



Name: _____

Sustainable Fishing and MPAs

> Section A) Defining Sustainability

Sustainability: A method of harvesting or using a resource so that the resource is not depleted or permanently damaged. The goal of sustainability is to use resources in ways that preserve them for future generations of humans and other species.

i) Explain why overfishing is unsustainable. How is it depleting or permanently damaging our oceans?

ii) What do you think will happen if we keep overfishing and using our ocean resources in ways that are wasteful and destructive? How will this affect us, and other communities around the world?





Name: _____

iii) How can MPAs encourage sustainable fishing practices in our oceans?





> **Section B) MPAs and the “Spillover Effect”**

The Apo Island Reserve: A Timeline

Apo Island is a small island in the Philippines that is surrounded by coral reef. As the oldest community-based MPA in the world, it has become a model to help us understand and appreciate the long-term benefits of marine protected areas.

1976 – Fishers on Apo Island were depleting fish stocks by fishing in non-sustainable ways. Dynamite was thrown into the ocean to stun or kill fish, so they would float to the surface to be scooped up. Fishers also threw rocks at the coral reefs to scare fish into a net. Both these methods of fishing were destroying the coral reefs around the island.

↓

1978 – A university in the Philippines established a coral reef conservation program to protect the reef from damage. They worked to educate locals about the health of the reef and help them understand that the ocean is a limited, not an endless, resource.

↓

1982 – The university received government approval to form the Apo Island Reserve. Almost 10% of the reef became a no-take area. Most local fishers did not support the project, and worried that it would limit their catch.

↓

1985 – The success of the reserve was evident to the whole community. Fish populations increased in the area. As healthy populations built up in the reserve, juvenile and mature fish moved out of the MPA and into nearby fishing grounds – this is called the spillover effect. As a result of spillover, fishers took in larger catches than before the reserve was created. The reserve was enlarged to include the entire reef, up to 500 metres from the shore. The original reserve area remained as a no-take zone. Fishing in the rest of the reef was limited to allow only non-destructive fishing methods. Non-residents were banned from fishing in the area completely.

↓

1994 – With the support of the national government, local fishers formed a group called Bantay Dagat, which means “watchers of the sea”. This group helps to enforce MPA regulations, and monitors tourist boats in the sanctuary in order to protect the safety of the reef.

↓

Now – Fish stocks in the area have increased tenfold, and have remained stable for over 15 years. The Apo Island Reserve has become a model for the global community to show how MPAs can help heal damaged ocean environments, and support sustainable fishing.





Name: _____

i) Explain how and why local fishers' opinions about the Apo Island Reserve have changed in the last 30 years.

ii) Explain how the Apo Island Reserve is a good example of a sustainable fishing environment.

iii) How has support from the locals been essential to the success of the Apo Island Reserve?





Name: _____

iv) Find a partner in the class. Pretend that one of you is a documentary filmmaker, and the other is a fisher from Apo Island. The filmmaker has been hired by WWF-Canada to interview fishers from Apo Island. The video footage will be shown to fishers from other parts of the world who are worried that MPAs in their area might reduce their catch. The documentary filmmaker must ask the Apo fisher five questions. The goal is to educate other fishers about the short-term and long-term effects of MPAs. Write your questions and answers in the space provided.

Q:

A:

Q:

A:





Name: _____

Q:

A:

Q:

A:

Q:

A:





Name: _____

> **Section C) The Creation of an MPA**

Divide the class into three groups. Group 1 is a conservation organization that has conducted research on an important coral reef in your community. Your evidence shows that the reef will die unless it becomes protected by an MPA. Group 2 is a government agency that must set regulations for the MPA. Group 3 is made up of local fishers who are there to reflect the interests and concerns of the community that relies on the fishing industry.

Each group should take about 20 minutes to prepare a presentation that addresses their concerns and suggestions for the MPA regulations. Then, each group has five minutes to present their ideas. Finally, all three groups must work together to decide on a list of regulations for the MPA. Draw a diagram of what the MPA will look like. Who will enforce the regulations? How will fishers be reassured that their jobs are safe? What must happen to protect the reef? What kinds of fishing, if any, will be allowed?





Answers: Sustainable Fishing and MPAs

Section A) Defining Sustainability

i) Open

- When we remove too many individuals from a population or species of fish from the ocean, there are fewer fish left to spawn and reproduce. And this leads to fewer young fish that will become mature and part of the breeding pool. Remove mature fish = remove breeding pool; remove young fish = remove fish that will replace old fish and become breeding stock. Population or species will experience a decline, making them more vulnerable to overfishing which would put them at risk and even jeopardize their survival.
- We are fishing in a way that will permanently damage fish stocks. Fishing stocks already low or in decline will not allow them to recover and will drive them to extinction.
- By wiping out species in the ocean, we are disrupting food webs and affecting interactions between species that could result in damages to entire ecosystems.

ii) Open

- The ability of the ocean to dilute pollution can be seen as an essential service, but too much toxic pollution can build up in the bodies of fish and of marine mammals like whales, dolphins and polar bears, hurting both the animals themselves and the people who eat them.
- Mining in the ocean, removing sand and gravel or drilling for oil and gas can destroy habitat and lead to pollution.
- Sometimes people remove corals, seahorses and other marine species to sell as souvenirs or in the aquarium trade. If too many are taken, the species can become endangered and we lose the chance to enjoy them in the future. This can also harm the other species connected to them in the ecosystem.
- Many tourists travel to enjoy marine species like whales, birds, fish and corals. If they are gone, the tourism industry and the people who work in it would suffer.
- Sometimes tourists and boaters damage marine species, like corals, by walking on the reef, taking home shells or dropping an anchor. This kind of irresponsible use can mean that the species will not be there to enjoy in the future.
- Overfishing will wipe out species, upsetting the balance of the ocean ecosystem in ways that it can't recover.

Canon



Answers: Sustainable Fishing and MPAs

(continued)

- Pollution will wipe out species and contaminate the world's water supply.
- Millions of communities around the world depend on fish for food and livelihood; without resources from the ocean these communities would collapse.

iii) Open

- By protecting spawning and nursery grounds, we can ensure that more fish will survive to maturity and reproduce, therefore helping to establish healthy fish populations.
- The eggs, larvae, juvenile and mature fish will often move into areas where fishing is allowed, which means communities will benefit from bigger and more plentiful catches in the future.

Section B) MPAs and the “Spillover Effect”

i) Open

- Fishers often fear that MPAs will result in smaller catches because they restrict fishers from harvesting seafood from traditional fishing grounds.
- However, within a few years of establishing the reserve, fishers from Apo Island noticed that fish stocks were increasing, and their catches were growing.
- From then on, local fishers have not only supported the reserve's growth, they have become active enforcers of reserve regulations as “watchers of the sea”. Local buy-in and support is key to its success.

ii) Open

- Fishers respect and support the no-take zone, a key to the success of the MPA. This allows fish to spawn, hatch and grow in the reserve without human disruption.
- As a result, more fish reach maturity and spill over into surrounding fishing grounds.
- Destructive fishing techniques were banned, which protect species but also safeguards the habitats that are necessary to the survival of these species.
- In the last 15 years, stocks have remained stable and healthy. This also means security for the fishers and is testament to the effectiveness of MPAs and the benefits they can offer.

Canon



Answers: Sustainable Fishing and MPAs

(continued)

iii) Open

- Community involvement has ensured the success of the project because locals understand, support and help to regulate the rules.
- Local fishers provide much needed understanding about the fishing areas, and their input helps conservationists understand more about the species who live there.
- Locals have the knowledge, access and interest to keeping the project alive and thriving. They, more than anyone else understand the importance of preserving the area.

Canon