

As agriculture, industry, oil and gas developments, mining, forestry and cities continue to grow, demands to develop and drain wetlands will continue. This will lead to some big challenges: how can we develop the land and protect wetlands at the same time? Is this even possible? Can we find a way to balance our desires for a healthy economy while conserving ecosystems that are so important? Part of the solution may be wetland mitigation. You will learn more about this as you read on.

We know that if a wetland is drained, there is loss of habitat: water, food, shelter and space, and many other important features are lost. We also know that a wetland can be affected when the land surrounding the wetland is developed. For example, how can a wetland become a good home for ducks if the upland habitat or the surrounding riparian area were not there to provide nesting areas, feeding areas or shelter? If the riparian area is destroyed, what will stop sediment from washing into and filling in the wetland?

Wetland mitigation is based on the understanding that the environment and the economy are closely linked. While we know that the environment will change because of human development and natural forces, we also know that we cannot continue to lose wetlands. Mitigation tries to encourage people to conserve the wetland ecosystem as a whole: the water, the riparian and the upland. One of the most important parts of wetland mitigation is that it tries to make sure there is no overall loss of wetlands.

So, when the loss of one wetland cannot be avoided, we want to restore, create and enhance (improve or make better) a wetland somewhere else. Preferably, a wetland will be restored, created or enhanced very close to where an old one is damaged or destroyed. If not nearby, it should at least be in the same watershed. And it should be at least as large, if not larger, than the one destroyed.

**Mitigate:** *to lessen or minimize the severity of a loss or damage; to make an action not quite as bad as it could be.*

Wetland mitigation uses a three-step approach. You may use one, two or all three of these approaches when you debate the fate of the wetland in the "No Wetland Loss" Challenge!

### **The three-step approach of mitigation is:**

#### **1. Avoid** impacts:

- a. The best option for conserving wetlands and their functions is to leave them alone! Over centuries, wetlands have adapted to the landscape that surrounds them. It would take many years for them to recover from disturbance or for the surrounding landscape to recover from their loss.
- b. Avoid disturbing wetlands of high quality that are unique, or are of national or international significance.
- c. Choose developments that will not affect a wetland, or choose a different design or a different site for the project.

2. **Minimize** unavoidable impacts:

- a. If the project must go ahead, reduce any harmful effects on the wetland to a minimum. Consider all stages of the project, including planning, design, building, and monitoring the wetland afterward.

3. **Compensate** for impacts that can't be avoided:

- a. Compensate means to do something to make up for a loss. In mitigation, compensation should be a last choice after the first two options — avoid and minimize — are considered. It is used to make up for any loss of wetland functions or values that could not be avoided.
- b. It means that if a wetland were damaged or destroyed in one spot, then a wetland that was drained some time in the past is restored.
- c. The compensate option allows for wetlands to be restored or improved at another site. It's a good option for bringing an old wetland "back to life." Creating brand new wetlands where they never existed in the past is not a good choice because it is very difficult to replicate a natural wetland.
- d. Protecting a wetland somewhere else does not count under compensation because it would not make up for the loss of wetland functions and values if an existing wetland were destroyed.

**Monitoring** means to evaluate a project over the long term. Monitoring is always an important part of mitigation, of any project, so that it can be evaluated for its success or failure.

**Monitor:** to check the quality or content or to test or sample on an ongoing basis. It is similar to writing an exam in that the teacher can test or evaluate your work or your knowledge. Monitoring occurs over a period of time. Your teacher monitors your work and behaviour each day and summarizes your performance on report cards, parent-teacher interviews, frequent tests, class activities, and in other ways. For newly created, restored or disturbed wetlands, they should be monitored to make sure that they function like a wetland should.

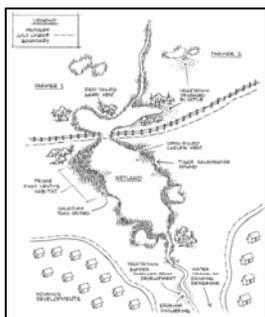
Teacher reads to class:

“A community is considering what to do about a proposal that affects a local wetland. A town on the Alberta prairies has just received a request to develop a golf course. The developer has completed all the necessary forms and is hoping to get permission to start building. The golf course would be located between a wetland and a new housing development. Up until now, the wetland has been untouched. But if the golf course proposal is accepted as it is written, the values and functions of the wetland will be destroyed. More than one half of the wetland falls within the proposed boundary of the golf course. There are already new housing developments in the area and, as a result, some of the smaller wetlands have been lost. Some people are very excited about the prospect of having a golf course so close to home, while others are very upset. A meeting is being held to discuss the proposal.

You are going to receive information in the form of a role-play card. When you receive the card, read it carefully to yourself. Next, you will be asked to introduce yourself to others in your group. To do this, read the information printed above the line on the card out loud to everyone at your meeting. All of the information below the line is for you to think about and to use to develop an argument for the position or “side” you are taking.

When you are doing research for your role, answer the following questions. This will ensure you have enough information so that you can participate in the debate.

When you research these questions, pretend you are playing your role. How would your character answer these questions?”



**Tip:** Make a transparency of the wetland map (enclosed in this electronic folder) and project when discussing or make copies for students.

## Research Questions

1. **Avoidance** - Is a golf course the best way to use the land that is currently occupied by natural plants and a wetland? Is there anywhere else the golf course could be located? What could you do to educate your neighbours about wetlands?
2. **Minimization** - If the golf course must be built on and near the wetland, can it be built or designed in such a way to reduce impacts on the wetland? Will your livelihood (how you earn a living) be affected?
3. **Compensation** - If it is not possible to avoid damaging the wetland, suggest how to improve wetland habitat in other locations, or how to enhance or restore what may be left of the original wetland. Would you agree to restore a nearby wetland?

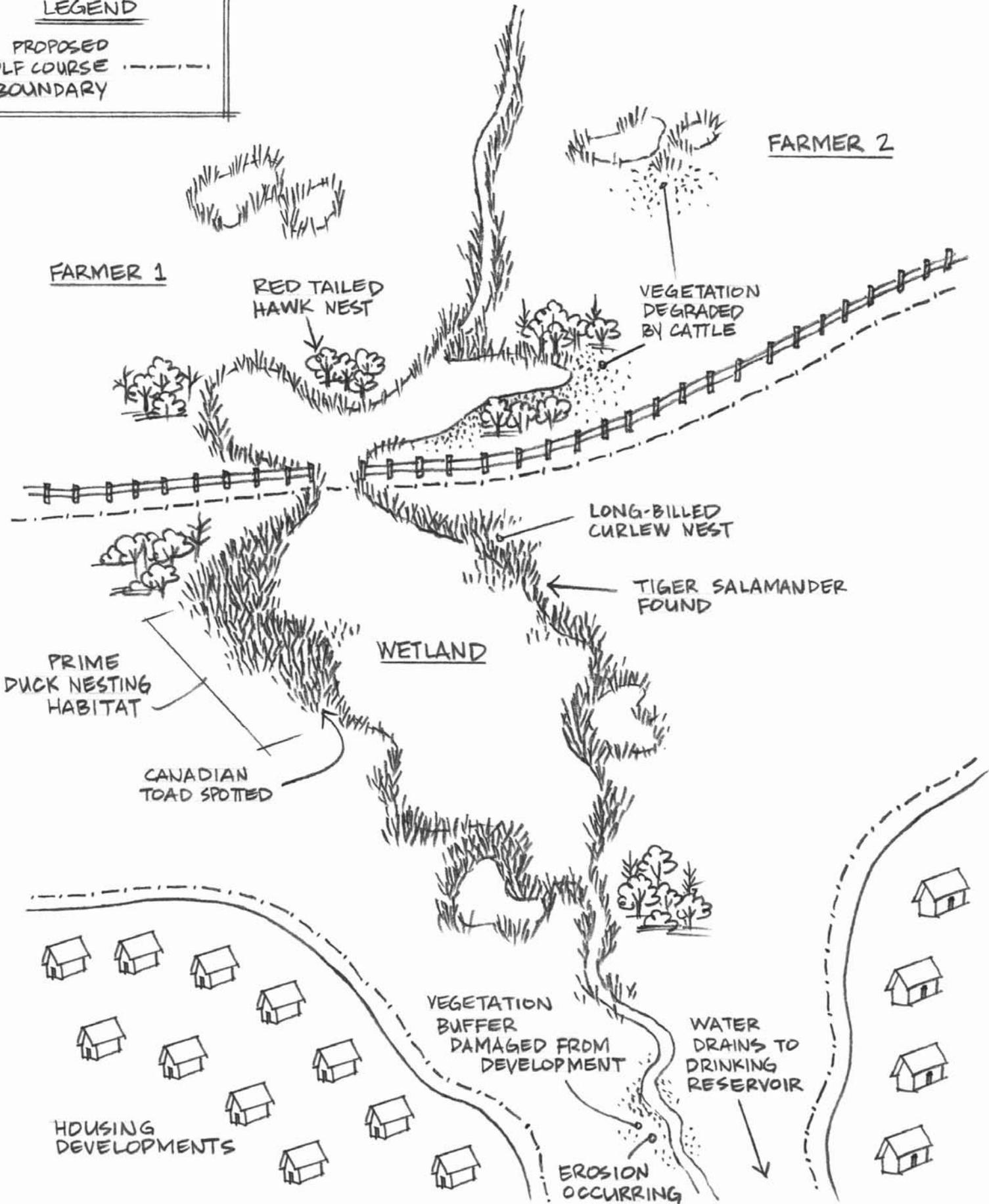
More information for you to consider or become familiar with before participating in the role-play:

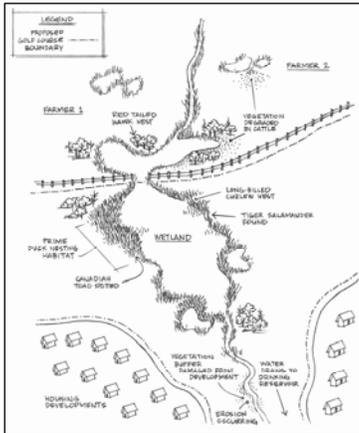
- Everyone should aim for the same goal and that is keeping the wetland and preventing wetland loss.
- Be aware: some “players” are determined to build the golf course regardless of wetland damage, some are open to developing some of the wetland and protecting other parts, and others do not want any development whatsoever!
- Study the map. Could the golf course be built somewhere else? What would be affected then? Remember to think about the three components (or zones) of a healthy wetland: the upland, riparian and the aquatic zone.
- Consider what is required for a wetland to function; what are the three zones or components of a wetland?
- If upland plants, vegetative buffers and aquatic plants are kept around they will help to trap sediment, filter the water and provide habitat. This is good for wildlife and for people, too.
- Think about what you have learned about wetland characteristics, referring back to any wetland experiments you may have done.
- The flow of water should be maintained to keep it in a natural state. Think about building bridges and installing culverts if needed.
- Bridges and fencing can be used to keep people out of sensitive areas and allow for natural water flow.
- Is it possible to improve wetland habitat on the cattle rancher’s land and provide him or her with an alternative watering method? For example, pump water from the wetland into troughs using solar pumps to keep cattle out of the wetland, while providing them with a source of clean water.
- Learn more about protecting the riparian at [www.cowsandfish.org](http://www.cowsandfish.org)
- One way that wetlands can benefit farmers is by contributing to local precipitation associated with the water cycle. More wetlands mean more evaporation, so more clouds form. More clouds = more precipitation. And that means more water in the wetlands!
- A wetland’s ability to store water during periods of heavy rain and then slowly release it during times of drought will benefit the surrounding landscape.
- A bait station could be used by the grain farmer to compensate for any loss of grain due to waterfowl. A bait station is a structure set up by Ducks Unlimited Canada and filled with grain to lure ducks and geese away from farmer’s fields.
- Mosquitoes tend not to develop on marshes or ponds that are affected by wind and waves. In addition, these types of wetlands usually have sufficient aquatic predators to prey on any developing mosquitoes. Of more concern are birdbaths, unattended pet watering bowls, inflatable wading pools, old tires, plastic tarps or buckets in your yard where water can collect.
- Establishing nature trails might be one suggestion (refer to *Sighting Seeing with a Dragonfly* on the Poster Back for the definition of an ecotourist).

- Find out how much fertilizer is needed to keep grass green. Excessive (too much) fertilizer may run down to the wetland during periods of heavy rain. Excessive fertilizers can cause algae to grow more quickly. When algae die, oxygen in the water is used up when it decomposes. This leaves little oxygen in the water for the other animals to “breathe.” Do nearby homes use fertilizers? Will the golf courses use fertilizers?
- Since people live next to the wetland, what can they do in their own yards to keep the wetland healthy? For example, do they apply chemicals to their lawns or do they apply a sprinkling of compost to help store water and add nutrients?
- Can you educate the community about wetlands? Pamphlets, community meetings and interpretive signs are good ways to spread the word about the value of wetlands.
- Are there benefits to having a golf course in town?
- Could local people find jobs at the golf course?
- Could local people find jobs at the wetland? Is this necessary?
- What economic benefits do wetlands bring without anyone actually working there? (think about water quality, etc.)
- While you may not agree with what others have to say, be respectful and listen. You may learn something new!
- Be prepared to disagree with others. Use this disagreement to find ways to work together.

LEGEND

PROPOSED  
GOLF COURSE  
BOUNDARY





### Instructions

Make a transparency of the map (enclosed in this electronic file) or one photocopy to each student.

Cut apart the stakeholder cards and have students read to themselves. The dark print is what they say aloud, the gray is background information for them to help with their roles and to develop improvisational opinions.

**Stakeholder** - an individual, organization or government interested in environmental outcomes (e.g., healthy wetlands) in Alberta.



Copy and cut cards apart.

## Local Politician

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am the local politician. I will chair the meeting and try to get everyone to agree on the decision. I want to hear from everyone, and help to make sure that we discuss the issue openly and honestly. It is very important that we respect everybody’s point of view. Nobody has a wrong or stupid idea for what we should do with the golf proposal or the wetland. But we will have different ideas and different views. I want all of us to work together and make a good decision. We will want to consider the economy, the community, the people and the natural environment, including wildlife in our final decision.”

Personally, you like the idea of draining the marsh to use as a golf course. You believe that building a golf course will help the local economy. It also means that you will not have to drive as far to play golf. However, your town has just declared a Wetland Conservation Plan. As a town leader, you must show support for your town’s own plan to protect wetlands. It will be quite a challenge to protect the wetland while wanting the golf course proposal to be accepted. What a challenge! If you are forced to save some of the wetland, you might suggest that one-third of the wetland could be saved, if really necessary, for recreation and tourism purposes. You recognize there is an election coming up and you would like to please everyone.

Wetland Dilemma

## Conservation Club Member

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am the local member of “Wonderful Wetlands”, an organization devoted to saving wetlands.”

Your position is that the wetland should not be drained. Instead, it should be preserved. You will argue that saving the wetland protects biodiversity and offers educational and tourism opportunities that should not be missed. The wetland provides habitat for ducks, amphibians and so much more, and it acts as water storage during droughts. You recognize that people need places for recreation, so you will argue that not everyone knows how to play golf, but everyone can enjoy a wetland! The golfers have been able to find other places to golf all these years, so why change that now? Now that the Town has a Wetland Conservation Plan, it is even more important to leave the wetland as it is. Your position is that under no circumstances should the wetland be drained.

**Wetland Dilemma**



## Land Developer

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am the developer who is proposing to fill in the wetland and develop a golf course.”

You are looking at the economic benefits that the golf course will bring, such as tourists and jobs. The golf course will pay taxes to the Town for allowing it to operate here. These taxes can be used for other community programs, including recycling, water treatment and so on. This will be of great benefit to the Town.”

You will argue that “no one uses the area now, so what is the big deal?” If nothing else, covering the wetland will get rid of most of the mosquitoes that everyone hates. The other thing you will want to share is that if you don’t build it here, you will build it in another town and they will receive all the economic benefits from it. People from this town will end up going to another town to pay to play golf. Maybe even some of the people from this town will find jobs at the golf course in the other town, too. It would be much nicer to have the golf course here so that people can work and play right in their own backyards. You want to drain the wetland, fill it in, and get on with building a golf course.

**Wetland Dilemma**

## Farmer #1

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am a grain farmer whose land borders the wetland. I would like to see the marsh drained.”

You see draining the wetland as an opportunity to add more land to your farm if some of the land were to become available as part of the golf course development. The soil beneath the wetland is very rich and productive. The wetland attracts birds, which feed off your grain fields and you receive no compensation\* for this crop loss. As well, you would like to see fewer mosquitoes.” With low grain prices, farmers need all the help they can get and you see this as an opportunity to improve your finances. More grain in your fields means more money in your pocket! You want the developer to get permission to develop the golf course, but only if you get some of that land for your grain fields.

\*Compensate means to do something that will make up for a loss. When farmers lose cattle or crops to difficult circumstances, sometimes they are paid money to help with some of their losses.

Wetland Dilemma



## Farmer #2

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am a cattle rancher whose land borders the marsh. I would like to see the marsh kept as it is.”

Your cattle use the marsh as a source of drinking water. The land bordering the marsh is good cropland for forage\* crops, even in drought years. You also use the marsh to help drain the low-lying areas of your land. If you did not have the marsh, there would be no place to drain the water off your land. Personally, you like to hunt and draining the marsh will remove your local spot for bird hunting. Golf courses don't put food on people's tables; farmers do!

\*forage is a crop that is eaten by cattle or is used for hay; it is not harvested for people to eat.

Wetland Dilemma

## Concerned Citizen

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I am a local citizen who has just moved into a nearby house. I like to use the wetland area for recreational opportunities and I do not wish to see the wetland drained for development.”

You enjoy bird watching and nature photography. You recognize that mosquitoes are a nuisance but birds and insects use them as food. You also know that the marsh is valuable for flood control and local water quality. One of the reasons why you purchased your home is because it was so close to the wetland. If you wanted to live on a golf course you would have moved somewhere else! You do not wish to lose this special place. You think that if the wetland were developed into a tourist attraction, it would be easier on the environment than a golf course would be. Just think of the chemical pesticides, the continual lawn mowing, the water used to keep the greens green. There are enough golf courses and not enough wetlands!

**Wetland Dilemma**



## Transportation Engineer (optional participant)

## Role Play Card

“Hello, my name is \_\_\_\_\_ and I represent the local transportation department. I have some concerns regarding the wetland and its effect on the local roads nearby.”

You are personally a hunter and you believe in the protection of wetlands because you understand the important role they play in ensuring a healthy environment. However, as a person representing the transportation department, you wish to bring several points to the table that involves public safety:

- In winter, the open water on the marsh can create fog, which can reduce visibility on the roadway.
- This fog is known to create icy conditions.
- There have been a number of serious accidents on the roadway and the evidence points to the wetland as being one of the causes of the accidents.

These points should be considered in any decision that is made.

**Wetland Dilemma**