



CSPE Lesson Plan

Biodiversity and Wetlands

Introduction

Wetlands are a vital component of the water cycle. The complex interaction of their elements - water, soil, plants and animals fulfil many important functions and provide vital ecological services. Wetlands are providers and users of water. They maintain their structure and functions, and they provide water for us and other animals and plants. Ireland is one of 160 Contracting Parties to the Convention on Wetlands which first convened in Ramsar, Iran in 1971, and is since called the Ramsar Convention. This intergovernmental treaty embodies the commitments of its member countries to maintain the ecological character of their **Wetlands of International Importance** and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories.

This lesson highlights the importance of wetlands to local communities. It encourages students to become active citizens through thinking about how development affects individuals within their local community. It also encourages students to use information to develop arguments, debate issues and allows them to participate in a democratic election.

Curriculum Link

- Stewardship of the Environment
- Law - Why vote & How to vote (Elections)
- Community Development/Action:
- Interdependence

Aim

- Encourage students to think about how local communities are affected by development.
- Give students the skills needed to become active participants in their communities.
- Students will apply the knowledge they have learnt about wetlands to individuals (in the role play) and develop an argument based on that information.
- Students will take part in a democratic vote.





Materials

- Comprehension Sheet
- Role Play cards
- Wetlands Benefits - hand out

Introducing the topic

- Ask students if they can explain the terms – wetlands and biodiversity.
 - Wetlands: An area of land that is saturated with water either permanently or seasonally – e.g. turlough, fens, bogs.
 - Biodiversity: The variability among living organisms from all sources, including land based and aquatic ecosystems, and the ecosystems of which they are part (animal and plant life in an area).
- Are there any local wetlands in your area?
- Begin by telling students that: rivers, lakes and other wetlands provide us with a variety of benefits that help our economy and which are valuable.
- Ask students to brainstorm how they might be useful. Possible answers include:
 - transport
 - drinking water
 - water for agriculture and industry
 - waste assimilation
 - flood protection
 - fishing
 - recreation
 - regulation of the water cycle
 - nutrient cycling
 - sediment capture and fertilisation of flood plains





Watch the Biodiversity and wetlands clip and complete the comprehension exercises.

Comprehension

1. What are the two main types of wetlands mentioned in the clip?

2. Name some of the species which live in the wetlands mentioned.

3. What is the main type of pollution which is harming the wetlands?

4. What damage is this causing?

5. "The Current decline in wetlands is comparable or equivalent to major extinctions in history" – what is meant by this?

6. What did the research team expect to find before they surveyed the wetlands?

7. What did they find out?

8. What benefits do wetlands provide for the area in which they are located?

9. Why are farmers draining their land?

10. What could be done to encourage farmers to protect the wetlands on their land?





Classroom Debate

Required materials:

- Role Play Cards
 - Copy of 'Benefits of Wetlands' hand out for each student
 - Organise class in to 15 groups (less can be used if needed).
 - *A chairperson and a secretary will be needed - these roles can be assigned later or carried out by the teacher.*
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- Explain to students that a planning application has been made to the local town council to build a new housing development very close to the site of the local wetland. Give each student the handout on 'Benefits of Wetlands'.
 - Loch Alainn Reserve is a local lake with areas of fen and bog with pathways. It attracts a lot of tourists, particularly during the summer months. The locals walk there and many of the local teenagers and children take part in the windsurfing and sailing club.
 - The proposal before the council is for a new housing estate "Loch Alainn View" with one hundred homes (50 three bedroom, 50 four bedroom) and one small block of apartments (six one bed units). The developer, Mr. King, proposing to build the land is a well-known local who has lived in the area all of his life.
 - Encourage students to think about the potential impacts of a housing development. Try to elicit answers such as: disturbance from construction, draining of wetlands to build, pollution from septic tanks, the visual impact on a place of beauty, the increased demand on the locality – shops, schools, doctors etc., Brainstorm to board so that the information is on view for remainder of the discussion (add to as new ideas emerge during the discussion).



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- Working in pairs each group will be given a role and must decide how the development of the housing estate will impact on them and their community. Working together they will fill in the card and come up with an argument for/against the proposed development (this could be a homework exercise for debate in the next class, if being given for homework, encourage students to research the topic on the websites listed in follow-on activities).
- They will then attend a town meeting where a discussion will be held on the issue. One person from each group must speak on behalf of that person outlining their argument for / against.
- After listening to all sides of the debate (chaired and recorded) a vote will be held to decide whether the housing estate should go ahead.





Follow on activities

- Are there any developments which have impacted on the local community?
- Are there any developments which would be beneficial to the community?
- Where is the closest area of wetlands?
- Is it protected? Should it be protected? Research Special Areas of Conservation (SAC's)
- Links:
 - www.irishwetlands.ie
 - www.epa.ie
 - www.conservation.ie/Habitatcons
 - www.npws.ie
 - <http://www.npws.ie/publications/leaflets/>
 - www.ipcc.ie
 - <http://www.heritagecouncil.ie/wildlife/publications/>
 - <http://www.antaisce.ie/naturalenvironment/NaturesWayBooklets.aspx>
 - <http://www.fisheriesireland.ie/>

Suggested Homework

- Draw a poster to encourage people to enjoy and protect their local wetlands.
- Write the talk you would give to a local tourism committee highlighting the economic and environmental importance of wetlands to the area.
- Write a list of all of the developments you would like to see in your area – how would they benefit the community?
- What developments do you think were a bad idea – why?
- What are the local issues that you feel the local community should have a say in.

Possible Action Projects

- Invite a guest speaker from the local council to explain the planning process and how the community is involved. Past planning processes etc.
- Organise a local awareness campaign highlighting the importance of local wetlands to the community.





Role Play Cards

Name: Mr. Smith
Information: Local builder, Mr. Smith has been out of work for the past three months.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: <i>(think about your job, your home, your family, your environment etc.)</i> <ul style="list-style-type: none">• _____• _____• _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Brown
Information: Local hotelier. The wetlands draw a lot of tourists to the area for fishing, boating and birdwatching.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: <i>(think about your job, your home, your family, your environment etc.)</i> <ul style="list-style-type: none">• _____• _____• _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mrs. Jones
Information: Mrs. Jones moved from the city to live in a more rural community after her city home was flooded for the second time. She enjoys walking.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: <i>(think about your job, your home, your family, your environment etc.)</i> <ul style="list-style-type: none">• _____• _____• _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Ms. O'Brien
Information: Ms. O'Brien has four grown up children, all of them have had to move away from the local area in search of employment. They would like to live in the area but it is difficult to get good housing.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Jennings
Information: An environmental activist and a keen birdwatcher. He runs birdwatching weekends in conjunction with the local hotel.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Miss Miller
Information: Principal of the local primary school. The school is in danger of losing a teacher due to a decline in pupil numbers.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Finnerty
Information: Runs a local organic farm, produces organic products. Cuts turf from the local bog.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Greene
Information: A local farmer, has a very large contract with a major shopping chain. Does not mind using nitrates in his farming.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Ms. Jennings
Information: Local shopkeeper
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Miss Walsh
Information: Local butcher
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. King
Information: Property Developer. Owns the land near the wetlands. Has made the proposal.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment, etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Ms. Donohoe
Information: Has recently built her 'dream home' on a site near the proposed development. She lives there with her husband and three young children.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Fahy
Information: A recently retired policeman. He now spends his time fishing and walking. Cuts turf from the local bog – his family have done so for many generations.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Grant
Information: Owns a holiday home in the area. Spends every weekend and summer there.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment, etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Mr. Ryan
Information: Owns and runs a B&B in the local area.
I think that the development <i>should/should not</i> go ahead.
This development will affect me in the following ways: (<i>think about your job, your home, your family, your environment etc.</i>)
<ul style="list-style-type: none"> • _____ • _____ • _____
Therefore I would strongly urge people to vote <i>against / in favour</i> of the proposed development.

Name: Dr. Jacob

Information: A research student/scientist studying carnivorous plant species found in the bog. His findings have been published on: <http://www.ipcc.ie/a-to-z-peatlands/carnivorous-plants-killers-in-the-bog/>

I think that the development *should/should not* go ahead.

This development will affect me in the following ways:

(think about your job, your home, your family, your environment, etc.)

- _____
- _____
- _____

Therefore I would strongly urge people to vote *against / in favour* of the proposed development.



Benefits of Wetlands

- Rivers, lakes and wetlands provide us with a variety of benefits that help our economy and are valuable. These include:
 - transport
 - drinking water
 - water for agriculture and industry
 - waste assimilation
 - flood protection
 - fishing
 - recreation
 - regulation of the water cycle
 - nutrient cycling
 - sediment capture and fertilisation of flood plains
- Most of the benefits above depend on our water being good quality. This allows water to be used for drinking, fish production, recreation and amenity. If our wetlands have a high level of biodiversity (animal and plant life) this tells us that the water quality is good.
- If water is polluted, it is possible to clean up rivers and lakes to some degree. Rivers such as the Thames or Liffey are cleaner than they were in the past. However, restoration takes time and costs money. The main causes of water pollution in Ireland are agricultural and sewage.
- Pollution by nitrates is a threat to both human and wildlife health and considerable amounts of money are being spent to reduce this risk. For example over one billion euro has been invested over the past ten years under various schemes including the Farm Waste Management Scheme and the Farm Improvement Scheme. Biodiversity can make a difference as many species found in rivers, lakes and wetlands are involved in recycling nitrates before water filters down to groundwater, which we use for drinking water.



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- In Ireland, peatlands are one wetland feature of the landscape. Peatlands act as a sponge, absorbing water at times of high rainfall and acting as a defence against flooding. Clearing up after flooding and fixing the damage to property and farm land costs money.
- Mosses are good at absorbing water and are used for this in horticulture and gardening. Peatlands and their vegetation regulate the flow of water with economic and social benefits. They are also very valuable in terms of biodiversity.
- Peatlands are of major benefit in off-setting global warming. Although they do release methane, a greenhouse gas, they also act as carbon store, without which huge quantities of CO₂ would be released into the atmosphere. If peat is burned as a fuel this carbon is released.

