WLD1010

Introduction to Wildlife

This module will encourage students to develop the attitude, skills and knowledge related to wildlife and ecosystems, and develop and understanding for the need to manage wildlife. (Alberta Ed.)

There are several components to this module. The manual contains the majority of the information needed to complete this module, as well as the references to documents and video clips not contained within the manual. A series of worksheets accompany this manual and they are best completed while reading the appropriate section of the manual. The final component of the module is the completion of a couple of practical assignments which are to be completed outside of the worksheets. Details for the complete of these projects are included in the worksheets.

Completing this module will be very dependent on your own personal work habits. It has been designed to be completed as an individual, but there are provisions for group projects if the teacher will allow it and the course are set up to support them. Throughout the worksheets there are points for you to have your instructor initial your work. The purpose of these checkpoints is to ensure that you are working efficiently and at a pace to finish the module in a reasonable amount of time, as well as to allow the teacher to assess your understanding and provide support where needed.

***Please don’t make any marks in this manual.***

(P1) Begin this module by watching the video “Elements of Biology – Ecosystems”. Complete the quiz at the end, writing your answers in the appropriate spaces in the workbook.

**Surfin' the Food Web**

[[](javascript:popup_photo('Bird%20Feeding','diagrams/regions33.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Bird%20Feeding','diagrams/regions33.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))A successful [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem) depends on the exchange of energy between organisms. This energy is passed on from individual to individual via feeding. Different [species](http://www.abheritage.ca/abnature/glossary.htm#species) are grouped together based on what they eat, and these groupings are called [trophic levels](http://www.abheritage.ca/abnature/glossary.htm#trophiclevel).

There are four basic trophic levels, but it is possible to have five or six as well. In the bottom level are the producers, and then come the [herbivores](http://www.abheritage.ca/abnature/glossary.htm#herbivore), the [carnivores](http://www.abheritage.ca/abnature/glossary.htm#carnivore), and the detrivores. All of these levels exchange life-giving energy.

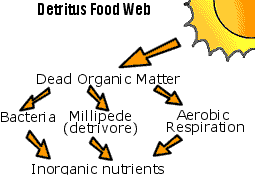
[[](javascript:popup_photo('Carnivor:%20Red%20Fox','diagrams/fox,red-PN89.1.3834.jpg','Photograph%20by%20Edgar%20T.%20Jones;%20Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Carnivor:%20Red%20Fox','diagrams/fox,red-PN89.1.3834.jpg','Photograph%20by%20Edgar%20T.%20Jones;%20Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))Different trophic levels both give and take energy from one another in a linkage referred to as a [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb) or [food chain](http://www.abheritage.ca/abnature/glossary.htm#foodchain). Food webs are very complex, and even biologists have yet to understand all the dynamics and interactions in food webs. A simplified version of a food web would function like this: plant grows, animal eats plant, animal eats animal who ate plant, both animals and plants die, and are in turn eaten by smaller organisms, who convert this organic material back into organic compounds in soil that can be taken up again by plants.

There are two types of food webs that make up the larger, more general definition of food webs: [grazing webs](http://www.abheritage.ca/abnature/Ecosystems/grazing.htm) and [detritus webs](http://www.abheritage.ca/abnature/Ecosystems/detritus.htm).

# The Decomposition Process

The detritus [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb) works in conjunction with the [grazing food web](http://www.abheritage.ca/abnature/Ecosystems/grazing.htm), but its separate function merits separate mention. The detritus food web is very complex and the following is a simplification intended to outline the process.

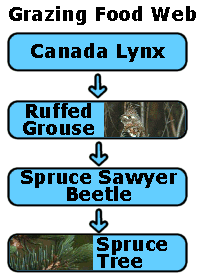
The object of the detritus food web is to break down tissues of dead organisms and transform their organic material back into inorganic material so plants can take them up again and restart the grazing food web.



The activities of the detritus food web are undertaken by smaller [species](http://www.abheritage.ca/abnature/glossary.htm#species) of both animals and plants like algae, worms, beetles and bacteria. These species are called detrivores, or decomposers.

The decomposition process can be more productive in an aerobic environment. Aerobic respiration increases the rate of decomposition, and without oxygen different inorganic materials are released such as molecules of methane, carbon dioxide and organic acids, among others.

# Grazing Food Webs

A grazing [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb) involves the general exchange of energy in an [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem). By no means are grazing food webs simple to explain. They involve complex interactions between [species](http://www.abheritage.ca/abnature/glossary.htm#species) of animals and plants that even ecologists do not completely understand. The following diagram is intended to provide a basic understanding of the process and how it differs from the [detritus food web](http://www.abheritage.ca/abnature/Ecosystems/detritus.htm).

The grazing food web begins with green plants that tap the sun's rays through [photosynthesis](http://www.abheritage.ca/abnature/Ecosystems/photo.htm) and convert inorganic material into organic material. In the food web, plants make up the category called primary producers. Both pine trees and blue grama grass are examples.

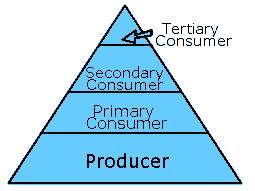
[](javascript:popup_photo('%20White-tailed-doe','%20diagrams/deer,white-tailed-doe-PN89.1.4113.jpg','Photograph%20by%20Edgar%20T.%20Jones'))In the next layer of the [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb) are the [herbivores](http://www.abheritage.ca/abnature/glossary.htm#herbivore), also known as primary consumers. Primary consumers get their energy and nutrient requirements by eating primary producers. Some typical herbivores include [species](http://www.abheritage.ca/abnature/glossary.htm#species) like the Beaver and the White-tailed Deer.

Next are the secondary consumers, otherwise known as [carnivores](http://www.abheritage.ca/abnature/glossary.htm#carnivore). These are animals that feed on primary consumers and include species like the Short-tailed Weasel.

[[](javascript:popup_photo('Carnivores:%20Cougar','diagrams/cougar-PN74.2.48.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Carnivores:%20Cougar','diagrams/cougar-PN74.2.48.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))At the top of the [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb) are the tertiary consumers. These animals may consume either primary or secondary consumers. They might also be omnivores (like Black Bears) and consume plant matter as well. Tertiary consumers include animals like the Northern Pike found in many Alberta lakes, and the Gray Wolf.

# Biomass and Ecological Pyramids

The combined weight of all [species](http://www.abheritage.ca/abnature/glossary.htm#species) of plants and animals that may exist within an [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem) make up what ecologists refer to as the [biomass](http://www.abheritage.ca/abnature/glossary.htm#biomass). Biomass is usually measured in dry weight per unit area, and ecologists use it to discover and compare the level of animal and plant activity and energy exchange in an ecosystem. Biomass is usually the highest at the bottom of the [food web](http://www.abheritage.ca/abnature/glossary.htm#foodchain), with the producers, and decreases through [herbivores](http://www.abheritage.ca/abnature/glossary.htm#herbivore) and [carnivores](http://www.abheritage.ca/abnature/glossary.htm#carnivore). Ecosystems have four basic [trophic levels](http://www.abheritage.ca/abnature/glossary.htm#trophiclevel).



As shown in the accompanying diagram, the biomass of primary consumers is much less than the primary producers. Potentially, herbivores could eat all of the available biomass of plants in an ecosystem. The plant biomass that herbivores do consume, however, does not become part of the primary consumer biomass.

Secondary consumers depend on the biomass of primary consumers or herbivores for their energy and nutrition requirements. Like the diagram shows, in an ecosystem there are much fewer secondary consumers than primary consumers. This is due to the fact that herbivores have, over time, developed many defenses to prevent them from being eaten by carnivores. These defenses include things like porcupine quills, and the ability of a snowshoe hare to change colors with the seasons.

Finally, tertiary consumers consume the biomass of primary carnivores and herbivores. Primary carnivores have also developed defense mechanisms such as sharp claws and the ability to run fast.

# The Importance of all Creatures

[[](javascript:popup_photo('%20','diagrams/bee-clyde.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('%20','diagrams/bee-clyde.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))Every living thing has a special place in its [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem) called an [ecological niche](http://www.abheritage.ca/abnature/glossary.htm#niche) or ecosystem service. These services are not restricted to animals, but extend to plants, and even bacteria. Nor is the ecological niche simply a place where a particular animal chooses to live. Certain [species](http://www.abheritage.ca/abnature/glossary.htm#species) have specific behaviors or attributes that directly affect the lives of other species in the ecosystem. For example, a honeybee collects pollen from flowers to feed its larvae. In doing so, the bee pollinates the flowers thereby ensuring the reproduction of the plant. So, without the honeybee many plants would have a hard time reproducing.

The ecosystem service also has to be thought of in terms of competition. Two animals that perform the same service cannot live in the same ecosystem - there are just not enough resources for both of them! Eventually one will out-compete the other. All of the individual species that inhabit an ecosystem are part of a delicate balance. If one species disappears in that area, through natural or man-made causes, another species existing at low population levels will increase and fill that empty niche.

It might be easier to think of ecosystem services as competing shoe stores in a small town or village. If the two stores are selling the same shoes, one or both of them will eventually go out of business. However, if they sold slightly different types of shoes, there could be room for both in the town. The same idea applies with animals and plants in an ecosystem. If there are two similar species of insects, for example, one of them will either have to leave, or adapt to the environment to occupy a slightly different niche, as one will prove more competitive in obtaining resources than the other.

# Species Relationships

Landscape, [climate](http://www.abheritage.ca/abnature/glossary.htm#climate) and [species](http://www.abheritage.ca/abnature/glossary.htm#species) interact with one another to form an ecosystem. There are, however, special links within ecosystems that help make up the larger picture of inter-species relationships. These relationships can be beneficial for both species involved, but relationships can also develop that are detrimental, sometimes even resulting in death.

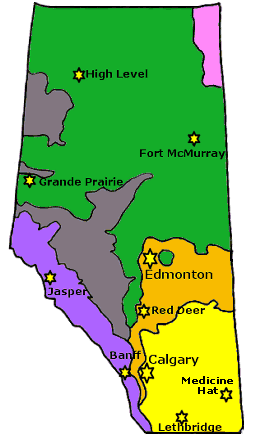
Symbiosis is the most mutually beneficial type of relationship. It involves two species living together in some form to their mutual benefit. This is good news for both species involved, as they can both gain protection, opportunity for food, the riddance of "pests", or even a place to live. A good example of a symbiotic relationship is found in lichens. Lichens grow in diverse forms and colors, and live in even more diverse places such as trees, stumps and rocks. Although lichens look to be a single species of vegetation, they are actually comprised of two species: fungus and algae. The alga relies on the fungus as a body for structure and protection. The fungus absorbs the by-products created when the alga produces nutrients.

Commensalism is more of a one-sided relationship. A commensalistic relationship is one that benefits one of the [species](http://www.abheritage.ca/abnature/glossary.htm#species) involved, but not the other. The other species is not usually negatively affected, and generally remains indifferent. However, in some cases it might lose out. An example of commensalism can be found on many species of trees - perhaps even in your own backyard! Many [epiphytic plants](http://www.abheritage.ca/abnature/glossary.htm#epiphyte) grow on the sides of trees and use them as a support without stealing any of the tree's nutrients.

Parasitism is a type of predation that maximizes the use of resources. It is true that all animals are in essence a type of parasite, as they need to kill other species (plant or animal) in order to live. Parasitism, however, is different in that the parasite lives within or on the larger animal, negatively affecting its daily life.  There are, however, some parasites that take what they need without negatively affecting the host.  An example of a parasite is the common leech that sucks the blood of many large mammals.

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| **What is an Ecosystem**  Within all [species](http://www.abheritage.ca/abnature/glossary.htm#species), individuals interact with each other - feeding together, mating together, and living together. Some species have a pecking order as well, and each individual has a role to play within it.  However, it is not only individuals within a species that interact. Different species of animals interact with each other all the time. For instance, animals eat other animals through their interactions in a [food web](http://www.abheritage.ca/abnature/Ecosystems/detritus.htm). But plants are included in this web as well as they, too, are eaten by animals.  [["Cold" Rocky Mountains](javascript:popup_photo('Rocky%20Mountains','diagrams/mountains10.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Rocky%20Mountains','diagrams/mountains10.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))What would happen if the weather were really cold all the time? Well, not all species of animals, plants and bacteria would be able to survive. What differences are there between species who live in the [Rocky Mountains](http://www.abheritage.ca/abnature/mountains/mountain.htm) and those who inhabit the Sahara desert? Landscape also determines where plants and animals might live. But what, exactly, is an [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem)? An [Feeding on wood](javascript:popup_photo('Feeding%20on%20Wood','diagrams/parkland27.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))ecosystem is a geographical area of a variable size where plants, animals, the landscape and the climate all interact together. | | http://www.abheritage.ca/abnature/images/spacer.gif |
| The whole earth's surface can be described by a series of interconnected ecosystems.  All living beings form and are part of ecosystems.   They are diverse and [always changing](http://www.abheritage.ca/abnature/Ecosystems/changing.htm). Within an ecosystem, all aspects of the environment (both living things and their non-living settings) interact and affect one another. Every species affects the lives of those around them.  A small ecosystem in the [boreal forest](http://www.abheritage.ca/abnature/boreal/boreal.htm) might look something like this: in the summertime, trees in forests (that produce oxygen used by living things through [photosynthesis](http://www.abheritage.ca/abnature/Ecosystems/photo.htm)) lower the temperature in the forest for communities in the hot summer months. In turn, some members of the communities will probably feed upon the tree to gain nourishment, thus affecting or stunting the tree's growth.  Different areas in the world house different ecosystems. For example, you won't find an elephant or a tropical rainforest in Alberta! The different world ecological units are called [biomes](http://www.abheritage.ca/abnature/glossary.htm#biome) and they each have different [flora](http://www.abheritage.ca/abnature/glossary.htm#flora), fauna, landscapes and weather patterns. An ecosystem is not the same thing as a biome. A biome is a large unit that is home to many different ecosystems. Within Alberta, there are six different biomes that each have their own specific flora and fauna distribution. These regions are: [Grassland](http://www.abheritage.ca/abnature/grasslands/grassland.htm), [Parkland](http://www.abheritage.ca/abnature/parklands/parkland.htm), [Boreal Forest](http://www.abheritage.ca/abnature/boreal/boreal.htm), [Foothill](http://www.abheritage.ca/abnature/foothills/foothills.htm), [Rocky Mountain](http://www.abheritage.ca/abnature/mountains/mountain.htm) and the [Canadian Shield](http://www.abheritage.ca/abnature/shield/shield.htm), all indicated on the map of Alberta's Regions. | | | |
| **How Ecosystems Develop** |

Many of the [eco-zones](http://www.abheritage.ca/abnature/glossary.htm#ecozone) or [biomes](http://www.abheritage.ca/abnature/glossary.htm#biome) that you are familiar with - the [Boreal Forest](http://www.abheritage.ca/abnature/boreal/boreal.htm), the [Rocky Mountains](http://www.abheritage.ca/abnature/mountains/mountain.htm) - are areas where [species](http://www.abheritage.ca/abnature/glossary.htm#species) have been interacting for many years. Although living things are always interacting, however, the relationships between species are not always the same. For instance, [glaciers](http://www.abheritage.ca/abnature/glossary.htm#glacier) retreat, leaving a completely different environment in their wake. Animals and plants adjust and create new relationships with one another in a way that will sustain the balance of life and growth within their [ecosystem](http://www.abheritage.ca/abnature/glossary.htm#ecosystem)

**Alberta’s Natural Regions**

This map shows the natural regions of Alberta. They don’t follow any specific boundaries because they are dependent on changes in topography. Many of the regions are marked by rivers and creeks, or the edges of hill ranges.

You likely are most familiar with the grassland ecosystem, but may have spent time in other ecosystems. The differences between the various natural regions are not always obvious – the rocky mountain region is obviously different than the grasslands based solely on the landscape – but the differences go much deeper.



# (P2) Watch the video clip “Essential and Endangered Grassland Biomes” and complete the appropriate questions in the workbook.

# Changing Ecosystems

[Ecosystems](http://www.abheritage.ca/abnature/glossary.htm#ecosystem) are not unchanging. Natural changes in climate will result in a change in environmental conditions, which results in a change in ecosystems. The influence of mankind can change the ecosystem. These influences may be direct or indirect. Examples of direct influences are logging and agriculture where the original vegetation is removed. Indirect influences result from global changes in the environment caused by civilization, like global warming due to the release of greenhouse gases. In many cases, an ecosystem changes and may appear different. For example, after the [glaciers](http://www.abheritage.ca/abnature/glossary.htm#glacier) retreated from Alberta there was very little fertile soil. The first plants to grow were very hardy ones called pioneer species, such as lichens and grasses. These plants became established in the sand, silt and clay that covered the landscape. Their roots grew into cracks and helped to break down these mostly unfertile materials. When these plants died, the organic material in them combined with the sand and clay to form a simple soil.

[[](javascript:popup_photo('Burned%20Parkland%20Succession','diagrams/PB93.4.19-burned-parkland-succession-Ian_D_Macdonald.jpg','Photograph%20by%20Ian%20D.%20Macdonald;%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton%20Alberta'))](javascript:popup_photo('Burned%20Parkland%20Succession','diagrams/PB93.4.19-burned-parkland-succession-Ian_D_Macdonald.jpg','Photograph%20by%20Ian%20D.%20Macdonald;%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton%20Alberta'))This soil allowed other types of plants to become established. As the soil layer grew deeper, larger and stronger plants became established, and some of the original plants were replaced. This replacement of some plant species with others, and the associated change in animal species, is called [succession](http://www.abheritage.ca/abnature/glossary.htm#succession). An ecosystem that is in a stable state, or is not in the process of being succeeded by another, is known as a climax community. Natural processes such as fire, flooding, and insect invasion can disturb whatever plant and animal species are present, and radically change the local environment. The area then starts the successional sequence again, beginning with the pioneer species and building towards the climax community. In this way, the ecosystems are constantly being rejuvenated by the environment  It is important to note, however, that just because an ecosystem has reached a "climax" does not mean it stops changing.  Like all ecosystems, a climax community is in constant flux.

(P3) Read the chapter “Wildlife Management” in the Alberta Conservation and Hunter Education handbook. Complete assignment P1 in your workbook. Have your instructor initial your progress and mark your assignment.

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| **Population Regulation** | |
| [[Bird Nest](javascript:popup_photo('Bird%20Nest','diagrams/regions36.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Bird%20Nest','diagrams/regions36.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))Animal and plant populations naturally regulate themselves in an amazing process that sustains all life on earth. In an environment that houses many plants and animals, an increase in the population of one [species](http://www.abheritage.ca/abnature/glossary.htm#species) could cause a great disruption in the [food web](http://www.abheritage.ca/abnature/glossary.htm#foodweb), and in the functioning of the ecosystem. Thus, populations within all ecosystems have internal regulating mechanisms like births and deaths to ensure everything stays in order. |
| There are four basic processes that regulate the size of populations: births and immigration (both of which cause an increase in population) and death and emigration (which result in a decrease in population). These processes are mostly restricted to mobile creatures, like animals. When  resources are plentiful, more individuals will be attracted to the area, and there will be more births. If times are not so good, however, no new individuals will be attracted to the area and many will disperse in search of a new and better place. As a result, there will also be a decrease in the birth rate.  As a population increases in size, there is a corresponding increase in competition for resources such as food, water, nutrients and even space. The resulting decrease in available resources slows down the population growth either through a decrease in the birth rate, an increase in the death rate, or a combination of both. Eventually, however, the birth and death rates will even out so that the population can successfully survive on the available resources.  [[Predators: Wolf](javascript:popup_photo('Predators:%20Wolf','diagrams/regions28.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))](javascript:popup_photo('Predators:%20Wolf','diagrams/regions28.jpg','Photograph%20Courtesy%20of%20the%20Provincial%20Museum%20of%20Alberta,%20Edmonton,%20Alberta.'))A similar example can be seen in the search for food - a major factor that contributes to population control. If predators find a shortage of prey, their population will be reduced by starvation. This decrease in predators will enable the prey population to increase again as not as many of them are being killed. In turn, this increase in numbers of prey makes it easier for the predators to catch and eat once again. The predators will then increase in population and begin to take more prey. The cycle repeats as there is a resulting shortage of prey.  As a population grows, overcrowding becomes a major problem for the [species](http://www.abheritage.ca/abnature/glossary.htm#species) at hand. Not only does overcrowding cause increased competition for resources as discussed above, it causes other imbalances that can be even more detrimental to the population. Disease becomes a major problem when a group of animals are in close proximity to each other. Just as the bubonic plague spread very rapidly through the cities of Europe, diseases are passed along very easily when there is not enough room for a population to spread out. Some diseases, if fatal, can cause population numbers to drop rapidly. Other diseases can debilitate the entire population, causing a decrease in the birth rate through different means, such as sterility. | |

**Environmental Issues**

Alberta is recognized world-wide for its magnificent natural beauty, however, this admiration for its landscape may also be contributing to Alberta's greatest crisis. Although humans have roamed the Canadian prairies for approximately 12,000 years, a fleeting moment on the geological time scale, this same period has witnessed the increasingly aggressive exploitation of the lands.

However, with the introduction of firearms and increased mobility, the balance between man and nature has been rapidly altered in favor of man and, in many cases, at the expense of nature. Furthermore, the relatively recent settlement and development of Alberta has meant a wholesale landscape modification in terms of agricultural development of the province so that today, only 30 percent of Alberta's natural habitat remains untouched -- that is, in its "natural state".

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So, every living thing – and many non-living things – play a part in ecosystems, food webs, detritus webs, as well as being the source and target of many issues and problems. Man, being the only living creature known to “understand” how nature works and supposedly “understand” what is best for the relationship between nature and man, can describe the desired relationship in a few different ways. Conservation, preservation and environmentalism are all bantered about as being the best way to go. There are, however, some very different thoughts on the subject.

The basic definition of conservation is that because man has had such an affect on the environment, he should make every effort to manage as many aspects of it as possible to allow for it to continue to thrive and live on in relative harmony with mankind. Preservationists are individuals who believe the outdoors should be left untouched by humans. Environmentalists also believe in the idea of leaving nature untouched, but often extend their thinking into all animals and all land and living things as being part of the environment and should not be subject to any management of any scale.

The following article was written by the Abundant Wildlife Society of North America, based in South Dakota. It does a fairly good job of explaining the differences between environmentalism and conservation, but the reader should understand that this group views the issue from the standpoint that there is no room for any viewpoint other than their own. Some people may refer to groups like this as a radical organization, but others may see them as just another varying viewpoint presenting their perspective on an issue. As you read it, try to decide where you stand in the discussion. (This will be important later on in this module.)

(P4) Watch the video clips “Nature Conservancy of Canada”, “ACA’s Wildlife Program”, and “Champions of the Land”; read the following articles on Environmentalism and Wildlife Management in Africa and complete the related questions in the workbook.

**ENVIRONMENTALISM vs CONSERVATION: A LOOK AT TWO ROADS**

In years past, Conservation, the wise use of natural renewable resources, was supported and understood by a majority of people. It was taken for granted that man, due to his ability to reason, had the power and right to improve, change and utilize the environment.

Irrigation ditches were built, diverting the natural flow of water to man-made ditches, thus making mountain streams live streams year around due to return flow. This enhanced the land for man and animal. Stock reservoirs and dams were built in the semiarid parts of the West allowing the land to support stock and wildlife which, in years past, supported few animals due to limited water.

Man continued to progress, and with that progression he learned new ways to better conserve and use nature. Land in eastern states was often left in a state of little use after coal mining. Learning from those mistakes, man came west to mine coal and now often reclaims the land better than it was in its natural state.

Logging, though never very pretty to look at, was found to be the best thing for nature's forests. Instead of dying off of disease, insect infestation, fire and other common tree killers, wood could be harvested and utilized, thus making forests healthier and man had a natural resource to use.

Then along came Environmentalism, a view that nature and natural forces should be the dominating force of change, a concept that Nature is "god" and man no more or less than any other living creature in the natural flow of events. This new philosophy was based upon several tenets:

**1.** Nature was perfect until Man disfigured it.

**2.** Man invariably disrupts and wreaks havoc in the environment.

**3.** The Natural Balance of Nature is the only way to go.

**4.** Man must reject all of modern technology and call for a return to a simple, pastoral life free of fumes, artificial chemicals, and any noise but the chirping of birds and the croaking of frogs. (Science News)

**5.** Animals have a right to live as much as man and therefore man has no right to eradicate or control   
 any living creature.

This philosophy looks good. After all, who wouldn't like to slow down and get out of the rat race of life? And we have all seen those places on this earth which have been set aside so that the natural beauty and grandeur of nature fills our being with wonder and awe. Just think of what the land must have looked like before man came? And who enjoys killing something for the sake of killing? Besides, go to any major city and you will see places where it seems man has made a mess of everything he has touched.

Ah yes, but the longer one contemplates such a belief system, the more questions come to mind which are quite disturbing.

In spite of his obvious mistakes in the past, man has really improved the land. Agriculture now feeds millions of people utilizing land that was able to support only a few people in its natural state. Without modern technology, man would have to build a fire to stay warm, walk to get anywhere and continually look for food for sustenance.

And the Balance of Nature may be natural, but there is nothing more cruel. Animal life prospers for a time, then dies off due to limited food supply, harsh weather, disease or predation and the cycle starts over again only to repeat itself. Animals used to die off by the hundreds in winter blizzards, due to lack of food and shelter. Do we stop feeding the massive herds of elk in the west to let nature take its natural course? Should there be a law requiring farmers and stockmen to tear down their barns and sheds so animals can face the elements naturally?

But what right does man have to take animal life for his consumption or because it is detrimental to his way of life?

One only has to look at the consequences if man should stop his consumption and control on the land. How quick would the rats increase in the cities and carry disease as in the days of the Plague? Or, what would be the consequences if there were no termite control? Should wolves in Alaska and Canada be allowed to regulate game naturally so that the native Indian and Eskimo can starve due to shortages of meat as in yesteryear? Their history speaks of hunger often. And the coyote of the plains, let it increase until disease such as rabies reduces its numbers as in years past. Watch nature at its finest as this animal writhes in pain and agony, slowly going mad. Not to mention the animals and humans it can bite, spreading this fatal disease.

Letting animals such as elk, deer, and moose increase unchecked will also have negative impacts. Moose are habitat destroyers if not kept in check. They ruin their forage and soon start to die of malnutrition or susceptibility to harsh weather and their numbers crash. Elk and deer can destroy crops that would feed the hungry mouths found in many parts of the world.

A serious look at these two philosophies is needed today. Common sense would dictate that we need to get back to Conservation. Man can and should control the extremes of nature through hunting, keeping numbers down and utilizing the meat to feed people. He should control those pests that wreak havoc with his crops and livestock so that he may not only feed himself but others. We need to ask hard questions like how much benefit is a coyote in a city suburb or on a rancher's range? Does the coyote become more valuable after it eats 10 sheep? Just because it is a part of nature, do we let it come in the back yard and attack our child as they have done in California, Yellowstone National Park and in the National Parks of Canada?

Conservation should be everyone's concern. It does not mean elimination of any species, but rather the control and management of all animals for the benefit of man and animal.

Since Conservation, not environmentalism, was important to those before us, we were given a heritage richer than any other nation. We have more to eat, more to see and more to enjoy than most of the world. It didn't just happen, nor will it continue unless we have a common sense philosophy.

**Wildlife Management in Africa**

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| Africa is the world's second largest continent, with a total land area of more than 19 million sq km (about 11.8 million sq mi). It is home to more mammal species than any other land region in the world. But these animals share the continent with approximately 800 million people-whose numbers are increasing at a rate of about 2.8 percent annually-as well as with growing populations of domestic livestock. While humans and wildlife have long coexisted in Africa, unprecedented human population growth over the past century has brought with it an increase in wild habitat destruction and certain forms of hunting. These trends have already driven many animal species to extinction and left many others threatened. But they have also given rise to a wide range of national, regional, and local wildlife management programs, and to ongoing debates about the best means of preserving Africa's biodiversity while meeting human needs.  **EARLY CONSERVATIONISM IN AFRICA**  Wildlife management, as the term is currently understood, began in Africa in 1900, when European colonial administrators met at the Convention for the Preservation of Animals, Birds, and Fish in Africa. Their wildlife management plans were intended to ensure the continued survival of animals that they considered either useful or harmless to people. Elephants and rhinoceroses were highly valued, for example, for their tusks and horns. These and other big-game species, such as zebras, lions, and hippopotamuses, were also considered prize trophy animals by wealthy European and American safari hunters. To ensure conservation of these species, the convention limited elephant and rhino hunting, and prohibited the hunting of infant and adolescent elephants as well as adult female elephants with calves. A few species defined as "harmless," that is, those that did little or no damage to human beings or their property-including gorillas, chimpanzees, pygmy hippopotamuses, white-bearded wildebeests (a subspecies of the blue wildebeest), giraffes, and mountain zebras-were also fully protected. Some of these species, especially the primates, were also considered of scientific interest. Lions, leopards, hyenas, and wild dogs, which attacked domestic animals, were defined as vermin and therefore considered open game.  Approaches to wildlife management shifted in the 1920s with the widespread introduction of national parks to Africa. National parks were modeled on those in the United States, such as Yellowstone National Park, which were themselves modeled on hunting parks in medieval Britain. At a time of rapid industrialization and urbanization in the United States, national parks were seen to preserve "unspoiled" scenic areas for tourists. Colonial governments adopted this model for Africa, but their priority was not so much scenery as wildlife. It was to be preserved, observed, and studied, but in a way that would not threaten humans or their property. Thus a central tenet of wildlife management that developed during this period was to *contain* animals in a "wild" but bordered setting. The land set aside for parks, however, was often already inhabited by people, many of whom had long depended on both the land and the wild animals for survival.  In both colonial and independent Africa, the creation of national parks often resulted in the eviction of farming communities and nomadic herders from their traditional lands. During the 1950s the British colonial government evicted the Maasai people from Serengeti National Park. As recently as 1988 in Tanzania more than 5000 pastoral people were relocated to create parkland. Inside park borders, activities such as cutting timber, gathering wild foods, hunting, grazing, and watering domestic livestock are generally officially prohibited. In practice, the prohibitions have proven difficult to enforce. People in local communities who have historically depended on access to the parklands' natural resources for subsistence often sorely resent the restrictions. Poaching is a particularly serious concern to wildlife managers, but it is believed that at least some of the poachers-especially those who target rare species like the black rhino-are not local people killing for meat but rather "professionals" hired by smugglers of rhino horn and other animal products banned from international trade. The governments of Kenya and Zimbabwe have responded to the poaching problem by authorizing park rangers to shoot suspected poachers on sight.  **CHANGING VIEWS ON WILDLIFE MANAGEMENT** For a number of reasons, wildlife management experts in recent years have begun to look beyond the standard strategies of creating national parks and banning hunting to ensure wildlife conservation. One reason is the difficulty that authorities have controlling poaching. In addition, groups who have been threatened with eviction from their traditional lands have become increasingly vocal in defense of their property rights. Tanzanian Maasai, for example, organized the group Korongoro Integrated Peoples Oriented to Conservation (the acronym KIPOC means "we shall recover" in Maasai) in the early 1990s to lobby for the rights of "indigenous minority peoples." At the same time, however, international conservation groups such as the World Wildlife Fund continue to call for stronger measures to protect certain African wildlife species.  These international groups have launched letter-writing and fund-raising campaigns that have made African wildlife conservation an issue of global concern. Yet their stance on certain issues has not always won support in Africa. In the past, they have been criticized for ignoring regional variations in wildlife populations and their significance to people, and in some cases for ignoring the counsel of wildlife biologists. These conflicts were especially apparent in the debate leading up to the 1989 global ban on ivory trading, agreed to by the 130 member-nations of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). American and European conservation and animal rights groups led the call for the ban and based their arguments on the endangered status of elephant populations in East Africa. In fact, the elephant populations had declined drastically just in the years since independence: in Kenya, for example, poachers had reduced the elephant population from 167,000 in 1973 to a mere 19,000 by 1989. In southern Africa, on the other hand, elephants had become so numerous that they were regularly damaging not only farmers' crops but also wild vegetation. Some parks in this region cull their elephant populations simply to prevent them from eating all their food supply. Not surprisingly, governments in southern African countries such as Botswana, South Africa, and Zimbabwe, along with many wildlife biologists, all opposed the proposed universal ivory trade ban, which would deprive the countries of millions of dollars of revenue. Nevertheless, the ban was initiated because of the pressure that conservationist groups put on CITES member-nations.  It took eight years before the southern African nations convinced other CITES members to agree to a partial lifting of the ivory trade ban. The agreement that passed in June 1997 permitted Botswana, Namibia, and Zimbabwe to sell their excess ivory stocks to Japan. Animal rights groups, which are also against wildlife culling, such as the United States Humane Society (USHS), opposed the agreement. Instead, they promote contraception and park expansion to handle wildlife population growth: in 1996, for example, the USHS gave South Africa's Kruger National Park $5 million to fund both research on hormonal birth control for elephants and additional land purchases.  **CONTEMPORARY APPROACHES TO WILDLIFE MANAGEMENT** Despite the controversies surrounding certain species, wildlife managers have agreed on a few basic strategies needed for effective conservation. Many experts endorsed the notion of reserves that will be able to provide for the largest number of species with the largest range. In areas where large amounts of land cannot be set aside, several small reserves can be linked to one another to allow migration. The need for such links became clear in the 1990s in Botswana where, although the country had reserved approximately 40 percent of its total land area for wildlife habitat, the wildebeest population fell by 94 percent between 1979 and 1994, and the hartebeest population by 83 percent. Scientists discovered that these animals' migratory routes had been cut off by farm fencing, and huge numbers had died of thirst or hunger.  Managers must also attempt to keep the genetic diversity alive with the species. Inbreeding can be dangerous. Only a 10 percent increase in inbreeding can lower reproductive performance by 10 to 25 percent, which could explain much of the cheetah's declining numbers. Scientists have determined that cheetahs are heavily inbred. If species numbers drop too low, then captive breeding in zoos or special reserves can help restore genetic diversity. Animals born in captivity, however, then have to be reintroduced into the wild, which raises another set of risks.  Another principle of contemporary wildlife management is to minimize the harm wildlife can inflict on nearby human settlements. One approach is to set aside buffer zones between game reserves and farmland, so wildlife straying off a reserve are less likely to trample crops or attack domestic livestock. The idea of the buffer zone assumes that park authorities are responsible for patrolling the park boundaries, and that once animals cross the buffer zone into human habitat, people should be able to kill them in self-defense.  Perhaps the most difficult task facing wildlife managers is to make wildlife conservation worthwhile for local people. One well-known example of an attempt to make conservation profitable for village communities is Zimbabwe's Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). Initiated in the mid-1980s, this program seeks to promote economic development in the long-impoverished communal lands (roughly 42 percent of Zimbabwe's total land area) through the sustainable use of natural resources-including elephants. Zimbabwean farmers have traditionally had an adversarial relationship with elephants, because the animals do so much damage to their fields. A single animal can easily eat or trample a family's entire food crop. To make conservation more attractive to farming communities, the Zimbabwean government gave them a voice in determining how many elephants could be hunted each year within their own districts, and then planned to turn over to these communities a portion of the profits generated by hunting tours.  The benefits to local communities from controlled elephant hunting are significant. The mostly foreign hunters who come to shoot elephant and other game in Zimbabwe pay as much as $12,000 for one trophy, in addition to a daily hunting fee of $1000. In 1993, 12 districts with a total population of 400,000 earned more than $1.5 million through trophy fees. Some of this money has gone into village projects such as schools and granaries, but some has also gone into building fences to protect crops from elephants. The revenue has also helped discourage poaching and encouraged communities actively to promote wildlife survival in their districts.  Another approach to reconciling the needs of people and wildlife is the creation of luxury resorts that provide both protected space for animals and abundant employment and entrepreneurial opportunities for local communities. This approach is controversial but increasingly popular with cash-poor African governments. In 1996, for example, Mozambique granted American entrepreneur James Blanchard a long-term lease to an extensive tract of land south of the capital of Maputo. He planned to construct an $800 million, 10.25 sq km (4000 sq mi) tourist park and game reserve. It included part of the Atlantic coastline, as well as such amenities as golf courses, a floating casino, and a steam train that carried visitors through the areas containing herds of elephant and antelope. Developers anticipated that once the animal populations grew sufficiently, controlled hunting would be introduced as a way to cull herds and attract high-end big-game hunters. The plan did not please everybody, in part because it would displace an estimated 10,000 people in farming and fishing communities. The park's supporters argued, however, that employment opportunities, ranging from game trackers to construction workers to domestic jobs in the hotels, would mitigate the hardship.  Other reserves in Namibia and Botswana offer basically the same kinds of luxury wildlife tourism, but with one important modification. The parks' developers attempted to win the acceptance of nearby communities by building clinics and schools and by employing as many local people as possible. They offered jobs not only for cooks and chambermaids but also in ironworking and construction. In addition, some of these parks encouraged local farmers to grow produce that could be purchased and used by their hotel restaurants and catering facilities.  Tourism alone offers no definitive solution to the challenges of preserving wildlife and its habitat, and in any case it is only feasible in countries that boast the big-game species and scenic landscapes that attract visitors from overseas. Moreover, foreign tourist companies still receive the "lion's share" of the profits generated from "safari" tourism in the game-rich countries of East and southern Africa. Still, wildlife management strategies in Africa are now more sensitive than they once were to the needs of both animals and people.  Contributed by Robert Fay |

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(P5) Read the following section of Alberta’s Wildlife Act and complete the definition of wildlife assignment in your workbook

**Interpretation**

**1(1)** In this Act,

(a) “animal” means a vertebrate, other than a human being or

fish;

(a.1) “appointed officer” means a wildlife officer appointed under section 1.1(1) who is an employee of the Crown and subject to the *Public Service Act*;

(a.2) “authorization” means an instrument issued under section

22.1(1);

(b) “big game” means animals of a kind prescribed as such;

(c) “bird of prey” means a bird of a kind prescribed as such;

(d) “controlled animal” means an animal of a kind prescribed

as such;

(e) “Crown” means the Crown in right of Alberta;

(f) “dog” means a domestic dog (canis domesticus);

(f.1) “domestic cervid”, “domestic cervid production farm”, “authorized present or prospective domestic cervid” and “prospective domestic cervid” have the meanings

respectively ascribed to those expressions by the *Livestock Industry Diversification Act*, and “domestic cervid production farm licence” means a licence issued under

that Act;

(g) “endangered animal” means an animal of a kind prescribed as such;

(h) “endangered organism” means an endangered animal or another organism of an endangered species;

(i) “endangered species” means

(i) a kind of endangered animal,

(ii) a kind of invertebrate prescribed as an endangered invertebrate,

(iii) a kind of plant, alga or fungus prescribed as an endangered plant, alga or fungus, or

(iv) a kind of fish prescribed as an endangered fish, or any combination of any of those kinds of organisms;

(j) “fur-bearing animal” means an animal of a kind prescribed as such;

(k) “fur farm” means a fur farm within the meaning of the*Fur Farms Act*, and “fur farm licence” means a valid and subsisting licence issued under that Act;

(l) “game bird” means an upland game bird or a migratory game bird;

(m) renumbered as (f.1) 2009 c36 s2;

(n) “guide”,

(i) used as a verb, means hunt in the manner specified in clause (o)(v), and

(ii) used as a noun, means a person who so hunts;

(o) “hunt” means, subject to subsection (6), with reference to a subject animal,

(i) shoot at, harass or worry,

(ii) chase, pursue, follow after or on the trail of, search for, flush, stalk or lie in wait for,

(iii) capture or wilfully injure or kill,

(iv) attempt to capture, injure or kill, or

(v) assist another person to hunt in a manner specified in subclause (i), (ii), (iii) or (iv) while that other person is so hunting;

(p) “licence” means a valid and subsisting licence issued under section 13(1) authorizing hunting, and includes a tag or other component part of a licence;

(q) “migratory game bird” means a bird of a kind prescribed as such;

(r) “Minister” means the Minister determined under section 16 of the *Government Organization Act* as the Minister responsible for this Act;

(s) “non-game animal” means an animal of a kind prescribed as such;

(t) “non-licence animal” means an animal of a kind prescribed as such;

(u) repealed 2002 c30 s33;

(v) “open season” means a period established as such under section 23;

(w) “permit” means a valid and subsisting permit issued under section 13(1) authorizing an activity other than hunting;

(x) “permit premises” means premises or parts of premises where an activity for which a permit is required is conducted;

(y) “prescribed”

(i) in the expression “prescribed by the Lieutenant Governor in Council” means prescribed or otherwise provided for by regulations made by the Lieutenant

Governor in Council, and

(ii) otherwise, means prescribed or otherwise provided for by regulations made by the Minister;

(z) “privately owned land” means

(i) land held under a certificate of title by a person other than the Crown,

(ii) land held under an agreement for sale under which the Crown is the seller, or

(iii) land or classes of land held under leases or other dispositions from the Crown that are prescribed to be privately owned land;

(aa) “record” includes

(i) an account, book, return, statement, report, document or memorandum of information whether in writing or in electronic form or represented or reproduced by

any other means, and

(ii) the results of the recording of details of electronic data processing systems and programs to illustrate what the systems and programs do and how they operate;

(aa.1) “recreational licence” means a licence of a type that is

prescribed as recreational;

(bb) “resident” means a person who

(i) has his or her only or primary residence in Alberta and

(A) is a Canadian citizen or admitted to permanent residence in Canada, or

(B) has lived in Canada for the 12-month period immediately preceding the relevant date, or

(ii) is on full-time service with the Armed Forces of Canada and would, if an election were held under the *Canada Elections Act* (Canada), be eligible to vote in

Alberta under that Act;

(cc) “skin”, where used in relation to an animal, includes its hide or pelt, with or without the pelage, and, in the case of a bird, includes the plumage;

(dd) “subject animal” means a wildlife animal, a controlled animal or any other kind of animal prescribed as a subject animal;

(ee) “tag”,

(i) used as a noun, means a tag issued under section 14, and

(ii) used as a verb, means affix a tag pursuant to section 37;

(ff) “this Act” means this Act and the regulations;

(gg) “traffic” or “traffic in” means

(i) sell, buy, barter or trade, or offer to do so, or

(ii) solicit, advertise, display or expose for sale, barter or trade or with a view to effecting a sale, barter or trade;

(hh) “trap”,

(i) used as a noun, means a device, other than a weapon, designed and commonly used to capture, injure or kill animals of any kind, and

(ii) used as a verb, means capture, injure or kill animals of any kind, or attempt to do so, by means of the use of a trap;

(ii) “upland game bird” means a bird of a kind prescribed as such;

(jj) “vehicle” means a device, other than an aircraft or boat, in, on or by which a person or thing may be transported;

(kk) “weapon” means a firearm or any other device that propels a projectile by means of an explosion, spring, air, gas, string, wire or elastic material or any combination of

those things;

(ll) “wildlife” means big game, birds of prey, fur-bearing animals, migratory game birds, non-game animals, non-licence animals and upland game birds, and includes any hybrid offspring resulting from the crossing of 2 wildlife animals;

(mm) “wildlife guardian” or “guardian” means a person appointed as a wildlife guardian under section 2(1);

(nn) “wildlife officer” or “officer” means a person holding office as a wildlife officer under section 1.1(1) or 1.2.

***(P6) Occupational Connection Worksheet***

Complete an Occupational Connection Sheet for this module. The purpose of the worksheet is to develop an understanding of how the activities undertaken in this module may be connected to an occupation. Your research may come from several sources. A speaker may come to your class to talk about the role of wildlife in their occupation. You may chose to research the Alberta Learning Information Service ([www.alis.alberta.ca](http://www.alis.alberta.ca)) or any other Canadian information service. The role wildlife takes in the occupation may be direct and obvious, or it may be indirect or just a small component of. When you finish your Occupational Connection Worksheet, go over it with your instructor and have them initial your activity sheet.

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