Habitat Destruction

Litter

Climate Change

(*The last Polar Bear* by Gerard Van der Leun is licensed by CC by-NC-ND 2.0)

Pollution (Image: Chris Jordan)

Overfishing

(fish2172, by C. Ortiz Rojas NOAA's Fisheries Collection, http://www.photolib.noaa.gov/htmls/fish2172.htm)

Bycatch

(Bob Fisher moves a cownose ray, which was caught as bycatch off the coast of Virginia by Virginia Sea Grant is licensed by CC by 2.0)

Activity 4 # Five pressures on our seas

litter sewage marine life plastics oil chemicals poison food web	pollution
disrupts growing demand depletes stock ecosystem	overfishing
warming seas primary producers acidic corals plankton	climate change
nurseries young fish trawling ecosystem dredging destroying ocean health	habitat destruction
Sharks tuna endangered predators food web decline lost habitat destruction pollution	predator loss

Activity 5

Marine animal role play cards

seal	*I am a seal. I am a curious animal who likes to poke my long nose into small places and I love to explore things I find floating in the water.*	lobster	*I am a lobster. I crawl inside things to find food and sometimes I get stuck.*
sea bird	*I am a sea bird. I sometimes mistake small pieces of plastic for my prey. It makes me feel full.*	fish	*I am a fish. If I get covered in oil from an oil spill it can clog up my gills.*
turtle	*I like to eat jellyfish. I have to be careful not to mistake a plastic carrier bag for a jellyfish.*	whale	*I am a whale. I like to take big gulps of water so that I can filter krill from it.*
dolphin	*I am a dolphin. If I get tangled in an old fishing net it will mean that I can't swim fast and can drown.*	crab	*I am a crab. I must be careful not to get my pincers tangled in old fishing tackle.*

Activity 7 Role Cards for 'Arran Marine Protected Area'

1. Chairperson
Your role is to chair the public meeting and to keep order so that everyone who is supposed to speak gets a chance to do so. You can draw up a timetable. You will need to gather information about each of the groups and individuals so that you have some idea of how people are thinking. You have to sum up and supervise the voting at the end of the meeting. You are a Community Councillor so you are used to being in charge and are good at keeping control.

2. Tour Boat Operator
You own a RIB and take groups of tourists ultimately out to see the seabirds at Ailsa Craig and travel through the proposed Marine Protected Area. You have been making a lot of money lately and want to see your business continue to thrive, so you support the proposed Marine Protected Area around southern Arran as anything that's good for wildlife is good for business.

3. Commercial Fishing Organisation Officer
You spend your time talking about fishing, and want to see commercial fishing people with good access to their traditional fishing grounds. You have accepted that you need to talk with conservationists but think everyone is pushing 'nature' too much. You have already agreed to the regulations controlling the size of nets, where these can be placed, and where trawlers can go. You are not prepared to see the southern part of Arran become a restricted area to trawling.

4. Professional Trawler Operator
You own a trawler operating in the locality. You are sick of being told what to do: you have had to change the size of your nets and where you place them, and are worried that restrictions are going to be placed so that you can only fish xx kilometres offshore. You want to fish just offshore as that is where most fish are. You are sorry that the sea bed gets damaged by the trawling equipment, but if lines and ropes and plastic bags used for bait fall overboard, well, that's life and you have to make a living.

5. Original Island Landowner
You are a descendant of the Hamilton family who used to own the whole island. The sea and land traditionally belonged to you and your family and you believe that you have a right to be involved at the decision-making level rather than being consulted along with the others as just another interested party. You are concerned about the area and do not want more development to go ahead as it may impact upon the cultural areas of significance to your family. You think that the proposed Marine Protected Area is too narrow.

6. Regular tourist
You are a tourist who has been coming to the island for over 30 years. You used to take part in the Sea Angling Festivals every year as a child until they ceased in the 1980s. It concerns you that this kind of event can no longer takes place as there just aren't enough fish left in the seas. You are saddened that you won't be able to participate in this kind of Festival with your children, like your parents did with you.

Activity 7 Role Cards for 'Arran Marine Protected Area'

7. Marine Scotland Officer
You represent the Minister for the Environment and have to wait to see how people react to the proposal. The ideas in the proposal were originally put forward by you so you know a lot about it and try to persuade everyone to agree with it.

8. Tourist Developer
You own a lot of land around the Arran shore, and want to see tourism expand. You spent a lot of time in the United States looking at hotels, motels and marinas and are keen to see more shops, more boats and more activity in Lamlash Bay and around the south end of Arran. You know that the marine environment has to be protected as it is the draw card for tourists but, after all, everyone has to make money.

9. Otter Conservation Society
You are the representative of the organisation which specialises in otter watching, conservation and providing information to the public. You have travelled all over the world looking at otters and are very knowledgeable about them. Nothing should happen to these mammals who are only just increasing in numbers after years of decline. You would like the whole proposed Marine Protected Area as a Marine Park with no zones for fishing or entry, and you would really like all boats to be kept away if possible too.

10. Countryside Ranger
You have been on Arran at Lamlash Bay for two years and spend most of your time keeping tabs on any fishing in the No Take Zone, supervising the rescue of injured animals caught in plastic, and in reporting pollution to your office. You think fishing needs to be kept well away from the marine life, and don't want any more tourists. You feel the kelp forests, a vital habitat outlined in the proposed Marine Protected Area, need to be protected as they provide valuable fish breeding habitats.

11. North Ayrshire Town Planner
You are the local planner from North Ayrshire Council and are a bit confused as to what the best thing would be. You are knowledgeable about land use, but you don't know much about water around Arran except that it is 'salt'. You have never been in a boat, and are frightened of anything that is connected with the sea. You are happy to see the Marine Protected Area go ahead so do not mind tourists, developers etc., so long as they follow the rules.

12. Scientists - seal Expert
You are a well-known expert on seals and have just completed your PhD on these mammals. You know lots about their food, and haul out areas, and know how important the haul out area at Kildonan is for the local population. You think there is insufficient protection for fish in the area and you are aware that fishermen from outside Arran tend to take far less care than local fishing boats. You like otters too but think that seals deserve more fuss.

13. COAST member
COAST has been the main driving force behind the MPA and wants it to pass through. However, you do not agree with the government's recommendations to allow trawling and dredging inside the MPA. You believe that the fishermen should prove that destructive methods of fishing are not harmful to certain habitats before they are allowed to fish inside the MPA. You are very passionate about the marine environment, but you must maintain professionalism, to ensure you remain on good terms with different members of the community and government.

14. Resident from the North side of the Island
You are from Pirnmill and enjoy diving, boating and fishing. You would like to know why the whole of the Island isn't included in the MPA as you often see dredgers just outside your house. You also want to make sure that you are still allowed to angle, sail, kayak and dive inside the MPA.

15. Arran Natural History Society
You represent the Arran Natural History society who would like to know why there are not more birds protected in the MPA. There is only one species protected, out of all the sea bird species on Arran. The rest are supposed to be covered by other legislation but it hasn't worked. You are very frustrated that the birds are being ignored.

16. Commercial Fisherman- Creeler
You fish for lobster using lobster pots, a method that of fishing that will be allowed inside the MPA. You want the MPA because of the negative effects trawling and dredging has on the sea floor and your lobster stock. You have also been helping researchers studying the NTZ in Lamlash and have seen the positive results.

Activity 8a

Shore litter survey sheet

Beach location:

Type of litter	Number found
Plastic bottles	
Plastic bags	
Other plastic	
Fishing line, ropes and nets	
Paper	
Glass	
Metal	
Pottery/china	
Tyres	
Polystyrene	
Other	

How do you think some of these things will affect wildlife?

For example, a small crab could get entangled with a piece of fishing net and this would restrict its movement. ***How would this affect the crab?***

Do some research on the internet to find out about other ways animals are affected by litter.

Activity 8b

No more rubbish!

Marine litter causes real problems for wildlife and because it is mostly made of plastic, metal or glass it does not break down quickly. Even when the plastic has broken down it is still there in our seas in tiny little pieces which get into the food chain. ***Find out how long each of these things will take to break down.***

Object	Length of time	Object	Length of time
waxed milk carton	3months	plastic bottle	
newspaper		tin can	
6 pack plastic ring		newspaper	
fishing line		glass	
polystyrene cup		woollen hat	
apple core		cotton buds	
aluminium can		cardboard	

Do some research on marine litter (debris) and prepare a talk to deliver to your class.