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Explanation of the Curriculum

Welcome to Tundra's Wolf Curriculum! I have developed this curriculum for Grades 5-7 in elementary school and for the full grades of high school.

There is ample information on the Web about wolves in general, so I wanted to focus on the valuable role of the wolf in the ecosystem by creating and maintaining healthy ecosystems. I have included for expanded reference, good books and videos that compliment the concepts I have developed in this curriculum.

Parents or teachers can help to explain these concepts on the videos or in the books to their students where the content is more adult focused.

All the pictures of wolves in this curriculum are my very high content wolfdogs. They are Tundra, Nahanni and Mahikan. Teachers, students and parents are welcome to come and visit us to learn more about wolves and to interact with them. They are all very friendly. Please see the PDF brochure, "A Day with the Wolves" for details of the program.

If traveling to Nanaimo is not feasible, then we can get together via Facebook Messenger. You will be able to see Tundra, Nahanni and Mahikan live and to ask questions.

Should you have questions about the material or you want clarification or expansion on anything in the curriculum, please feel free to call me (250) 616-4682 or by any one of my two email addresses: meshach915@gmail.com or tundra@tundraspeaks.com

A big part of the curriculum is to search through the websites, book and videos I have recommended. In particular my website, www.tundraspeaks.com to learn about Tundra and Mahikan raising her two pups. I recommend you read my blog from May 22, 2014 till present to learn how exciting and challenging it was in raising Nahanni and Mahikan.

Enjoy learning about wolves and in particular my journey living with my wolves - Tundra, Nahanni and Mahikan.

Yours in wolf conservation,

Gary R. Allan
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GREY WOLF (Canis lupus)

Introduction

This carnivore was the widest ranging predator found in the world. It lived on every continent except Australia (which has the dingo that is closely related to the wolf). The wolf also did not reside in South America.

With the advent of animal husbandry and agriculture around 10,000 BC, the wolf has been relentlessly persecuted by humans. Through this intensive extirpation of the Grey Wolf, it now only occupies a small fraction of its traditional world territory.

Canada has the largest population anywhere in the world. Our population estimate is 54,000 - 60,000, but there are areas of Canada where the wolf has been extirpated. This includes Atlantic Canada, Southern Quebec and Southern Ontario plus the southern Prairies.

The Grey Wolf resides in Russia (approx. 30,000 wolves), Europe where it is slowly recolonizing its former territory. The wolf resides in the Middle East - Saudi Arabia, Israel, Iraq, Iran, Afghanistan and through Pakistan and northern India. China also has a sizeable wolf population, particularly in Inner Mongolia.

It resides in Ethiopia and also in the United States. The US has a small population in the Great Lakes area (Minnesota, Michigan and Wisconsin) that numbers around 4,000. In the Northern Rocky Mountain states (Wyoming, Montana and Idaho) there are approximately 3,000 wolves. Alaska has the largest wild population of 6,000 - 8,000 wolves but they are relentlessly hunted and trapped there.

There are five sub-species of the Grey Wolf in North America. They are the Arctic Wolf (canis lupus arctos), Eastern Timber Wolf (canis lupus lycaon), Canis lupus nubilus and Canis lupus occidetalist. Nubilus and Occidentalist would have the largest population of the five sub-species.

Physical Characteristics

Length - up to 1.8 meters (6 feet) including tail.
Height - 84 to 96.5 cm (33 to 38 inches) at the shoulder.
Average weight - females (65-80 lb. 30-38 kg)
males (75-125 lb. 35-58 kg)
Colour - Wolves come in many colours - gray, black, white, reddish, cream, tan, brown and sandy brown.
Mating - around January or February (depending on latitude)
Gestation - 63 days
Litter size - 3 to 8 pups
Prey/Diet - moose, deer, caribou, elk, bison, rabbits, and rodents.

The Grey Wolf is a very adaptable animal as it can live in many different habitats:
Arctic, Tundra, Northern Boreal Forest, Plains, Temperate Forest, and Desert.

Questions:

1. How many sub-species of the Grey Wolf are there? Name them.
2. What different habitats do wolves live in? Why are they so adaptable?
3. Which continents does the Grey Wolf not live on?
4. Why does Canada have the largest wolf population in the world?
5. List 4 physical characteristics of the Grey Wolf.



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Wolf Pup Development

We have helped raise five wolf pups. Nahanni and Mahikan were both five weeks old when we received them from the breeder, Tundra was 3 weeks old. When Mahikan was 5 years old she gave birth to Denali & Stqe:ye.

Nahanni is an Arctic wolf and Mahikan is a black-phase wolf. Both are very high content wolfdogs and very close to being 100% wolf. On my website, www.tundraspeaks.com, I have written a blog on raising Nahanni & Mahikan from May 2014 to October 2014. Also from May 2019 to December 2019, I have written about Mahikan raising her 2 pups.

Nahanni is named after the beautiful, rugged National Park in the N.W.T. Mahikan means wolf in the Cree language. I purchased these two very high content wolfdogs from, in my opinion, the best breeder in the world. I brought Nahanni & Mahikan home on May 22, 2014 and I write this daily blog on their behavior, actions and development. I have also commented on how wild wolf pups would develop in the wild.

In this section I have included Gordon Haber's wolf pup development on the wolf pups he studied as a wolf biologist for 43 years. Look for similarities and differences between Nahanni & Mahikan & the wild pups that Gordon studied. Also see how Mahikan raised her pups & what are the similarities & differences she encountered with her pups.

There is a Youtube video I produced called

The First Two Years of Life of an Alaska Wolf

Late February/ Early March
Alpha female and alpha male engage in courtship and mating.

Early/Mid May
Pups are born in their natal den - as many as nine pups in a litter.

Late May/Early June
Pups emerge from the natal den for the first time. The rest of the family group cuddles, cleans, and plays with them.

July
Pups are weaned and spend more time out of the den. Adults may take pups on short walks. Adults hunt at night and return in the morning to a welcoming chorus-howl, bringing food from distant kills.

July/August
To prepare pups for winter travel, adult wolves may move pups between dens and rendezvous site or to nearby kills.

Late September/October
Pups leave dens behind and begin their nomadic winters, traveling regularly with older family members.

September thru November
Pups are in "hesitation and fear" stage of traveling and hunting and need constant help and prodding from adult wolves. Pups begin learning hunting traditions and territories.

December/January
Pups progress to the "foolhardy boldness" stage of hunting.

May
Now a year old, pups progress to the third stage of hunting skills: contributing effectively to the group, albeit with less skill and more hesitancy than experienced adults.



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May/June
Yearlings eagerly await the appearance of the new siblings, who have been seen up to now only by the mother and any other females who are cooperatively nursing.

June
New pups emerge, and yearlings play with them, perhaps also pup-sitting them while other more experienced adults go off to hunt. Yearlings also help on hunts to provide for pups.

September
As the family begins their nomadic ways again, yearlings help the new pups navigate streams and other first-time adventures.

September thru May
In their second winter, yearlings continue to learn hunting skills and territories, including boundaries and prey locations. They remain less adept at hunting and scavenging than adults.

June
With another round of siblings, the two-year-olds help even more, perhaps even lactating and helping to nurse the new litter.

September
Entering their third winter, the two-year-olds have learned their territory and have become competent hunters, able to fully assist and support the family group. Some may disperse to other areas, but most try to stay with the family group.

Reference: Among Wolves by Gordon Haber and Marybeth Holleman

Raising Pups

Wolf dens are elaborate, deep, honeycombed series of burrows and entrances that are used year after year. All members of the group are involved in preparing the dens. They include play areas for the pups, rest areas and lookouts for adults only, socializing areas for hunting departures and arrivals., and a maze of interconnecting trails, spread over as much as fifty acres.

During intervening periods most wolf dens are also used by other animals, including foxes, ground squirrels, porcupines and wolverines. Burrows at some sites were probably excavated originally by ground squirrels and were later enlarged by foxes, then wolves.

Many dens in Denali National Park may have been used for thousands of years or longer. Archaeological evidence indicates that at least three ancient wolf dens in Denali were also shared with humans from three thousand to ten thousand years ago.

Raising new pups at a den is social glue for wolves, without which individuals seem more likely to split apart and disperse at a time of year when some young adults are already predisposed to disperse.

Yearlings develop some of the closest bonds with the new pups, and their close care of the young pups is one of the manifestations of the wolves' sophisticated cooperative breeding behavior, in this case a form of "helping" that amounts to a division of labor.

Adult wolves engage in deliberate teaching, particularly of two to three month old pups. Older wolves take them on short "puppy" walks to better acquaint the pups with the world outside the natal den.

Loss of significant adults (and teachers) can cause groups to lose unique hunting abilities, the ability to hunt certain prey at all, the ability to maintain their territory.

In some wolf family groups, such as the Toklats, that rely heavily on the most challenging prey like mused sheep, pups require a two-three year period to learn from older, more experienced wolves. If they are denied this, by loss of the adults, then their very survival is at stake. Much of this learning amounts to traditions that are refined over time, behavior that helps adapt the group to the specific resources and other conditions of its area.



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Pups progress through four distinct phases in learning how to hunt: (1) hesitation and fear for the first few months after homesites are abandoned in the fall; (2) exuberant (and ineffective) overreaction to potential prey in midwinter; (3) effective participation, with adult guidance, at about one year old; and (4) effective hunting at two to three years old.

This prolonged period of dependency of pups on the adults, about 25 percent of their total life span, provides the means by which knowledge can be passed from one generation to another. This is a general characteristic of intelligent animal societies, including our own. And as with the young in many primitive human societies, young wolves have the added advantage of being raised in an extended family, where the presence of many adults caring for them - not just one or two parents - exposes them to the broadest possible opportunity for learning.

Questions:

1. How did Tundra and Meshach initially react towards the addition of the two new pups? How do you think a wolf pack reacts to the birth of new pups?
2. List 4 significant milestones the Alaska wolf pups achieve in their first year?
3. From reading my blog on raising Nahanni and Mahikan, do you think it was easy getting them to trust me and bond with me? Explain your answer.
4. Explain how the wolf dens help keep the wolf pack strong and together.
5. What does Mahikan mean in the Cree language?



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Arctic Wolves

This sub-species of the Grey Wolf is the most northerly sub-species and is the only sib-species that has camouflaged its coat colour to blend in with its surroundings, to enhance its hunting success. As winter covers eight months in the Arctic this is an extreme advantage to the arctic wolf.

Due to the extreme cold in the Arctic (minus 60F), arctic wolves have two thick layers of fur under the guard hairs. The guard hairs help to repel the moisture from the snow and rain and provides a waterproof barrier. As winter intensifies, the outer layer of fur gets thicker. Nahanni has a very thick coat which he developed it in August because that is when his arctic cousins are building their winter coats.

Arctic wolves are not as big as some of their southern counterparts. Their ears are smaller and their snout is not as long. The smaller ears are an adaptation to managing the colder arctic temperatures. Since wolves have a counter circulatory system, the warm blood stays in their foot pads longer to keep the paws from freezing and sticking on the snow and ice.

The main prey of arctic wolves is muskoxen, Peary caribou and arctic hares. Prey is scarce in the High Arctic (above 75 degrees N) due to the lack of vegetation, so arctic wolves have large territories (up to 10,000 sq. km) to provide enough food for them. Arctic wolves are also very territorial in protecting this scarce prey base.

Arctic wolves are able to store fat in their body which can be used to help them survive. Therefore, they do not need to feed as often as other wolf sub-species. However, starvation is a constant problem and a leading reason for arctic wolf mortality.

Wolf biologist, David Mech who studied an arctic wolf pack from 1987-2006, observed that arctic hares and wolf numbers were positively correlated, meaning that when arctic hare numbers declined so did wolf numbers. This relationship did not correspond as well with muskoxen when their numbers declined. Dr. Mech even observed that one year arctic hare population really crashed and the next year the wolf pack did not produce any pups.

In the High Arctic, wolves experience 24 hour darkness from October 18 - February 23 and the mean daily temperature is minus 34 degree C. Wolves still need to hunt during this four month period. David Mech one year which given permission from the Nunavut government to radio collar one of the pack members. The alpha male, Brutus was radio collared and this allowed the researchers to follow his movements during the winter. From January 19-29, Brutus and his pack made a 263KM (straight line) journey searching for food. They averaged 41KM during this trip all under complete darkness. However, during the summer they can hunt in 24 hour daylight.

In this harsh arctic environment, arctic wolves have adapted their coat to camouflage with its surroundings to hunt more successfully. Arctic wolves in the High Arctic are not hunted or trapped because no humans live up there. This is the only large protected area in North America where wolves can live without the fear of be killed by humans.

For more information on Arctic wolves see David Mech's website : www.arctic.noaa.gov/essay_mech.html
This essay has many studies attached to it for further arctic wolf study.
Read David Mech's blog when he resided with the arctic wolf pack. Pay particular attention to the winter months:
http://internationalwolfcenter.blogspot.ca/search?updated-max=2010-03-11T13:47:00-06&max-results=5&start=30&by-date+false

Questions

1. Why is the arctic wolf's coat white?
2. Explain why the arctic is such a harsh environment to live in for arctic wolves?
3. Name 3 ways that arctic wolves have adapted to survive in this harsh environment.
4. Arctic wolves seem to be able to travel in total darkness in winter almost as easily as total light in summer. Explain why?
5. When everything is frozen in winter how do arctic wolves drink water?

Reference: An excellent book is, The Arctic Wolf: Living with the Pack by L. David Mech. This book describes in detail the author's experience living with an arctic wolf pack on northern Ellesmere Island.



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Trophic Cascades and Keystone Species

What is a trophic cascade? Well quite simply, it is a relationship that involves three levels:
- a top predator (sometimes a keystone species)
- a herbivore (prey for the top predator)
-plants and shrubs (food for the herbivore)

Trophic cascades involves a relationship among members of a food web in which a keystone predator influences the abundance and behaviour to its herbivore prey, and that in turn affects how things grow.

The wolf is a keystone predator so it is significantly involved in a trophic cascade. Dr. Cristina Eisenberg, author of "The Wolf's Tooth: Keystone Predator, Trophic Cascades and Biodiversity" states: "Wolves touch everything in an ecosystem, from trees to butterflies to songbirds, because of how they influence their prey's behaviour and presence, and how that in turn affects the way their prey eat and use a landscape."

Trophic refers to nutrition (food) and cascades is the direction in which the nutrition flows. Think of the picture of the waterfall as it cascades down over the rocks. At the bottom are the plants, shrubs or grass. They receive nutrients from the soil which is watered by the rain and fertilized by animals including herbivores (deer).

The middle layers, the herbivore which eats the plant material that it has helped fertilize. The top layer is the keystone predator (wolf) which eats the herbivore but also chases the herbivore so it does not eat all the plant material including trees.

The wolf is an ecological engineer because as a keystone predator, it controls everything from the top. As Cristina says, the wolf touches everything in an ecosystem. It keeps the herbivores in check so they do not eat everything, which they will do. This allows beavers to use the trees (aspen,birch, and cottonwood) to build dams and create wetlands. These wetlands provide a habitat for waterfowl and aquatic animals (frogs, fish, otters). Songbirds have trees to build nests in and songbirds distribute seeds which results in new trees and shrubs.

Too many deer eat all the trees and bushes which line the creek and river banks. This causes soil erosion and it flows into the water which clogs fish gills and disrupts other aquatic life. Wolves ensure that deer and other herbivores do not eat all the trees and shrubs on the riverbanks (riparian environment) and this protects the aquatic environment.

Cecil Godkin's book, "Wolf Island" is an excellent resource for younger grades (elementary school) to learn about trophic cascades. The Youtube video, "How Wolves Change Rivers" is an excellent resource explaining the reintroduction of wolves into Yellowstone National Park and how it effected a trophic cascade. This video is appropriate for Grades 4-7 and high school. For a longer and more in-depth examination of trophic cascades in Yellowstone with the reintroduction of wolves, watch the video "Lords of Nature" which is available in libraries.

What is a keystone ? A keystone is the stone at the apex (top) of an arch which holds all the other stones in place and gives the arch strength. Arches are used in buildings and bridges. If you remove the keystone, the arch will collapse. In 1968, Robert Paine, biologist coined the term keystone species based on this concept of the keystone being vital to holding the arch up, therefore a keystone species will keep the ecosystem from collapsing.

What is a keystone species? It is a dominant predator (wolf) that touches everything in the ecosystem by consuming and controlling the abundance of a particular prey species (deer), and a prey species that competes against and excludes other species from eating trees and shrubs which they all need.

The wolf will kill enough deer and chase the other deer it does not kill so that other species such as beavers can eat the trees and build their dams, so songbirds can build their nests in the trees.

The wolf is a dominant predator (keystone species) because it roams freely on the landscape and is always present. A bear (grizzly or black) is a top predator but not a keystone species because it hibernates half the year. A cougar is a top predator and is active all year but is not a keystone species because it is a solitary animal that does not have the same, pervasive presence as a wolf has on the landscape.

What happens if we remove a keystone species such as a wolf from the ecosystem? Well, like the arch, the ecosystem collapses. This happened to Yellowstone National Park when they extirpated wolves from the park in 1925. For 70 years, until they were reintroduced into the park, wolves



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were absent and the elk herds multiplied. They browsed on all the aspen, willow and cottonwood trees which destabilized the park, destroying its ecosystem. There was no trophic cascade process occurring because the wolf (keystone species) was absent.

That was rectified when the wolves were reintroduced in 1995 and the wolves radically and quickly restored the park back into a functioning ecosystem. See the two above recommended videos which clearly demonstrates this healing process.

Other examples of the destruction done by herbivores (deer) when wolves are absent from the landscape includes the eastern United States and Eastern Canada. The intense over browsing of the deciduous and hardwood trees is destroying the natural regeneration of these trees. If all browsing by deer of the eastern hemlock was eliminated today it would take 70 years to allow eastern hemlock seedlings to grow back to the height of mature eastern hemlock. Scotland, which is wolf-free, 99% of the Caledonia pinewoods are destroyed and can not regenerate itself because of over browsing by red deer (elk).

Closer to home, certain islands of Haida Gwaii had deer introduced to these islands, where there are no predators, including wolves. On certain islands there is 85% less shrub and trees and 20-50% fewer plant species because of the intense over browsing by deer.

Wolves are so important in the ecosystem they do help to protect biodiversity. John Terborgh, a leading scientist (biologist) explains, "trophic cascades loom at least as large as climate change in their capacity to destabilize the mechanisms that sustain biodiversity. Of the two threats, climate change and the disruption of trophic relationships, the latter is the more urgent because trophic relationships have been altered for decades or even centuries over much of the earth, whereas climate change has only recently begun to disturb ecological processes."

Wolves by regulating the ecosystem can play a small part in affecting climate change buy by no means arrest it. They can ensure that plants, trees, and shrubs can still absorb carbon by remaining free from intense over browsing.

Questions:

1. Explain what a trophic cascade is and give an example of it in an ecosystem.
2. What is a keystone species? Why are they so important in the ecosystem?
3. Give some examples that occurs to an ecosystem when a keystone species is removed?
4. Do you think it was a good decision to reintroduce wolves to Yellowstone? Give reasons for your decision.
5. In the video, "How Wolves Change Rivers" give a list of the positive changes that wolves brought to the Yellowstone ecosystem.



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Isle Royale Wolf-Moose Project

In Lake Superior just off the shores of Ontario, lies a US National Park on Isle Royale. The park was established in 1940 and the Ojibway people called the islands Minong. Around 1900, moose populated the islands having swam the 15 miles from Ontario. Around 1948, presence of wolves were detected on the islands and it is believed the wolves walked over on the ice when Lake Superior was frozen over.

There are no human settlements on Isle Royale and visitors only come over for the summer. In addition to wolves and moose, beavers, foxes, and snowshoe hares reside on the island. The flora consists of spruce, fir, aspen and birch trees. Isle Royale is a closed environment, and since 1958, it has been at the centre of a predator/prey study. The Isle Royale Wolf-Moose Project is the longest continuous research study of any predator/prey system in the world.

This predator/prey system is very simple because being an island, there are no migrating moose or wolves onto Isle Royale except for a wolf that ventured to the island in 1997. No humans can hunt or trap on the island, so the only mortality for wolves is strife with another pack, old age, or being killed by a moose. Moose are the main prey for wolves but in the summer they predate on beavers and snowshoe hares.

From 1960 to 1980, wolves and moose seemed to be in balance. Rolf Peterson, biologist from Michigan Technological University stated that the 1970's were good times for wolves. Several new packs appeared and grew in size. Pup survival was also positive and by 1980, there were 50 wolves in 5 packs on Isle Royale. This was the highest number of wolves during the 55 years that the study has been conducted.

In 1981, a visiting dog (dogs were prohibited on the island) brought the virus, canine parvovirus to the island killing 36 wolves and all new born pups. The population of wolves plummeted to 14. The moose population rose from about 1,000 in 1980 to around 2,500 in 1995 due to low wolf predation.

In 1996, the moose population fell rapidly due to a severe winter, outbreak of moose ticks and lack of forage for moose. The moose population dropped from its all-time high of 2,400 in 1995 to 500 moose in 1996.

From 1995 to 2006, the wolf population increased to 30 individuals but by 2006 the moose population had declined and they were harder to find and kill. The number of wolf packs declined and by 2011, there were only 9 wolves. From 2011 to 2014, the moose population has nearly doubled.

The researchers Rolf Peterson and John Vucetich are concerned that the wolves suffer from a lack of genetic diversity (too much inbreeding) and the inability to hunt. Only 6 moose were killed in 2014 during the 2 month period the researchers live on the island. This predation rate is 2% and has been very low for the past 3 years.

The debate now is whether the US National Park Service should restock the island with new wolves which would improve the genetic diversity of the wolves on Isle Royale. Another option is to allow the wolves to be extirpated on Isle Royale and to observe the changes to the ecosystem and reintroduce wolves if needed at a later date. Another possibility is a new ice bridge could form in Lake Superior and new wolves would recolonize Isle Royale. With warmer winters it is unlikely that another ice bridge would form.

In June 2018, United States National Park Service (NPS) decided to restore wolf predation on Isle Royale. In October 2018, NPS moved one male & three females from Minnesota to Isle Royale. In March 2019, NPS and Ontario Ministry of Natural Resources moved 7 male and 4 females from Ontario to Isle Royale. With a reasonable population of wolves the study can continue on.

Resources:

Book: The wolves of Isle Royale by Rolf Peterson
Video: Fortunate Wilderness - The wolf and moose study of Isle Royale a film by George Desort
There are annual reports and other very good material on the website, www.isleroyalewolf.org regarding this fascinating study.

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Questions:

1. Consult the graph contained in the Figure 1 on page 3 of the 2004-05 Annual Report, showing the fluctuating wolf and moose numbers and give two reasons why this is such an important graph for understanding wolf predation?
2. For the purposes of wolf predation, what is the significance that Isle Royale is a closed ecosystem?
3. Give two important dates for the fluctuation of wolf numbers?
4. Give two important dates for the fluctuation of moose numbers?
5. What is your prediction now that Isle Royale has been restocked with wolves? Will the number of wolves and moose stabilize? Are their enough wolves on Isle Royale to have a viable population for breeding, predation?

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Wolves and Connectivity

Because of the recent, rapid and intensive industrial activity (logging, mining, and oil and gas development) the natural landscape has been considerably altered. Habitats for animals have either been fragmented or destroyed due to this industrial activity.

Where the habitat has been fragmented, it is important to have corridors that allows animals to move freely from one habitat patch to another. Therefore, connectivity is the measure of the ability of organisms to move among separated patches of suitable habitat.

A corridor is a space that improves the ability of organisms to move among patches of their habitat. An example of a corridor for a wolf might be a hydro right of way.

Large carnivores such as grizzly bears, cougars, and wolves require large territories to have sufficient prey to meet their food needs. These territories usually contain resources which humans want to extract, thereby setting up conflict between humans and wildlife for the use of that territory.

As we have learned, wolves can reside in may different habitats so they are highly adaptive. This means they can move from one fragmented, disturbed habitat to a different fragmented habitat and survive.

In addition, we have learned from Yellowstone that wolves as a keystone species can assist in restoring ecosystems. Therefore, as these wolves connect one habitat patch to another or disperse to recolonize area they have been extirpated from, these ecosystems have a chance of being restored, depending on the extent of the damage done to the habitat.

Here are some examples of wolves connecting various territories to another as they freely move on the landscape, as well wolves moving into areas where they had previously been extirpated from.

In Alberta's Kananaskis Valley in June 1991, the Central Rockies Wolf Project, live trapped a female wolf and placed a radio collar on her. Little did the researchers know that Pluie (the name they gave her) would be a great disperser. She headed south, criss-crossing parts of Alberta, BC, Montana, and Idaho. Eighteen months later, she was killed near Invermere, BC by a trapper. Her travels were not in a straight line but she criss-crossed much territory and it was estimated she covered an area the size of Switzerland. Pluie traveled along the Yellowstone to Yukon (Y2Y) corridor which is very important corridor for large carnivores.

Another wolf in Alaska dispersed over 800KM from his natal pack. This was the longest recorded migration prior to Pluie's feat. These long migrations are very important for colonizing or recolonizing wolf habitat and establishing a keystone species in that ecosystem. Another important benefit is genetic diversity so there is no inbreeding and the wolves stay strong.

Since 1924, a wolf has not been sighted in the state of California. In early 2012, a lone male wolf crossed into northern California from Oregon. This wolf was from a pack in northeastern Oregon where he was radio collared and he criss-crossed eastern Oregon until his arrival in California. He remained in California for 15 months unable to find a mate but preying on deer and not cattle which were abundant in the area.

This wolf brought a great deal of excitement to people of California. If a pair of wolves travel down to California and begin a pack, then they will recolonize that area and because wolves are on the move, this scenario may become reality quickly.

In November 2014, a female wolf was confirmed sighted in northern Arizona on the North Rim of the Grand Canyon in the Kaibab National Forest. This female wolf likely had dispersed from a wolf pack near Yellowstone and wandered through Colorado to enter Arizona.

This is just the start of the dispersal of wolves into habitats they previously resided in many years ago. This is connectivity and it will mean wolves will be able to recolonize these areas and be an integral member of these ecosystems.

Questions

1. Research the topic of wolf dispersal. Why do wolves disperse? Do both sexes of wolves disperse from the natal pack? Identify 4 important benefits of wolf dispersal to the ecosystem.



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First Nations and Wolves

Different cultures have different perceptions of animals and Nature. The First Nation people regard the wolf as a respected friend whose hunting ability they wanted to emulate. The aboriginal people lived in harmony with the wolf and did not see it as an adversary unlike the view that the Europeans brought to North America when they colonized the Americas.

In the Pacific NorthWest, the aboriginal people knew that wolves mate for life and live in close family units and wolves are regarded as a family-oriented symbol in West Coast Native culture.

The wolf clan is an important clan in the Native family system and the wolf crest is the result of an ancestor who visited the houses of the wolves where he was taught certain songs and dances. The aboriginal people regarded the wolf as the most spiritual animal and the shamans (Native spiritual healers) received many of their healing powers from the wolf.

Universally, the wolf was revered by the aboriginal people because it was a good hunter and the wolf symbolizes cunning and was associated with a special spirit a man had to acquire to become a successful hunter.

Because the First Nation people had a very special spiritual and cultural connection to the wolf, they lived in close proximity to each other. They shared the land together.

In, "Who Speaks for Wolf" by Paula Underwood, a grandfather is talking to his grandson about the legend of the wolf for his people. The grandson is curious why the wolf is so close to them as they sit by the fire at night. The grandfather states, "we have known each other for a long time, we have learned to live with one another."

The grandfather told his grandson how many years ago, the lesson his people learned when they did not respect the wolf. His people were growing large in numbers and they decided to move to another territory. Wolf Brother who was a member of the tribe but not present when the decision to move was made. Upon Wolf Brother's return and having found out about the decision he stated, "I think that you will find that it is too small a place for both and that it will require more work then - than change would presently require."

The tribe found that Wolf Brother was correct and there was conflict with his people and the wolf. The tribe made a decision to move from this wolf territory. They stated, "they saw that it was possible to hunt down this Wolf People until they were no more but they would change from a People who only took life to sustain their own and would become a people who took life rather than move a little."

The grandfather said it was a lesson we have never forgotten, "let us now learn to consider wolf." That was the Wolf Question.

The grandfather said when the wooden ships came, bringing a new People (Europeans), they looked at them and saw that what we accomplish by much thought and considering the needs of all. We could not teach them to ask Wolf's Question. They did not understand he was their brother.

This story clearly demonstrates the difference in cultural perspective these two peoples have regarding the wolf. The aboriginal view is much more healthy view which understands the valuable role the wolf plays in the ecosystem. The European view is one of vengeance and hatred of the wolf because they place a higher emphasis in cleansing the wolf from the landscape than co-existing with it as the First Nation people do.

Chief Dan George stated, "one thing to remember is to talk to the animals. If you do, they will talk back to you. But if you don't talk to the animals, they will not talk back to you, then you won't understand and when you don't understand you will fear and when you fear you will destroy the animals, and if you destroy the animals, you will destroy yourself."

From my work with First Nation people by visiting their schools with Tundra, being invited with Tundra to National Aboriginal Day, talking to First Nation groups, I have learned their stories and myths and legends from them. I will share these stories with your students upon a visit.

For further research about First Nation views read "Wolf: Legend, Enemy, Icon" by Rebecca Grambo. Also, "Of Wolves and Men" by Barry Lopez.