Principles, criteria, process and steps towards establishing YSLME MPA Network

Sangjin LEE

PMO, YSLME Phase II

Key Challenge

How to get from general principles to practical actions that go beyond the establishment of single or groups of MPAs to an operational MPA network in the YS

What is an MPA Network?

Not just a collection of MPAs

- Must interact in some meaningful manner to meet management, social and/or conservation objectives of the network
- Is also a network of people

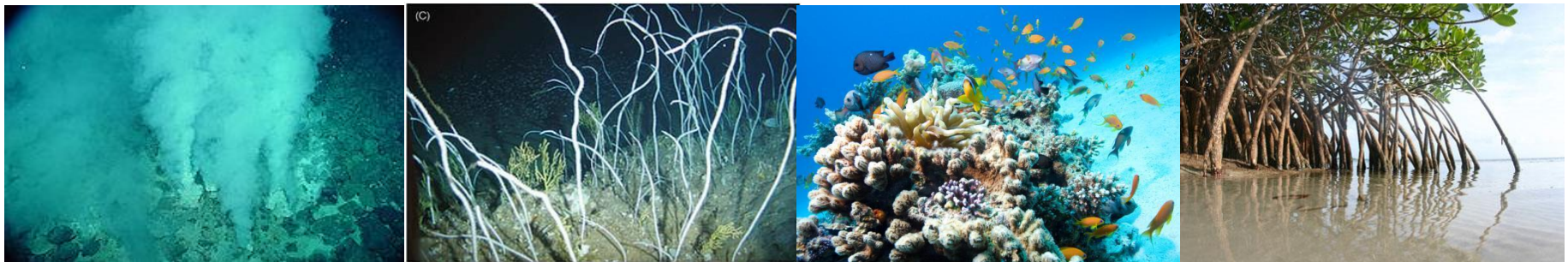# Principle: Ecologically __REPRESENTATIVE__ network

What does it mean when we say we are designing an "ecologically representative" network?

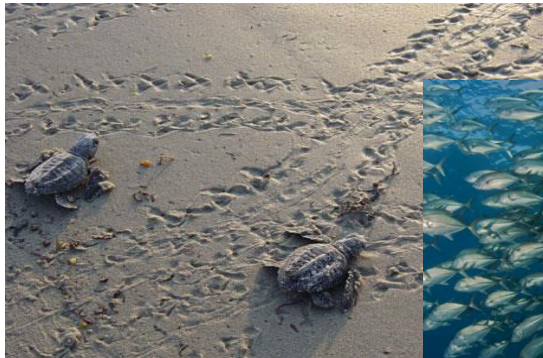*Defining focus of network: all ecosystems and habitats?*

What exactly are we trying to protect?

Principle: Ecologically [REPRESENTATIVE](#) network

Defining focus of network:

- *All ecosystems and habitats?*
- *Critical habitat for threatened or endangered species?*
- *Areas important for vulnerable life stages?*

Principle: Ecologically <u>**REPRESENTATIVE**</u> network

Defining focus of network:

- To protect important life and history stages of <u>fisheries resources</u>

Result or benefits:

- Increase in population of fisheries resources
- Increase in protein source
- Increase in income
- Sustainable management

Need to be specific about our focus for our MPA network ***BEFORE*** *we design the network and start selecting the appropriate sites*

What about biophysical <u>Connectivity?</u>

MPA network design *should seek to maximize and enhance the linkages among individual MPAs, groups of MPAs* within a given ecoregion, or networks in the same and/or different regions

MPAs in a network that interact through ecological and oceanographic linkages enhance the ecological function of and benefits to each

- Large migratory species can have ranges of 1,000km

- Pelagic fish, e.g., blue fin tuna, hundreds to several thousand km

- Smaller fish and bottom dwelling invertebrates – 1 to 100s km

- Sessile species – can be < 1km
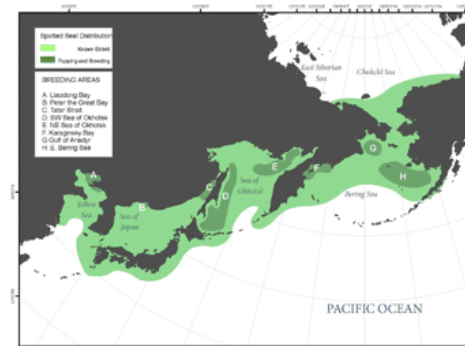
What about biophysical [Connectivity?](#)

Connectivity may also allow for movement of marine life from one habitat to another during different life stages
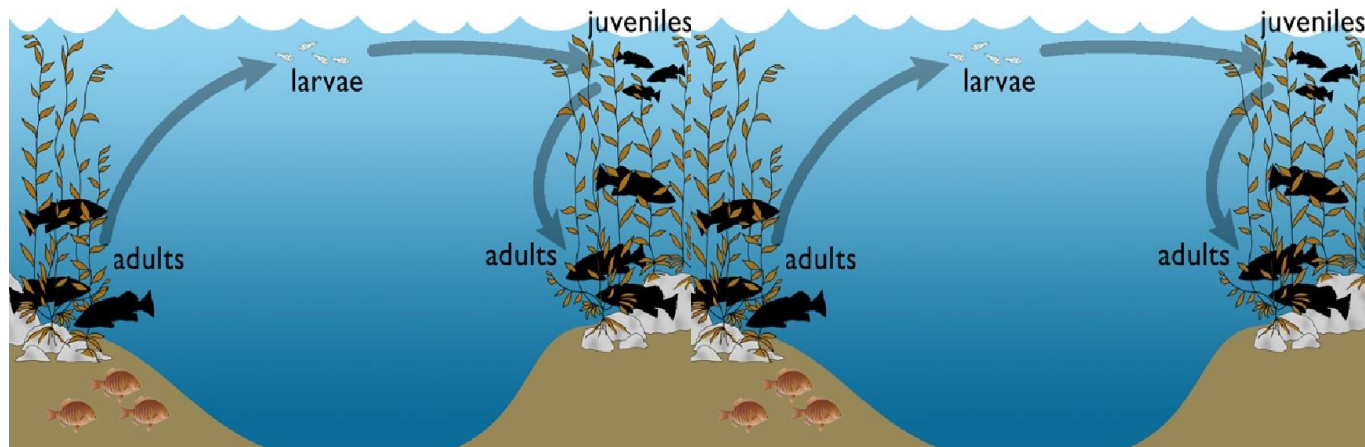
What about biophysical <u>Connectivity?</u>

Regional Network of MPAs in West Africa – 23 MPAs in 6 countries

- Type: Ecological, Social, Governance

- Purpose & Need: High levels of biophysical connectivity through Canary Island and Guinea upwellings, and the movement of migratory species

- *Goal: to ensure, at the scale of the eco-region that: "the preservation of a coherent set of critical habitats….for the regeneration of natural resources and the conservation of biodiversity to the benefit of the societies"*

What about biophysical [Connectivity?](#)

Regional Network of MPAs in West Africa – 23 MPAs in 6 countries

- *Administration:* a secretariat facilitates and coordinates the network activities with technical assistance and financials support from international partners
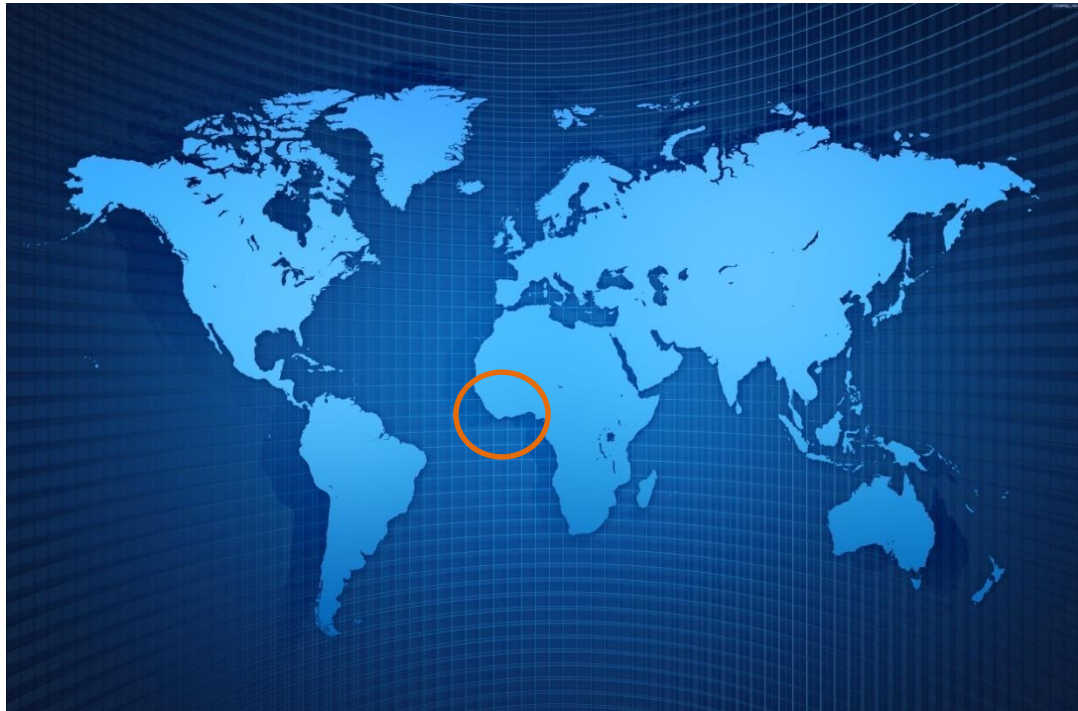
MPA Training Tool Kit

Title

Designing a network of MPAs for the Yellow Sea based on principles of biophysical connectivity

Authored by Rocio Lozano-Knowlton and Anne Walton

Summarizes the *presentations, theory, practices, and exercises worksheets* **utilized during the "Designing a network of MPAs for YSLME Workshop" held in Seocheon, ROK, July 23-27, 2018**

Background

Goal: to provide a consolidated framework **for MPA practitioners and associated working groups** of the YSLME Phase II project to continue **to establish a functional network of MPAs** **based on biophysical connectivity**

Steps, process and materials were designed and presented by authors of this toolkit **based on 3 indicators and endangered species of the Yellow Sea: a fish (Yellow Croaker), a sea pinniped (Spotted Seal), and a sea bird (Spoon-billed Sandpiper)**

Table of Contents

Day 1: Design **principles** of MPA networks

Day 2: **Analyzing the setting** for the YSLME MPA network

Day 3: Understanding **tools and approaches** for managing impacts on species and habitats

Day 4: **Creating the model** for the YSLME network

Day 5: Moving towards making the YSLME MPA network a reality

DESIGNING A NETWORK OF MPAs *for the* YELLOW SEA LARGE MARINE ECOSYSTEM
Workshop Overview

Day 1:
DESIGN PRINCIPLES OF MPA NETWORKS

What we are working with:
MPAs in China
MPAs in ROK
YSLME 23 MPAs

Models & Frameworks for Scaling-up to MPA Networks

Developing Objectives for a Multiple Species MPA Network

Day 2:
ANALYZING THE SETTING FOR THE MPA NETWORK

Status of the Knowledge and Data Gaps for the 3 Representative Species

Analysis of Human Impacts on the 3 Representative Species

Vulnerability Assessment of the 3 Representative Species and Associated Habitat

Day 3:
TOOLS & APPROACHES FOR MANAGING IMPACTS

Risk Assessment on the 3 Representative Species

Management Intervention Results Chain

Assessment of Management Capacity

Making Use of National, Regional and International Instruments and Agreements

Day 4:
CREATING THE MODEL FOR THE YSLME MPA NETWORK

Biophysical Design Framework for the YSLME MPA Network

Linking Site Selection Criteria to the MPA Network Objectives

What it Will Take to Make the MPA Network Operational

Day 5:
MAKING THE MPA NETWORK A REALITY

Using GIS Decision-Making Tools to Design the MPA Network

Building a Road Map for Designing the YSLME Network

Building a Road Map for Making the YSLME MPA Network Operational

OUTCOMES:
1. Understanding the added value of scaling up to MPA Networks
2. Articulation of objectives for the YSLME MPA network

OUTCOMES:
1. Understanding status of knowledge
2. Data gap analysis
3. Vulnerability assessment for species and habitat

OUTCOMES:
1. Risk assessment for representative species
2. Management options for addressing impacts
3. Management capacity assessment

OUTCOMES:
1. Framework for the YSLME MPA Network
2. Site selection criteria for the network
3. Understanding operational guidelines

OUTCOMES:
1. Familiarization with decision-making tools
2. Road map for designing network
3. Road map for making network operational

YSLME
UNDP/GEF Yellow Sea Large Marine Ecosystem

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

Day 1. Design Principles of MPA Networks

Main goals and outcomes:

- Creation of an inventory of MPAs in the YS already established by the governments of PRC and ROK

- Understanding of their status, types of MPAs, what do they protect, articulation of the first draft of SMART objectives and a big picture of the YSLME MPA network

Participants looked at what information as made available during the study undertaken and published by WWF, KORDI, and KEI in 2006

- The 23 Potential Priority Areas (PPAs) for conservation of the YS Ecoregion

- Information was gathered that can be useful now for the establishment of the YSLME MPA Network

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 1. Design Principles of MPA Networks

23 Potential Priority Areas (PPAs) for conservation of the YS Ecoregion

- Key steps in the process to make a determination of the location, size and distribution of the 23 PPAs
- Criteria or guidance provided to select each of the 23 PPA sites

4 categories covered by some of the 23 PPAs for 3 indictors are:

- **Key places** where life history stages take place are included (ecologically important areas)
- **Key habitats** associated with life history stages are included
- **Important migratory pathways or stopovers** are included
- Sites selected to address **priority human impacts** on this resource

Table of Contents

Day 1: Design Principles of MPA networks

1.1. Review of the 23 recommended YSLME PPAs

    - YSLME PPA network assessment

1.2. Overview of China's existing MPAs in the YS

1.3. Overview of ROK's existing MPAs in the YS
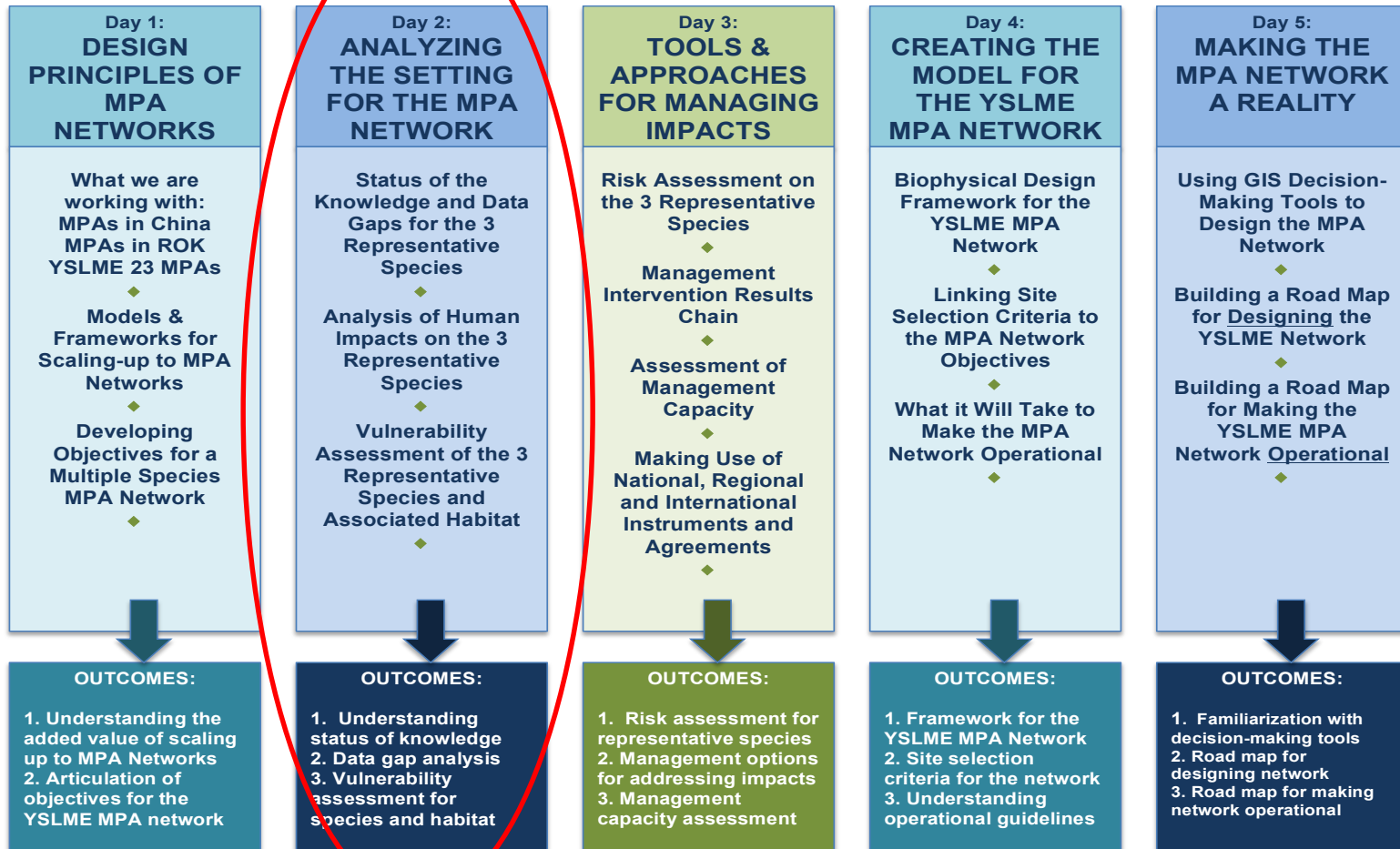
1.4. Identifying the gaps among the collective MPAs

    - connectivity optimization

    - key stages/places of life history of representative species captured

    - replication of ecological (biophysical) features that support the health of
     the species

    - adequate number of viable sites included

DESIGNING A NETWORK OF MPAs *for the* YELLOW SEA LARGE MARINE ECOSYSTEM
Workshop Overview

Day 1: DESIGN PRINCIPLES OF MPA NETWORKS	Day 2: ANALYZING THE SETTING FOR THE MPA NETWORK	Day 3: TOOLS & APPROACHES FOR MANAGING IMPACTS	Day 4: CREATING THE MODEL FOR THE YSLME MPA NETWORK	Day 5: MAKING THE MPA NETWORK A REALITY
What we are working with: MPAs in China MPAs in ROK YSLME 23 MPAs ◆ Models & Frameworks for Scaling-up to MPA Networks ◆ Developing Objectives for a Multiple Species MPA Network ◆	Status of the Knowledge and Data Gaps for the 3 Representative Species ◆ Analysis of Human Impacts on the 3 Representative Species ◆ Vulnerability Assessment of the 3 Representative Species and Associated Habitat ◆	Risk Assessment on the 3 Representative Species ◆ Management Intervention Results Chain ◆ Assessment of Management Capacity ◆ Making Use of National, Regional and International Instruments and Agreements ◆	Biophysical Design Framework for the YSLME MPA Network ◆ Linking Site Selection Criteria to the MPA Network Objectives ◆ What it Will Take to Make the MPA Network Operational	Using GIS Decision-Making Tools to Design the MPA Network ◆ Building a Road Map for Designing the YSLME Network ◆ Building a Road Map for Making the YSLME MPA Network Operational
OUTCOMES: 1. Understanding the added value of scaling up to MPA Networks 2. Articulation of objectives for the YSLME MPA network	**OUTCOMES:** 1. Understanding status of knowledge 2. Data gap analysis 3. Vulnerability assessment for species and habitat	**OUTCOMES:** 1. Risk assessment for representative species 2. Management options for addressing impacts 3. Management capacity assessment	**OUTCOMES:** 1. Framework for the YSLME MPA Network 2. Site selection criteria for the network 3. Understanding operational guidelines	**OUTCOMES:** 1. Familiarization with decision-making tools 2. Road map for designing network 3. Road map for making network operational

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 2. Analyzing the Setting for the YSLME MPA Network

Main goal

To understand significance of data for the design of an effective and functional MPA network

Information that are crucial for MPA Network design

- Life history of the indicator species
- Habitat types associated with their life cycles
- Conditions of those habitats
- Conditions of target species
- Human use impacts

Day 2. Analyzing the Setting for the YSLME MPA Network

Why do we need information and data for planning efforts?

Network planning efforts must be able to successfully **integrate information about regional, national and global processes** such as sea level rise and temperature change, with local information about coastal land uses, marine ecosystems and socioeconomics


Sea temperatures will increase

Figure 5: Trends in ocean temperature will continue and will intensify under both B1 and A2 (and A1B) scenarios. Multi-model annual mean surface temperature differences (C°) for B1 (top row) and A2 (bottom row) for period 2026-2035 and 2090-2099 (relative to 1980-1999). (Data provided by Julie Arblaster based on Meehl et al., 2007).
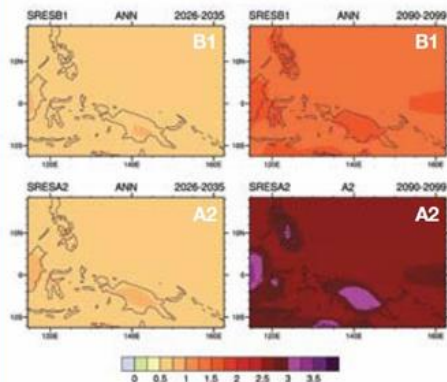
Ocean acidity will rise

Figure 6. Reef calcification will decrease to very low levels if atmospheric CO_2 increases above 450 ppm. Projected changes in the aragonite saturation state (i.e. availability of calcium and carbonate ions required for calcification) of sea water as a function of atmospheric CO_2 concentration (white number in each panel, ppm). The pink dots represent the current distribution of carbonate coral reef ecosystems. The regions suitable for coral reefs are defined by the blue areas – note that the conditions necessary for carbonate reef development contract to the equator (and the Coral Triangle) with increasing levels of atmospheric carbon dioxide (reprinted with permission from Science Magazine, Hoegh-Guldberg et al. 2007).

Yellow Sea Algal Bloom
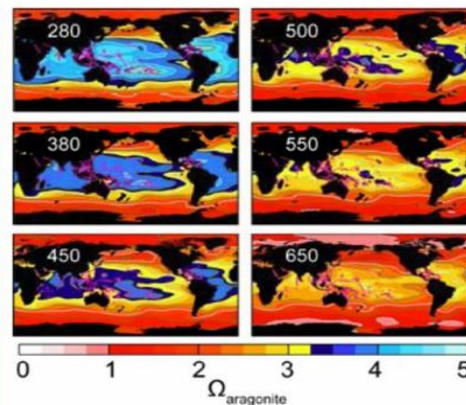
Day 2. Analyzing the Setting for the YSLME MPA Network

Existing data and current level of knowledge on

- Species coverage
- Critical life history stages and associated habitat
- Ecological conditions
- Socioeconomic activities

State of the knowledge for each of the 3 representative species

- Objective: to layout basic life history and spatial requirements for three species
- Activities:
  - ✓ Identified information on 1) distribution and abundance; 2) spatial depiction of critical life history stages; 3) associated habitat; and 4) major threats
  - ✓ Used map to draw on spatial references to the above information

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING
WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

Day 2. Analyzing the Setting for the YSLME MPA Network

WORKSHEET 2.2: Identification of Data Gaps

Use the worksheet only for the purposes of identifying data gaps on a country-by-country basis. Each individual will use this as their own worksheet, then collectively your small team will prioritize data gaps for each country and put those results on a flip chart for sharing in plenary.

Check one species only: ☐ SPOTTED SEAL   ☐ SPOON-BILLED SANDPIPER   ☐ YELLOW CROAKER

Country	POPULATIONS	DAY-TO-DAY SURVIVAL & MAINTAINING HEALTHY POPULATIONS			HUMAN USE ACTIVITIES	
	Distribution & Abundance	Critical Life History Stages	Associated Habitat Types	Associated Ecological Processes	Priority Threats	Effectiveness of Management Measures to Address Threats
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

Day 2. Analyzing the Setting for the YSLME MPA Network

WORKSHEET 2.3: Template for Data Sources
As you write down specific data sources in the matrix, also indicate the specific country this might be applicable to, if appropriate.

Check one species only: ☐ SPOTTED SEAL   ☐ SPOON-BILLED SANDPIPER   ☐ YELLOW CROAKER

DATA SOURCES ↓	DATA NEEDS						
	Distribution & Abundance	Behavior – Critical Life History Stages	Associated Habitat Types	Associated Ecological Process	Human Use Impacts & Threats	Management Measures to Address Threats	Other
MODELS/ EXTRAPOLATIONS							
IN-SITU DATA							
SATELLITE DATA							
INDIVIDUAL AS SOURCE							
LITERATURE SOURCE							

Day 2. Analyzing the Setting for the YSLME MPA Network

State of the knowledge for each of the 3 representative species

- Activities:
  - ✓ Identified information on 1) distribution and abundance; 2) spatial depiction of critical life history stages; 3) associated habitat; and 4) major threats

Threats:

Impacts from Fisheries

- Entanglement, bycatch, overfishing
- Decreasing fish stocks

"Fishing down the food chain"
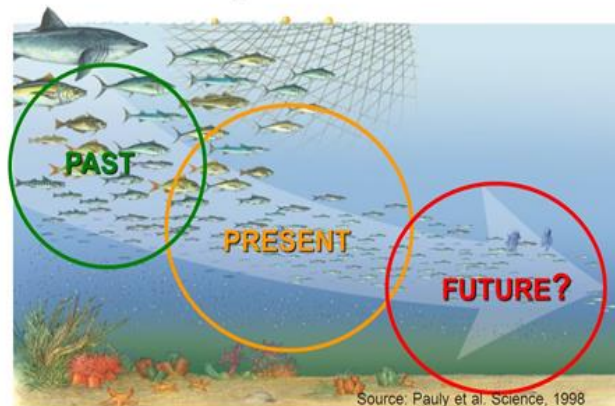
PAST

PRESENT

FUTURE?

Source: Pauly et al. Science, 1998

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

Day 2. Analyzing the Setting for the YSLME MPA Network

Threats:

Impacts from Fisheries

- Entanglement, bycatch, overfishing

- Decreasing fish stocks

- Overfishing

- Impacts from Shipping

Ecosystem Overfishing
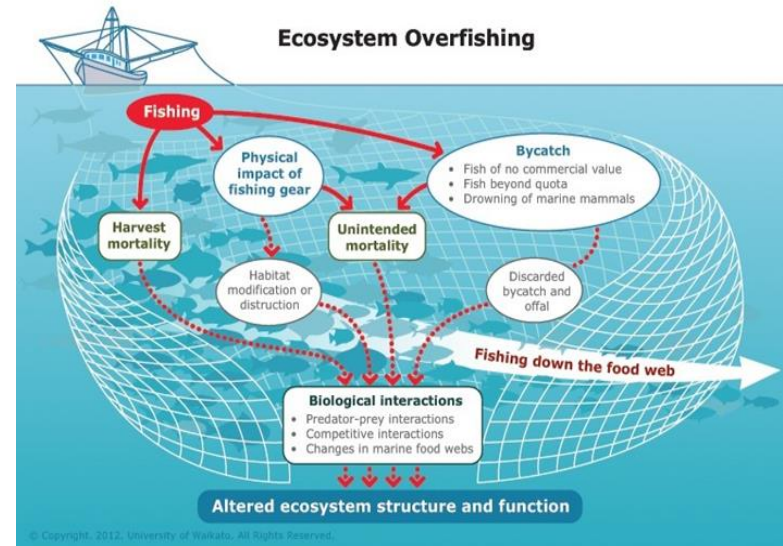
Day 2. Analyzing the Setting for the YSLME MPA Network

Threats:

Impacts from Fisheries

- Entanglement, bycatch, overfishing
- Decreasing fish stocks
- Overfishing
- Impacts from Shipping
- Discharge of pollutants and
  invasive species, oil spills
- Climate Change
- Habitat loss
- Unsustainable mariculture

Forcings and fluxes: → natural
→ anthropogenic
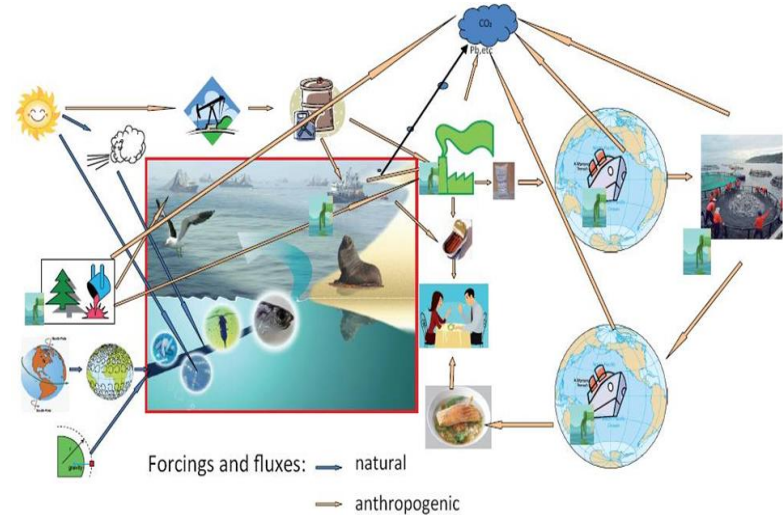
Day 2. Analyzing the Setting for the YSLME MPA Network

Impact Analysis:

- Based on type of human use impact

- Intensity + frequency of the activity

- Level of impact as a result of the intensity frequency

Resilience Analysis:

- Resists impact from human use activity

- Recovers from impact

- Irreversible impacts

- Resilience level (level of adaptability)

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

DESIGNING A NETWORK OF MPAs *for the* YELLOW SEA LARGE MARINE ECOSYSTEM
Workshop Overview

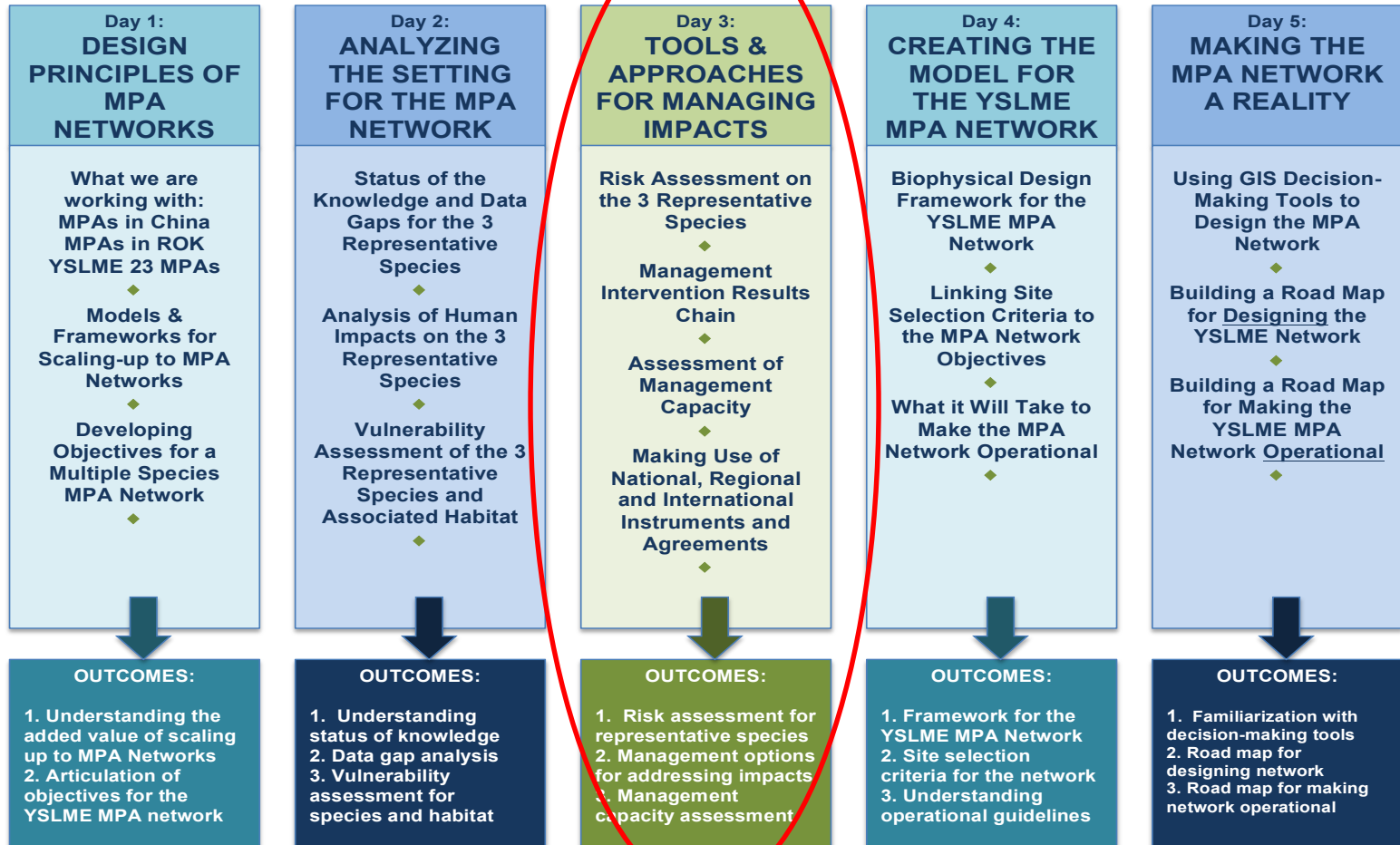| Day 1: **DESIGN PRINCIPLES OF MPA NETWORKS**	Day 2: **ANALYZING THE SETTING FOR THE MPA NETWORK**	Day 3: **TOOLS & APPROACHES FOR MANAGING IMPACTS**	Day 4: **CREATING THE MODEL FOR THE YSLME MPA NETWORK**	Day 5: **MAKING THE MPA NETWORK A REALITY**
What we are working with: MPAs in China MPAs in ROK YSLME 23 MPAs ◆ **Models & Frameworks for Scaling-up to MPA Networks** ◆ **Developing Objectives for a Multiple Species MPA Network** ◆	**Status of the Knowledge and Data Gaps for the 3 Representative Species** ◆ **Analysis of Human Impacts on the 3 Representative Species** ◆ **Vulnerability Assessment of the 3 Representative Species and Associated Habitat** ◆	**Risk Assessment on the 3 Representative Species** ◆ **Management Intervention Results Chain** ◆ **Assessment of Management Capacity** ◆ **Making Use of National, Regional and International Instruments and Agreements** ◆	**Biophysical Design Framework for the YSLME MPA Network** ◆ **Linking Site Selection Criteria to the MPA Network Objectives** ◆ **What it Will Take to Make the MPA Network Operational** ◆	**Using GIS Decision-Making Tools to Design the MPA Network** ◆ **Building a Road Map for Designing the YSLME Network** ◆ **Building a Road Map for Making the YSLME MPA Network Operational** ◆
OUTCOMES: 1. Understanding the added value of scaling up to MPA Networks 2. Articulation of objectives for the YSLME MPA network	**OUTCOMES:** 1. Understanding status of knowledge 2. Data gap analysis 3. Vulnerability assessment for species and habitat	**OUTCOMES:** 1. Risk assessment for representative species 2. Management options for addressing impacts 3. Management capacity assessment	**OUTCOMES:** 1. Framework for the YSLME MPA Network 2. Site selection criteria for the network 3. Understanding operational guidelines	**OUTCOMES:** 1. Familiarization with decision-making tools 2. Road map for designing network 3. Road map for making network operational

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 3. Understanding tools and approaches for managing impacts on species and habitats

Main goal

- To understand the **adaptive capacity of 3 species' key habitats**
- To get early calibration on what **management interventions** might be appropriate to addressing the impacts on 3 species

Adaptive capacity of the 3 species' key habitats

- Adaptive capacity of different habitat types

    - Each habitats' response to the frequency and intensity of the impacts from human use (fragility and recovery rate)

YSLME MPA NETWORKING
WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 3. Understanding tools and approaches for managing impacts on species and habitats

Adaptive capacity of the 3 species' key habitats

1. Considerations for evaluation

- Extent, distribution and connectivity: geographical extent, integrity, continuity
- Past experience of recovery: rate of regeneration
- Value/importance: value ecologically or societally
- Physical diversity: diverse physical and topographical characteristics
- Biodiversity: level of diversity of component species and functional groups in a habitat

Day 3. Understanding tools and approaches for managing impacts on species and habitats

POSTER 3.1: Adaptive Capacity Assessment of Key Habitats (based on condition and response)

This is a rapid assessment of the status and condition of the "ecological potential" for each major habitat associated with key life cycle periods of your representative species. Review definitions for "ecological potential" terms in handout 1.3. Then, rate on a scale from 1-5 (see scoring interpretation at bottom of poster) for each habitat type. If you think your answers might vary considerably by stressor, consider evaluating the habitat for each stressor separately.

REPRESENTATIVE SPECIES: ☐ Spotted Seal   ☐ Spoon-billed Sandpiper   ☐ Yellow Croaker

HABITAT TYPE	ECOLOGICAL POTENTIAL	SCORE	RATIONALE
1.	a. Extent, distribution & connectivity		
	b. Past evidence of recovery		
	c. Value/ importance		
	d. Physical diversity		
	e. Biodiversity		
	(divide total score by 5) **TOTAL SCORE** ➔		
2.	a. Extent, distribution & connectivity		
	b. Past evidence of recovery		
	c. Value/ importance		
	d. Physical diversity		
	e. Biodiversity		
	(divide total score by 5) **TOTAL SCORE** ➔		
3.	a. Extent, distribution & connectivity		
	b. Past evidence of recovery		
	c. Value/ importance		
	d. Physical diversity		
	e. Biodiversity		
	(divide total score by 5) **TOTAL SCORE** ➔		
4.	a. Extent, distribution & connectivity		
	b. Past evidence of recovery		
	c. Value/ importance		
	d. Physical diversity		
	e. Biodiversity		
	(divide total score by 5) **TOTAL SCORE** ➔		
5.	a. Extent, distribution & connectivity		
	b. Past evidence of recovery		
	c. Value/ importance		
	d. Physical diversity		
	e. Biodiversity		
	(divide total score by 5) **TOTAL SCORE** ➔		

Day 3. Understanding tools and approaches for managing impacts on species and habitats

2. Management Intervention Results Chain

- Look at management approaches appropriate to the network of MPAs, and relevant to the stressors we are trying to address

- What does managing an MPA actually mean?

    - Have to **manage human interactions** with natural resources

- How do we manage human behavior?

    Influence behavior - Education; Voluntary compliance; and Best management practices

    Modify behavior – Regulations; Permits; Spatial restrictions; Temporal zones

    Control behavior – Prohibitions; Enforcement and recommendations to other authorities

    Other measures: Economic incentives – user fees etc.

Day 3. Understanding tools and approaches for managing impacts on species and habitats

3. Assessment of Management Capacity

➢ The ability of effectively manage human use activities

1. Management potential

✓ Staff is well trained and technically competent

✓ Management is responsive and able to adapt to change

✓ Stakeholder support and engagement is strong

✓ Management is proactive rather than reactive

✓ Management engages in strong partnerships

2. Organizational capacity

✓ MPAs are backed by strong political will

✓ MPAs have the necessary authority, policy and regulations

✓ MPAs are supported by strong enforcement program

✓ MPAs are committed to monitoring and evaluation programs

✓ MPAs have sustainable financing mechanisms secured and in place

YSLME

UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING
WORKSHOP

14-16 January 2019 • Dalian, Liaoning, PR China

Day 3. Understanding tools and approaches for managing impacts on species and habitats

POSTER 3.3: MPA Management Adaptive Capacity

We will conduct this evaluation by MPA designation category (under what authority was this MPA designated as indicated horizontally across the top). Try to keep in mind your representative species to best understand how these different kinds of MPAs might address the types of impacts you are concerned with. To score each MPA type based on the evaluation criteria, review the scoring system at the bottom of the poster. You may work on this in plenary, as a whole group, or break into country groups. See scoring system at bottom of matrix.

Management Capacity Evaluation Criteria ↓	China MPA Designations					South Korea MPA Designations						
	SEPA	SOA	SFA	Prov. Gov	MOA	Marine Life Protected Area	Marine Ecologic Protected Area	Wetland Protected Area	Marine Environ Conserv	Fisheries Resource Protect	National, Province, Co. Park	Natural Heritage
Management Potential												
1. MPA staff are well trained and technically competent, providing sufficient time, understanding and dedication to effectively manage. 2. MPA management is knowledgeable and responsive to change in the environment and able to adapt management approaches and actions during incidents or high periods of stress.												
3. Stakeholder relationships are strong and adaptable to changing situations in both the environment and MPA management. 4. Management is proactive in its ability to identify, respond and adapt to changes before they become evident and an unmanageable problem.												
5. MPA management has strong partnership relationships with other transboundary or interagency entities, in which they work together to solve problems.												
TOTAL SCORES → (Management potential by MPA designation type)												

Day 3. Understanding tools and approaches for managing impacts on species and habitats

5. Assessment of national, regional and international legal instruments and agreement

- 6 Categories of MPAs
  - ➢ Strict protection (e.g., Nature Reserve/ Wilderness Area)
  - ➢ Protection of ecosystem biodiversity and ecological structure (e.g., National Park)
  - ➢ Conservation of natural features (e.g., Natural or National Monument)
  - ➢ Conservation through active management (e.g., Habitat/Species management Area)
  - ➢ Landscape/seascape conservation and recreation (e.g., Protected Seascape)
  - ➢ Sustainable use of natural ecosystems (e.g., Managed Resource Protected Area)

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 1: **DESIGN PRINCIPLES OF MPA NETWORKS**	Day 2: **ANALYZING THE SETTING FOR THE MPA NETWORK**	Day 3: **TOOLS & APPROACHES FOR MANAGING IMPACTS**	Day 4: **CREATING THE MODEL FOR THE YSLME MPA NETWORK**	Day 5: **MAKING THE MPA NETWORK A REALITY**
What we are working with: MPAs in China MPAs in ROK YSLME 23 MPAs ◆ **Models & Frameworks for Scaling-up to MPA Networks** ◆ **Developing Objectives for a Multiple Species MPA Network** ◆	**Status of the Knowledge and Data Gaps for the 3 Representative Species** ◆ **Analysis of Human Impacts on the 3 Representative Species** ◆ **Vulnerability Assessment of the 3 Representative Species and Associated Habitat** ◆	**Risk Assessment on the 3 Representative Species** ◆ **Management Intervention Results Chain** ◆ **Assessment of Management Capacity** ◆ **Making Use of National, Regional and International Instruments and Agreements** ◆	**Biophysical Design Framework for the YSLME MPA Network** ◆ **Linking Site Selection Criteria to the MPA Network Objectives** ◆ **What it Will Take to Make the MPA Network Operational** ◆	**Using GIS Decision-Making Tools to Design the MPA Network** ◆ **Building a Road Map for Designing the YSLME Network** ◆ **Building a Road Map for Making the YSLME MPA Network Operational** ◆
OUTCOMES: 1. Understanding the added value of scaling up to MPA Networks 2. Articulation of objectives for the YSLME MPA network	**OUTCOMES:** 1. Understanding status of knowledge 2. Data gap analysis 3. Vulnerability assessment for species and habitat	**OUTCOMES:** 1. Risk assessment for representative species 2. Management options for addressing impacts 3. Management capacity assessment	**OUTCOMES:** 1. Framework for the YSLME MPA Network 2. Site selection criteria for the network 3. Understanding operational guidelines	**OUTCOMES:** 1. Familiarization with decision-making tools 2. Road map for designing network 3. Road map for making network operational

YSLME MPA NETWORKING
WORKSHOP
14-16 January 2019 ● Dalian, Liaoning, PR China

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 4. Creating the Model for the YSLME Network

Main goal

- To design the **site selection criteria**

Considerations of site selection

- Biophysical criteria (protecting key life history stages of 3 species, protecting critical habitats, and addressing areas of greatest impacts)
- Social criteria
- Governance criteria

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 4. Creating the Model for the YSLME Network

MPA Site Selection: Ecological Consideration

- Recovery of fish stocks
- Exports of eggs, larvae and adults
- Protection and/or recovery of essential fish habitat
- Protection of threatened or endangered species
- Protect fisheries resources during critical stages such as spawning
- Build resilience for fisheries resources in the face of climate change

MPA Site Selection: Socioeconomic Consideration

- Sustain livelihood opportunities
- Provide food security
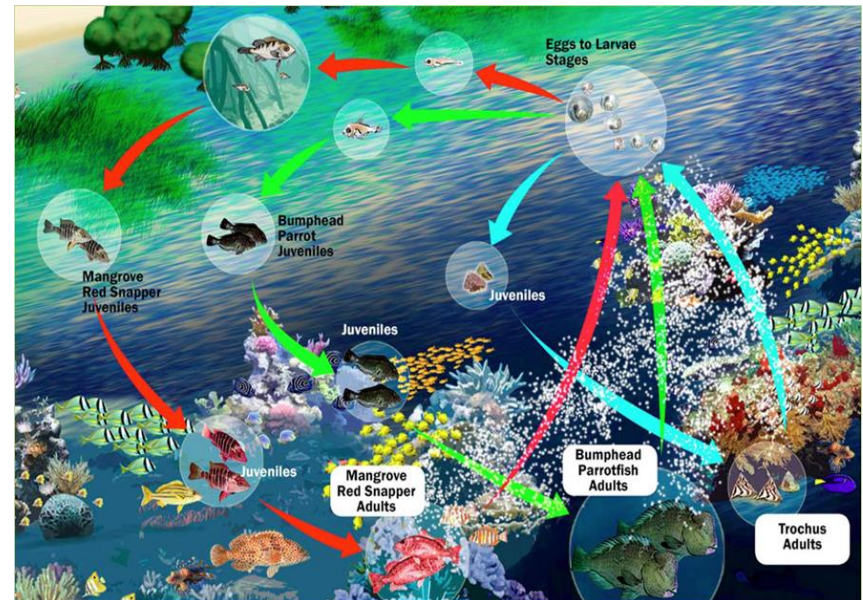- Provide opportunities for engagement in MPA management

Day 4. Creating the Model for the YSLME Network

Ecological Consideration: Habitats

Ecological Consideration: Connectivity

Each species of fish need different healthy habitats where it can eat, live, grow and reproduce

To represent 20-40% of each habitat in the management area (Green et al., 2013)
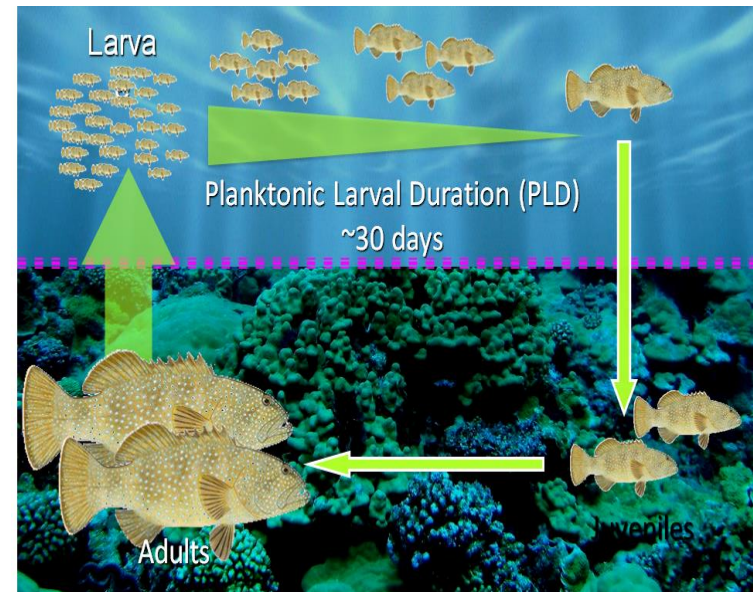
Day 4. Creating the Model for the YSLME Network

Ecological Consideration: Reproductive Stage

**Ecological Consideration: Life history**

- Successful reproduction depends on location, numbers, body size and timing
- Since adults and juveniles are most vulnerable to fishing outside of MPAs, we **should set the size of MPAs according to movement patterns of adults/juvenile fishes**

Day 4. Creating the Model for the YSLME Network

Ecological Consideration: Resiliency

From Gombos et al. 2013 and Green et al. 2013
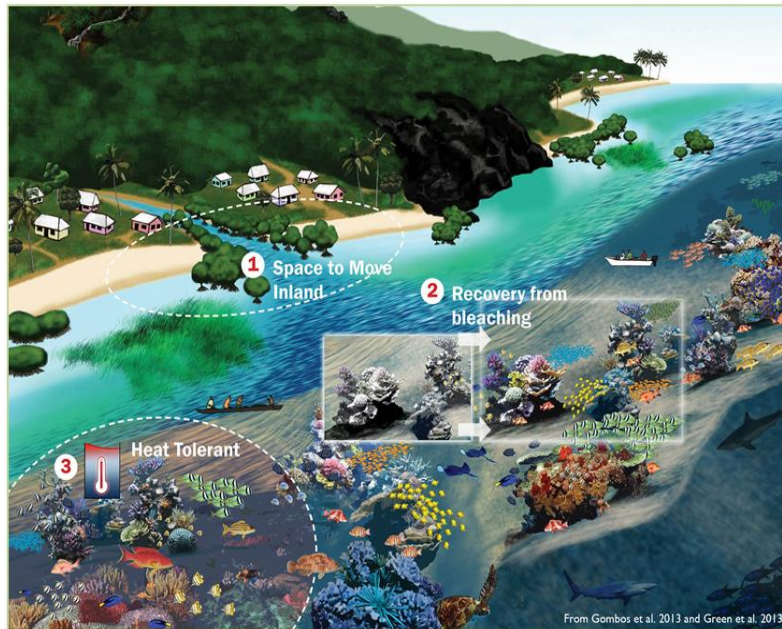
Challenges of using MPAs for migratory species protection

- Size or scale required to protect highly migratory species is not typical of MPA models

- Habitat needs are fluid and difficult to define in terms of **providing place-based habitat protection for highly mobile species**

- May be **difficult to use the MPA management model as a means to address threats to highly migratory species**

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 4. Creating the Model for the YSLME Network

MPA Management - Consideration

- Scientific
- Economic
- Social or cultural
- National & International
- Feasibility and practicality

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 4. Creating the Model for the YSLME Network

MPA Network Operational Process

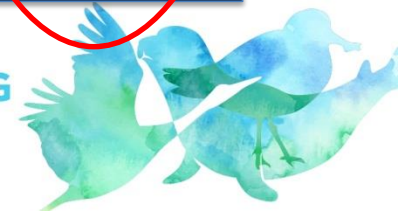| Identification of Shared Issues and Opportunities | Planning and Formation/Strengthening of a Network Management Council | Implementing Coordinated Programs and Policies | Monitoring and Evaluation | Feedback and IEC |

MPA Network

Day 4. Creating the Model for the YSLME Network

VIETNAM MPA NETWORK
Management Effectiveness 4-Part Evaluation Program Model

ANNUAL EVALUATION *of foundational strengths & weaknesses*

PART 1:
EVALUATING MANAGEMENT CONDITIONS
Site capacity

5-YEAR EVALUATION *establishing anticipated results & measures of success*

PART 2:
RESULTS-BASED MANAGEMENT PLANNING
Addressing threats to target resources

PART 3:
MONITORING FOR MANAGEMENT EFFECTIVENESS
Selecting indicators of success

5-YEAR EVALUATION *determining effectiveness of MPA management*

PART 4
RATING THE MPAs STATUS AND TRENDS
Are you getting results

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

DESIGNING A NETWORK OF MPAs *for the* YELLOW SEA LARGE MARINE ECOSYSTEM
Workshop Overview

Day 1: DESIGN PRINCIPLES OF MPA NETWORKS	Day 2: ANALYZING THE SETTING FOR THE MPA NETWORK	Day 3: TOOLS & APPROACHES FOR MANAGING IMPACTS	Day 4: CREATING THE MODEL FOR THE YSLME MPA NETWORK	Day 5: MAKING THE MPA NETWORK A REALITY
What we are working with: MPAs in China MPAs in ROK YSLME 23 MPAs ◆ Models & Frameworks for Scaling-up to MPA Networks ◆ Developing Objectives for a Multiple Species MPA Network ◆	Status of the Knowledge and Data Gaps for the 3 Representative Species ◆ Analysis of Human Impacts on the 3 Representative Species ◆ Vulnerability Assessment of the 3 Representative Species and Associated Habitat ◆	Risk Assessment on the 3 Representative Species ◆ Management Intervention Results Chain ◆ Assessment of Management Capacity ◆ Making Use of National, Regional and International Instruments and Agreements ◆	Biophysical Design Framework for the YSLME MPA Network ◆ Linking Site Selection Criteria to the MPA Network Objectives ◆ What it Will Take to Make the MPA Network Operational ◆	Using GIS Decision-Making Tools to Design the MPA Network ◆ Building a Road Map for Designing the YSLME Network ◆ Building a Road Map for Making the YSLME MPA Network Operational
OUTCOMES: 1. Understanding the added value of scaling up to MPA Networks 2. Articulation of objectives for the YSLME MPA network	**OUTCOMES:** 1. Understanding status of knowledge 2. Data gap analysis 3. Vulnerability assessment for species and habitat	**OUTCOMES:** 1. Risk assessment for representative species 2. Management options for addressing impacts 3. Management capacity assessment	**OUTCOMES:** 1. Framework for the YSLME MPA Network 2. Site selection criteria for the network 3. Understanding operational guidelines	**OUTCOMES:** 1. Familiarization with decision-making tools 2. Road map for designing network 3. Road map for making network operational

YSLME MPA NETWORKING WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China
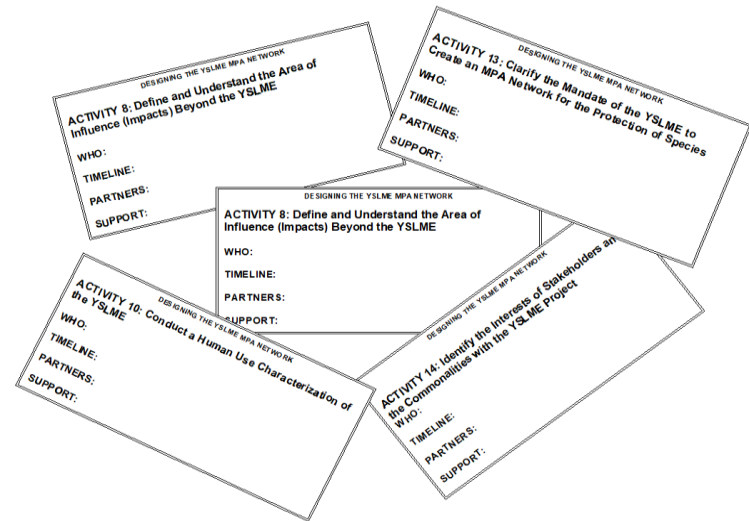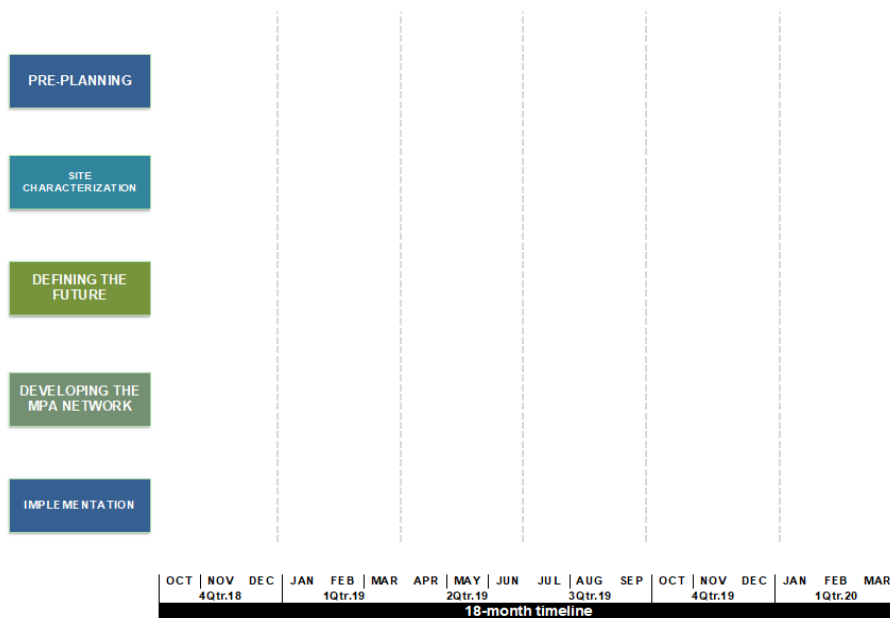
YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Day 5. Moving towards making the YSLME MPA Network a Reality
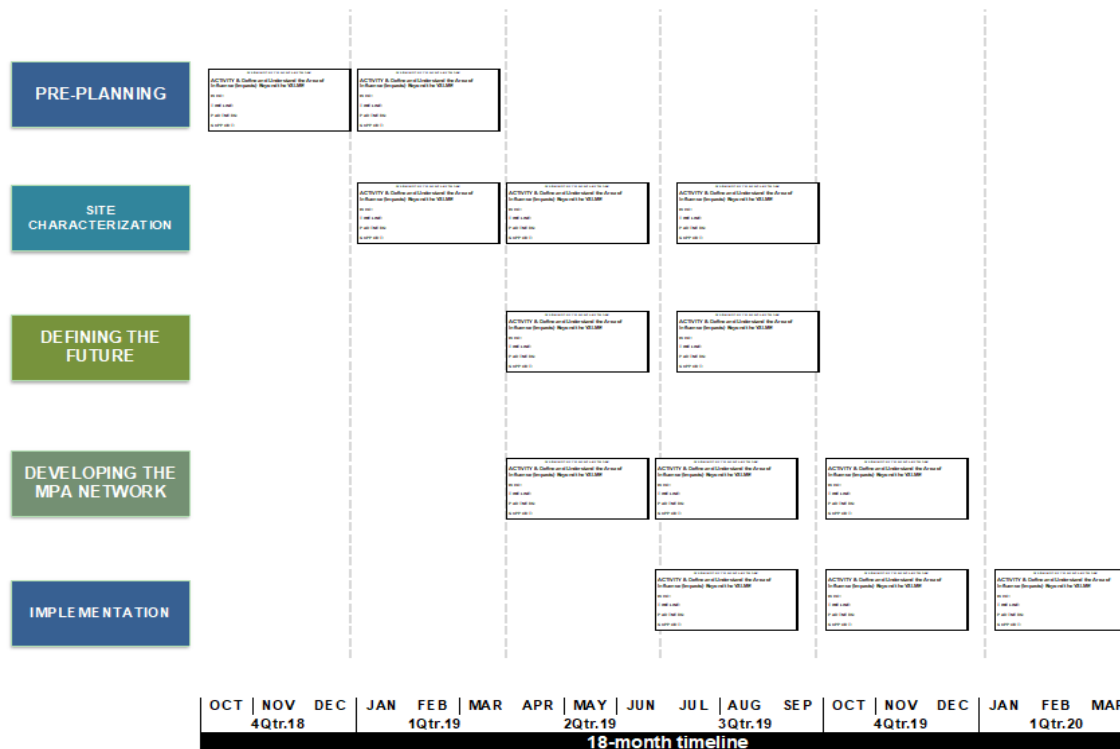
Main goal

- To build a "Roadmap of process steps for making the YSLME MPA Network Operational"

WORKSHEET 5.1: Sample Road Map

Day 5. Moving towards making the YSLME MPA Network a Reality

WORKSHEET 5.1: Sample Road Map

Summary of 1ˢᵗ Regional WS on Designing a Network of MPAs for the YSLME Based on Biophysical Connectivity (July 2018, ROK)

Major findings

- Prioritization of conservation efforts among the 23 PPAs is an emerging priority

- No baseline of MPA coverage in YS by PRC, ROK and DPRK makes it difficult for the **establishing a regional MPA network target** for the YS

- Gaps in conservation of known habitats of both spotted seal and SBS, and clear need for expanding current network of MPAs for both species

- Distribution of MPA coverage indicate areas where potential threats to marine biodiversity may be reduced by the creation of new MPAs. Monitoring the effectiveness of designated MPAs and analyzing how increasing coverage relates to the conservation of ocean biodiversity and productivity remain of high importance

- Needs to agree on assessment criteria of the effectiveness of YSLME MPA network

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem

Summary of 1ˢᵗ Regional WS

Consensus made at the workshop

Spotted Seal

- Priority activities are

    ✓ **Joint surveys** to calibrate number of populations, distribution, migration routes

    ✓ **Engagement and capacity development of DPRK**

    ✓ **Establishing integrated management plan**

    ✓ Information exchange and research with MPAs in Bohai Sea in light of ecological connectivity

    ✓ Designating new MPAs or adoption and implementation of management measures

- Experts from MABIK and NIFS in ROK and Liaoning Ocean and Fisheries Research Institute ad FIO of PRC agreed to **prepare a joint proposal to monitor the migration of spotted seals**

- Collaboration with DPRK for monitoring and assessment of the species

YSLME

UNDP/GEF Yellow Sea
Large Marine Ecosystem

**YSLME MPA NETWORKING
WORKSHOP**

14-16 January 2019 • Dalian, Liaoning, PR China

Summary of 1ˢᵗ Regional WS

Consensus made at the workshop

SBS

- Agreed activities are
  - ✓ **increasing the critical habitats by 30% in YS** by designating new MPAs
  - ✓ Improving the value of the MPAs by promoting visibility of site designated
  - ✓ **Establishing a committee under the framework of YSLME MPA network** to share data and experience
- Enhanced opportunities of financial support to NGOs through YSGP

Summary of 1ˢᵗ Regional WS

Recommendations of the workshop

Small Yellow Croaker

- Protecting 30% of spawning grounds through designation as MPAs
- Adding value to product by avoiding overfishing
- Reducing the number of fishing vessels in line with national policy objectives to minimize fishing pressure

YSLME

UNDP/GEF Yellow Sea
Large Marine Ecosystem

YSLME MPA NETWORKING
WORKSHOP
14-16 January 2019 • Dalian, Liaoning, PR China

YSLME MPA Networking Workshop

Objectives

- *To familiarize with the theories and principles of MPA networking through biophysical connectivity*

- To review the progress of implementation of PCAs with FIO, NMEMC and YSFRI

- To build on the results and recommendations and follow-up actions suggested at the MPA training WS in Seocheon, ROK, *to discuss and agree on the objectives of the YSLME MPA Network focusing on spotted seals, small yellow croaker, SBS and processes for each group*

Thanks !

YSLME
UNDP/GEF Yellow Sea
Large Marine Ecosystem