introduction to

Marine Conservation Science



Short course • Feb 1-4, 2017 • Mawlamyine University




Instructor

Tara Sayuri Whitty, PhD

Center for Marine Biodiversity & Conservation

Scripps Institution of Oceanography

Assistant Instructor

Wint Hte

&

Teaching Assistants

Aung Naing Soe

Yin Yin

Point B Design + Training

introduction to

Marine Conservation Science

My research areas: Small-scale fisheries & conservation

Example: Marine mammals that are accidentally captured in small-scale fishing gear ("bycatch")

Malampaya Sound Protected Area Office

Instructor
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Marine Conservation Science

My research areas: Small-scale fisheries & conservation

Point B Marine Conservation Research Team

Small-scale fisheries in the Gulf of Mottama

"Social Potential for Mud Crab Co-Management"

Interviewing fishing villages to understand their interest in mud crab management

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What are your areas of expertise?



introduction to

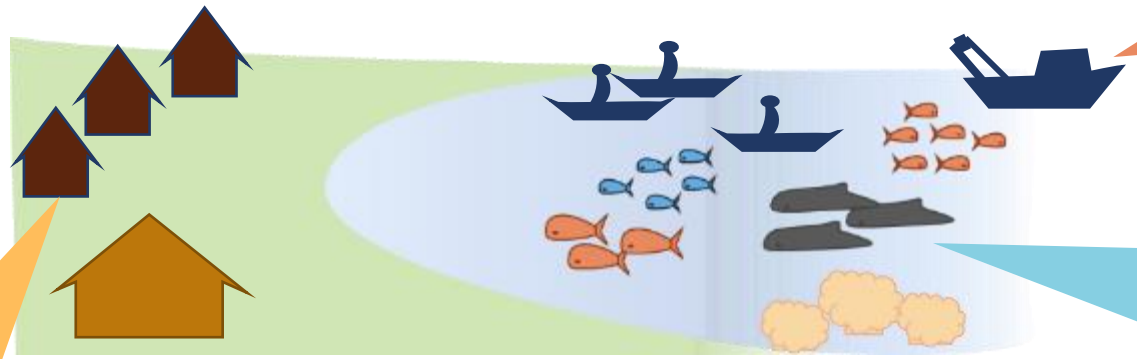
Marine Conservation Science

This is an INTRODUCTORY course

I can develop a longer course for late 2017. Please let me know what you would like to learn more about!

Course Overview

DAY 1 (3pm to 5pm)
What is conservation? What is conservation science?
Why is conservation important?



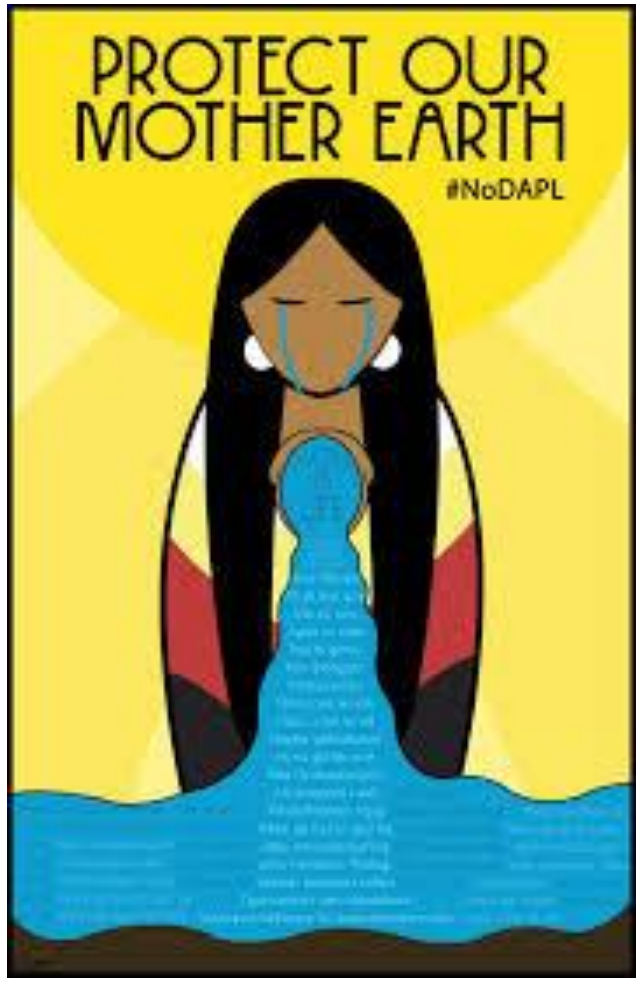
DAY 3 (3pm to 5pm)
Threats
Conservation approaches

DAY 2 (3pm to 5pm)
Species
Biodiversity
Habitats
Ecosystems

DAY 4 (10am to 2pm)
Human Communities
Conservation case studies

Conservation

what does this mean to you?



Conservation

Definitions

"The protection, care, management, and maintenance of ecosystems, habitat, wildlife species and populations, within or outside of their natural environments, in order to safeguard the natural conditions for their long-term permanence"

International Union for the Conservation of Nature (IUCN)

"Conservation should benefit ecosystems, nonhuman organisms, and current and future human beings"

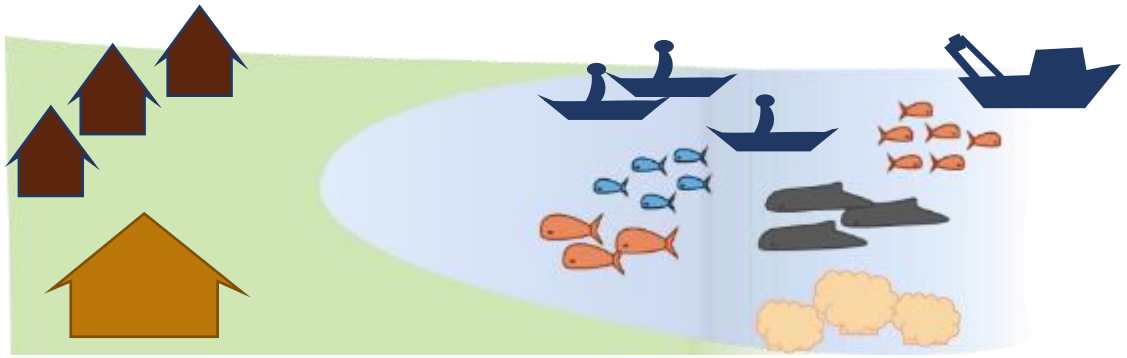
- Chan et al. 2007: When collide – human welfare and biological conservation

"…conservation must benefit the poorest not just because it is the **right thing to do**, but because it is **imperative for conservation effectiveness**"

- Marvier 2014: New conservation is true conservation

Conservation

Environmental/ Resource Management

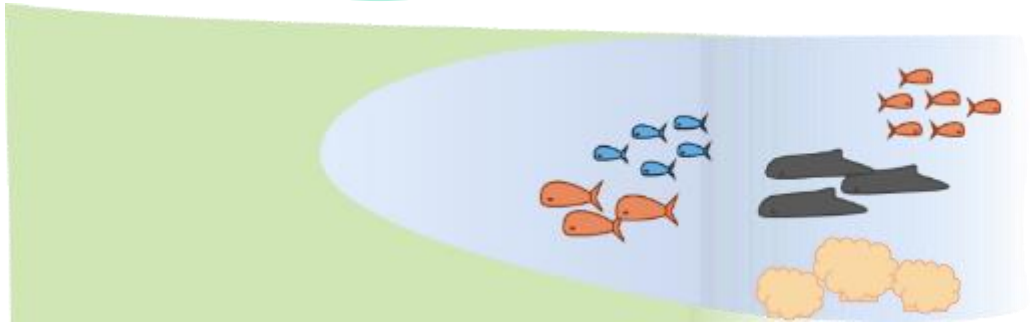


Conservation

Focus:

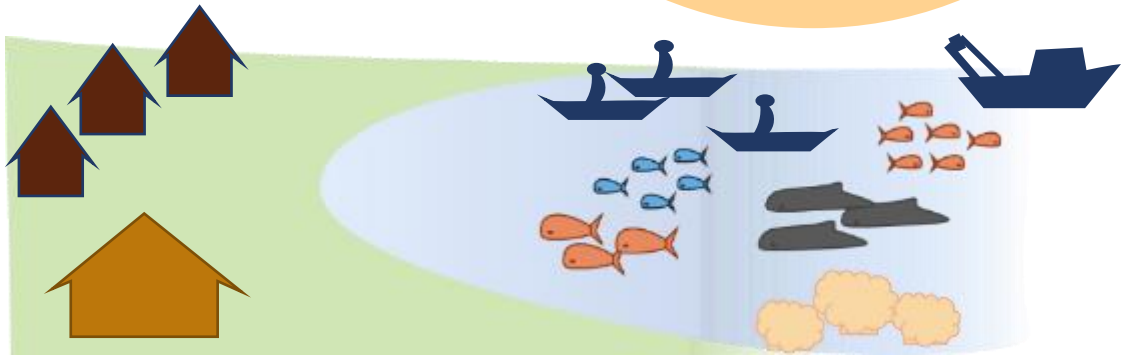
Protecting nature

- **Species**
- **Habitats**
- **Ecosystems**



The extreme form of this is called "**preservation**" – protecting things in "pristine" condition

Environmental/ Resource Management



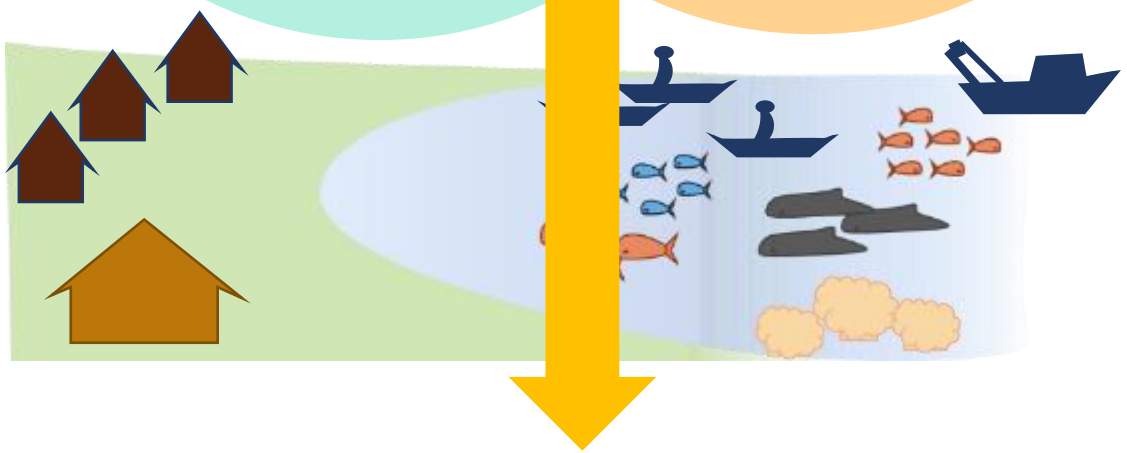
Focus:
Managing resources that people **use**

Examples: fisheries, forests

Historically, this was also called "**wise use**"

Conservation

Environmental/ Resource Management

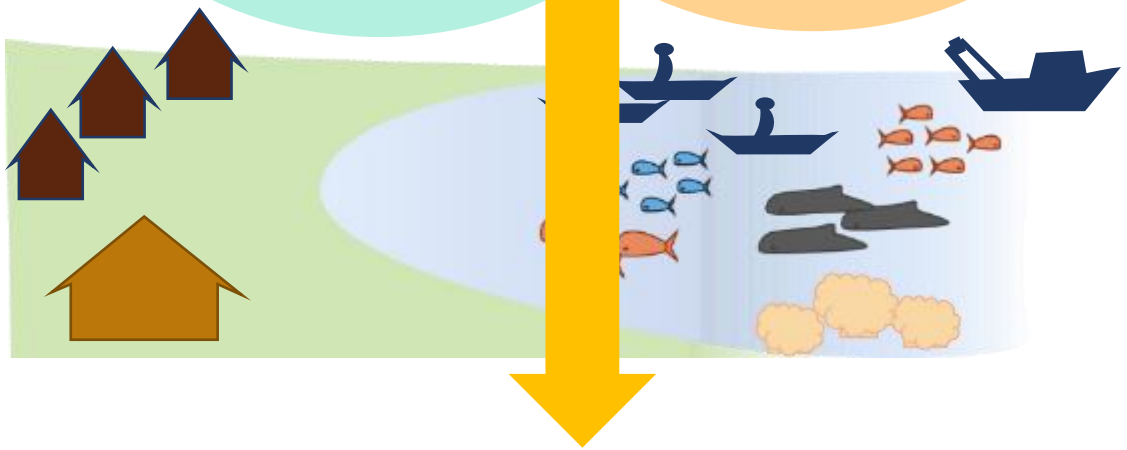


There is a lot of overlap!

- Conservation often happens in areas where people use resources
- Sometimes, people want to conserve resources because they use them – we will talk more about this later

Conservation

Environmental/ Resource Management



HELVETAS Swiss Intercooperation

Network Activities Group

IUCN

BANCA

Example: **Community-Led Coastal Management in the Gulf of Mottama Project**

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

This project aims to make the GoM a Ramsar Site

Species of interest:

Critically Endangered Spoon-Billed Sandpiper

- A focus of this project is conserving this animal
- It is threatened by hunting, and other threats in its migratory route

&

Resource management

Sustainable livelihoods in the Gulf of Mottama

- Fisheries and mud crab harvesting
- Farming
- Bird-watching training

Example: **Community-Led Coastal Management in the Gulf of Mottama Project**

THE RAMSAR CONVENTION AND ITS MISSION

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".

Example: **Community-Led Coastal Management in the Gulf of Mottama Project**

Conservation

For this course

1. Conservation aims to protect some part of nature (species, habitat, ecosystem) against threats

2. Conservation is based on human values (why we want to protect nature)

3. Conservation needs to consider human communities and social, political, and economic issues

Conservation threats

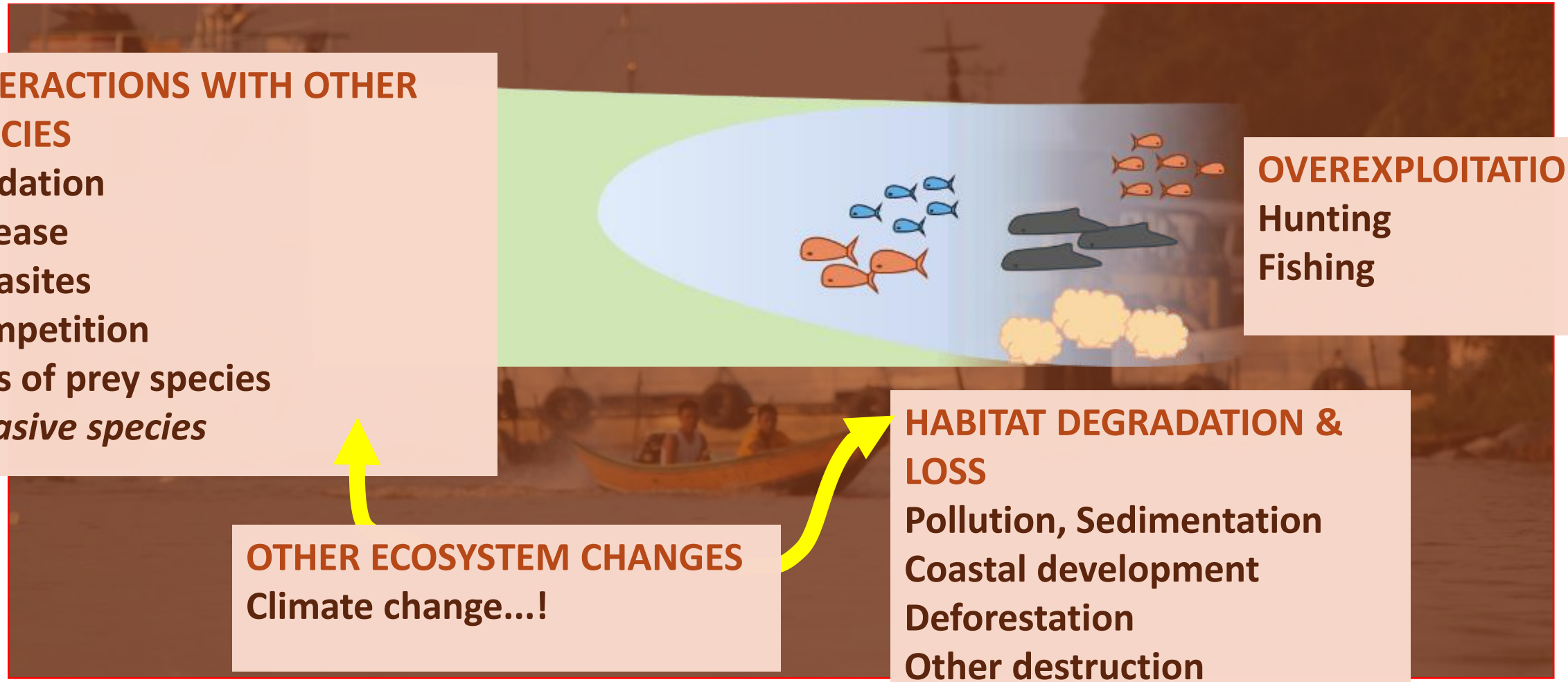
examples?

1. Conservation aims to protect some part of nature (species, habitat, ecosystem) against threats

more on Day 3

NOTE: Threats are not always human-caused!

Conservation threats



INTERACTIONS WITH OTHER SPECIES

Predation
Disease
Parasites
Competition
Loss of prey species
Invasive species

OVEREXPLOITATION

Hunting
Fishing

OTHER ECOSYSTEM CHANGES

Climate change...!

HABITAT DEGRADATION & LOSS

Pollution, Sedimentation
Coastal development
Deforestation
Other destruction

Conservation Science

"multidisciplinary" or "interdisciplinary"

how can *your* major be applied to conservation?

Ecology

Communications

Mathematics

Marine Science

Anthropology

Economics

Chemistry

Zoology

Climate Science

Geography

Geology

Political Science

Engineering

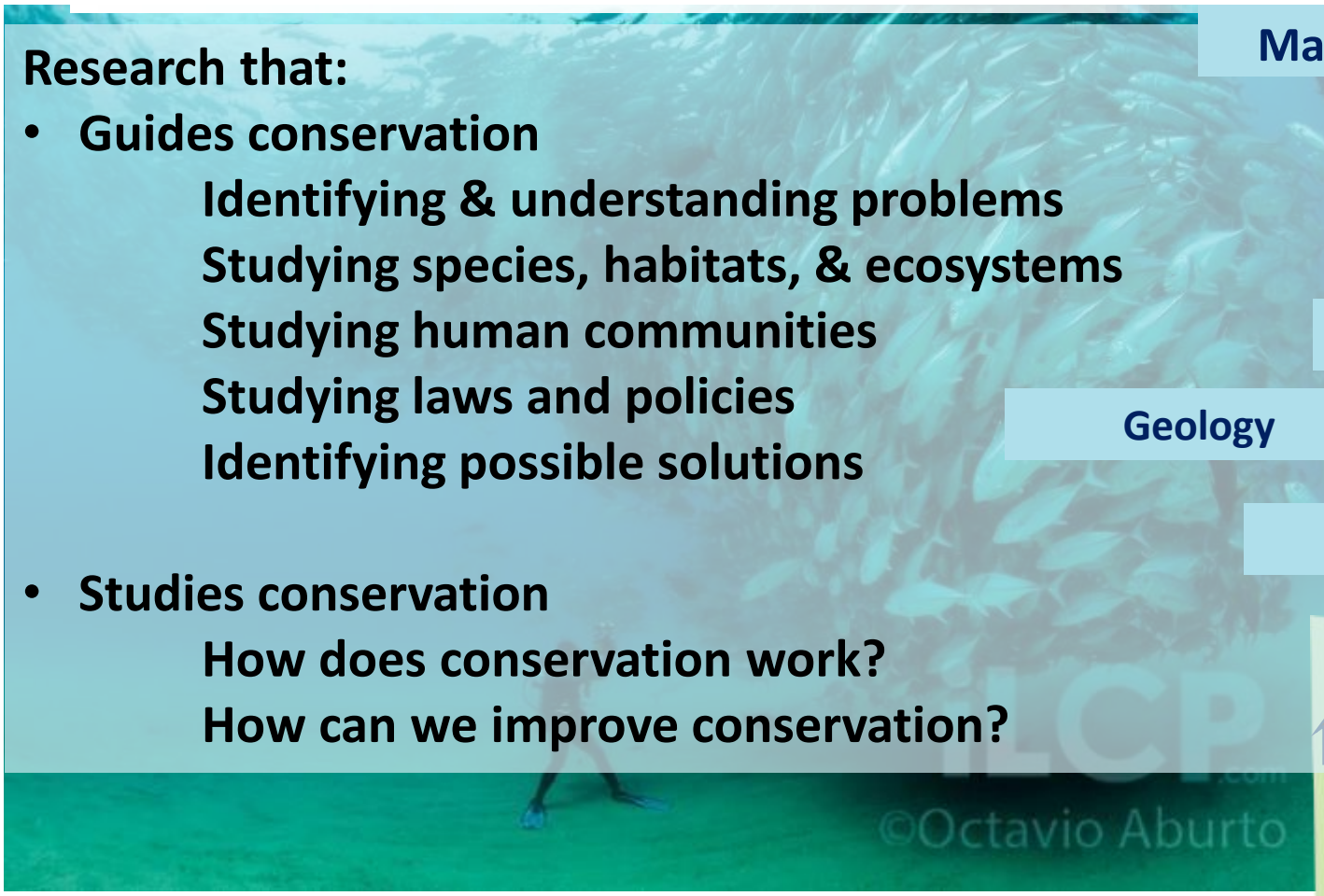
Botany

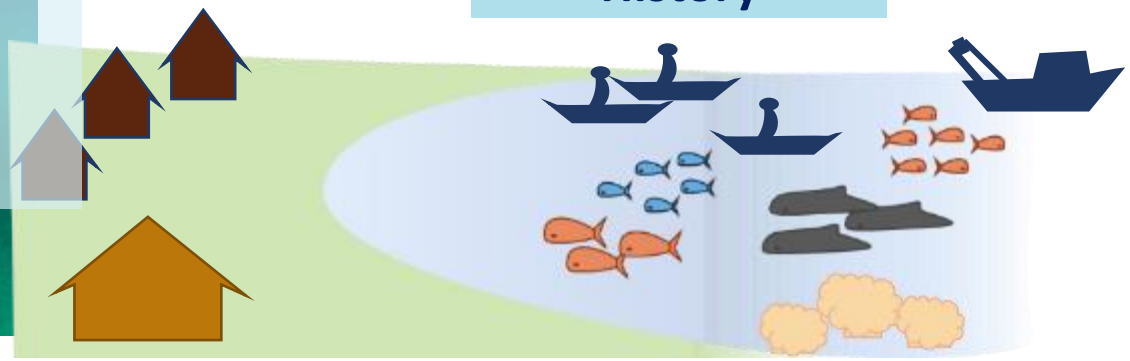
History

Research that:

- **Guides conservation**
  - Identifying & understanding problems
  - Studying species, habitats, & ecosystems
  - Studying human communities
  - Studying laws and policies
  - Identifying possible solutions

- **Studies conservation**
  - How does conservation work?
  - How can we improve conservation?

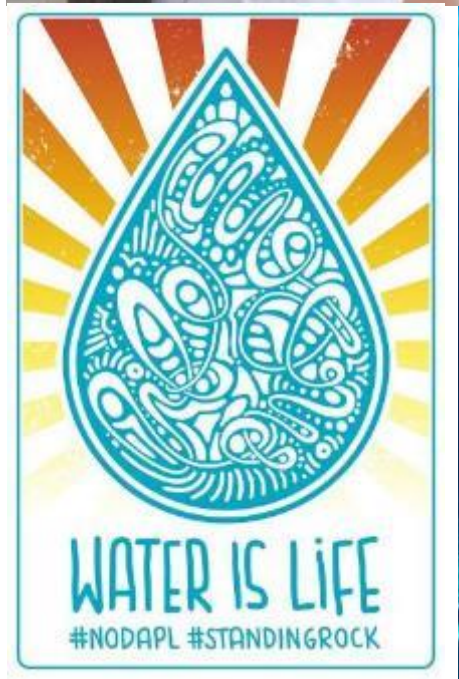




Conservation

why is this important to you?

(20 minute discussion + share)



Conservation & Values

"intrinsic" "non-use values"

Existence value

"I just like knowing that it exists"

Even if you will never see it or make money from it, it is important to you

Nature's rights

"All species have a right to exist"

This can also come from religious or spiritual beliefs

Conservation & Values

"ecosystem services" "use values"

The Millenium Ecosystem Assessment (2005) report defines 4 types of ecosystem services:

Provisioning

Regulating

Supporting

Cultural

Conservation & Values

Provisioning

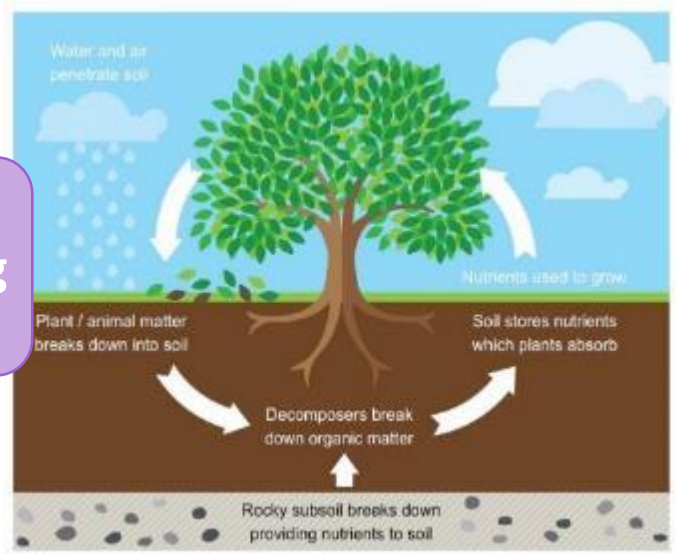
- food
- livelihood
- materials
- bio-prospecting

Provides products or goods that humans use

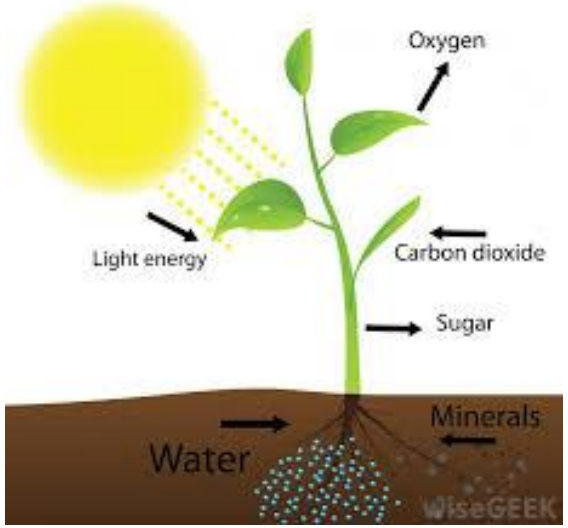
"Products obtained from ecosystems"

Conservation & Values

nutrient recycling



Primary production*



soil production

Supporting

Supports other ecosystem functions

"...necessary for the production of all other ecosystem services"

Conservation & Values

Shapes the environment

"Benefits obtained from the regulation of ecosystem processes"

- Regulating
  - coastal protection

- water filtration
- air purification
- pest & disease control
- carbon storage

Conservation & Values

Contributes to culture, spiritual needs, and well-being

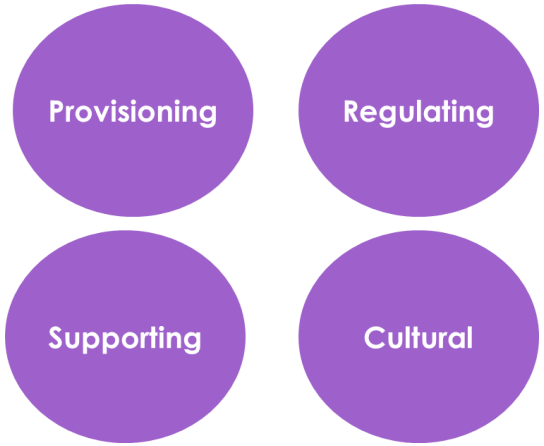
> *"Nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences"*

Cultural

- well-being
- science and education
- recreation
- spiritual links
- cultural rituals
- arts

Conservation & Values

in "environmental economics"
researchers try to calculate the $ value of these services to prove to governments that saving the environment is a good investment.



example: Mangrove valuation in Mexico
(Gulf of California Marine Program)

For local fisheries:
Each hectare of mangrove contributes USD $37,500/year

For the duck & goose-hunting industry in USA, for migratory birds that go from Mexico up to USA and Canada:

- **Each square kilometer of healthy coastal lagoon in Mexico = $1600 in hunting rights**
- **Depending on how much hunters are willing to pay to conserve this service, it could be worth $3M to $6M**

gulfprogram.ucsd.edu blog; by Octavio Aburto

Conservation & Values

So, there can be many different reasons for conservation because people have different values for nature...

...what happens when these different values are in conflict?

example: Chinook salmon vs California sea lions at the Bonneville Dam, Columbia River, USA

Conservation & Values

- A type of **chinook salmon** is endangered.
- The main causes are changes to their river habitat, but they were also caught for food.
- To help them navigate the river, there is a “fish ladder” at Bonneville Dam

They are protected under US law (the Endangered Species Act)

example: Chinook salmon vs California sea lions at the Bonneville Dam, Columbia River, USA

Conservation & Values

example: Chinook salmon vs California sea lions at the Bonneville Dam, Columbia River, USA

- California sea lions think that salmon are **delicious**
- They stay near the fish ladder where they can easily catch the salmon.

→ **This is a serious problem for the endangered salmon!**

- Managers want to shoot the sea lions who are feeding on this salmon.

California sea lions are protected under US law (US Marine Mammal Protection Act)

Conservation & Values

Endangered animal
Important for food and culture
Many threats, especially habitat change

example: **Chinook salmon vs California sea lions at the Bonneville Dam, Columbia River, USA**

so...how do you decide? Protect the sea lions or the salmon?

What else would you want to know before making your decision?

Protected, but not endangered (but were threatened in the past)
Charismatic (many people think they are cute, intelligent, etc.)
But many fishers do not like them
They are not the only threat to Chinook Salmon

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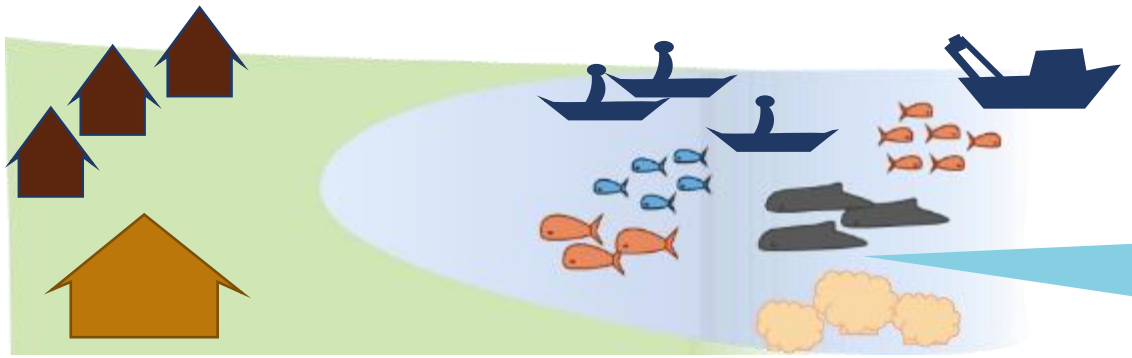
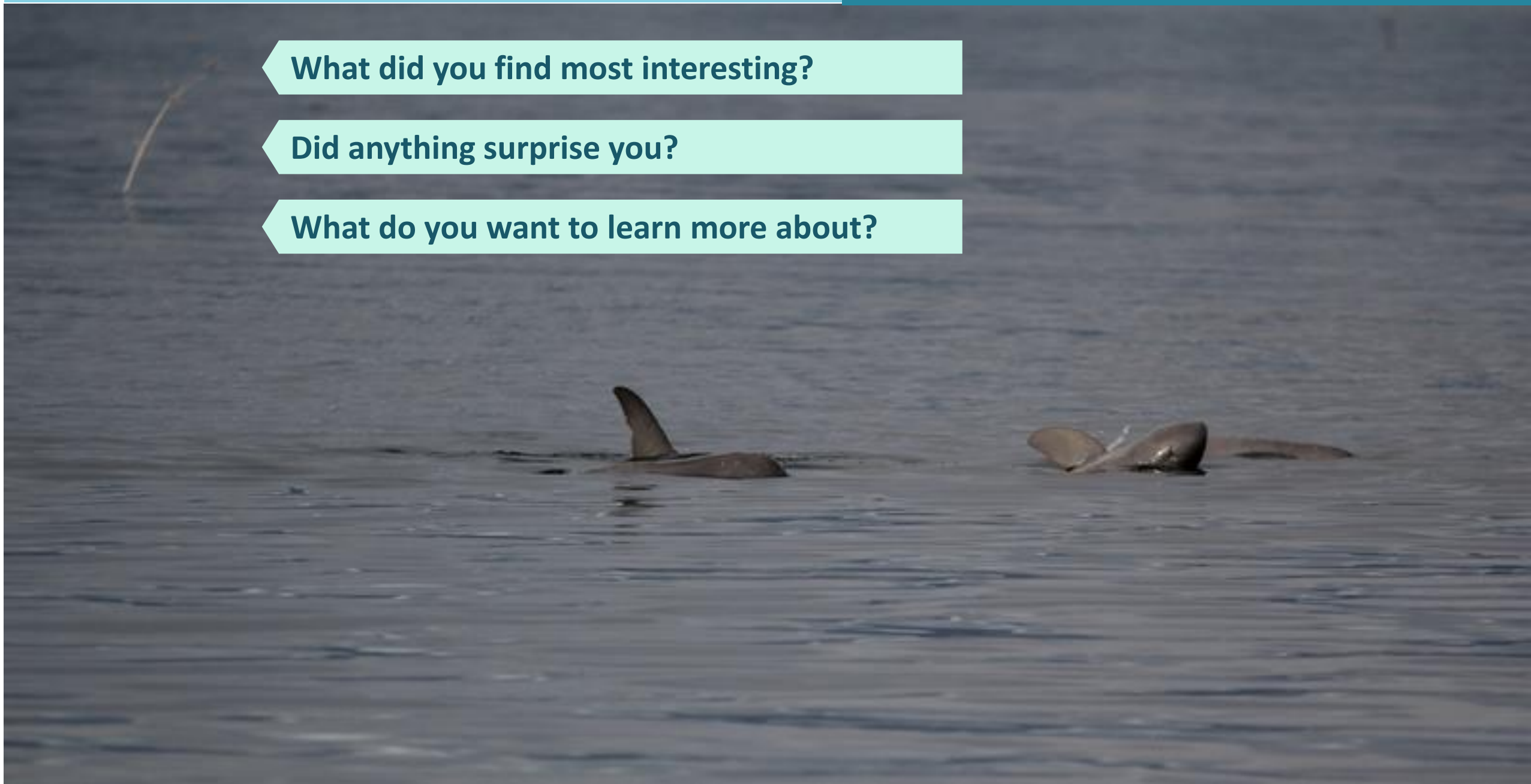


DAY 2 (3pm to 5pm)
Species
Biodiversity
Habitats
Ecosystems

QUESTIONS? COMMENTS?

Email me ☺ tara.whitty@gmail.com

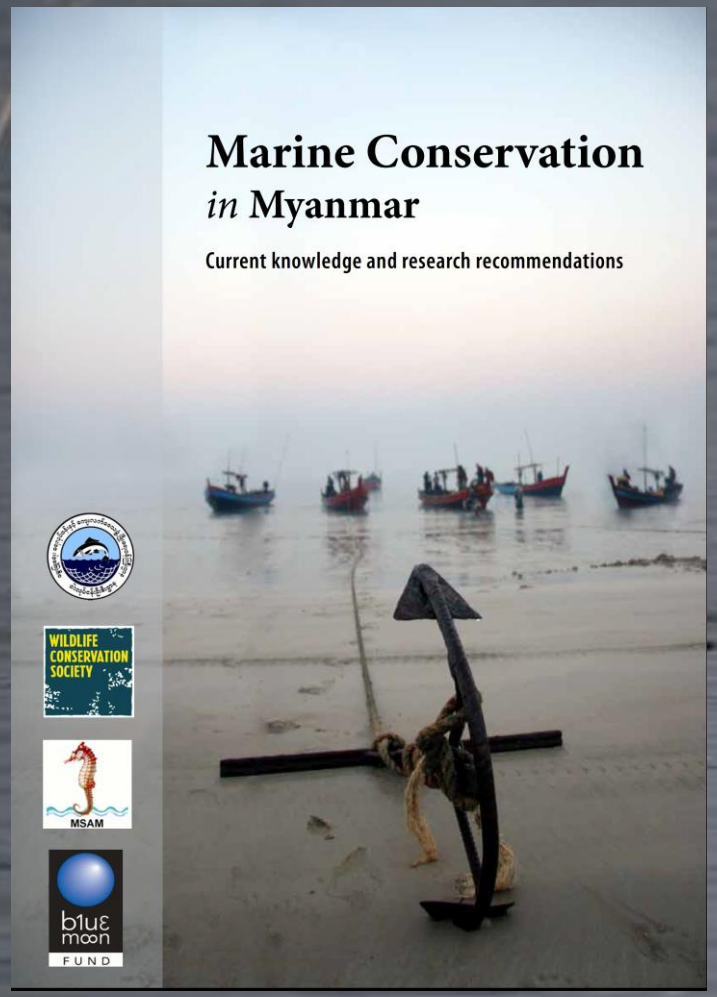


- What did you find most interesting?
- Did anything surprise you?
- What do you want to learn more about?

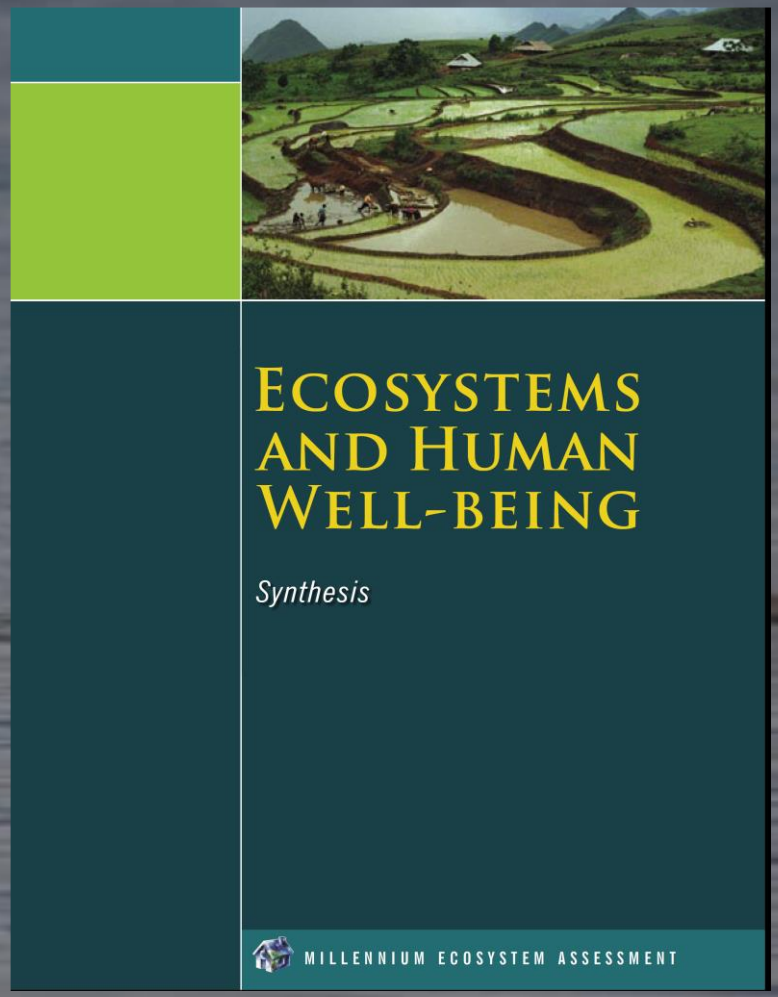
QUESTIONS? COMMENTS?

Email me ☺ tara.whitty@gmail.com

Learn More



Report on Marine Conservation in Myanmar



Millenium Ecosystem Assessment

QUESTIONS? COMMENTS?

Learn More

Textbooks: **Coming soon (we hope!)**

Academic articles: **Many! But not all are free. (try emailing the authors!)**

Websites

IUCN Red List
National Geographic
BBC.co.uk/nature
Conservation organization websites – WWF, Wildlife Conservation Society, Conservation International, The Nature Conservancy, Rare, Flora and Fauna International, IUCN

Books

(ask me for copies)
Silent Spring, by Rachel Carson
Witness to Extinction, by Sam Turvey
for children: The Lorax, by Dr. Seuss