achieving national and international policy and its own Vision and Objectives) when monitoring and evaluating.
- The MSP Authority can support the use of marine plans in a variety of ways:
  - Digital online tools (like the MMO’s Explore Marine Plans digital mapping service which helps understand the spatial policies in an area of interest)
  - In-person and online training sessions, workshops and webinars which can include an overview of the plans, policy application and interactive Q&A segments
  - Published training materials like guidance documents, case studies and videos
  - Stakeholder engagement by Authority staff to raise awareness and understanding of marine plans and their use.



## **Slide 19 - Monitoring, Evaluation & Reporting**

### **Key message:**

Monitoring and evaluation of the use of a marine plan are essential to understanding their effectiveness in achieving the vision and objectives for the marine area (“Marine planning and development,” 2021; UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

- You need good monitoring planned throughout the MSP process (i.e. it's done in tandem of other stages) to ensure it is effective. It also helps to have monitoring requirements set out in the legislation to ensure that it happens and the plan can be continuously improved as needed.
- The “Effects” of the marine plan and its policies are real world impacts on the applicants, decision-makers, their activities and decisions, and ultimately on the marine area.
- The “Effectiveness of the marine plan is how well the policies are being used in securing marine plan, national and international objectives.
- Legislation may require production of a Monitoring report for the MSP Authority, wider Government and even stakeholders.
- Monitoring information and evaluation can be used to inform changes within plan policies and updating or replacing a marine plan


## **Slide 20 - Stakeholder Engagement**

### **Key message:**

Stakeholder engagement is an integral part of marine planning (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

- Even if not mandated under MSP legislation it is essential to prepare marine plans in consultation with stakeholders. This ensures transparency and inclusivity in decision-making, and to encourage participation from all relevant parties, including public authorities, industry, conservation groups, and local communities etc.
- The benefits of engaging with stakeholders include:
  1. Stakeholders contribute knowledge and sector-specific expertise into local conditions, priorities, and challenges that might not be available through data alone. This enhances the accuracy and relevance of marine plans and their effectiveness in addressing real-world issues.
  2. Early and continuous involvement fosters trust and transparency. When stakeholders feel their voices are heard, they are more likely to support and comply with the plans. Marine environments are used by diverse groups (e.g., fisheries, shipping, conservationists). Engaging stakeholders ensures these groups work together to balance competing interests and minimise conflicts.

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3. Involving all stakeholders, including underrepresented groups, ensures the plans are fair and equitable, preventing the marginalisation of certain communities or industries.
- Engagement methods need to be tailored to the specific needs of stakeholders and factors such as accessibility, familiarity with technology. Cultural norms must also be considered as, when engaging stakeholders, adherence to ethical principles is crucial. These principles include respect, fairness, and transparency, ensuring informed consent, maintaining confidentiality, and involving a diverse range of stakeholders. Contributions should be acknowledged, and compensation or incentives provided when appropriate. The aim is to ensure the scope of engagement benefits the widest number of stakeholders.
  - In addition, gender, level of education, cultural background, any disabilities (including hidden), caring responsibilities, work patterns, and ability to travel must be considered as part of the engagement plan. Communication with stakeholders should take place in an appropriate local language. Effort should be made to understand all potential barriers to stakeholder engagement and the solutions to ensure participation is as comprehensive as possible. Engagement should work ‘both ways’ and stakeholders should have appropriate opportunities to provide feedback, express concerns or ask questions at each stage of the MSP process.

### **Slide 21 - Plan Level Assessments**

#### **Key message:**

Marine plans may require, and be supported by, plan-level assessments such as Sustainability Appraisal and Impact Assessment (“Marine plan - user guide,” 2015).


#### **Supporting points:**

There are five key assessments that are integral to the marine planning process at the MMO: Sustainability Appraisal, Habitats Regulations Assessment, Equality Assessment, Impact Assessment and MCZ Assessment. Each of these assessments plays a vital role in ensuring that marine plans are not only effective but also responsible, inclusive, and compliant with legal and environmental standards.

Two of these are relevant to Ghana:

- The Sustainability Appraisal ensures that the marine plans contribute to the long-term sustainability of the marine environment and the economy. It assesses the environmental, social, and economic impacts of proposed plans and policies, helping to identify the best options that align with sustainable development principles.
- Impact Assessment analyses the potential consequences of marine plans, including environmental, social, and economic outcomes. It evaluates both positive and negative impacts and ensures that the plan aligns with the overall objectives, such as minimising environmental damage and enhancing positive social and economic effects.

Another three are more MMO-specific:

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- The Habitats Regulations Assessment is specifically focused on ensuring that the marine plans do not adversely affect the integrity of protected habitats and species under the European Union's Habitats Directive. It ensures that any potential negative impacts on special areas of conservation or special protection areas are thoroughly considered and mitigated.
  - The Equality Assessment evaluates how the marine plan may affect different groups within society, focusing on equality and non-discrimination. It ensures that vulnerable and underrepresented groups are considered and that the plan does not disproportionately disadvantage them in any way, promoting fairness and inclusion.
  - The Marine Conservation Zone assessment assesses potential impacts on protected habitats and species, ensuring that development, fishing, or other activities do not harm the ecological integrity of the MCZ. When developing marine plans, the MMO assesses how policies and proposed activities align with the protection requirements of MCZs. This process ensures that marine planning decisions support the conservation objectives of MCZs, prevent significant harm, and contribute to the UK's wider network of MPAs.

Together, these assessments provide a comprehensive framework that helps the Authority make informed decisions, ensuring that marine planning is effective, balanced, and legally compliant while addressing environmental sustainability, social equity, and long-term benefits. It is worth noting these are plan-level assessment, but are also necessary at a project level, which is explained in more detail later.

### **Slide 22 - MPA Designation**

#### **Key message:**

Within MPA designation there is likely to be a governing body that is responsible for decision making. This governing body will consult with scientific advisory bodies that will provide evidence-led guidance on the type and location of MPAs (Day et al., 2012).

#### **Supporting points:**

- The governing body responsible for MPA designation has the final say in decision making.
- The scientific advisory bodies will supply the governing body with assessments, evidence and recommendations on site location, conservation objectives, management measures etc. And will likely be responsible for monitoring the MPAs once designated and adopted.
- The stages outlined on the slide are a generic template as to how the MPA designation process runs from start to finish.
- Slide content aims to build on that from previous modules and set the context of this section



## **Slide 23 - Different types of MPAs**

### **Key message:**

MPAs vary in their level of protection, primary conservation focus, and management objectives. Some MPAs are strictly protected, while others allow sustainable use, ensuring a balance between conservation and human activities (Day et al., 2012).

### **Supporting points:**

- Some MPAs are fully protected, meaning no extractive activities like fishing or mining are allowed, while others permit regulated use to balance conservation with sustainable resource use.
- MPAs may be designed to protect biodiversity, support fisheries management by protecting breeding and nursery grounds, preserve cultural heritage like shipwrecks and sacred sites, or enhance climate resilience by safeguarding habitats like coral reefs and seagrass beds.
- While some MPAs prioritise strict protection with minimal human impact, others focus on sustainable use, scientific research, or eco-tourism, depending on conservation goals.
- Effective MPAs require careful planning to protect marine ecosystems while supporting local communities, fisheries, and economic activities where appropriate.
- Slide content aims to build on that from previous modules and set the context of this section

## **Slide 24 - Assessments relevant to MPA designation**

### **Key message:**

Conducting thorough ecological, socio-economic, legal, climate, and cumulative impact assessments ensures that Marine Protected Areas (MPAs) are effectively designed, scientifically informed, and socially supported for long-term conservation success (Day et al., 2012; UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

- Ecological, socio-economic, legal, climate resilience, and cumulative impact assessments are crucial for informed decision-making.
- Using the best available data helps MPAs achieve conservation goals effectively.
- Considering economic and social impacts reduces conflicts and improves support.
- Data limitations, resource constraints, and balancing competing interests require careful management.
- Regular updates to assessments help adapt to climate change and evolving human activities.
- Slide content aims to build on that from previous modules and set the context of this section



## Slide 25 - Role of MSP in MPA designation

### **Key message:**

MSP can support MPA designation through gathering relevant evidence on their features and to understand impacts of other activities on them (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

- Governing bodies responsible for decision-making in MPA designation and MSP may be different which requires coordination in their respective functions.
- MSP provides spatial data on marine activities such as fishing, shipping, renewable energy, and tourism to help identify potential conflicts with proposed MPAs. It contributes to environmental impact assessments and evaluates how an MPA designation could affect marine industries and biodiversity.
- MSP facilitates consultations with stakeholders, including: fishing and aquaculture industries, offshore energy developers, local communities and conservation groups, and ports, shipping, and tourism sectors. It gathers feedback and concerns to ensure decision-making balances conservation goals with sustainable use of marine resources and minimises conflicts.
- Integration of MPA considerations into marine plans ensures protection of biodiversity within sustainable development.

## Slide 26 - MSP can benefit MPAs

### **Key message:**

MSP provides benefits for MPAs through integrating conservation goals into plan policies and minimising conflict with MPAs (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

- MSP encourages stakeholder participation and collaboration, including local communities, industries, and conservation organisations.
- MSP facilitates broader support for MPAs, informed decision-making, and effective management.
- MSP helps address the shortcomings of individual MPAs by providing a coordinated, large-scale approach to marine conservation.
- By strategically locating MPAs within an MSP framework, conservation efforts can be more effective in protecting and preserving marine ecosystems and biodiversity.
- MPAs, especially when strategically located linked through relevant marine plans, can serve as ecological corridors or stepping stones that maintain connectivity between different marine regions. This is vital for the movement of species, larval dispersal, and gene flow.



## Slide 27 - MPAs can benefit MSP

### **Key message:**

MPAs play a critical role in achieving the ecological objectives of MSP as part of sustainable development (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

#### **Ecosystem Protection and Conservation:**

MPAs are designated to protect and conserve marine ecosystems, habitats, and species. They play a critical role in achieving the ecological objectives of MSP, ensuring that a portion of the marine environment remains free from harmful human activities.

#### **Ecosystem-Based Management:**

MSP emphasises an ecosystem-based approach to management, and MPAs are an effective application of this principle. By safeguarding entire ecosystems within their boundaries, MPAs support the broader ecosystem-based management goals of MSP.

#### **Scientific Research and Data:**

MPAs often serve as platforms for scientific research and data collection. The data and insights generated within MPAs inform MSP decisions, providing valuable information about the health and dynamics of marine ecosystems.

## Slide 28 - MSP Policies relevant to MPAs

### **Key message:**

Marine plans can have a range of policies covering MPAs or activities impacting on them (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

Marine plan MPA policy supports the practical application of existing national and international legislation and policy. It adds value by clarifying the need for public authorities to not only consider impacts on individual sites but also impacts on the overall ecological coherence of the MPA network. It can highlight the need to refer to the most current government guidance as to 'how' to take account of a network.

## Slide 29 - Issues for MPA network addressed by MSP

### **Key message:**

Many issues facing conservation management and MPAs must be addressed through MSP (South African National Biodiversity Institute (SANBI), 2019).

### **Supporting points:**

#### **Challenges**

- **Data Gaps – Lack of Monitoring:** There are significant data gaps for the condition assessments for many MPAs, which are essential for assessing the health and recovery of habitats. Without consistent monitoring, it is difficult to evaluate the effectiveness of management measures or determine how MPAs are responding to pressures and conservation efforts.

- **MPA impact and displacement of activities:** MPAs place restrictions on certain activities, which may cause those other activities to be displaced. What are the economic, environmental, social impacts of this for those other activities?
- **Impacts from Industry on MPAs:** Activities such as offshore wind farms, aggregate dredging, and cabling routes can have significant impacts on MPA features. This list isn't exhaustive, as there are other areas such as water quality that could have impacts on MPAs. While some of these activities are nationally significant, they need careful management to minimise damage to habitats and biodiversity. Fishing activities, particularly bottom trawling, can be highly damaging to benthic habitats within MPAs. However, more research is needed into the displacement impacts on the fishing industry both ecologically on sensitive habitats and species outside of the MPA network, but also on the social and economic impacts on the fishing industry.
- **Effectiveness of MPAs and Insufficient Management Measures:** Questions remain about whether MPAs are meeting their conservation objectives, with many lacking robust management plans and enforcement mechanisms. Globally, there are Protected Area Management Effectiveness scores being conducted but this isn't consistent across nations.
- **Interconnectivity at Feature Level:** MPAs often function as isolated patches, but ecosystems depend on connectivity for species movement, reproduction, and resilience. Without planning for connectivity, MPAs may fail to provide adequate protection for highly mobile species or habitat networks. Marine plans MPA-1 policies support proposals that enhance ecological connectivity across MPAs.
- **Habitat/Species Shifts Due to Climate Change and Coastal Erosion:** Climate change is causing shifts in species distributions and habitats, which has the potential leaving some MPA features unprotected. Coastal erosion further exacerbates changes, impacting nearshore habitats within MPAs. Adaptive management is necessary to account for these dynamic changes and to ensure MPAs remain effective in a changing environment, MPA-3 policy aims to...

## Opportunities

- **Strengthening governance and collaboration:** Biodiversity does not conform to national borders. Effective, holistic conservation protection and management requires national and international collaboration.
- **Innovative funding mechanisms:** Funds can be provided from new sources and initiatives including blue carbon, sustainable tourism, compensation from adverse impacts from authorised activities.
- **Improving stakeholder engagement:** Improving stakeholder engagement can enhance collaboration and support for MPA designation and management.
- **Adaptive management strategies:** Management of MPAs must adapt to changing environmental conditions which can support or hinder achievement of MPA objectives e.g. climate change.
- **Advances in science and technology:** Advances in science and technology can provide better understanding of MPAs and new tools to manage them.



## **Slide 30 - Monitoring & Stakeholder Engagement**

### **Key message:**

Monitoring is integral to understanding MPA conditions over time and informing adaptive management strategies (UNESCO-IOC/European Commission, 2021).

### **Supporting points:**

Monitoring data can be gathered from many sources:

- By the MSP authority themselves and from other government departments.
- Directly for MPA purposes or as a consequence of other processes including authorisations of activities affecting the marine area.
- From Marine Plan Monitoring Surveys.
- Academia.

Alternative methods of assessing MPA effectiveness and condition need to be considered.

Need to improve understanding of displacement as a result of MPA designations.

### **Stakeholder Engagement:**

- Monitoring can be improved through effective stakeholder engagement and collaboration with Decision-makers, other government departments, environmental NGOs and industry groups.

## **Slide 31 - Background to marine spatial planning (MSP) in Ghana**

### **Key message:**

MSP has commenced in Ghana (<https://luspa.gov.gh/projects/> / <https://www.mspglobal2030.org/msp-roadmap/msp-around-the-world/africa/ghana/>).

### **Supporting points:**

This section introduces the origins of MSP in Ghana, highlighting its alignment with sub-regional conventions that support MSP.

It emphasises Ghana's integration into global frameworks and treaties, such as the Sustainable Development Goals, reinforcing the country's collaborative approach to sustainable marine governance.

## **Slide 32 - Purpose of Abidjan Convention**

### **Key message:**

The Abidjan Convention, for example, addresses critical environmental challenges that manifest in Ghana, particularly through pollution (<https://www.unep.org/abidjan-convention>).

### **Supporting points:**

Once conventions are signed by political leaders, deliberate steps must be taken to integrate them into the local context.

- Key pressures along Ghana's coast include:
- Improper land use

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- Population increase
  - Conflicts over shared resources
  - Sea level rise
  - Declining fish stocks
  - Poor disposal of domestic and industrial waste
  - Deforestation in river catchment areas

To effectively implement the Convention, pilot projects are often initiated before nationwide adoption. In this regard, Ghana launched a pilot project under the Abidjan Convention to develop a Sub-Regional (Western Regional) Marine Spatial Development Framework.

The goal is that insights gained from this pilot will inform and strengthen the full-scale rollout of MSP across Ghana.

### **Slide 33 - Justification for MSP in Ghana**

#### **Key message:**

MSP is essential to guide the effective use, protection and conservation of the coastal and marine ecosystems and ecosystem services (UNESCO-IOC/European Commission, 2021) (<https://luspa.gov.gh/projects/>).

#### **Supporting points:**

- Marine and coastal resources management needs to reduce the pressures of human activities on the resources that leads to conflicts eg between conservation, fisheries, maritime transport, tourism and petroleum activities.
- Evidence on the Marine Protected Areas (MPAs) is essential to understand their interactions with other activities and uses.
- In this regard, Marine Protected Areas serve as an effective tool for safeguarding marine biodiversity and ecosystem functions.
- Marine plans aim to ensure the protection of marine ecosystems and their valuable services.

### **Slide 34 - Adopted Approach to MSP**

#### **Key message:**

The approach to MSP has largely adopted the approach to Land-use planning in Ghana (<https://mamiwataproject.org/pilot-projects/pilot-projects-ghana-context/>).

#### **Supporting points:**

- A pilot MSP project in Ghana adopted the guidelines developed under the Abidjan Convention.
- In adapting the pilot to the Ghanaian context, it became evident that the processes closely mirrored those used in land-use planning in Ghana. This similarity made it easier to integrate and apply the model effectively.

- The **Western Region Sub-Regional Marine Spatial Development Framework (MSDF)** was developed using the **ecosystem services approach** to **Integrated Coastal Zone Management (ICZM)** and **Coastal and Marine Spatial Planning (CMSP)**. This approach aimed to:
  - Achieve multiple objectives for coastal and ocean use while minimising conflicts among resource users.
  - Reduce negative impacts on ecosystems and ecosystem services, promoting sustainable development.
  - Support the integration of environmental and resource management with economic development and governance priorities at local and national levels.
- The **ecosystem services approach** involves identifying marine and coastal ecosystems along with their associated services, human users (institutions and sectors that depend on them), and the key drivers influencing ecosystem conditions. It also considers external activities that indirectly impact land, water bodies, coastal areas, and the marine environment.

### **Slide 35 - Pilot Area in the Ghana National Context**

#### **Key message:**

The Ghana MSP pilot covered the coast of four Western Region coastal districts and adjacent marine area out to 200nm and produced a Marine Spatial development Framework (<https://mamiwataproject.org/pilot-projects/pilot-projects-ghana-context/>).

#### **Supporting points:**

##### **Plan Area and Scope**

- The Plan Area is part of Ghana's coastline, located primarily within the Western Region. Under Land Use and Spatial Planning Act, 2016 (Act 925) ((Government of Ghana, 2016), and the National Development Planning (System) Act, 1994 (Act 480) (Government of Ghana, 1994), a Spatial Development Framework (SDF) can be prepared as an integrated sub-national, sub-regional, and multi-district plan. Given the nature and scope of this initiative, the most suitable approach was the development of a sub-regional Marine Spatial Development Framework (MSDF).
- The Pilot Project covers four coastal districts, extending beyond their administrative boundaries offshore into Ghana's Exclusive Economic Zone (EEZ), up to 200 nautical miles (nm) from the coast.

##### **Geographic Coverage**

- The coastline within the Plan Area stretches from Ghana's border with Ivory Coast in the Jomoro District to the easternmost part of the Ahanta West District. The seaward boundary includes Ghana's EEZ along these four districts, while the landward boundary extends inland from the coastline to the 50m contour line.

##### **Historical Definitions of the Coastal Zone**

- The definition of Ghana's coastal zone has evolved over time:

- The Coastal Zone Indicative Management Plan (CZIMP) (EPA, 1990) defines the landward limit as a line connecting the landward extents of lagoons, lagoonal depressions, marshes, estuarine swamps, and intervening interfluvial areas.
- The Coastal Zone Profile of Ghana (Armah and Amlalo, 1998) approximates this boundary as extending 10 km inland from the coastline, enclosed by the 30m contour line to capture the catchment areas of coastal streams for effective land use, environmental planning, and monitoring.
- The National Environmental Action Plan (Government of Ghana, 1988) sets the seaward boundary at the edge of the continental shelf, though alternative definitions extend it to the sublittoral fringe, the continental shelf edge, or the 200 NM EEZ, depending on the issue at stake.

### **Project-Specific Adaptations**

- For the purposes of this project, the landward limit has been extended to the 50m contour line to incorporate ecologically sensitive areas such as:
  - Inzulenzu (village on stilts) in the Jomoro District
  - Forest reserves and watersheds beyond the 30m contour line
- This broader coverage ensures that critical ecosystems and natural resources are adequately considered within the MSDF.

### **Marine Spatial Development Framework (MSDF)**

- Under the Marine Management Project of the Abidjan Convention, Ghana is expected to develop its first Pilot MSDF to guide the future preparation of MSPs for the country's entire coastal and maritime waters.
- The MSDF will play a vital role in:
  - Addressing key environmental challenges
  - Enhancing tourism potential along Ghana's western coast
  - Improving fisheries management to ensure long-term sustainability

### **Slide 36 - Areas to Consider in MSP Preparation**


#### **Key message:**

Ghana MSP requires a baseline of the current situation and development of Vision, Goals, Objectives and Policies (UNESCO-IOC/European Commission, 2021).

#### **Supporting points:**

#### **Situation Analysis/ Baseline Study covers:**

- Profile/Physical Characteristics of the Project Area
- Natural Environment – ecosystems, habitats and species
- Man-made Environment – built infrastructure

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- Population and Social Environment – numbers and locations of people within the communities of the four districts
  - Economic Environment – formal and informal revenue-generating industries and activities
  - Governance Framework – the legislation, national and international policies relevant to MSP and the marine area.

### **Slide 37 - MPA and MSP Integration**

#### **Key message:**

MSP, and the pilot MSDF, proposes the delineation and designation of Marine Protected Areas (MPAs) within the pilot region (Government of Ghana, 2012).

#### **Supporting points:**

##### **Pilot MSDF and Marine Protected Areas (MPAs)**

- A key function of the MSDF is to protect critical marine habitats, such as:
  - Coral reefs
  - Mangroves
  - Fish spawning grounds
- The primary goal is to conserve biodiversity, safeguard ecosystems, and ensure sustainable fish stocks.
- Additionally, the MSDF outlines zoning strategies, including:
  - Buffer zones around sensitive areas
  - Regulations to minimise the impact of fishing, oil exploration, and other activities on marine environments
- These measures will help maintain ecological balance while promoting sustainable economic activities in Ghana's coastal and maritime regions.

### **Slide 38 - Implementation Plan**

#### **Key message:**

The Ghana MSP authority, the Land Use and Spatial Planning Authority, is developing a Plan to implement MSP that includes MPAs.

#### **Supporting points:**

- All relevant Ghana government ministries, departments and authorities will be included in Ghana's MSP
- An MPA Monitoring System has been initiated to gather data from all relevant sources to support designation of MPAs
- There is a need to build the MSP capacity of all relevant stakeholders
- Current information on spatial plans in Ghana is available at:  
<https://luspa.gov.gh/spatial-plans/>



### Slide 39 - MPA and Marine Spatial Planning (UK specific material)

### Slide 40 - MSP framework in the UK

#### **Key message:**

MSP is a devolved function across the UK and is underpinned by the Marine Policy Statement (HM Government, 2011) and the Marine and Coastal Access Act 2009. The legislation requires cross border cooperation.

#### **Supporting points:**

- All marine plans in the UK are underpinned by the Marine Policy Statement. The Marine Policy Statement (MPS) is the UK framework for preparing marine plans and taking decisions that affect the marine environment. It was prepared and adopted for the purposes of section 44 of the Marine and Coastal Access Act 2009, a key piece of legislation in the UK designed to promote sustainable use and protection of marine and coastal environments.
- The MPS also sets the direction for new marine licensing and other authorisation systems in each Administration. The MPS applies to all UK waters. Therefore, all devolved administrations are working towards the same high level marine objectives, so that the system works holistically.
- Marine planning is a devolved function in the UK, which means each country within the UK (England, Scotland, Wales and Northern Ireland) have their own national administration that is responsible for their marine plans. The secretary of State for the Department of Environment, Food and Rural Affairs is the marine planning authority for England, and functions that are related to marine planning have been delegated to the MMO.
- As required under the legislation, cross-border co-operation also extends to the European countries whose waters we share a border with, as listed on the slide.


### Slide 41 - MPA designation in England

#### **Key message:**

Multiple organisations play distinct but interconnected roles in the designation, management, and enforcement of MPAs in English waters to ensure effective marine conservation.

#### **Supporting points:**

- Defra oversees marine policy and the overall establishment of MPAs in English waters.
- The Marine Management Organisation ensures marine activities align with conservation objectives.
- The Joint Nature Conservation Committee advises on MPAs in offshore waters beyond 12 nautical miles.
- Natural England provides guidance on the designation of MPAs, particularly Marine Conservation Zones (MCZs).

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- These organisations work together to maintain a consistent and effective approach to marine protection across different jurisdictions.

## **Slide 42 - Different types of MPA in England**

### **Key message:**

England's MPAs include various types, each with distinct conservation goals, legal frameworks, and management approaches, often overlapping to create a comprehensive marine protection network (<https://jncc.gov.uk/our-work/about-marine-protected-areas/>).

### **Supporting points:**

- MPAs range from Marine Conservation Zones (MCZs) that allow some sustainable activities to No-Take Zones (NTZs) with full protection.
- MPAs are designated under national (e.g., Marine and Coastal Access Act 2009) and international laws (e.g., Ramsar Convention).
- Sites such as SACs, SPAs, and Ramsar sites often coexist, offering multiple layers of conservation benefits.
- HPMAs and NTZs provide the highest protection, while other MPAs balance conservation with sustainable use.
- Development projects (e.g., offshore wind farms) in MPAs must undergo environmental assessments to ensure they do not harm protected species and habitats.


## **Slide 43 - MMO role in MPA designation and management**

### **Key message:**

Defra leads MPA designation with scientific advice from NE and JNCC, while MMO supports the process through data analysis, stakeholder consultation, impact assessments, marine planning, and enforcement.

### **Supporting points:**

- The Department for Environment, Food and Rural Affairs (Defra) is the government body responsible for making final decisions on the designation of Marine Protected Areas (MPAs). It relies on scientific guidance and recommendations from advisory organisations such as Natural England (NE) and the Joint Nature Conservation Committee (JNCC) to ensure that MPAs are selected based on ecological importance and conservation needs.
- The Marine Management Organisation (MMO) plays a crucial role in supporting the designation process by collecting and analysing information on existing marine activities. This helps assess how proposed MPAs might interact with different sectors, ensuring that decisions are made with a comprehensive understanding of the marine environment.
- MMO compiles and processes spatial data to understand how the designation of an MPA could affect various industries, such as fishing, shipping, offshore energy, and tourism. By mapping out marine activities and their overlaps with proposed MPAs,



MMO provides essential insights into potential conflicts or synergies between conservation efforts and economic interests.

- MMO facilitates consultation with a wide range of stakeholders, including fishing communities, industry representatives, conservation groups, and local authorities. This process ensures that all relevant perspectives are considered, helping to balance ecological protection with the needs of communities that rely on marine resources. Stakeholder input is critical in shaping MPA management measures and ensuring effective implementation.
- MMO ensures that MPAs are incorporated into the broader framework of marine planning. This involves aligning conservation goals with other policies related to marine industries, coastal development, and resource management. By integrating MPAs into national and regional marine plans, MMO helps create a coordinated approach to sustainable ocean management.

#### **Slide 44 - Assessments: SA, HRA and MCZ**

##### **Key message:**

Marine plans undergo assessments such as the Sustainability Appraisal, Habitats Regulation Assessment, and Marine Conservation Zone assessment to ensure environmental, social, and economic sustainability while protecting designated habitats and species.

##### **Supporting points:**

- The Sustainability Appraisal fulfils the requirements set out by the Strategic Environmental Assessment (SEA) Directive (<https://www.gov.uk/guidance/strategic-environmental-assessment-and-sustainability-appraisal>). It evaluates the potential social, economic, and environmental impacts of marine plans, ensuring that sustainability principles are integrated into decision-making. By assessing factors such as biodiversity conservation, economic development, and community well-being, the SA ensures that marine planning supports long-term environmental health while allowing for responsible economic activity.
- The Habitats Regulation Assessment ensures that marine plans comply with the legal obligations of the Habitats Directive and the Birds Directive (<https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>). Its primary purpose is to prevent activities that could negatively impact designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The assessment identifies whether proposed marine plans might interfere with protected habitats or species and determines if mitigation measures are necessary to avoid significant harm.
- The Marine Conservation Zone assessment evaluates how new marine plans might affect designated MCZs and their protected features (<https://www.gov.uk/guidance/marine-licensing-impact-assessments#marine-conservation-zone-assessment>). This process ensures that activities proposed within or near MCZs do not compromise the conservation objectives of these sites. The assessment considers potential risks such as habitat degradation, water pollution, or increased human activity and recommends strategies to minimise negative impacts while maintaining ecological integrity.



## Slide 45 - MPA Policies in English Marine Plans

### **Key message:**

The next few slides cover the MPA policies in English marine plans and their evolution over time. Plan policy MPA-1 has evolved over time to clarify how public authorities should assess both individual and network-wide impacts on Marine Protected Areas, incorporating the mitigation hierarchy and ensuring alignment with the latest government guidance to strengthen ecological coherence and policy effectiveness.

### **Supporting points:**

- Plan policy MPA1 adds value to existing policy by clarifying the need for public authorities to not only consider impacts on individual sites, but also impacts on the overall ecological coherence of the Marine Protected Area network. It supports the practical application of legislation in the marine plan areas by highlighting the need to refer to the most current government guidance as to 'how' to take account of a network.
- Policy MPA1 started with the text in top right of the screen for our current East marine plan (<https://www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans>), the first plan we published back in 2014. When developing the first MPA policies, defining the characteristics of a network at the United Kingdom-level was still in an early stage.
- As context changed, this supported the development of more prescriptive policy in the newer marine plans. The first evolution came in the South marine plans in 2018 (<https://www.gov.uk/government/publications/the-south-marine-plans-documents>), the text on the left of the screen. This was the first introduction of the mitigation hierarchy. The current wording in the NWSWNESE plans, published in 2021 (<https://www.gov.uk/government/publications/the-south-west-marine-plans-documents>), is more concise and clearer, with additional clarification to highlight what proposals will be supported.
- In the newer marine plans (NE/NW/SE/SW), MPA-1 ensures that proposals that may have adverse impacts on the objectives of marine protected areas must demonstrate that they will, in order of preference avoid, minimise, mitigate adverse impacts, with due regard given to statutory advice on an ecologically coherent network.


## Slide 46 – MPA Policies in English Marine Plans

### **Key message:**

Plan policy MPA-2 ensures that proposals consider the impact of climate change on Marine Protected Areas, prioritising avoidance, minimisation, and mitigation of adverse effects while encouraging enhancements that improve resilience, with consistent wording maintained from the South marine plan (2018) to the remaining plans (2021).

### **Supporting points:**

- The effects of climate change on habitats and species poses a challenge to designated marine protected area sites in the marine plan areas. MPA-2 ensures proposals account for adverse impacts on each impacted individual marine protected



area's ability to adapt to climate change, improving resilience and working towards a well-managed marine protected area network.

- Proposals that cannot avoid, minimise or mitigate adverse impacts should not be supported.
- This policy applies to any organisation or individual putting forward a proposal including, but not restricted to, those applying for an authorisation.
- Proposals that enhance the ability of a marine protected area to adapt to the effects of climate change should include information demonstrating how this will be achieved. Enhancement refers to measures taken which have a positive impact. An example of enhancement could include the removal of hard coastal defence structures in favour of soft engineering, which enables habitat rollback.
- Where positive impacts have been identified, proposals must also assess adverse impacts in line with relevant legislation. Enhancement is not a substitute for avoidance, minimisation or mitigation measures.
- You'll see that this policy wording was kept the same from the South marine plan in 2018 to the remaining plans in 2021.

#### **Slide 47 - MPA Policies in English Marine Plans**

##### **Key message:**

Plan policy MPA-3 supports adaptive management and boundary changes within the Marine Protected Area network to enhance resilience against climate change impacts, ensuring flexibility in response to shifting habitats and species, with statutory conservation bodies and Defra considering these adaptations in site designation and management.

##### **Supporting points:**

- Anthropogenic activities such as the burning of fossil fuels, deforestation, farming and methane release from animal farming have serious adverse impacts on the climate. These impacts include, but are not limited to, increased ocean acidity, temperature shifts, and increased storm activity. Climate change may result in marine protected area feature migration and/or feature displacement due to shifts in ranges of habitats and species. MPA-3 ensures flexibility by supporting boundary changes to improve the resilience of the marine protected area network. MPA-3 enables adaptive management to help mitigate the loss of features within sites, and support adaptation to climate change.
- The statutory nature conservation bodies monitor marine protected areas and may determine that the condition of a feature is changing or deteriorating due to climate change. This policy should also be considered when recommending and designating new marine protected areas to ensure that boundaries allow for adaptive management if necessary. Defra should consider this policy when designating, amending or de-selecting marine protected areas



## **Slide 48 - MPA Policies in English Marine Plans**

### **Key message:**

Plan policy MPA-4 ensures the protection of designated geodiversity within marine plan areas by requiring proposals to avoid, minimise, or mitigate significant adverse impacts on geological and geomorphological features, aligning with statutory monitoring requirements and conservation objectives.

### **Supporting points:**

- Geodiversity in the marine plan areas has formed over billions of years. With natural change happening slowly over a long timescale, geodiversity is particularly vulnerable to human impacts. MPA-4 makes sure proposals account for significant adverse impacts on designated geodiversity, protecting important geological and geomorphological features that underlie and determine the character of our landscape and seascape.
- Proposals that have significant adverse impacts on geological features of sites of special scientific interest, marine conservation zones or regionally important geological sites must demonstrate that they have, in order of preference, avoided, minimised or mitigated such impacts in accordance with statutory monitoring requirements, such as Marine Conservation Zone Assessment (as required by the Marine and Coastal Access Act 2009 Section 126), Sites of Special Scientific Interest Assessment, and the conservation objectives set out by the statutory nature conservation bodies.



## Module 8: Your Voice

### Slide 1

Module 8 - Your Voice.

### Slide 2 - MPA Course Overview

This is the last of eight modules in this course on Marine Protected Areas (MPAs).

The course is made up of eight modules. Each module consists of a presentation, module notes. A reading list is provided to support additional learning.

It is recommended that at least an hour or two of additional study per module of additional reading/associated activities are undertaken in order to get the most from the course.

### Slide 3 - Context

This module differs from the others. It's now your chance to think about the impact you have and what you are doing to minimise this for the future. This is meant to be an interactive module that will make you think

### Slide 4 - Are we being good ancestors?

Through this course we've discussed the importance of our marine environment, the functions and services that it provides and the impacts that unsustainable development and exploitation are having. All life depends on the global ocean for its survival whether directly or indirectly, and yet we continue to over exploit the very thing that keeps us alive.

Discussion – what do YOU think are the biggest impacts to the marine environment? What can we do to change things?

### Slide 5 - Why now?

Play video - <https://youtu.be/lr4Z-ZB5vcY?si=7WwEUf8ckSiA23fU>

The video shows the importance of taking action against climate change (and unsustainable use of our natural environment). It highlights the impacts that might befall future generations if we fail to act.

Discussion:

What changes to the marine environment have you seen in your lifetime?

The actions of past generations have always impacted future generations most- so why is it so critical to make a change, and to take action now?

### Slide 6 - Environmental Action in Ghana

Play video - <https://youtu.be/2srAQ0fDU20?si=Cp7wRXbBF103AI4X>

What is currently being done to address environmental change? This video provides an example of action being taken to protect the biodiversity and environmental integrity of Ghana's precious wetland ecosystems.

### Slide 7- Environmental Action in Ghana

Play video - <https://youtu.be/gTQuXd3f8Lc?si=CjdDB0M1I4qmriyj>



Discussion:

Are there other best practice examples of environmental action in Ghana that it would be useful to share or to share with other countries?

Are there any innovative approaches in Ghana which would be useful to share or to share with other countries?

### **Slide 8 - Global Action**

*Play video - [https://youtu.be/BOWsRF6its8?si=mmwrpy\\_j-RT\\_PbLK](https://youtu.be/BOWsRF6its8?si=mmwrpy_j-RT_PbLK)*

Discussion:

Are there other best practice examples of environmental action in other countries that could be relevant or applicable to Ghana?

### **Slide 9 - Global Action**


*Play video - <https://youtu.be/ZtB780to73Q?si=oMe59bxHB3fqFVBq>*

### **Slide 10 - What can you do?**

People attending this course are likely to already have an interest in marine conservation, but everyone needs to play their part.

Topics that might come up in response to the questions on the slide:

- Younger generations are the future stewards of the ocean, and their engagement can significantly contribute to raising awareness, promoting conservation efforts, and ensuring the long-term health of marine ecosystems by actively participating in decision-making processes and advocating for sustainable practices; essentially, they will inherit the consequences of today's environmental choices, making their involvement crucial for a healthy ocean future. As the next generation, young people will be responsible for managing the oceans in the coming decades, so their input and understanding of marine issues is vital.
- Increased Awareness and Advocacy: By actively engaging with MPAs, you can spread awareness about ocean conservation to their peers and communities, driving positive change through education and activism.
- Community Engagement: Involving people in local MPA initiatives can foster a sense of ownership and responsibility for the marine environment, leading to increased community support for conservation efforts.
- Scientific Learning and Research: Participation in marine research projects can provide people with valuable scientific knowledge and hands-on experience related to ocean ecosystems.
- Policy Influence: Engagement in decision-making processes can influence policy development related to MPAs, ensuring their concerns are heard and considered.
- Personal Growth and Development: Participating in MPA activities can develop valuable skills like leadership, critical thinking, problem-solving, and environmental stewardship.

- 
- Empowerment and Ownership: Providing people with a platform to voice their opinions and contribute to conservation initiatives can empower them to become active agents of change.
  - Different approaches for different people: How can we help people from different background and generations get involved? What about people who live inland?
  - Conservation careers, action groups, outreach, education, sharing within networks and communities.
  - Not just about science and hard skills other skills such as communication and soft skills are also important.

### **Slide 11 – Protect our Future**

*Play video - <https://youtu.be/5B8eajiYziE?si=oBavAQKQnoFcMhoh>*

### **Slide 12 - What change will you make?**

We hope that you have found this course inspiring and that it has made you feel empowered that you can make a difference.

- What change will you make based on what you have learned?
- How can you ensure that your work has impact?


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