

Intermediate Science 7
Unit 1: Interactions In An Ecosystem
Topic 8: Impact Of People



Student Name _____

How do you think we have impacted our environment?

1. Harvesting Resources

- The demand for natural resources has increased due to the increase in the human population
- Our technologies have enabled us to remove the resources we need.
- **Silviculture** is the he growing and cultivation of trees.

2. Habitat Loss/ Destruction

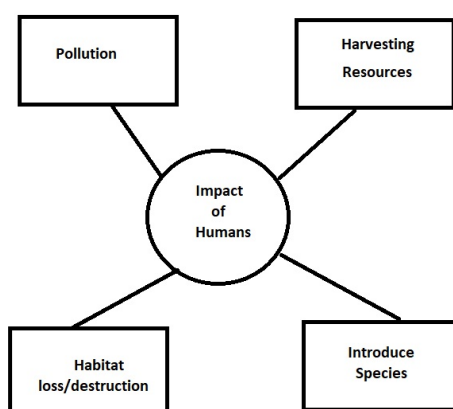
- Removing vegetation and soil removes shelter and food for animals
- Changes on land alter drainage of water which affects rivers and lakes.

3. Introduced Species

- **Biodiversity** refers to the number of species in an ecosystem
- Introduced species (exotic species) is an organism that is not native to the place or area where it is considered introduced and instead has been accidentally or deliberately transported to the new location by human activity.
- Introduced species can have negative impacts on the environment and affect ecological processes. If two species do share similar niches in an ecosystem, competition for survival may occur.

4. Pollution

- **Pollutants** refers to anything added to the environment that is harmful to a living thing.
- For example, pesticides pass from insect pests into food chains, where they may kill beneficial organisms such as birds or frogs.
- Fertilizers wash from farmers' fields into waterways, where they cause excessive growth of water plants



What is the effect of habitat conservation?

Habitat Conservation

Pros	Cons
Sustainability of resource	artificial habitats
Preservation of biodiversity	economic loss (jobloss, etc.)
Eco-tourism	limited human use

Local Groups Interested in Protecting the Environment

- Protected Areas Association
- Conservation Corps Newfoundland & Labrador
- OceanNet

National Groups Interested in Protecting the Environment

- Parks Canada
- Nature Conservancy of Canada
- David Suzuki

International Groups Interested in Protecting the Environment

- Friends of the Earth
- World Wildlife Fund
- Ducks Unlimited

STUDENT ACTIVITY - ENVIRONMENTAL IMPACT OF BUILDING A DAM

Introduction

The lower Churchill River is one of the most attractive hydroelectric resources in North America and is a key component of the province's energy resources. The project's two sites at Muskrat Falls and Gull Island have a combined capacity of over 3,000 megawatts (MW).

The Muskrat Falls Project is approximately a 12 billion dollar project that

includes construction of an 824 MW hydroelectric generating facility, over 1,600 km of transmission lines across the province, and the Maritime Link between Newfoundland and Nova Scotia. The project is an essential component of Nalcor's commitment to sustainability and climate change management. Once in service, power from Muskrat Falls will help meet the province's long-term energy needs by providing clean, renewable energy for future generations.



Background Information

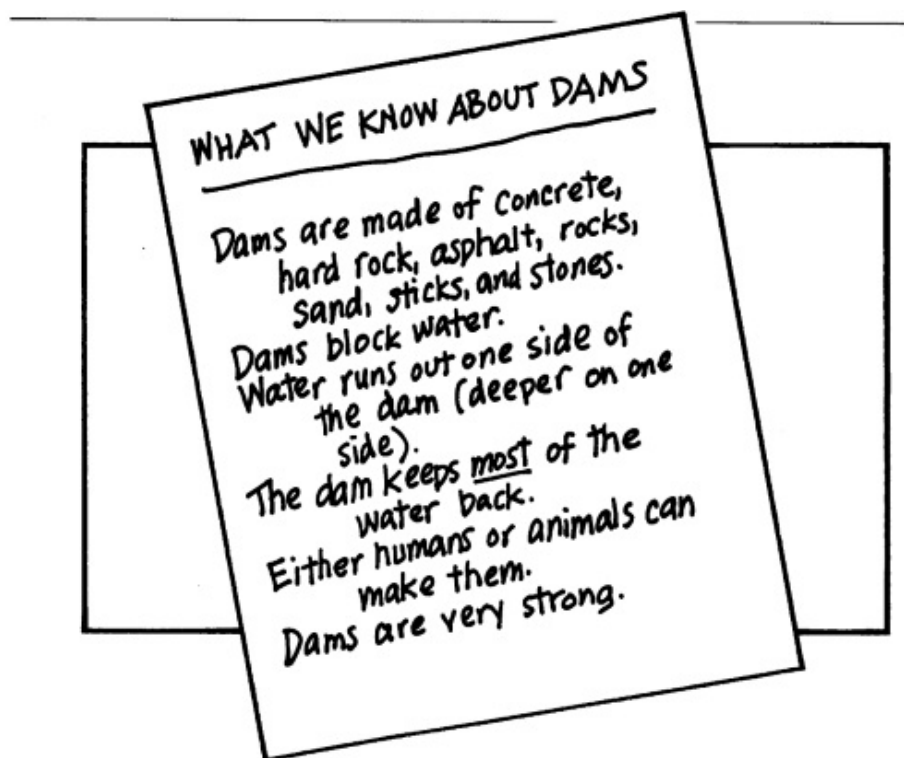
The average volume of water that flows in a stream determines the size of the stream channel. Some streams are small enough to step across, while others are hundreds of meters wide. If the volume of water in a stream remains constant, the channel changes very little. However, the volume of water in most streams changes continually. A severe storm may dramatically increase a stream's flow. This increased flow may cause the stream to overflow, or **flood**, its banks, eroding soil from some areas and depositing soil in other areas.

When rivers flood, they can damage property and crops. Homes, farms, livestock, and human lives may be lost. In particular, some areas are subject to **flash floods**, which are very sudden increases in runoff that may last from a few minutes to a few hours. The flooding of larger streams usually lasts from several hours to several days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

Levees are high ridges along the banks of streams that prevent or minimize flooding. When streams overflow their banks, the flow rate diminishes suddenly and heavier sediments are deposited along the stream bank. With repeated flooding, the deposits gradually grow higher until, after many episodes, a **natural levee** has been created that protects the area behind the levee from floods. **Artificial levees** are created by humans to provide some added protection

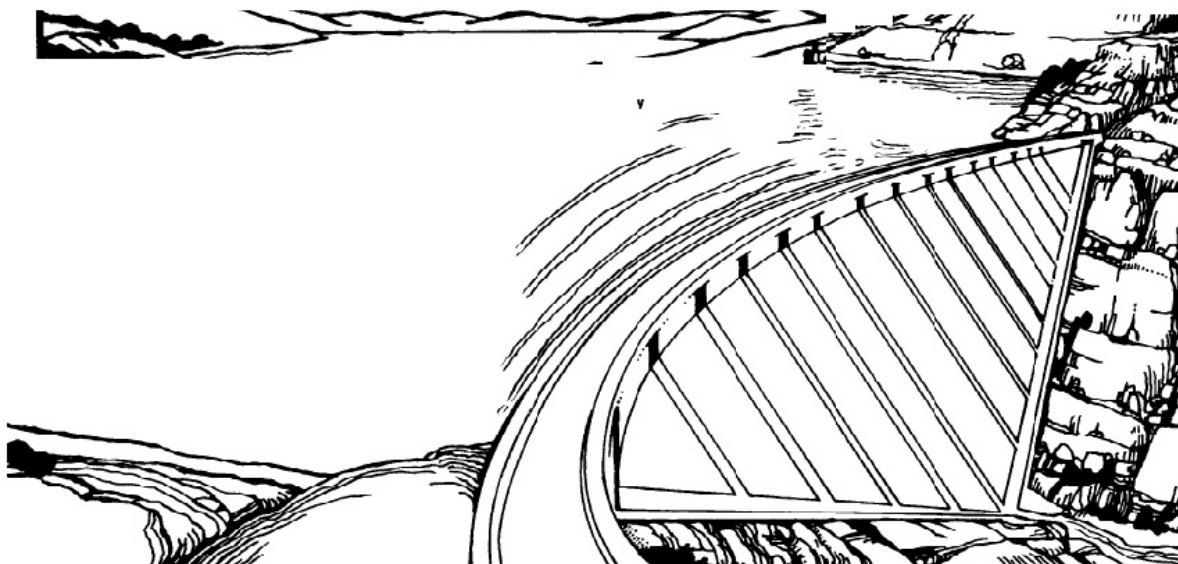
from floods. but like natural levees, they may be overtopped and eroded by heavy flooding'. One way to reduce flooding is to build a **flood-control dam**—a barrier that controls the direction and flow of water. The main function of a flood-control dam is to hold the excess water from a storm until it can be safely and slowly released when water levels have fallen.

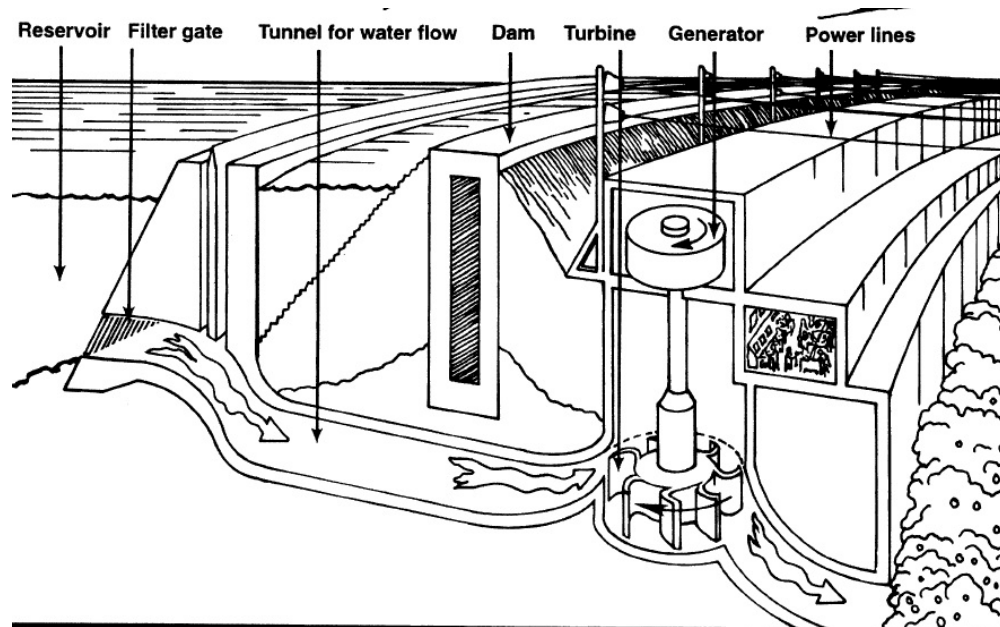
When the dam is completed, an artificial lake should form behind it. This lake acts as a **reservoir** for excess runoff. In a reservoir, stored water may be used to generate electricity (**hydroelectric power**), to supply drinking water to populated areas, or to irrigate farmland during dry periods. Some reservoirs are also used for recreational purposes, such as swimming and boating.



Releasing The River

Today, a massive concrete wall holds back part of the Churchill River. A concrete dam will be constructed in two sections with the north dam being 32 metres high and 432 metres long and the south dam being 29 metres high and 325 metres long. The reservoir will be 59 km long with an area of 101 km². The area of flooded land will be 41 km² at full supply level. The current reservoir for the Churchill Falls Generating Station is 6,527 km².





The water stored in the reservoir is used to make electricity.. This hydroelectricity can provide power to homes and businesses. Just like a waterfall, water from the lake gushes through narrow openings inside the dam. The water hits the blades of **turbines**, or engines, and causes them to spin. These engines power the generators that make electricity

The Pros of Muskrat Falls Project

- Significant employment and economic benefits for Newfoundlanders and Labradorians
- The Muskrat Falls Generating Station will have a capacity of 824 megawatts and annual energy production of 4.9 terawatt hours.
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- Long-term, clean, renewable power – 98% sustainable energy
- A reduction in greenhouse gas emissions from the province’s electricity system
- Diversification of the Newfoundland and Labrador economy
- A link to North America’s electricity grid for exports to allow for the sale of excess power to markets

The Cons of Muskrat Falls Project

- Concern for the future of Indigenous communities and cultural practices in Labrador if Muskrat Falls goes ahead
- Concerns that Nalcor wasn't properly managing the risk of contaminating the Churchill River with methylmercury, which, in turn, could flow downstream to Lake Melville, where many Inuit people live. Methylmercury — a neurotoxin linked to heart issues, intellectual problems in children and other effects — will poison their food supply, especially fish, which is a dietary staple.
- Financial burden for the people of Newfoundland and Labrador. Dams and transmission lines are expensive to build.
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- The flooding of large areas of land means that the natural environment is destroyed. Extensive. Therefore, flooding of the land will affect the ecosystem which is integral to Inuit culture.
- Although modern planning and design of dams is good, in the past old dams have been known to be breached (the dam gives under the weight of water in the lake). This has led to deaths and flooding.

5. Who would be interested in seeing the Muskrat Project going ahead? [1]

6. Who would be interested in stopping the Muskrat Project? [1]
