MOUNT ST. HELENS ERUPTION

http://volcanoes.usgs.gov/volcanoes/st_helens/st_helens_geo_hist_101.html

Geology and History Summary for Mount St. Helens

Mount St. Helens, located in Washington State, is the most active volcano in the Cascade Range, and it is the most likely of the contiguous U.S. volcanoes to erupt in the future. The volcano is almost 53 km (33 mi) due west of Mount Adams and approximately 80 km (50 mi) northeast of the Vancouver, Washington—Portland, Oregon metropolitan area. Volcanism occurs at Mount St. Helens and other volcanoes in the Cascades arc due to subduction of the Juan de Fuca plate off the western coast of North America.

Over its rich and complex 275,000-year history, Mount St. Helens has produced both violent explosive eruptions of volcanic tephra and relatively quiet outpourings of lava. In the beginning stages of eruptive activity, the volcano mostly consisted of a cluster of domes that was surrounded by an apron of tephra and debris fans of fragmented volcanic rocks.
It was only during the past few thousand years that the volcano grew to its pre-1980 elevation of 2,950 m (9,677 ft), making it the, then, fifth highest peak in Washington. Starting about 3,000 years ago, substantial amounts of basalt and andesite began to erupt as lava flows between phases of dacite eruptive activity. These lava flows buried large parts of a central cluster of dacite domes and flanking fans, which started the cone building in earnest.
Based upon detailed chemical analysis of the eruptive products from each stage of Mount St. Helens volcanism, scientists deduce that the volcano's magmatic system has evolved from relatively simple to more complex as the volcano matured. The evidence indicates that interaction between more silicic (dacite) magma batches with more mafic (basalt to andesite) magma increased from the earliest to most recent stages of Mount St. Helens volcanism.

http://volcanoes.usgs.gov/volcanoes/st_helens/st_helens_geo_hist_99.html

1980 Cataclysmic Eruption

Summary of Events

Magma began intruding into the Mount St. Helens edifice in the late winter and early spring of 1980. By May 18, the cryptodome (bulge) on the north flank had likely reached the point of instability, and was creeping more rapidly toward failure. A magnitude-5+ earthquake was accompanied by a debris avalanche, which in turn unloaded the confining pressure at the top of the volcano by removing the cryptodome. This abrupt pressure release allowed hot water in the system to flash to steam, which expanded explosively, initiating a hydrothermal blast directed laterally through the landslide scar. Because the upper portion of the volcano was removed, the pressure decreased on the system of magma beneath the volcano. A wave of decreasing pressure down the volcanic conduit to the subsurface magma reservoir, which then began to rise, form bubbles (degas), and erupt explosively, driving a 9-hour long Plinian eruption.
Precursory Activity

On March 16, 1980, the first sign of activity at Mount St. Helens occurred as a series of small earthquakes. On March 27, after hundreds of additional earthquakes, the volcano produced its first eruption in over 100 years. Steam explosions blasted a 60- to 75-m (200- to 250-ft) wide crater through the volcano's summit ice cap and covered the snow-clad southeast sector with dark ash.

Within a week the crater had grown to about 400 m (1,300 ft) in diameter and two giant crack systems crossed the entire summit area. Eruptions occurred on average from about 1 per hour in March to about 1 per day by April 22 when the first period of activity ceased. Small eruptions resumed on May 7 and continued to May 17. By that time, more than 10,000 earthquakes had shaken the volcano and the north flank had grown outward about 140 m (450 ft) to form a prominent bulge. From the start of the eruption, the bulge grew outward—nearly horizontally—at consistent rates of about 2 m (6.5 ft) per day. Such dramatic deformation of the volcano was strong evidence that molten rock (magma) had risen high into the volcano. In fact, beneath the surficial bulge was a cryptodome that had intruded into the volcano's edifice, but had yet to erupt on the surface.

Bulge (right) and small crater, Mount St. Helens summit. Crater area dropped in relation to the summit, and bulge shows pronounced fracturing because of its increased expansion. View looking south.
(Click image to view full size.)
Bulge (right) and small crater, Mount St. Helens summit. Crater area dropped in relation to the summit, and bulge shows pronounced fracturing because of its increased expansion. View looking south.

Debris Avalanche

With no immediate precursors, a magnitude 5.1 earthquake occurred at 8:32 a.m. on May 18, 1980 and was accompanied by a rapid series of events. At the same time as the earthquake, the volcano's northern bulge and summit slid away as a huge landslide—the largest debris avalanche on Earth in recorded history. A small, dark, ash-rich eruption plume rose directly from the base of the debris avalanche scarp, and another from the summit crater rose to about 200 m (650 ft) high. The debris avalanche swept around and up ridges to the north, but most of it turned westward as far as 23 km (14 mi) down the valley of the North Fork Toutle River and formed a hummocky deposit. The total avalanche volume is about 2.5 km3 (3.3 billion cubic yards), equivalent to 1 million Olympic swimming pools.

Lateral Blast

The landslide removed Mount St. Helens' northern flank, including part of the cryptodome that had grown inside the volcano. The cryptodome was a very hot and highly pressurized body of magma. Its removal resulted in immediate depressurization of the volcano's magmatic system and triggered powerful eruptions that blasted laterally through the sliding debris and removed the upper 300 m (nearly 1,000 ft) of the cone. As this lateral blast of hot material overtook the debris avalanche; it accelerated to at least 480 km per hr (300 mi per hr). Within a few minutes after onset, an eruption cloud of blast

tephra began to rise from the former summit crater. Within less than 15 minutes it had reached a height of more than 24 km (15 mi or 80,000 ft).

The lateral blast devastated an area nearly 30 km (19 mi) from west to east and more than 20 km (12.5 mi) northward from the former summit. In an inner zone extending nearly 10 km (6 mi) from the summit, virtually no trees remained of what was once dense forest. Just beyond this area, all standing trees were blown to the ground, and at the blast's outer limit, the remaining trees were thoroughly seared. The 600 km2 (230 mi2) devastated area was blanketed by a deposit of hot debris carried by the blast.

Plinian Eruption

Removal of the cryptodome and flank exposed the conduit of Mount St. Helens, resulting in a release of pressure on the top of the volcano's plumbing system. This caused a depressurization wave to propagate down the conduit to the volcano's magma storage region, allowing the pent-up magma to expand upward toward the vent opening. Less than an hour after the start of the eruption, this loss of conduit pressure initiated a Plinian eruption that sent a massive tephra plume high into the atmosphere. Beginning just after noon, swift pyroclastic flows poured out of the crater at 80 - 130 km/hr (50 to 80 mi/hr) and spread as far as 8 km (5 mi) to the north creating the Pumice Plain.
The Plinian phase continued for 9 hours producing a high eruption column, numerous pyroclastic flows, and ash fall downwind of the eruption. Scientists estimate that the eruption reached its peak between 3:00 and 5:00 p.m. When the Plinian phase was over, a new northward opening summit amphitheater 1.9 x 2.9 km (1.2 x 1.8 mi) across was revealed.

Over the course of the day, prevailing winds blew 520 million tons of ash eastward across the United States and caused complete darkness in Spokane, Washington, 400 km (250 mi) from the volcano. Major ash falls occurred as far away as central Montana, and ash fell visibly as far eastward as the Great Plains of the Central United States, more than 1,500 km (930 mi) away. The ash cloud spread across the U.S. in three days and circled the Earth in 15 days.

Lahars

During the first few minutes of this eruption, parts of the blast cloud surged over the newly formed crater rim and down the west, south, and east sides of the volcano. The turbulently flowing hot rocks and gas quickly eroded and melted some of the snow and ice capping the volcano, creating surges of water that eroded and mixed with loose rock debris to form lahars. Several lahars poured down the volcano into river valleys, ripping trees from their roots and destroying roads and bridges.

The largest and most destructive lahar occurred in the North Fort Toutle and was formed by water (originally groundwater and melting blocks of glacier ice) escaping from inside the huge landslide deposit through most of the day. This powerful slurry eroded material from both the landslide deposit and channel of the North Fork Toutle River. Increased in size as it traveled downstream, the lahar destroyed bridges and homes, eventually flowing into the Cowlitz River. It reached maximum size at about midnight in the Cowlitz River, about 80 km (50 mi) downstream from the volcano.

AMERICAN BLACK BEAR

http://www.nwf.org/Wildlife/Wildlife-Library/Mammals/Black-Bear.aspx. Accessed 3/2/15.

"American Black Bear - National Wildlife Federation." American Black Bear -. National Wildlife Federation, n.d. Web. 02 Mar. 2015.

Description: Not all black bears are black—their fur can range in color from pure white to a cinnamon color to very dark brown or black. Most populations have a mixture of these colors, including the pure white form which is found in some individuals in the island archipelago in southern British Columbia (Kermodi Island). This white black bear (called spirit bears, revered by Native Americans) is caused by inheriting a recessive gene for coat color from both the mother and the father who could, themselves, both be black. A genetic reason results in the light grey coat color called the “blue” or glacier bear in southeastern Alaska.

Regardless of these genetic variants, most of the bears in any region are black in color. Some bears have a white patch on their chests. They have a short, inconspicuous tail, longish ears, a relatively straight profile from nose to forehead, and small, dark eyes.

Black bears have relatively short claws which enable them to climb trees. Unlike cats, the claws are non-retractable.

Other than color, how do black bears differ from grizzly bears?

Black bears have longer and less rounded ears and a more straight profile from forehead to nose compared to grizzly bears.
Grizzlies have larger shoulder humps and a more dished-in facial profile and much longer front claws that are evident in the tracks.
Black bears and grizzly bears can both have a wide variety of colors and sizes, but most commonly in areas where both species occur, black bears are smaller and darker than grizzly bears.
Size: Black bears in some areas where food is scarce are much smaller than in other areas where food is abundant. Typically, adults are approximately 3 feet tall at the shoulder, and their length from nose to tail is about 75 inches. All bears, including black bears, are sexually dimorphic—meaning adult males are much larger than adult females. A large male black bear can exceed 600 lbs in weight while females seldom exceed 200 lbs.

Diet: American black bears are omnivorous, meaning they will eat a variety of things, including both plants and meat. Their diet includes roots, berries, meat, fish, insects, larvae, grass and other succulent plants. They are able to kill adult deer and other hoofed wildlife but most commonly are only able to kill deer, elk, moose and other hoofed animals when these are very young. They are able to kill livestock especially sheep. Bears are very attracted to human garbage, livestock food or pet food, or other human associated foods including fruit trees. Bears using these human associated foods can quickly become habituated to them and this commonly results in the bears being killed as nuisances. This is true for bee hives as well as bears are very attracted to honey.

Typical lifespan: Black bears can live up to 30 years in the wild but most die before they are in their early 20s.

Habitat: Because of their versatile diet, black bears can live in a variety of habitat types. They inhabit both coniferous and deciduous forests as well as open alpine habitats. They typically do not occur on the Great Plains or other wide open areas except along river courses where there is riparian vegetation and trees. They can live just about anywhere they can find food, but largely occur where there are trees.

Range: The American black bear's range covers most of the North American continent. They are found in Alaska, much of Canada and the United States, and extend as far south as northern Mexico.

Black bear mom and cubs
Life History and Reproduction: Black bears are typically solitary creatures except for family (a female with cubs) groups and during mating season, which peaks in May and June. Following fertilization, the embryo doesn't implant in the uterus until fall at the time of den entrance. This process of delayed implantation occurs in all bear species and allows the female bear's body to physiologically "assess" her condition before implantation occurs and the period of gestation leading to the birth of cubs really begins. Delayed implantation allows the female to not waste fat reserves and energy in sustaining a pregnancy that would have little chance of success because her condition is too poor. Females give birth to cubs every other year if food sources are sufficiently plentiful. In years when food supplies are scarce a female may skip an additional year or two between litters. The cubs are born in the mother's winter den, and will den with her again the following winter. The following spring when the cubs are 1.5 years old, the cubs and female will separate and the female will breed again. A black bear litter can be 1-5 cubs but most commonly litters are 2 cubs.

Threats: Conservation efforts for black bears have been effective and in most areas black bears are increasing and can sustain managed sport hunting. In areas with human populations, this can cause conflicts because bears are very attracted to human foods and refuse as well as to livestock and livestock foods. Since bears are large and strong animals, many people fear them and resent the damage they can cause. The key to successful co-existence between humans and bears is to recognize that it is no longer possible for either species to occupy all habitats but that where co-occupancy is possible and desirable, humans must be responsible for the welfare of the bear population. Wild areas with little human footprint will remain the most important habitat for bears but peaceful co-existence can occur in the urban-wildland interface as long as humans take the necessary steps to assure that the relationship remains a positive one.

Status: The American black bear is not currently a species of conservation concern and even the formerly listed black bear of Florida and Louisiana is now increasing. Habitats in western Texas from which black bears were extirpated are now being re-colonized.

- **http://animals.nationalgeographic.com/animals/mammals/black-bear/**

“Black Bear.” National Geographic. http://animals.nationalgeographic.com/animals/mammals/black-bear/ Accessed 3/2/15

Black bears are North America's most familiar and common bears. They typically live in forests and are excellent tree climbers, but are also found in mountains and swamps. Despite their name, black bears can be blue-gray or blue-black, brown, cinnamon, or even (very rarely) white.

Black bears are very opportunistic eaters. Most of their diet consists of grasses, roots, berries, and insects. They will also eat fish and mammals—including carrion—and easily develop a taste for human foods and garbage. Bears who become habituated to human food at campsites, cabins, or rural homes can become dangerous and are often killed—thus the frequent reminder: Please don't feed the bears!

Solitary animals, black bears roam large territories, though they do not protect them from other bears. Males might wander a 15- to 80-square-mile (39- to 207-square-kilometer) home range.

When winter arrives, black bears spend the season dormant in their dens, feeding on body fat they have built up by eating ravenously all summer and fall. They make their dens in caves, burrows, brush piles, or other sheltered spots—sometimes even in tree holes high above the ground. Black bears den for various lengths of time governed by the diverse climates in which they live, from Canada to northern Mexico.

Female black bears give birth to two or three blind, helpless cubs in mid-winter and nurse them in the den until spring, when all emerge in search of food. The cubs will stay with their very protective mother for about two years.

Fast Facts

Type: Mammal
Diet: Omnivore
Average life span in the wild: 20 years
Size: 5 to 6 ft (1.5 to 1.8 m) long
Weight: 200 to 600 lbs (90 to 270 kg)
Group name: Sleuth or Sloth
Did you know?
Black bears are not true hibernators. During their winter dormant period, though, they do not eat, drink, urinate, or defecate, but may wake up if disturbed.

- **http://www.bearlife.org/black-bear.html**

Black Bear

North American Black Bear liveBlack bears are one of the more common species in North America. They live in many different habitats are not picky about what they eat. Their keen sense of smell gives them much information about their environment and foods they eat.

The American black bear is considered a threatened species in some areas. In fact they are protected in the states of Louisiana, Texas, and Mississippi. In other areas they are actively hunted and are subject to open "hunting seasons".

CHARACTERISTICS

Black bear anatomy includes a straight face and flat shoulders. It has ears that are often pointed and a short tail. Fur color can vary from black to chocolate brown with gray combinations. One of the more notable facts about this species is that they are excellent climbers, even when cubs.

The black bear is very adaptable. They are quite intelligent and curious. But this smaller bear is very shy and generally avoids confrontations. Records of human attacks are rare.

FACTS

Size: Length is about 4 to 7 feet long. Weight is about 200 to 600 pounds.
Reproduction: Mating season vary depending on habitat climate but breeding usually occurs May through August.
Gestation: 60 to 70 days.
Birth: January or early February.
Litter size: 1 to 3 cubs. Baby pairs are common.
Birth Weight: Baby cubs are usually under one pound.
Vocalizations: Grunts, moaning sounds, and growling.
Threats: Loss of habitat, territory fragmentation, changes in environment due to global warming, poaching.

Black Bear cub climbing tree, California.Baby black bears are born and live in the safety of the mother's den during winter. The average cub litter size is 1 to 3. Babies are born blind. A black bear baby weighs between one half to one pound at birth.

They put on weight quickly. The mother spends the following year and a half weaning, feeding, and teaching her cubs what to eat and how to survive. At that point they venture on to live on their own.

The sad fact is that many baby cubs will not reach adulthood due to hunting and attacks from predators. The mother will usually mate every 2 years but frequency depends on food resources, age, environment, and habitat density.

HOW MANY BLACK BEARS LIVE IN NORTH AMERICA? The total black bear population is estimated to be between 600,000 to 700,000 (excluding baby cubs). Habitat distribution information suggests about 55% live in Canada, 40% live in the United States, and 5% are in Mexico (accurate population facts south of Mexico unknown). Thanks to conservation efforts their population in some areas, such as California, are on the increase.

WHERE DO BLACK BEARS LIVE? Historic information suggests black bear habitat included most of North America including Alaska, Canada, almost all of the lower 48 United States, and Mexico. Today their home range territory is mostly in Alaska and Canada. Their territory is greatly reduced in Mexico. In the continental United States they live in less than 20% of their original range.

Black bears prefer to live in dense forests where there is a variety of food to eat and they can raise their cubs. But they have adapted to many different habitats. They build their dens in caves, burrows, tree trunks, and brush or grass nests. They collect grass and leaves to pad their dens.

WHAT DO BLACK BEARS EAT? American black bears are eating machines and are mostly vegetarian. Baby cubs are also voracious eaters. At the top of the food chain they are not picky about their diet. They will eat field grasses, roots, tubers, nuts, berries of all kinds, fruits, and other foods.

They also eat ants, grubs, termites, beetles, and other insects. Black bears also like salmon and other kinds of fish and will hunt for small mammals if available where they live.

DO BLACK BEARS HIBERNATE? Information about black bear hibernation suggests they enter a partial state of the process. Although there is a drop in body temperature, metabolic rate, and heart rate, they can awaken from their sleep to defend their cubs or ward off attacks if necessary.

Black bear hibernation can last up to 6 or 7 months depending on their habitat and climate conditions. They make use of their body fat and do not eat or pass any wastes. One of the more notable facts is that some do not hibernate as long or skip the process altogether when food is abundant.

CAN BLACK BEARS SWIM? North American Black bears like to swim. If there is water where they live they will exploit it for food. Since bears like to hunt fish they are not shy of water. In fact their baby cubs take to the water quickly.

In their search for food in their habitat they can cross ponds, lakes, and rivers to get to better feeding grounds (including campgrounds, lodges, and resorts). They use their powerful front and hind legs to paddle swiftly through water and are actually graceful swimmers.

HOW FAST CAN A BLACK BEAR RUN? At its normal pace black bears waddle slowly and casually. When in danger or hunting for prey they have the ability to burst into running mode with speeds up to 25 to 30mph. They can run for short distances only.

BLACK BEAR TRACKS Black bear paws have short claws to help them climb, dig, gather plant food, and attack small mammals. They use their claws like fingers when they eat. Their front footprints have an oval base with a curved toe line. Hind tracks have a triangular indentation. Toes are spread out.

Depending on the ground surface their claws may not be visible making specie information more difficult. This is particularly true in soils that have a fair amount of sand such as grounds near lakes and rivers where they hunt for fish. Black bear cubs leave small prints with no claw indentations.

ELK

http://animals.nationalgeographic.com/animals/mammals/elk/

Elk are also called wapiti, a Native American word that means "light-colored deer." Elk are related to deer but are much larger than most of their relatives. A bull (male) elk's antlers may reach 4 feet (1.2 meters) above its head, so that the animal towers 9 feet (2.7 meters) tall.

Bull elk lose their antlers each March, but they begin to grow them back in May in preparation for the late-summer breeding season.

In early summer, elk migrate to high mountain grazing grounds where the cows (females) will give birth. Each cow typically has a single calf, which can stand by the time it is 20 minutes old.

During the late summer breeding season the bugling of bull elk echoes through the mountains. These powerful animals strip the velvet off their new antlers using them in violent clashes that determine who gets to mate with whom. Males with the bigger antlers, typically older animals, usually win these battles and dominate small herds.

In the winter, wapiti reconvene into larger herds, though males and females typically remain separate. The herds return to lower valley pastures where elk spend the season pawing through snow to browse on grass or settling for shrubs that stand clear of the snow cover.

Elk were once found across much of North America but they were killed off and driven to take refuge in more remote locations. Today they live primarily in western North America, especially in mountainous landscapes such as Wyoming's National Elk Refuge and Yellowstone National Park. Some eastern U.S. states have reintroduced small elk herds into heavily wooded wilderness areas.
Fast Facts

Type: Mammal
Diet: Herbivore
Average life span in the wild: 8 to 12 years
Size: Height at the shoulder, 4 to 5 ft (1.2 to 1.5 m)
Weight: 325 to 1,100 lbs (147 to 499 kg)
Group name: Gang

http://naturemappingfoundation.org/natmap/facts/elk_k6.html
NatureMapping Animal Facts for Kids

Elk

What they look like: Elk, or red deer, range in color from dark brown in winter to tan in summer. They have a characteristic buff colored rump and long thin legs. The head, neck, belly, and legs are darker than the back and sides. Elk generally have a long head with large ears.

The adult male, know as a buck, has widely branching antlers as long as 1 to 1.5 m from tip to tip (see photo).

Where they live: Elk were once found throughout much of the Northern Hemisphere, from Europe through northern Africa, Asia, and North America. Extensive hunting and habitat destruction have limited elk to a portion of their former range. Elk populations in eastern North America were reduced as a result of over-hunting.

Today large populations of elk in North America are found only in the western United States from Canada through the Eastern Rockies to New Mexico, and in a small region of the northern lower peninsula of Michigan.

Elk prefer open woodlands and avoid dense unbroken forests. Elk can be found in coniferous swamps, clear cuts, aspen-hardwood forests, and coniferous-hardwood forests.

Elk are widespread in Washington and found in a variety of habitats such as shrub steppe, bunchgrass, shrub plant communities, open meadows near open or closed canopy forests. They move into sub-alpine areas during the summer.

What they eat: Elk are browsers. They feed on grasses, sedges, and forbs in summer and woody growth in the winter months. Woody plants include cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood.

Elk are ruminant animals and therefore regurgitate their food and re-chew to aid in digestion. This is also known as chewing cud.

Behavior: Males attract females by bugling - a very loud call that can be heard over a distance.

Elk are considered pests by many farmers. Over-browsing can cause damage to valued trees and agricultural crops.

Reproduction: Bull elk lose the velvet on their antler shortly before the fall rut, in late September and early October. During the rut, they begin to compete for access to

females. Dominant males are able to build larger harems of females and restrict access to them by other males.

They defend a kind of "moving territory" around the harem. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense - sometimes resulting in injury. The seasonal harems usually consist of 1 bull and 6 females plus their yearling calves.

A female will give birth to 1 calf. The gestation is about 8 months. The young nurse and are weaned in 2 months.

Lifespan: Elk can live beyond 20 years.

Predation: Natural predators of elk include grizzly bears, gray wolves, American black bears, and mountain lions. Calves may fall victim to bobcats and coyotes.

Did you know? Elk are primarily crepuscular, browsing mainly at dawn and dusk.
Only male elk grow antlers, which are shed each year.
A young deer is called a fawn. An adult male deer is called a buck. The female is called a doe.

http://animaldiversity.org/accounts/Cervus_elaphus/
Cervus elaphus
Elk

By Rachel Lesley Senseman
Last updated: February 04, 2002

Geographic Range
Elk, or red deer, were once found throughout much of the Northern Hemisphere, from Europe through northern Africa, Asia, and North America. Extensive hunting and habitat destruction have limited elk to a portion of their former range. Elk populations in eastern North America were extirpated largely as a result of overhunting. Today large populations in North America are found only in the western United States from Canada through the Eastern Rockies to New Mexico, and in a small region of the northern lower peninsula of Michigan. Elk were reestablished in the eastern United States, including Michigan, with three transplantations throughout the 1900's. Various elk populations in the western United States, including Yellowstone National Park in Wyoming, contributed to the reestablishment. In Eurasia elk populations are now confined to protected areas and less populated regions. Their traditional range extended from 65 degrees N in Norway to 33 degrees N in Africa. Elk have been introduced to Ireland, Argentina, Chile, Australia, and New Zealand.

Habitat

Elk prefer open woodlands and avoid dense unbroken forests. Elk can be found in coniferous swamps, clear cuts, aspen-hardwood forests, and coniferous-hardwood forests. They are found through a wide range of elevations, typically from sea level to 3000 m, although they can also occur at higher elevations.

Physical Description
Elk range in color from dark brown in winter to tan in summer and have a characteristic buff colored rump. The head, neck, belly, and legs are darker than both the back and sides. Elk generally have a long head with large ears and widely branching antlers as long as 1.1 to 1.5 m from tip to tip are found on males only. A dark shaggy mane hangs from the neck to the chest. With a thick body, short tail and long slender legs, most elk stand approximately 0.75 to 1.5 m high at the shoulder and are 1.6 to 2.7 m from nose to tail. Most males are 10 percent larger than females and may weigh twice as much. Females weigh from 171 to 292 kg, averaging 241 kg. Males weigh from 178 to 497 kg, averaging 331 kg.

Reproduction
Shortly before the fall rut, in late September and early October, male elk lose the velvet on their antlers and begin to compete for access to females. Dominant males are able to maintain larger harems of females and restrict access to them. They defend a kind of "moving territory" around the harem. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense and result in injury, exhaustion, or death. Harems are usually made up of 1 bull and 6 females with their yearling calves and are seasonal.

Female elk protect their calves by hiding them in a secluded area during their first few weeks of life. They nurse and protect their young through their first year of life. Male elk do not contribute to the care of their young.

Behavior
Elk are social animals; they live in summer herds with as many as 400 individuals. These herds are matriarchal and are dominated by a single cow. Seasonal migrations occur elevationally, with elk being found at higher elevations during summer, and migrating to lower elevations during winter. As the fall mating season approachs, bulls form harems, which they defend with their large size and aggressive nature. In spring, the sexes separate; females leave to give birth, while bulls form their own separate summer herds. After birth, cows and their calves form nursery groups until calves are ready to join the herd. Bulls are only territorial during the mating season and are otherwise not aggressive toward other elk.

Elk browse in the early morning and late evening . They are inactive during the day and the middle of the night, when they spend most of their time chewing their cud.

Elk have a close association with white-tailed deer, sharing similar environments and similar habitats.

Elk have a home range of approximately 600 square miles.

Communication and Perception
Elk have keen senses of smell, hearing, and vision. They communicate with other elk using all of these senses, as well as touch. Elk are known as the noisiest of all cervids. Newborns bleat and squeal, females bark, grunt and squeal, and males are known for their characteristic low pitched bellow or roar, known as bugling. Bugling is used to attract mates and advertise territories during the fall rutting season and can be heard for long distances.

Food Habits
Elk are browsers feeding on grasses, sedges, and forbs in summer and woody growth (cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood) in the winter months. Favorites of the elk include dandelions, aster, hawkweed, violets, clover, and the occasional mushroom. Elk are ruminant animals and therefore regurgitate their food and remasticate to aid in digestion. This is also known as chewing cud.

Predation
Predators of elk include mountain lions, gray wolves, and bears. Calves may fall victim to bobcats and coyotes. Healthy adults are rarely preyed on. Elk protect themselves from predators through their herding behavior and large size. They may also use their antlers (males) and sharp hooves to protect themselves.

Known Predators
grizzly bears (Ursus arctos)
gray wolves (Canis lupus)
American black bears (Ursus americanus)
coyotes (Canis latrans)
mountain lions (Puma concolor)
bobcats (Lynx rufus)

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DARK EYED JUNCO

http://www.allaboutbirds.org/guide/Dark-eyed_Junco/id

Dark-eyed Juncos are neat, even flashy little sparrows that flit about forest floors of the western mountains and Canada, then flood the rest of North America for winter. They're easy to recognize by their crisp (though extremely variable) markings and the bright white tail feathers they habitually flash in flight. One of the most abundant forest birds of North America, you'll see juncos on woodland walks as well as in flocks at your feeders or on the ground beneath them.

Size & Shape
The Dark-eyed Junco is a medium-sized sparrow with a rounded head, a short, stout bill and a fairly long, conspicuous tail.

Color Pattern
Juncos vary across the country (see Regional Differences), but in general they're dark gray or brown birds brightened up by a pink bill and white outer tail feathers that periodically flash open, particularly in flight.

Behavior
Dark-eyed Juncos are birds of the ground. They hop around the bases of trees and shrubs in forests or venture out onto lawns looking for fallen seeds. You'll often hear their high chip notes, given almost absent-mindedly while foraging, or intensifying as they take short, low flights through cover.

Habitat
Dark-eyed Juncos breed in coniferous or mixed-coniferous forests across Canada, the western U.S., and in the Appalachians. During winter you'll find them in open woodlands, fields, parks, roadsides, and backyards.

http://animals.nationalgeographic.com/animals/birding/dark-eyed-junco/

Dark-eyed juncos are unique sparrows that nest on or near the ground in forests. In winter, they typically form flocks and often associate with other species, including chipping sparrows, pine and palm warblers (in the southeastern United States.), and bluebirds. When disturbed the entire flock suddenly flies up to a tree, usually perching in the open and calling in aggravation at the intrusion. Polytypic. Length 6.3" (16 cm).

Identification A fairly lean sparrow with a long notched tail and a small pinkish or horn-colored bill (bicolored in dorsalis). Two prominent white outer tail feathers in most subspecies; 3 outermost in the "white-winged." Most subspecies have a gray or brown head and breast sharply set off from a white belly. Otherwise highly variable. Male: typically darker with sharper markings. Female: typically browner with more indistinct markings. Juvenile: heavily streaked, often with a trace of adult pattern.

http://www.birdweb.org/birdweb/bird/dark-eyed_junco

The Dark-eyed Junco is commonly found in Washington in two forms, the Oregon and the Slate-colored. It is unclear whether other races of Dark-eyed Junco occur in the state. In Washington, the Oregon form is by far the more common. All forms in Washington have distinctive white outer tail feathers, white bellies, and pink bills. Oregon Juncos have dark hoods, which are bold black in males and gray in females and juveniles. They have rufous sides, brown backs, and gray wings. Slate-colored Juncos may have a brownish tinge on their backs, but for the most part are dark gray all over except for the white belly.

Habitat
During the breeding season, Dark-eyed Juncos use a variety of forested habitat, but prefer moist conifer or mixed forests with dense understory and forest openings. During the winter, they can be found in open woodlands and brushy areas including towns, gardens, and shrub-steppe habitat.

Behavior
Dark-eyed Juncos are flocking birds with a distinct social hierarchy. They forage on the ground in these groups, scratching with their feet to find food. The flash of white tail feathers serve as a signal that alerts members of the flock when one is alarmed.

Diet
During the summer, about half of the Dark-eyed Junco's diet is made up of insects and other arthropods, the other half consists of seeds. The young eat mostly arthropods. In winter, the diet shifts more to seeds and berries.

Nesting
The male Dark-eyed Junco sings from a high perch to defend his territory and attract a mate. During courtship, both members of a pair hop about on the ground with their wings drooped and their tails spread, showing off their white outer tail feathers. The nest, which the female builds, is almost always on the ground. It is often in a depression, hidden under grass, a log, a rock, or an upturned tree root. The nest is a cup made of grass, moss, lichen, rootlets, twigs, and bark fiber, and is lined with fine grass, hair, or feathers. The female incubates 3 to 5 eggs for 11 to 13 days. Both parents feed the chicks, which leave the nest at 9 to 11 days. Pairs typically raise 1 or 2 broods per year.

DOWNY WOODPECKER

http://www.birdweb.org/Birdweb/bird/downy_woodpecker

General Description
The Downy Woodpecker is the smallest of Washington's woodpeckers. Its plumage is a mix of black and white (but see below.) Its wings, lower back, and tail are black with white spots; its upper back and outer tail feathers are white. Its underside is white, and its head is marked with wide alternating black and white stripes. Males have a red spot at the backs of their heads which females lack. Downy Woodpeckers closely resemble the larger Hairy Woodpeckers, but Downys have relatively smaller bills, which give their heads a rounder, 'cuter' shape. Downy Woodpeckers found in western Washington are considerably darker than their eastern Washington counterparts, with most of the areas described above as 'white' actually a dingy tan. Juveniles look like adults but may have red on their foreheads.

Habitat
Downy Woodpeckers typically inhabit broadleaved and mixed forests, especially those with black cottonwood and willow. They are also often found in residential areas, along rivers and streams, and in orchards, city parks, and even agricultural areas as long as there are sufficient trees nearby. They are sometimes found in conifer forests after the breeding season and especially in burned areas. However, Downy Woodpeckers generally prefer deciduous environments in contrast to Hairy Woodpeckers, which may often be found in coniferous forests.

Behavior
Downy Woodpeckers maintain feeding territories year round but often join winter flocks of chickadees and nuthatches. They are acrobatic foragers that can hang upside-down and reach the outermost tips of branches. Males tend to forage farther out than females, which stay closer to the trunk. Downy Woodpeckers will also forage on mullein stalks and other herbaceous vegetation, but generally they feed by exploring bark crevices.

Diet
Insects, especially beetles and ants, are the main food of Downy Woodpeckers. They also feed on berries, seeds, and suet.

Nesting
Downy Woodpeckers form monogamous breeding pairs in late winter. Both members of the pair excavate nesting and roosting holes in soft or rotten wood. They often situate their cavity entrance in a spot surrounded by lichen or fungus, which helps to camouflage the hole. Both parents incubate the 4 to 5 eggs for about 12 days, and both feed the young. The young leave the nest after 20 to 25 days but follow the parents around for a few weeks thereafter. Each pair typically raises one brood a year.

http://animaldiversity.org/accounts/Picoides_pubescens/

Geographic Range: Downy woodpeckers are found throughout North America, from southeastern Alaska east to Newfoundland, extending south to southern California and Florida. The majority of downy woodpeckers throughout the geographic range are year-round residents. Some populations are locally migratory, especially those along the Atlantic coast. (Jackson and Ouellet, 2002)

Habitat: In the northern part of their range, downy woodpeckers favor open deciduous forests and woodlands. This includes mixed, secondary-growth forests of oak-hickory or beech-maple-hemlock. They are less common in conifer-dominated forests unless there is a deciduous understory. Downy woodpeckers are also common in cultivated areas such as orchards, and are sometimes found in urban and suburban settings. In the south, they frequent riparian woods or moist, aspen-willow stands. They are also found in the southern Rocky Mountains. (Jackson and Ouellet, 2002)

Physical Description: Downy woodpeckers are smallest woodpeckers native to North America. They are 14.5 to 17 cm long and weigh 21 to 28 g. They are largely black-and-white; their back is black with white down the center and their wings are black with white spots. The head is black with a white stripe above and below each eye. The tail is black with outer portions of white barred with black. The chest and belly are white to grayish.

Downy woodpeckers have whitish nasal tufts at the base of a thick, black, chisel-shaped bill. Males and females are similar in appearance, but the males have a small red patch on the nape of the neck. Juvenile males usually have a red patch on the forehead and lack red on the nape of the neck. Juvenile females look similar to juvenile males, but lack any red on the forehead or nape.

Reproduction: Downy woodpeckers are monogamous. Breeding pairs usually begin forming in late winter and early spring (January to March). Once a breeding pair forms, they forage together until incubation begins. This may be a form of mate guarding. Breeding pairs usually stay together for the length of a summer, and may mate together for more than one breeding season. (Jackson and Ouellet, 2002)

Mating System monogamous
The male and female excavate a nest cavity together, usually in a dead limb of a living or dead tree. Excavation takes 7 to 20 days, and is usually begun about two weeks before egg-laying. The female lays 3 to 8 eggs (average 4.8) at a rate of 1 per day. Both parents incubate the eggs; the male incubates at night and the adults share incubation during the day. The eggs hatch synchronously after 12 days. This nestlings are altricial at hatching, but develop very quickly. They are brooded nearly constantly for the first 4 days after hatching, and are fed by both parents. The chicks leave the nest 18 to 21 days after hatching. The parents continue to care for the fledglings for at least three weeks, feeding them, leading them to food sources and warning them of potential predators. Most young downy woodpeckers are able to breed the next season.

Downy woodpeckers occasionally have female "helpers" at the nest. These helpers are not usually offspring of the breeding pair. (Jackson and Ouellet, 2002)

Both parents incubate the eggs, keep the nest clean, feed the young and protect them from predators. The young remain with the parents for up to three weeks after fledging. (Jackson and Ouellet, 2002)

Behavior
Downy woodpeckers are diurnal and non-migratory. They are solitary, though they are occasionally seed foraging in loose association. Males defend a territory against other males, and females defend a territory against females. When an intruder enters a downy woodpecker's territory, the resident woodpecker uses threat displays, such as wing flicking, or fanning their tail, raising their crest and holding their bill high to try to drive the intruder away. If threat displays do not work, downy woodpeckers may attack the intruder, grappling with them in mid-air. (Jackson and Ouellet, 2002)

Communication and Perception
Downy woodpeckers use vocalizations and body signals to communicate. They produce a variety of sounds, including "pik", rattle, scolding, "wad", "chirp", squeak, screech, and distress calls. The "pik" call introduces the rattle call, and these are used during aggressive interactions. Short calls, the "wad" and "chirp", are uttered by young birds. A longer note call, the squeak, is also uttered by young downy woodpeckers. The screech and distress calls are used to signal alarm.

Drumming is a common non-vocal sound used by downy woodpeckers to communicate. This sound is heard in most frequently in late winter and spring, and is used to establish and defend a territory, to attract a mate and to communicate between mates.

Downy woodpeckers also use body postures to communicate. Postures exhibited by downy woodpeckers often include some combination of bill pointing and waving, wing flicking, crest raising, wing spreading, tail spreading, head turning and head swinging. (Jackson and Ouellet, 2002)

Food Habits
Downy woodpeckers are omnivorous. Their primary foods include insects and other arthropods, fruits, seeds, sap and some cambium tissue. Beetles, weevils, ants, bugs, plant lice and caterpillars are among the insects eaten. They also consume scale insects and spiders. Downy woodpeckers will also eat suet from backyard feeders.

Downy woodpeckers glean insects from the surfaces of trees, shrubs and large weeds, probe into crevices and excavate shallow holes into wood to find food. Males and females within a population often differ in their foraging habits. For example, in one study in Illinois, males spent more time excavating than females, and females probed bark surfaces more than males.

Downy woodpeckers drink water by scooping it up with their bill. They drink from water that collects on horizontal limb surfaces, in epiphytes, puddles, streams, ponds and bird baths. (Jackson and Ouellet, 2002)

Primary Diet omnivore
Animal Foods insects terrestrial non-insect arthropods
Plant Foods wood, bark, or stems seeds, grains, and nuts fruit sap or other plant fluids

Predation
Adult downy woodpeckers are preyed upon by several species of birds of prey. To hide themselves from predators, downy woodpeckers flatten themselves against the surface of the tree bark and remain motionless. Downy woodpeckers may also dodge a hawk by darting behind a tree branch, or winding their way around the branch to avoid the hawk. In urban areas, downy woodpecker predators include rats and domestic cats. Eggs and nestlings are vulnerable to climbing predators such as snakes and squirrels, as well as other woodpeckers, including red-bellied woodpeckers and hairy woodpeckers. By nesting in cavities, downy woodpeckers avoid predation of their eggs and young by animals that cannot get to these cavities. (Jackson and Ouellet, 2002)

Known Predators
northern goshawks (Accipiter gentilis)
peregrine falcons (Falco peregrinus)
sharp-shinned hawks (Accipiter striatus)
Cooper's hawks (Accipiter cooperii)
snakes (Serpentes)
squirrels (Sciuridae)
rats (Rattus)
domestic cats (Felis silvestris)
red-bellied woodpeckers (Melanerpes carolinus)
hairy woodpeckers (Picoides villosus)

http://www.allaboutbirds.org/guide/Downy_Woodpecker/id

The active little Downy Woodpecker is a familiar sight at backyard feeders and in parks and woodlots, where it joins flocks of chickadees and nuthatches, barely outsizing them. An often acrobatic forager, this black-and-white woodpecker is at home on tiny branches or balancing on slender plant galls, sycamore seed balls, and suet feeders. Downies and their larger lookalike, the Hairy Woodpecker, are one of the first identification challenges that beginning bird watchers master.

Size & Shape
Downy Woodpeckers are small versions of the classic woodpecker body plan. They have a straight, chisel-like bill, blocky head, wide shoulders, and straight-backed

posture as they lean away from tree limbs and onto their tail feathers. The bill tends to look smaller for the bird's size than in other woodpeckers.

Color Pattern: Downy Woodpeckers give a checkered black-and-white impression. The black upper parts are checked with white on the wings, the head is boldly striped, and the back has a broad white stripe down the center. Males have a small red patch on the back of the head. The outer tail feathers are typically white with a few black spots.

Behavior: Downy Woodpeckers hitch around tree limbs and trunks or drop into tall weeds to feed on galls, moving more acrobatically than larger woodpeckers. Their rising-and-falling flight style is distinctive of many woodpeckers. In spring and summer, Downy Woodpeckers make lots of noise, both with their shrill whinnying call and by drumming on trees.

Habitat
You'll find Downy Woodpeckers in open woodlands, particularly among deciduous trees, and brushy or weedy edges. They're also at home in orchards, city parks, backyards and vacant lots.

BOBCAT,

http://animals.nationalgeographic.com/animals/mammals/bobcat/
Bobcats are elusive and **nocturnal**, so they are rarely spotted by humans. Although they are seldom seen, they roam throughout much of North America and adapt well to such diverse habitats as forests, swamps, deserts, and even suburban areas.

Bobcats, sometimes called wildcats, are roughly twice as big as the average housecat. They have long legs, large paws, and tufted ears similar to those of their larger relative, the Canada lynx. Most bobcats are brown or brownish red with a white underbelly and short, black-tipped tail. The cat is named for its tail, which appears to be cut or "bobbed."

Fierce hunters, bobcats can kill prey much bigger than themselves, but usually eat rabbits, birds, mice, squirrels, and other smaller game. The bobcat hunts by stealth, but delivers a deathblow with a leaping pounce that can cover 10 feet (3 meters).

Bobcats are solitary animals. Females choose a secluded den to raise a litter of one to six young kittens, which will remain with their mother for 9 to 12 months. During this time they will learn to hunt before setting out on their own.

In some areas, bobcats are still trapped for their soft, spotted fur. North American populations are believed to be quite large, with perhaps as many as one million cats in the United States alone.

http://animaldiversity.org/accounts/Lynx_rufus/

Geographic Range
Bobcats are found throughout North America from southern Canada to southern Mexico. In the United States population densities are much higher in the southeastern region than in the western states.

Habitat: Bobcats can be found in a variety of habitats, including forests, semi-deserts, mountains, and brushland. They sleep in hidden dens, often in hollow trees, thickets, or rocky crevices.
Physical Description: Bobcats range in length from 65 to 105 cm, with the tail adding an extra 11 to 19 cm (bobcats got their name because of their short tails). They are 45 to 58 cm high at the shoulder and weigh between 4 and 15 kg.

Bobcat fur can be various shades of buff and brown, with dark brown or black stripes and spots on some parts of the body. The tip of the tail and the backs of the ears are black. They have short ear tufts, and ruffs of hair on the side of the head, giving the appearance of sideburns.

Mating System: Bobcats usually mate in the early spring, although the timing is variable. After a gestation of 60 to 70 days, a litter of about 3 kittens is born. The young open their eyes for the first time when they are 10 days old, and they nurse through their second month. Young bobcats disperse during the winter, when they are about 8 months old.

After the young are born, the mother's milk provides them with further nourishment. Female bobcats bring meat to their young and teach them how to hunt after they are weaned, staying with them for almost a year. Male bobcats do not help raise their offspring.

Bobcats live up to 12 years in the wild. In captivity, they may live up to 32 years. (Kurta, 1995)

Bobcats are basically terrestrial and nocturnal, although they are good climbers and are often active at dusk as well as during the night.

Bobcats mark their territories with scent to repel intruders. They make various yowling sounds to communicate with one another during the breeding season. Like all felids, bobcats have excellent vision and hearing and a well-developed sense of smell.

Food Habits: Bobcats are strictly meat eaters. Stealthy hunters, they stalk their prey, then pounce and (if successful) kill with a bite to the vertebrae of the neck. They hunt rodents, rabbits, small ungulates, large ground birds, and sometimes reptiles. They occasionally eat small domesticated animals and poultry.

Predation: Bobcat kittens are preyed upon by foxes, coyotes, and large owls. Humans are the only real threat to adult bobcats. (Kurta, 1995)

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http://a-z-animals.com/animals/bobcat/

Bobcat Classification and Evolution

The Bobcat is a medium-sized wildcat that is found in a variety of habitats across the southern half of North America. They are widespread and adaptable predators that are closely related to the larger and more northerly dwelling Canadian Lynx with the biggest difference being that the Bobcat only has a small "bobbed" tail, from which it gets it's name. Measuring about double the size of a domestic cat, the Bobcat has the greatest range of all North American felines but their secretive nature means that they are seldom seen by people. There are currently twelve recognised sub-species of Bobcat which vary in their colouration and geographic range, with individuals found in mountainous forest being darker with more markings than their lighter-coloured cousins that are found in more arid, semi-desert regions.

Bobcat Anatomy and Appearance

Due to the fact that the Bobcat belongs to the same family as the Lynx, they are similar in appearance but not at all the same. The Bobcat is smaller in size and has smaller feet and ear tufts than the Canadian Lynx, and often tends to be darker in colour. Bobcats have beige to brown or reddish fur that is mottled or spotted with the intensity of these markings depending on the individual and where it lives (those found in more open, arid areas tend to have fewer markings than those found amongst dense cover). The underside of the Bobcat is white so the darker spots are more distinctive and they also have a white tip to their short, black tail, which only grows to around 15cm in length . Like the larger Lynx, the Bobcat has ear tufts that are thought to heighten their hearing along with also having a ruff of longer fur around it's face.

Bobcat Distribution and Habitat

The Bobcat is the most widely distributed of all North American felines and is found across North America from southern parts of Canada right down to southern Mexico. They are incredibly versatile animals that have adapted to living in a variety of different habitats throughout the three different countries. Although Bobcats are known to prefer rocky hillsides that are well-vegetated, they are found in numerous different habitats throughout their natural range including mountain woodlands, coniferous forest, swampland, deserts and even in suburban areas in some places. The exact appearance of the Bobcat depends on what kind of habitat it is found in as the differing coat colors allow the individual to remain as camouflaged as possible in it's surroundings. The historical range of the Bobcat once extended right across North America but the capture of them for their fur and loss of their natural habitat has led to the disappearance of them in some areas.

Bobcat Behavior and Lifestyle

The Bobcat is solitary and nocturnal animal that is most active in the darkness of night, tending to hunt most during dawn and dusk. During the day, Bobcats sleep and rest in dens in the form of a rock crevice or hollow tree with one individual having a number of dens within it's home range. Bobcats are highly territorial and mark their ranges with scents from their urine and feces and distinctive claw marks on trees to alert others of their presence. Males patrol a large home range which often overlaps a number of smaller female territories but the two will not interact until the breeding season which begins in the winter. At other times of the year though, Bobcats tend to avoid one another to reduce the chances of them being injured in a fight.

Bobcat Reproduction and Life Cycles
Bobcats can only be found together during the breeding season when both males and females can mate with multiple partners and after a gestation period that last for 8 - 10 weeks, the female Bobcat gives birth to a litter of up to 6 kittens in a safe and secluded den. Bobcat kittens are born blind and open their eyes after about 10 days, feeding on their mother's milk until they are old enough to begin consuming meat. Most births occur in the late winter or early spring with Bobcat kittens usually remaining with their mother until the next winter when they are around eight months old and have learnt how to hunt independently. Female Bobcats tend to have a single litter every year and after mating, the male Bobcat plays no part in rearing the young.

Bobcat Diet and Prey
The Bobcat is a carnivorous feline meaning that it only hunts and eats other animals in order to gain the nutrients that it needs to survive. Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on fresh carrion. The Bobcat is an incredibly elusive predator that hunts it's prey by stalking it silently in the dark before pouncing on it with incredible force, and despite their size, Bobcats are known to be able to kill animals that are much larger than themselves. In areas where growing Human settlements have encroached on the Bobcat's natural habitat, they have also been known to take occasional livestock such as poultry and sheep.

Bobcat Predators and Threats
The Bobcat is a fierce and dominant predator in it's natural habitat with adult Bobcats therefore being threatened by few animals, the biggest concern to them being Cougars and Wolves. The small and vulnerable Bobcat kittens however, are preyed upon by a number of predators including Coyotes and Owls that are able to hunt the kittens whilst there mother has gone off to hunt. The biggest threat to Bobcat populations throughout North America is people that have previously hunted the Bobcat to near extinction in some areas for their soft fur. In areas where Bobcats are now forced to share their natural ranges with growing numbers of people, they have also been hunted by farmers who fear for their livestock. Despite the fact that they are very adaptable animals, Bobcats are also been threatened by habitat loss with populations being pushed into smaller and more isolated regions of their once vast natural range.

Bobcat Interesting Facts and Features
The Bobcat is also known as the Red Lynx due to the fact that the two are very similar in appearance but the Bobcat tends to be much darker and richer in colour than their northern relatives. They are incredibly secretive yet powerful animals that are able to pounce on their prey from up to three meters away before delivering a fatal bite, allowing Bobcats to also hunt animals that may be up to double their own size. Although Bobcats are generally quiet and not greatly vocal animals, the fierce growls and snarls that they make when they are hiding often leads people to believe that there is a Mountain Lion in the area.

MOUNT ST. HELENS ERUPTION

http://volcanoes.usgs.gov/volcanoes/st_helens/st_helens_geo_hist_101.html

Geology and History Summary for Mount St. Helens

Digital Elevation Map of Mount St. Helens with annotation of pre-1980 topography and deposits from 1980 - 2008.
(Click image to view full size.)
Digital Elevation Map of Mount St. Helens with annotation of pre-1980 topography and deposits from 1980 - 2008.

Mount St. Helens, located in Washington State, is the most active volcano in the Cascade Range, and it is the most likely of the contiguous U.S. volcanoes to erupt in the future. The volcano is almost 53 km (33 mi) due west of Mount Adams and approximately 80 km (50 mi) northeast of the Vancouver, Washington—Portland, Oregon metropolitan area. Volcanism occurs at Mount St. Helens and other volcanoes in the Cascades arc due to subduction of the Juan de Fuca plate off the western coast of North America.
Location of magma formation, accumulation, and storage beneath Mount St. Helens (locations are inferred from scientific data).
(Click image to view full size.)
Location of magma formation, accumulation, and storage beneath Mount St. Helens (locations are inferred from scientific data).

Over its rich and complex 275,000-year history, Mount St. Helens has produced both violent explosive eruptions of volcanic tephra and relatively quiet outpourings of lava. In the beginning stages of eruptive activity, the volcano mostly consisted of a cluster of domes that was surrounded by an apron of tephra and debris fans of fragmented volcanic rocks.
It was only during the past few thousand years that the volcano grew to its pre-1980 elevation of 2,950 m (9,677 ft), making it the, then, fifth highest peak in Washington. Starting about 3,000 years ago, substantial amounts of basalt and andesite began to erupt as lava flows between phases of dacite eruptive activity. These lava flows buried large parts of a central cluster of dacite domes and flanking fans, which started the cone building in earnest.
Based upon detailed chemical analysis of the eruptive products from each stage of Mount St. Helens volcanism, scientists deduce that the volcano's magmatic system has evolved from relatively simple to more complex as the volcano matured. The evidence indicates that interaction between more silicic (dacite) magma batches with more mafic (basalt to andesite) magma increased from the earliest to most recent stages of Mount St. Helens volcanism.

http://volcanoes.usgs.gov/volcanoes/st_helens/st_helens_geo_hist_99.html

1980 Cataclysmic Eruption

Summary of Events

Magma began intruding into the Mount St. Helens edifice in the late winter and early spring of 1980. By May 18, the cryptodome (bulge) on the north flank had likely reached the point of instability, and was creeping more rapidly toward failure. A magnitude-5+ earthquake was accompanied by a debris avalanche, which in turn unloaded the confining pressure at the top of the volcano by removing the cryptodome. This abrupt pressure release allowed hot water in the system to flash to steam, which expanded explosively, initiating a hydrothermal blast directed laterally through the landslide scar. Because the upper portion of the volcano was removed, the pressure decreased on the system of magma beneath the volcano. A wave of decreasing pressure down the volcanic conduit to the subsurface magma reservoir, which then began to rise, form bubbles (degas), and erupt explosively, driving a 9-hour long Plinian eruption.
Precursory Activity

On March 16, 1980, the first sign of activity at Mount St. Helens occurred as a series of small earthquakes. On March 27, after hundreds of additional earthquakes, the volcano produced its first eruption in over 100 years. Steam explosions blasted a 60- to 75-m (200- to 250-ft) wide crater through the volcano's summit ice cap and covered the snow-clad southeast sector with dark ash.

Within a week the crater had grown to about 400 m (1,300 ft) in diameter and two giant crack systems crossed the entire summit area. Eruptions occurred on average from about 1 per hour in March to about 1 per day by April 22 when the first period of activity ceased. Small eruptions resumed on May 7 and continued to May 17. By that time, more than 10,000 earthquakes had shaken the volcano and the north flank had grown outward about 140 m (450 ft) to form a prominent bulge. From the start of the eruption, the bulge grew outward—nearly horizontally—at consistent rates of about 2 m (6.5 ft) per day. Such dramatic deformation of the volcano was strong evidence that molten rock (magma) had risen high into the volcano. In fact, beneath the surficial bulge was a cryptodome that had intruded into the volcano's edifice, but had yet to erupt on the surface.

With no immediate precursors, a magnitude 5.1 earthquake occurred at 8:32 a.m. on May 18, 1980 and was accompanied by a rapid series of events. At the same time as the earthquake, the volcano's northern bulge and summit slid away as a huge landslide—the largest debris avalanche on Earth in recorded history. A small, dark, ash-rich eruption plume rose directly from the base of the debris avalanche scarp, and another from the summit crater rose to about 200 m (650 ft) high. The debris avalanche swept around and up ridges to the north, but most of it turned westward as far as 23 km (14 mi) down the valley of the North Fork Toutle River and formed a hummocky deposit. The total avalanche volume is about 2.5 km3 (3.3 billion cubic yards), equivalent to 1 million Olympic swimming pools.

Lateral Blast

The landslide removed Mount St. Helens' northern flank, including part of the cryptodome that had grown inside the volcano. The cryptodome was a very hot and highly pressurized body of magma. Its removal resulted in immediate depressurization of the volcano's magmatic system and triggered powerful eruptions that blasted laterally through the sliding debris and removed the upper 300 m (nearly 1,000 ft) of the cone. As

this lateral blast of hot material overtook the debris avalanche; it accelerated to at least 480 km per hr (300 mi per hr). Within a few minutes after onset, an eruption cloud of blast tephra began to rise from the former summit crater. Within less than 15 minutes it had reached a height of more than 24 km (15 mi or 80,000 ft).

The lateral blast devastated an area nearly 30 km (19 mi) from west to east and more than 20 km (12.5 mi) northward from the former summit. In an inner zone extending nearly 10 km (6 mi) from the summit, virtually no trees remained of what was once dense forest. Just beyond this area, all standing trees were blown to the ground, and at the blast's outer limit, the remaining trees were thoroughly seared. The 600 km2 (230 mi2) devastated area was blanketed by a deposit of hot debris carried by the blast.

Removal of the cryptodome and flank exposed the conduit of Mount St. Helens, resulting in a release of pressure on the top of the volcano's plumbing system. This caused a depressurization wave to propagate down the conduit to the volcano's magma storage region, allowing the pent-up magma to expand upward toward the vent opening. Less than an hour after the start of the eruption, this loss of conduit pressure initiated a Plinian eruption that sent a massive tephra plume high into the atmosphere. Beginning just after noon, swift pyroclastic flows poured out of the crater at 80 - 130 km/hr (50 to 80 mi/hr) and spread as far as 8 km (5 mi) to the north creating the Pumice Plain.
The Plinian phase continued for 9 hours producing a high eruption column, numerous pyroclastic flows, and ash fall downwind of the eruption. Scientists estimate that the eruption reached its peak between 3:00 and 5:00 p.m. When the Plinian phase was over, a new northward opening summit amphitheater 1.9 x 2.9 km (1.2 x 1.8 mi) across was revealed.

Over the course of the day, prevailing winds blew 520 million tons of ash eastward across the United States and caused complete darkness in Spokane, Washington, 400 km (250 mi) from the volcano. Major ash falls occurred as far away as central Montana, and ash fell visibly as far eastward as the Great Plains of the Central United States, more than 1,500 km (930 mi) away. The ash cloud spread across the U.S. in three days and circled the Earth in 15 days.

Lahars

During the first few minutes of this eruption, parts of the blast cloud surged over the newly formed crater rim and down the west, south, and east sides of the volcano. The turbulently flowing hot rocks and gas quickly eroded and melted some of the snow and ice capping the volcano, creating surges of water that eroded and mixed with loose rock debris to form lahars. Several lahars poured down the volcano into river valleys, ripping trees from their roots and destroying roads and bridges.

The largest and most destructive lahar occurred in the North Fort Toutle and was formed by water (originally groundwater and melting blocks of glacier ice) escaping from inside the huge landslide deposit through most of the day. This powerful slurry eroded material from both the landslide deposit and channel of the North Fork Toutle River. Increased in size as it traveled downstream, the lahar destroyed bridges and homes, eventually

flowing into the Cowlitz River. It reached maximum size at about midnight in the Cowlitz River, about 80 km (50 mi) downstream from the volcano.

AMERICAN BLACK BEAR

http://www.nwf.org/Wildlife/Wildlife-Library/Mammals/Black-Bear.aspx. Accessed 3/2/15.

"American Black Bear - National Wildlife Federation." American Black Bear -. National Wildlife Federation, n.d. Web. 02 Mar. 2015.

Description: Not all black bears are black—their fur can range in color from pure white to a cinnamon color to very dark brown or black. Most populations have a mixture of these colors, including the pure white form which is found in some individuals in the island archipelago in southern British Columbia (Kermodi Island). This white black bear (called spirit bears, revered by Native Americans) is caused by inheriting a recessive gene for coat color from both the mother and the father who could, themselves, both be black. A genetic reason results in the light grey coat color called the “blue” or glacier bear in southeastern Alaska.

Regardless of these genetic variants, most of the bears in any region are black in color. Some bears have a white patch on their chests. They have a short, inconspicuous tail, longish ears, a relatively straight profile from nose to forehead, and small, dark eyes.

Black bears have relatively short claws which enable them to climb trees. Unlike cats, the claws are non-retractable.

Other than color, how do black bears differ from grizzly bears?

Black bears have longer and less rounded ears and a more straight profile from forehead to nose compared to grizzly bears.
Grizzlies have larger shoulder humps and a more dished-in facial profile and much longer front claws that are evident in the tracks.
Black bears and grizzly bears can both have a wide variety of colors and sizes, but most commonly in areas where both species occur, black bears are smaller and darker than grizzly bears.
Size: Black bears in some areas where food is scarce are much smaller than in other areas where food is abundant. Typically, adults are approximately 3 feet tall at the shoulder, and their length from nose to tail is about 75 inches. All bears, including black bears, are sexually dimorphic—meaning adult males are much larger than adult females. A large male black bear can exceed 600 lbs in weight while females seldom exceed 200 lbs.

Diet: American black bears are omnivorous, meaning they will eat a variety of things, including both plants and meat. Their diet includes roots, berries, meat, fish, insects, larvae, grass and other succulent plants. They are able to kill adult deer and other hoofed wildlife but most commonly are only able to kill deer, elk, moose and other hoofed animals when these are very young. They are able to kill livestock especially sheep. Bears are very attracted to human garbage, livestock food or pet food, or other human associated foods including fruit trees. Bears using these human associated foods can quickly become habituated to them and this commonly results in the bears being killed as nuisances. This is true for bee hives as well as bears are very attracted to honey.

Typical lifespan: Black bears can live up to 30 years in the wild but most die before they are in their early 20s.

Habitat: Because of their versatile diet, black bears can live in a variety of habitat types. They inhabit both coniferous and deciduous forests as well as open alpine habitats. They typically do not occur on the Great Plains or other wide open areas except along river courses where there is riparian vegetation and trees. They can live just about anywhere they can find food, but largely occur where there are trees.

Range: The American black bear's range covers most of the North American continent. They are found in Alaska, much of Canada and the United States, and extend as far south as northern Mexico.

Black bear mom and cubs
Life History and Reproduction: Black bears are typically solitary creatures except for family (a female with cubs) groups and during mating season, which peaks in May and June. Following fertilization, the embryo doesn't implant in the uterus until fall at the time of den entrance. This process of delayed implantation occurs in all bear species and allows the female bear's body to physiologically "assess" her condition before implantation occurs and the period of gestation leading to the birth of cubs really begins. Delayed implantation allows the female to not waste fat reserves and energy in sustaining a pregnancy that would have little chance of success because her condition is too poor. Females give birth to cubs every other year if food sources are sufficiently plentiful. In years when food supplies are scarce a female may skip an additional year or two between litters. The cubs are born in the mother's winter den, and will den with her again the following winter. The following spring when the cubs are 1.5 years old, the cubs and female will separate and the female will breed again. A black bear litter can be 1-5 cubs but most commonly litters are 2 cubs.

Threats: Conservation efforts for black bears have been effective and in most areas black bears are increasing and can sustain managed sport hunting. In areas with human populations, this can cause conflicts because bears are very attracted to human foods and refuse as well as to livestock and livestock foods. Since bears are large and strong animals, many people fear them and resent the damage they can cause. The key to successful co-existence between humans and bears is to recognize that it is no longer possible for either species to occupy all habitats but that where co-occupancy is possible and desirable, humans must be responsible for the welfare of the bear population. Wild areas with little human footprint will remain the most important habitat for bears but peaceful co-existence can occur in the urban-wildland interface as long as humans take the necessary steps to assure that the relationship remains a positive one.

Status: The American black bear is not currently a species of conservation concern and even the formerly listed black bear of Florida and Louisiana is now increasing. Habitats in western Texas from which black bears were extirpated are now being re-colonized.

- **http://animals.nationalgeographic.com/animals/mammals/black-bear/**

“Black Bear.” National Geographic. http://animals.nationalgeographic.com/animals/mammals/black-bear/ Accessed 3/2/15

Black bears are North America's most familiar and common bears. They typically live in forests and are excellent tree climbers, but are also found in mountains and swamps. Despite their name, black bears can be blue-gray or blue-black, brown, cinnamon, or even (very rarely) white.

Black bears are very opportunistic eaters. Most of their diet consists of grasses, roots, berries, and insects. They will also eat fish and mammals—including carrion—and easily develop a taste for human foods and garbage. Bears who become habituated to human food at campsites, cabins, or rural homes can become dangerous and are often killed—thus the frequent reminder: Please don't feed the bears!

Solitary animals, black bears roam large territories, though they do not protect them from other bears. Males might wander a 15- to 80-square-mile (39- to 207-square-kilometer) home range.

When winter arrives, black bears spend the season dormant in their dens, feeding on body fat they have built up by eating ravenously all summer and fall. They make their dens in caves, burrows, brush piles, or other sheltered spots—sometimes even in tree holes high above the ground. Black bears den for various lengths of time governed by the diverse climates in which they live, from Canada to northern Mexico.

Female black bears give birth to two or three blind, helpless cubs in mid-winter and nurse them in the den until spring, when all emerge in search of food. The cubs will stay with their very protective mother for about two years.

Fast Facts

Type: Mammal
Diet: Omnivore
Average life span in the wild: 20 years
Size: 5 to 6 ft (1.5 to 1.8 m) long
Weight: 200 to 600 lbs (90 to 270 kg)
Group name: Sleuth or Sloth
Did you know?
Black bears are not true hibernators. During their winter dormant period, though, they do not eat, drink, urinate, or defecate, but may wake up if disturbed.

- **http://www.bearlife.org/black-bear.html**

Black Bear

North American Black Bear liveBlack bears are one of the more common species in North America. They live in many different habitats are not picky about what they eat. Their keen sense of smell gives them much information about their environment and foods they eat.

The American black bear is considered a threatened species in some areas. In fact they are protected in the states of Louisiana, Texas, and Mississippi. In other areas they are actively hunted and are subject to open "hunting seasons".

CHARACTERISTICS

Black bear anatomy includes a straight face and flat shoulders. It has ears that are often pointed and a short tail. Fur color can vary from black to chocolate brown with gray combinations. One of the more notable facts about this species is that they are excellent climbers, even when cubs.

The black bear is very adaptable. They are quite intelligent and curious. But this smaller bear is very shy and generally avoids confrontations. Records of human attacks are rare.

FACTS

Size: Length is about 4 to 7 feet long. Weight is about 200 to 600 pounds.
Reproduction: Mating season vary depending on habitat climate but breeding usually occurs May through August.
Gestation: 60 to 70 days.
Birth: January or early February.
Litter size: 1 to 3 cubs. Baby pairs are common.
Birth Weight: Baby cubs are usually under one pound.
Vocalizations: Grunts, moaning sounds, and growling.
Threats: Loss of habitat, territory fragmentation, changes in environment due to global warming, poaching.

Black Bear cub climbing tree, California.Baby black bears are born and live in the safety of the mother's den during winter. The average cub litter size is 1 to 3. Babies are born blind. A black bear baby weighs between one half to one pound at birth.

They put on weight quickly. The mother spends the following year and a half weaning, feeding, and teaching her cubs what to eat and how to survive. At that point they venture on to live on their own.

The sad fact is that many baby cubs will not reach adulthood due to hunting and attacks from predators. The mother will usually mate every 2 years but frequency depends on food resources, age, environment, and habitat density.

HOW MANY BLACK BEARS LIVE IN NORTH AMERICA? The total black bear population is estimated to be between 600,000 to 700,000 (excluding baby cubs). Habitat distribution information suggests about 55% live in Canada, 40% live in the United States, and 5% are in Mexico (accurate population facts south of Mexico unknown). Thanks to conservation efforts their population in some areas, such as California, are on the increase.

WHERE DO BLACK BEARS LIVE? Historic information suggests black bear habitat included most of North America including Alaska, Canada, almost all of the lower 48 United States, and Mexico. Today their home range territory is mostly in Alaska and Canada. Their territory is greatly reduced in Mexico. In the continental United States they live in less than 20% of their original range.

Black bears prefer to live in dense forests where there is a variety of food to eat and they can raise their cubs. But they have adapted to many different habitats. They build their dens in caves, burrows, tree trunks, and brush or grass nests. They collect grass and leaves to pad their dens.

WHAT DO BLACK BEARS EAT? American black bears are eating machines and are mostly vegetarian. Baby cubs are also voracious eaters. At the top of the food chain they are not picky about their diet. They will eat field grasses, roots, tubers, nuts, berries of all kinds, fruits, and other foods.

They also eat ants, grubs, termites, beetles, and other insects. Black bears also like salmon and other kinds of fish and will hunt for small mammals if available where they live.

DO BLACK BEARS HIBERNATE? Information about black bear hibernation suggests they enter a partial state of the process. Although there is a drop in body temperature, metabolic rate, and heart rate, they can awaken from their sleep to defend their cubs or ward off attacks if necessary.

Black bear hibernation can last up to 6 or 7 months depending on their habitat and climate conditions. They make use of their body fat and do not eat or pass any wastes. One of the more notable facts is that some do not hibernate as long or skip the process altogether when food is abundant.

CAN BLACK BEARS SWIM? North American Black bears like to swim. If there is water where they live they will exploit it for food. Since bears like to hunt fish they are not shy of water. In fact their baby cubs take to the water quickly.

In their search for food in their habitat they can cross ponds, lakes, and rivers to get to better feeding grounds (including campgrounds, lodges, and resorts). They use their powerful front and hind legs to paddle swiftly through water and are actually graceful swimmers.

HOW FAST CAN A BLACK BEAR RUN? At its normal pace black bears waddle slowly and casually. When in danger or hunting for prey they have the ability to burst into running mode with speeds up to 25 to 30mph. They can run for short distances only.

BLACK BEAR TRACKS Black bear paws have short claws to help them climb, dig, gather plant food, and attack small mammals. They use their claws like fingers when they eat. Their front footprints have an oval base with a curved toe line. Hind tracks have a triangular indentation. Toes are spread out.

Depending on the ground surface their claws may not be visible making specie information more difficult. This is particularly true in soils that have a fair amount of sand such as grounds near lakes and rivers where they hunt for fish. Black bear cubs leave small prints with no claw indentations.

ELK

http://animals.nationalgeographic.com/animals/mammals/elk/

Elk are also called wapiti, a Native American word that means "light-colored deer." Elk are related to deer but are much larger than most of their relatives. A bull (male) elk's antlers may reach 4 feet (1.2 meters) above its head, so that the animal towers 9 feet (2.7 meters) tall.

Bull elk lose their antlers each March, but they begin to grow them back in May in preparation for the late-summer breeding season.

In early summer, elk migrate to high mountain grazing grounds where the cows (females) will give birth. Each cow typically has a single calf, which can stand by the time it is 20 minutes old.

During the late summer breeding season the bugling of bull elk echoes through the mountains. These powerful animals strip the velvet off their new antlers using them in violent clashes that determine who gets to mate with whom. Males with the bigger antlers, typically older animals, usually win these battles and dominate small herds.

In the winter, wapiti reconvene into larger herds, though males and females typically remain separate. The herds return to lower valley pastures where elk spend the season pawing through snow to browse on grass or settling for shrubs that stand clear of the snow cover.

Elk were once found across much of North America but they were killed off and driven to take refuge in more remote locations. Today they live primarily in western North America, especially in mountainous landscapes such as Wyoming's National Elk Refuge and Yellowstone National Park. Some eastern U.S. states have reintroduced small elk herds into heavily wooded wilderness areas.
Fast Facts

Type: Mammal
Diet: Herbivore
Average life span in the wild: 8 to 12 years
Size: Height at the shoulder, 4 to 5 ft (1.2 to 1.5 m)
Weight: 325 to 1,100 lbs (147 to 499 kg)
Group name: Gang

http://naturemappingfoundation.org/natmap/facts/elk_k6.html
NatureMapping Animal Facts for Kids

Elk

What they look like: Elk, or red deer, range in color from dark brown in winter to tan in summer. They have a characteristic buff colored rump and long thin legs. The head, neck, belly, and legs are darker than the back and sides. Elk generally have a long head with large ears.

The adult male, know as a buck, has widely branching antlers as long as 1 to 1.5 m from tip to tip (see photo).

Where they live: Elk were once found throughout much of the Northern Hemisphere, from Europe through northern Africa, Asia, and North America. Extensive hunting and habitat destruction have limited elk to a portion of their former range. Elk populations in eastern North America were reduced as a result of over-hunting.

Today large populations of elk in North America are found only in the western United States from Canada through the Eastern Rockies to New Mexico, and in a small region of the northern lower peninsula of Michigan.

Elk prefer open woodlands and avoid dense unbroken forests. Elk can be found in coniferous swamps, clear cuts, aspen-hardwood forests, and coniferous-hardwood forests.

Elk are widespread in Washington and found in a variety of habitats such as shrub steppe, bunchgrass, shrub plant communities, open meadows near open or closed canopy forests. They move into sub-alpine areas during the summer.

What they eat: Elk are browsers. They feed on grasses, sedges, and forbs in summer and woody growth in the winter months. Woody plants include cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood.

Elk are ruminant animals and therefore regurgitate their food and re-chew to aid in digestion. This is also known as chewing cud.

Behavior: Males attract females by bugling - a very loud call that can be heard over a distance.

Elk are considered pests by many farmers. Over-browsing can cause damage to valued trees and agricultural crops.

Reproduction: Bull elk lose the velvet on their antler shortly before the fall rut, in late September and early October. During the rut, they begin to compete for access to

females. Dominant males are able to build larger harems of females and restrict access to them by other males.

They defend a kind of "moving territory" around the harem. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense - sometimes resulting in injury. The seasonal harems usually consist of 1 bull and 6 females plus their yearling calves.

A female will give birth to 1 calf. The gestation is about 8 months. The young nurse and are weaned in 2 months.

Lifespan: Elk can live beyond 20 years.

Predation: Natural predators of elk include grizzly bears, gray wolves, American black bears, and mountain lions. Calves may fall victim to bobcats and coyotes.

Did you know? Elk are primarily crepuscular, browsing mainly at dawn and dusk.
Only male elk grow antlers, which are shed each year.
A young deer is called a fawn. An adult male deer is called a buck. The female is called a doe.

http://animaldiversity.org/accounts/Cervus_elaphus/
Cervus elaphus
Elk

By Rachel Lesley Senseman
Last updated: February 04, 2002

Geographic Range
Elk, or red deer, were once found throughout much of the Northern Hemisphere, from Europe through northern Africa, Asia, and North America. Extensive hunting and habitat destruction have limited elk to a portion of their former range. Elk populations in eastern North America were extirpated largely as a result of overhunting. Today large populations in North America are found only in the western United States from Canada through the Eastern Rockies to New Mexico, and in a small region of the northern lower peninsula of Michigan. Elk were reestablished in the eastern United States, including Michigan, with three transplantations throughout the 1900's. Various elk populations in the western United States, including Yellowstone National Park in Wyoming, contributed to the reestablishment. In Eurasia elk populations are now confined to protected areas and less populated regions. Their traditional range extended from 65 degrees N in Norway to 33 degrees N in Africa. Elk have been introduced to Ireland, Argentina, Chile, Australia, and New Zealand.

Habitat

Elk prefer open woodlands and avoid dense unbroken forests. Elk can be found in coniferous swamps, clear cuts, aspen-hardwood forests, and coniferous-hardwood forests. They are found through a wide range of elevations, typically from sea level to 3000 m, although they can also occur at higher elevations.

Physical Description
Elk range in color from dark brown in winter to tan in summer and have a characteristic buff colored rump. The head, neck, belly, and legs are darker than both the back and sides. Elk generally have a long head with large ears and widely branching antlers as long as 1.1 to 1.5 m from tip to tip are found on males only. A dark shaggy mane hangs from the neck to the chest. With a thick body, short tail and long slender legs, most elk stand approximately 0.75 to 1.5 m high at the shoulder and are 1.6 to 2.7 m from nose to tail. Most males are 10 percent larger than females and may weigh twice as much. Females weigh from 171 to 292 kg, averaging 241 kg. Males weigh from 178 to 497 kg, averaging 331 kg.

Reproduction
Shortly before the fall rut, in late September and early October, male elk lose the velvet on their antlers and begin to compete for access to females. Dominant males are able to maintain larger harems of females and restrict access to them. They defend a kind of "moving territory" around the harem. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense and result in injury, exhaustion, or death. Harems are usually made up of 1 bull and 6 females with their yearling calves and are seasonal.

Female elk protect their calves by hiding them in a secluded area during their first few weeks of life. They nurse and protect their young through their first year of life. Male elk do not contribute to the care of their young.

Behavior
Elk are social animals; they live in summer herds with as many as 400 individuals. These herds are matriarchal and are dominated by a single cow. Seasonal migrations occur elevationally, with elk being found at higher elevations during summer, and migrating to lower elevations during winter. As the fall mating season approachs, bulls form harems, which they defend with their large size and aggressive nature. In spring, the sexes separate; females leave to give birth, while bulls form their own separate summer herds. After birth, cows and their calves form nursery groups until calves are ready to join the herd. Bulls are only territorial during the mating season and are otherwise not aggressive toward other elk.

Elk browse in the early morning and late evening . They are inactive during the day and the middle of the night, when they spend most of their time chewing their cud.

Elk have a close association with white-tailed deer, sharing similar environments and similar habitats.

Elk have a home range of approximately 600 square miles.

Communication and Perception
Elk have keen senses of smell, hearing, and vision. They communicate with other elk using all of these senses, as well as touch. Elk are known as the noisiest of all cervids. Newborns bleat and squeal, females bark, grunt and squeal, and males are known for their characteristic low pitched bellow or roar, known as bugling. Bugling is used to attract mates and advertise territories during the fall rutting season and can be heard for long distances.

Food Habits
Elk are browsers feeding on grasses, sedges, and forbs in summer and woody growth (cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood) in the winter months. Favorites of the elk include dandelions, aster, hawkweed, violets, clover, and the occasional mushroom. Elk are ruminant animals and therefore regurgitate their food and remasticate to aid in digestion. This is also known as chewing cud.

Predation
Predators of elk include mountain lions, gray wolves, and bears. Calves may fall victim to bobcats and coyotes. Healthy adults are rarely preyed on. Elk protect themselves from predators through their herding behavior and large size. They may also use their antlers (males) and sharp hooves to protect themselves.

Known Predators
grizzly bears (Ursus arctos)
gray wolves (Canis lupus)
American black bears (Ursus americanus)
coyotes (Canis latrans)
mountain lions (Puma concolor)
bobcats (Lynx rufus)

Contributors

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DARK EYED JUNCO

http://www.allaboutbirds.org/guide/Dark-eyed_Junco/id

Dark-eyed Juncos are neat, even flashy little sparrows that flit about forest floors of the western mountains and Canada, then flood the rest of North America for winter. They're easy to recognize by their crisp (though extremely variable) markings and the bright white tail feathers they habitually flash in flight. One of the most abundant forest birds of North America, you'll see juncos on woodland walks as well as in flocks at your feeders or on the ground beneath them.

Size & Shape
The Dark-eyed Junco is a medium-sized sparrow with a rounded head, a short, stout bill and a fairly long, conspicuous tail.

Color Pattern
Juncos vary across the country (see Regional Differences), but in general they're dark gray or brown birds brightened up by a pink bill and white outer tail feathers that periodically flash open, particularly in flight.

Behavior
Dark-eyed Juncos are birds of the ground. They hop around the bases of trees and shrubs in forests or venture out onto lawns looking for fallen seeds. You'll often hear their high chip notes, given almost absent-mindedly while foraging, or intensifying as they take short, low flights through cover.

Habitat
Dark-eyed Juncos breed in coniferous or mixed-coniferous forests across Canada, the western U.S., and in the Appalachians. During winter you'll find them in open woodlands, fields, parks, roadsides, and backyards.

http://animals.nationalgeographic.com/animals/birding/dark-eyed-junco/

Dark-eyed juncos are unique sparrows that nest on or near the ground in forests. In winter, they typically form flocks and often associate with other species, including chipping sparrows, pine and palm warblers (in the southeastern United States.), and bluebirds. When disturbed the entire flock suddenly flies up to a tree, usually perching in the open and calling in aggravation at the intrusion. Polytypic. Length 6.3" (16 cm).

Identification A fairly lean sparrow with a long notched tail and a small pinkish or horn-colored bill (bicolored in dorsalis). Two prominent white outer tail feathers in most subspecies; 3 outermost in the "white-winged." Most subspecies have a gray or brown head and breast sharply set off from a white belly. Otherwise highly variable. Male: typically darker with sharper markings. Female: typically browner with more indistinct markings. Juvenile: heavily streaked, often with a trace of adult pattern.

http://www.birdweb.org/birdweb/bird/dark-eyed_junco

The Dark-eyed Junco is commonly found in Washington in two forms, the Oregon and the Slate-colored. It is unclear whether other races of Dark-eyed Junco occur in the state. In Washington, the Oregon form is by far the more common. All forms in Washington have distinctive white outer tail feathers, white bellies, and pink bills. Oregon Juncos have dark hoods, which are bold black in males and gray in females and juveniles. They have rufous sides, brown backs, and gray wings. Slate-colored Juncos may have a brownish tinge on their backs, but for the most part are dark gray all over except for the white belly.

Habitat
During the breeding season, Dark-eyed Juncos use a variety of forested habitat, but prefer moist conifer or mixed forests with dense understory and forest openings. During the winter, they can be found in open woodlands and brushy areas including towns, gardens, and shrub-steppe habitat.

Behavior
Dark-eyed Juncos are flocking birds with a distinct social hierarchy. They forage on the ground in these groups, scratching with their feet to find food. The flash of white tail feathers serve as a signal that alerts members of the flock when one is alarmed.

Diet
During the summer, about half of the Dark-eyed Junco's diet is made up of insects and other arthropods, the other half consists of seeds. The young eat mostly arthropods. In winter, the diet shifts more to seeds and berries.

Nesting
The male Dark-eyed Junco sings from a high perch to defend his territory and attract a mate. During courtship, both members of a pair hop about on the ground with their wings drooped and their tails spread, showing off their white outer tail feathers. The nest, which the female builds, is almost always on the ground. It is often in a depression, hidden under grass, a log, a rock, or an upturned tree root. The nest is a cup made of grass, moss, lichen, rootlets, twigs, and bark fiber, and is lined with fine grass, hair, or feathers. The female incubates 3 to 5 eggs for 11 to 13 days. Both parents feed the chicks, which leave the nest at 9 to 11 days. Pairs typically raise 1 or 2 broods per year.

DOWNY WOODPECKER

http://www.birdweb.org/Birdweb/bird/downy_woodpecker

General Description
The Downy Woodpecker is the smallest of Washington's woodpeckers. Its plumage is a mix of black and white (but see below.) Its wings, lower back, and tail are black with white spots; its upper back and outer tail feathers are white. Its underside is white, and its head is marked with wide alternating black and white stripes. Males have a red spot at the backs of their heads which females lack. Downy Woodpeckers closely resemble the larger Hairy Woodpeckers, but Downys have relatively smaller bills, which give their heads a rounder, 'cuter' shape. Downy Woodpeckers found in western Washington are considerably darker than their eastern Washington counterparts, with most of the areas described above as 'white' actually a dingy tan. Juveniles look like adults but may have red on their foreheads.

Habitat
Downy Woodpeckers typically inhabit broadleaved and mixed forests, especially those with black cottonwood and willow. They are also often found in residential areas, along rivers and streams, and in orchards, city parks, and even agricultural areas as long as there are sufficient trees nearby. They are sometimes found in conifer forests after the breeding season and especially in burned areas. However, Downy Woodpeckers generally prefer deciduous environments in contrast to Hairy Woodpeckers, which may often be found in coniferous forests.

Behavior
Downy Woodpeckers maintain feeding territories year round but often join winter flocks of chickadees and nuthatches. They are acrobatic foragers that can hang upside-down and reach the outermost tips of branches. Males tend to forage farther out than females, which stay closer to the trunk. Downy Woodpeckers will also forage on mullein stalks and other herbaceous vegetation, but generally they feed by exploring bark crevices.

Diet
Insects, especially beetles and ants, are the main food of Downy Woodpeckers. They also feed on berries, seeds, and suet.

Nesting
Downy Woodpeckers form monogamous breeding pairs in late winter. Both members of the pair excavate nesting and roosting holes in soft or rotten wood. They often situate their cavity entrance in a spot surrounded by lichen or fungus, which helps to camouflage the hole. Both parents incubate the 4 to 5 eggs for about 12 days, and both feed the young. The young leave the nest after 20 to 25 days but follow the parents around for a few weeks thereafter. Each pair typically raises one brood a year.

http://animaldiversity.org/accounts/Picoides_pubescens/

Geographic Range: Downy woodpeckers are found throughout North America, from southeastern Alaska east to Newfoundland, extending south to southern California and Florida. The majority of downy woodpeckers throughout the geographic range are year-round residents. Some populations are locally migratory, especially those along the Atlantic coast. (Jackson and Ouellet, 2002)

Habitat: In the northern part of their range, downy woodpeckers favor open deciduous forests and woodlands. This includes mixed, secondary-growth forests of oak-hickory or beech-maple-hemlock. They are less common in conifer-dominated forests unless there is a deciduous understory. Downy woodpeckers are also common in cultivated areas such as orchards, and are sometimes found in urban and suburban settings. In the south, they frequent riparian woods or moist, aspen-willow stands. They are also found in the southern Rocky Mountains. (Jackson and Ouellet, 2002)

Physical Description: Downy woodpeckers are smallest woodpeckers native to North America. They are 14.5 to 17 cm long and weigh 21 to 28 g. They are largely black-and-white; their back is black with white down the center and their wings are black with white spots. The head is black with a white stripe above and below each eye. The tail is black with outer portions of white barred with black. The chest and belly are white to grayish.

Downy woodpeckers have whitish nasal tufts at the base of a thick, black, chisel-shaped bill. Males and females are similar in appearance, but the males have a small red patch on the nape of the neck. Juvenile males usually have a red patch on the forehead and lack red on the nape of the neck. Juvenile females look similar to juvenile males, but lack any red on the forehead or nape.

Reproduction: Downy woodpeckers are monogamous. Breeding pairs usually begin forming in late winter and early spring (January to March). Once a breeding pair forms, they forage together until incubation begins. This may be a form of mate guarding. Breeding pairs usually stay together for the length of a summer, and may mate together for more than one breeding season. (Jackson and Ouellet, 2002)

Mating System monogamous
The male and female excavate a nest cavity together, usually in a dead limb of a living or dead tree. Excavation takes 7 to 20 days, and is usually begun about two weeks before egg-laying. The female lays 3 to 8 eggs (average 4.8) at a rate of 1 per day. Both parents incubate the eggs; the male incubates at night and the adults share incubation during the day. The eggs hatch synchronously after 12 days. This nestlings are altricial at hatching, but develop very quickly. They are brooded nearly constantly for the first 4 days after hatching, and are fed by both parents. The chicks leave the nest 18 to 21 days after hatching. The parents continue to care for the fledglings for at least three weeks, feeding them, leading them to food sources and warning them of potential predators. Most young downy woodpeckers are able to breed the next season.

Downy woodpeckers occasionally have female "helpers" at the nest. These helpers are not usually offspring of the breeding pair. (Jackson and Ouellet, 2002)

Both parents incubate the eggs, keep the nest clean, feed the young and protect them from predators. The young remain with the parents for up to three weeks after fledging. (Jackson and Ouellet, 2002)

Behavior
Downy woodpeckers are diurnal and non-migratory. They are solitary, though they are occasionally seed foraging in loose association. Males defend a territory against other males, and females defend a territory against females. When an intruder enters a downy woodpecker's territory, the resident woodpecker uses threat displays, such as wing flicking, or fanning their tail, raising their crest and holding their bill high to try to drive the intruder away. If threat displays do not work, downy woodpeckers may attack the intruder, grappling with them in mid-air. (Jackson and Ouellet, 2002)

Communication and Perception
Downy woodpeckers use vocalizations and body signals to communicate. They produce a variety of sounds, including "pik", rattle, scolding, "wad", "chirp", squeak, screech, and distress calls. The "pik" call introduces the rattle call, and these are used during aggressive interactions. Short calls, the "wad" and "chirp", are uttered by young birds. A longer note call, the squeak, is also uttered by young downy woodpeckers. The screech and distress calls are used to signal alarm.

Drumming is a common non-vocal sound used by downy woodpeckers to communicate. This sound is heard in most frequently in late winter and spring, and is used to establish and defend a territory, to attract a mate and to communicate between mates.

Downy woodpeckers also use body postures to communicate. Postures exhibited by downy woodpeckers often include some combination of bill pointing and waving, wing flicking, crest raising, wing spreading, tail spreading, head turning and head swinging. (Jackson and Ouellet, 2002)

Food Habits
Downy woodpeckers are omnivorous. Their primary foods include insects and other arthropods, fruits, seeds, sap and some cambium tissue. Beetles, weevils, ants, bugs, plant lice and caterpillars are among the insects eaten. They also consume scale insects and spiders. Downy woodpeckers will also eat suet from backyard feeders.

Downy woodpeckers glean insects from the surfaces of trees, shrubs and large weeds, probe into crevices and excavate shallow holes into wood to find food. Males and females within a population often differ in their foraging habits. For example, in one study in Illinois, males spent more time excavating than females, and females probed bark surfaces more than males.

Downy woodpeckers drink water by scooping it up with their bill. They drink from water that collects on horizontal limb surfaces, in epiphytes, puddles, streams, ponds and bird baths. (Jackson and Ouellet, 2002)

Primary Diet omnivore
Animal Foods insects terrestrial non-insect arthropods
Plant Foods wood, bark, or stems seeds, grains, and nuts fruit sap or other plant fluids

Predation
Adult downy woodpeckers are preyed upon by several species of birds of prey. To hide themselves from predators, downy woodpeckers flatten themselves against the surface of the tree bark and remain motionless. Downy woodpeckers may also dodge a hawk by darting behind a tree branch, or winding their way around the branch to avoid the hawk. In urban areas, downy woodpecker predators include rats and domestic cats. Eggs and nestlings are vulnerable to climbing predators such as snakes and squirrels, as well as other woodpeckers, including red-bellied woodpeckers and hairy woodpeckers. By nesting in cavities, downy woodpeckers avoid predation of their eggs and young by animals that cannot get to these cavities. (Jackson and Ouellet, 2002)

Known Predators
northern goshawks (Accipiter gentilis)
peregrine falcons (Falco peregrinus)
sharp-shinned hawks (Accipiter striatus)
Cooper's hawks (Accipiter cooperii)
snakes (Serpentes)
squirrels (Sciuridae)
rats (Rattus)
domestic cats (Felis silvestris)
red-bellied woodpeckers (Melanerpes carolinus)
hairy woodpeckers (Picoides villosus)

http://www.allaboutbirds.org/guide/Downy_Woodpecker/id

The active little Downy Woodpecker is a familiar sight at backyard feeders and in parks and woodlots, where it joins flocks of chickadees and nuthatches, barely outsizing them. An often acrobatic forager, this black-and-white woodpecker is at home on tiny branches or balancing on slender plant galls, sycamore seed balls, and suet feeders. Downies and their larger lookalike, the Hairy Woodpecker, are one of the first identification challenges that beginning bird watchers master.

Size & Shape
Downy Woodpeckers are small versions of the classic woodpecker body plan. They have a straight, chisel-like bill, blocky head, wide shoulders, and straight-backed

posture as they lean away from tree limbs and onto their tail feathers. The bill tends to look smaller for the bird's size than in other woodpeckers.

Color Pattern: Downy Woodpeckers give a checkered black-and-white impression. The black upper parts are checked with white on the wings, the head is boldly striped, and the back has a broad white stripe down the center. Males have a small red patch on the back of the head. The outer tail feathers are typically white with a few black spots.

Behavior: Downy Woodpeckers hitch around tree limbs and trunks or drop into tall weeds to feed on galls, moving more acrobatically than larger woodpeckers. Their rising-and-falling flight style is distinctive of many woodpeckers. In spring and summer, Downy Woodpeckers make lots of noise, both with their shrill whinnying call and by drumming on trees.

Habitat
You'll find Downy Woodpeckers in open woodlands, particularly among deciduous trees, and brushy or weedy edges. They're also at home in orchards, city parks, backyards and vacant lots.

BOBCAT,

http://animals.nationalgeographic.com/animals/mammals/bobcat/
Bobcats are elusive and **nocturnal**, so they are rarely spotted by humans. Although they are seldom seen, they roam throughout much of North America and adapt well to such diverse habitats as forests, swamps, deserts, and even suburban areas.

Bobcats, sometimes called wildcats, are roughly twice as big as the average housecat. They have long legs, large paws, and tufted ears similar to those of their larger relative, the Canada lynx. Most bobcats are brown or brownish red with a white underbelly and short, black-tipped tail. The cat is named for its tail, which appears to be cut or "bobbed."

Fierce hunters, bobcats can kill prey much bigger than themselves, but usually eat rabbits, birds, mice, squirrels, and other smaller game. The bobcat hunts by stealth, but delivers a deathblow with a leaping pounce that can cover 10 feet (3 meters).

Bobcats are solitary animals. Females choose a secluded den to raise a litter of one to six young kittens, which will remain with their mother for 9 to 12 months. During this time they will learn to hunt before setting out on their own.

In some areas, bobcats are still trapped for their soft, spotted fur. North American populations are believed to be quite large, with perhaps as many as one million cats in the United States alone.

http://animaldiversity.org/accounts/Lynx_rufus/

Geographic Range
Bobcats are found throughout North America from southern Canada to southern Mexico. In the United States population densities are much higher in the southeastern region than in the western states.

Habitat: Bobcats can be found in a variety of habitats, including forests, semi-deserts, mountains, and brushland. They sleep in hidden dens, often in hollow trees, thickets, or rocky crevices.
Physical Description: Bobcats range in length from 65 to 105 cm, with the tail adding an extra 11 to 19 cm (bobcats got their name because of their short tails). They are 45 to 58 cm high at the shoulder and weigh between 4 and 15 kg.

Bobcat fur can be various shades of buff and brown, with dark brown or black stripes and spots on some parts of the body. The tip of the tail and the backs of the ears are black. They have short ear tufts, and ruffs of hair on the side of the head, giving the appearance of sideburns.

Mating System: Bobcats usually mate in the early spring, although the timing is variable. After a gestation of 60 to 70 days, a litter of about 3 kittens is born. The young open their eyes for the first time when they are 10 days old, and they nurse through their second month. Young bobcats disperse during the winter, when they are about 8 months old.

After the young are born, the mother's milk provides them with further nourishment. Female bobcats bring meat to their young and teach them how to hunt after they are weaned, staying with them for almost a year. Male bobcats do not help raise their offspring.

Bobcats live up to 12 years in the wild. In captivity, they may live up to 32 years. (Kurta, 1995)

Bobcats are basically terrestrial and nocturnal, although they are good climbers and are often active at dusk as well as during the night.

Bobcats mark their territories with scent to repel intruders. They make various yowling sounds to communicate with one another during the breeding season. Like all felids, bobcats have excellent vision and hearing and a well-developed sense of smell.

Food Habits: Bobcats are strictly meat eaters. Stealthy hunters, they stalk their prey, then pounce and (if successful) kill with a bite to the vertebrae of the neck. They hunt rodents, rabbits, small ungulates, large ground birds, and sometimes reptiles. They occasionally eat small domesticated animals and poultry.

Predation: Bobcat kittens are preyed upon by foxes, coyotes, and large owls. Humans are the only real threat to adult bobcats. (Kurta, 1995)

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http://a-z-animals.com/animals/bobcat/

Bobcat Classification and Evolution

The Bobcat is a medium-sized wildcat that is found in a variety of habitats across the southern half of North America. They are widespread and adaptable predators that are closely related to the larger and more northerly dwelling Canadian Lynx with the biggest difference being that the Bobcat only has a small "bobbed" tail, from which it gets it's name. Measuring about double the size of a domestic cat, the Bobcat has the greatest range of all North American felines but their secretive nature means that they are seldom seen by people. There are currently twelve recognised sub-species of Bobcat which vary in their colouration and geographic range, with individuals found in mountainous forest being darker with more markings than their lighter-coloured cousins that are found in more arid, semi-desert regions.

Bobcat Anatomy and Appearance

Due to the fact that the Bobcat belongs to the same family as the Lynx, they are similar in appearance but not at all the same. The Bobcat is smaller in size and has smaller feet and ear tufts than the Canadian Lynx, and often tends to be darker in colour. Bobcats have beige to brown or reddish fur that is mottled or spotted with the intensity of these markings depending on the individual and where it lives (those found in more open, arid areas tend to have fewer markings than those found amongst dense cover). The underside of the Bobcat is white so the darker spots are more distinctive and they also have a white tip to their short, black tail, which only grows to around 15cm in length . Like the larger Lynx, the Bobcat has ear tufts that are thought to heighten their hearing along with also having a ruff of longer fur around it's face.

Bobcat Distribution and Habitat

The Bobcat is the most widely distributed of all North American felines and is found across North America from southern parts of Canada right down to southern Mexico. They are incredibly versatile animals that have adapted to living in a variety of different habitats throughout the three different countries. Although Bobcats are known to prefer rocky hillsides that are well-vegetated, they are found in numerous different habitats throughout their natural range including mountain woodlands, coniferous forest, swampland, deserts and even in suburban areas in some places. The exact appearance of the Bobcat depends on what kind of habitat it is found in as the differing coat colors allow the individual to remain as camouflaged as possible in it's surroundings. The historical range of the Bobcat once extended right across North America but the capture of them for their fur and loss of their natural habitat has led to the disappearance of them in some areas.

Bobcat Behavior and Lifestyle

The Bobcat is solitary and nocturnal animal that is most active in the darkness of night, tending to hunt most during dawn and dusk. During the day, Bobcats sleep and rest in dens in the form of a rock crevice or hollow tree with one individual having a number of dens within it's home range. Bobcats are highly territorial and mark their ranges with scents from their urine and feces and distinctive claw marks on trees to alert others of their presence. Males patrol a large home range which often overlaps a number of smaller female territories but the two will not interact until the breeding season which begins in the winter. At other times of the year though, Bobcats tend to avoid one another to reduce the chances of them being injured in a fight.

Bobcat Reproduction and Life Cycles
Bobcats can only be found together during the breeding season when both males and females can mate with multiple partners and after a gestation period that last for 8 - 10 weeks, the female Bobcat gives birth to a litter of up to 6 kittens in a safe and secluded den. Bobcat kittens are born blind and open their eyes after about 10 days, feeding on their mother's milk until they are old enough to begin consuming meat. Most births occur in the late winter or early spring with Bobcat kittens usually remaining with their mother until the next winter when they are around eight months old and have learnt how to hunt independently. Female Bobcats tend to have a single litter every year and after mating, the male Bobcat plays no part in rearing the young.

Bobcat Diet and Prey
The Bobcat is a carnivorous feline meaning that it only hunts and eats other animals in order to gain the nutrients that it needs to survive. Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on fresh carrion. The Bobcat is an incredibly elusive predator that hunts it's prey by stalking it silently in the dark before pouncing on it with incredible force, and despite their size, Bobcats are known to be able to kill animals that are much larger than themselves. In areas where growing Human settlements have encroached on the Bobcat's natural habitat, they have also been known to take occasional livestock such as poultry and sheep.

Bobcat Predators and Threats
The Bobcat is a fierce and dominant predator in it's natural habitat with adult Bobcats therefore being threatened by few animals, the biggest concern to them being Cougars and Wolves. The small and vulnerable Bobcat kittens however, are preyed upon by a number of predators including Coyotes and Owls that are able to hunt the kittens whilst there mother has gone off to hunt. The biggest threat to Bobcat populations throughout North America is people that have previously hunted the Bobcat to near extinction in some areas for their soft fur. In areas where Bobcats are now forced to share their natural ranges with growing numbers of people, they have also been hunted by farmers who fear for their livestock. Despite the fact that they are very adaptable animals, Bobcats are also been threatened by habitat loss with populations being pushed into smaller and more isolated regions of their once vast natural range.

Bobcat Interesting Facts and Features
The Bobcat is also known as the Red Lynx due to the fact that the two are very similar in appearance but the Bobcat tends to be much darker and richer in colour than their northern relatives. They are incredibly secretive yet powerful animals that are able to pounce on their prey from up to three meters away before delivering a fatal bite, allowing Bobcats to also hunt animals that may be up to double their own size. Although Bobcats are generally quiet and not greatly vocal animals, the fierce growls and snarls that they make when they are hiding often leads people to believe that there is a Mountain Lion in the area.

VOLCANO

Eruption

1857	Last eruption of Mount St. Helens before 1980
March 16, 1980	Small Earthquakes shake the mountain. Slight earthquakes shook the mountain for next few days
March 20, 1980	4.2 magnitude earthquake.
	Earthquakes continued, some days more than one per minute
March 25-27, 1980	Bulge begins to grow on summit. Rate of growth is about 5 feet per day.
March 27, 1980	Volcano erupted sending up steam and ash 6000 feet into the air. Opened a 250 foot crater at the top of the mountain.
March 27-April 21, 1980	Smaller eruptions spewed from crater
On and off until May 16, 1980	Smaller eruptions on and off. Some lasted minutes, others lasted hours. Mountain began to experience rhythmic tremors, like a beating drum, which means that magma is moving inside the mountain.
March 25 on	Bulge grows as big as 450 feet in height in some places.
May 18, 1980 7:00AM	Geologist David Johnston takes readings on the mountain. Nothing new is different.
May 18, 1980 8:32:20 am	• 5.2 magnitude earthquake. Shook the bulge, made it shudder, ripple and churn and collapse in a massive avalanche of broken rock and loose natural material.Avalanche moved at a rate of 180 miles per hour. • Steam and ash that had been bottled up in the mountain blasted out sideways from the hole left by the bulge. Blast reached speeds of 670 miles per hour. Outran avalanche. • Column of ash erupted straight up from the crater. Rose 16 miles into the air. • Pyroclastic flows, hot mixtures of burning materials from inside the volcano, bubbled and frothed out, mixing with the ash and volcanic material that fell back on the mountain from the ash column. Temperature of this flow was more than 480° • Glacier melted from the heat and created a mudflow or lahar down the mountain. Reach speeds of 90 miles per hour sliding down the mountain.
	During the eruption: Wind, thunder and lightning were felt. Very strong.

The Numbers:

Height:	Lost 1313 feet.
Crater:	250 feet on March 27th, enlarged to 1 mile by two miles, and 2100 feet deep Looked like a stadium with an opening on the North side.
Time:	Bulge collapse and slide down mountain: 9 minutes Blast: about 30 seconds Eruption of ash: 9 hours.
Debris Avalanche	24 square miles and 13 miles from the crater, average depth: 150 feet
Spirit Lake	Depth reduced by 200 feet. Floor rose 295 feet.
Blast:	Leveled 230 square Miles of old growth forest: Eight Miles closest to blast: Blown totally bare Next 11 Miles: trees lay like pick up sticks without leaves or branches Fringes of blowdown: trees remained standing and burnt, like sentinels of the devastation.
Mudflow	33 to 66 feet in depth. Covered 23 square miles. Jammed rivers and creeks near the mountain. The Columbia River channel, miles away, rose by more than 20 feet.
Ash Cloud	Scientists estimate explosion was more 400 times more powerful than the atomic bomb explosion in Hiroshima during WWII. Cloud darkened the whole area. Blanketed nearby towns and cities like Portland, Oregon and Spokane and Yakima, Washington. 540 million tons of ash. 22,000 square miles covered. Traces of ash reached as far as Virginia and floated in the atmosphere for two weeks.
Pyroclastic Flow	Small fan shaped zone. Two weeks after the eruption temperature still 570° to 785°
Lava	Amazingly enough, there was no lava. Magma bubbled up inside the crater, but it did not pour out of the crater.
Loss of Life	57 Humans 5000 deer, 1500 elk, 200 black bears, 15 mountain lions, 300 bobcats, 11,000 hares, 1400 coyotes, and uncounted birds, squirrels and small mammals. 12 million fish.
Number of days	59 days from first tremor to eruption

BLACK BEARS

1. **http://www.nwf.org/Wildlife/Wildlife-Library/Mammals/Black-Bear.aspx. Accessed 3/2/15**

Most are black. Some have white patch on chest. (1.)

There are some which are white. Natives called them spirit bears. (1)

Claws allow them to climb trees. Non retractable claws. (1.)

There are some which are white. Natives called them spirit bears. (1)

Roots, berries, meat, fish, insects, larvae, grass and other succulent plants. They are able to kill adult deer and other hoofed wildlife but most commonly are only able to kill deer, elk, moose and other hoofed animals when these are very young.(1.)

Black bears can live up to 30 years in the wild but most die before they are in their early 20s. (1)

Because of their versatile diet, black bears can live in a variety of habitat types. They inhabit both coniferous and deciduous forests as well as open alpine habitats. They typically do not occur on the Great Plains or other wide open areas except along river courses where there is riparian vegetation and trees. They can live just about anywhere they can find food, but largely occur where there are trees. (1)

The American black bear is not currently a species of conservation concern and even the formerly listed black bear of Florida and Louisiana is now increasing. Habitats in western Texas from which black bears were extirpated are now being re-colonized.(1)

2. **http://animals.nationalgeographic.com/animals/mammals/black-bear/**

Keen sense of smell gives them information about their environment and foods they eat. (2.)

Some do not hibernate as long or skip the process altogether when food is abundant. (2.)

Most of their diet consists of grasses, roots, berries, and insects. They will also eat fish and mammals—including animals which another animal killed. (2.)

When winter arrives, black bears spend the season sleeping in their dens, feeding on body fat they have built up by eating ravenously all summer and fall. They make their dens in caves, burrows, brush piles, or other sheltered spots—sometimes even in tree holes high above the ground. (2.)

During their winter dormant period, though, they do not eat, drink, or pass waste, but may wake up if disturbed. (2.)

Female black bears give birth to two or three blind, helpless cubs in mid-winter and nurse them in the den until spring, when all emerge in search of food. The cubs will stay with their very protective mother for about two years.

3. http://www.bearlife.org/black-bear.html

They use their claws like fingers when they eat. (3.)

Excellent climbers, even when cubs. (3.)

Grunts, moaning sounds, and growling. (3.)

Like to swim. If there is water where they live they hunt for food. Since bears like to hunt fish they like water. Baby cubs swim early. (3.)

Will eat field grasses, roots, tubers, nuts, berries of all kinds, fruits, and other foods. (3.)

They also eat ants, grubs, termites, beetles, and other insects. Black bears also like salmon and other fish and will hunt for small mammals if available where they live. (3.)

Black bear hibernation can last up to 6 or 7 months depending on their habitat and climate conditions. They make use of their body fat and do not eat or pass any wastes. (3.)

Baby black bears are born and live in mother's den during winter. (3.)

The mother spends the following year and a half weaning, feeding, and teaching her cubs what to eat and how to survive. After 1.5 years they leave to live on their own. (3.)

<u>Vocabulary</u>

Hibernation: Spend the winter inactive, in a dormant state.

ELK

1. http://animals.nationalgeographic.com/animals/mammals/elk/

A bull (male) elk's antlers may reach 4 feet (1.2 meters) above its head, so that the animal towers 9 feet (2.7 meters) tall. (1.)

Elk also called Wapiti

In early summer, elk migrate to high mountain grazing grounds where the cows (females) will give birth. Each cow typically has a single calf, which can stand by the time it is 20 minutes old.(1)

Elk lose their antlers each March, but they begin to grow them back in May in preparation for the late-summer breeding season. (1.)

Bulls bugle during mating season. Strip the velvet off their new antlers using them in violent fights. Males with the bigger antlers, older animals, usually win these battles and get to mate with a small group of females.
(1.)

In the winter, **wapiti** form large herds, though males and females typically remain separate. The herds return to lower valley. Spend winter pawing through snow to browse on grass or settling for shrubs that stand clear of the snow cover. (1)

In early summer, elk migrate to high mountain grazing grounds where the cows (females) will give birth. Each cow typically has a single calf, which can stand by the time it is 20 minutes old. (1.)

During the late summer breeding season the **bugling** of bull elk echoes through the mountains. These powerful animals strip the velvet off their new antlers using them in violent clashes that determine who gets to mate with whom. Males with the bigger antlers, typically older animals, usually win these battles and dominate small herds.
(1.)

2. http://naturemappingfoundation.org/natmap/facts/elk_k6.html

Elk **ruminate**. They bring their food back up and re-chew to aid in digestion. This is also known as chewing cud. (2)

Bull elk lose the velvet on their antler shortly before the fall rut, in late September and early October. During the rut, they begin to compete for females. Dominant males are able to build larger harems of females and keep other males away. (2)

They defend a kind of "moving territory" around the **harem**. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense - sometimes resulting in injury. The seasonal harems usually consist of 1 bull and 6 females plus their yearling calves. (2)

Elk are primarily **crepuscular**, browse mainly at dawn and dusk.
Only male elk grow antlers, which are shed each year. (2)
A young deer is called a fawn. An adult male deer is called a buck. The female is called a doe. (2)

Elk were once found throughout much of the Northern Hemisphere, from Europe through northern Africa, Asia, and North America. Extensive hunting and habitat destruction have limited elk to a portion of their former range. Elk populations in eastern North America were reduced as a result of over-hunting.

They feed on grasses, **sedges**, and **forbs** in summer and woody growth in the winter months. Woody plants include cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood. (2)

Can live beyond 20 years. (2)

Natural predators of elk include grizzly bears, gray wolves, American black bears, and mountain lions. Calves may fall victim to bobcats and coyotes. (2)

A female will give birth to 1 calf. The gestation is about 8 months. The young nurse and are weaned in 2 months. (2)

3. http://animaldiversity.org/accounts/Cervus_elaphus/

After birth, cows and their calves form nursery groups until calves are ready to join the herd. Bulls are only territorial during the mating season and are otherwise not aggressive toward other elk. (3)

As the fall mating season approaches, bulls form harems, which they defend with their large size and aggressive nature. (3)

In spring, the sexes separate; females leave to give birth, while bulls form their own separate summer herds.

Vocabulary:
Wapity: Native name for elk
Ruminate: Part of the digestion of some animals with hooves. They have an organ called a rumen where partially digested food is stored. Later, the animal brings up the partially digested food (cud)and continues to chew it.
Cud: Partially digested food
Harem: a group of females attached to a male.
Sedges: a type of grass
Forbs: a flowering herb, not a grass.

DARK EYED JUNCO

1. http://www.allaboutbirds.org/guide/Dark-eyed_Junco/id

Juncos vary across the country (see Regional Differences), but in general they're dark gray or brown birds brightened up by a pink bill and white outer tail feathers that periodically flash open, particularly in flight. (1)

Dark-eyed Juncos breed in coniferous or mixed-coniferous forests across Canada, the western U.S., and in the Appalachians. During winter you'll find them in open woodlands, fields, parks, roadsides, and backyards. (1)

Flit about forest floors of the western mountains and Canada, then flood the rest of North America for winter. (1)

Dark-eyed Juncos are birds of the ground. They hop around the bases of trees and shrubs in forests looking for fallen seeds. (1)

You'll often hear their high chip notes, while looking for food. Take short, low flights through cover. (1)

2. http://animals.nationalgeographic.com/animals/birding/dark-eyed-junco/

Nest on or near the ground in forests. (2)

Form flocks and often group with other species. When disturbed the entire flock suddenly flies up to a tree, usually perching in the open and calling in aggravation at the intrusion. (2)

nest on or near the ground in forests. In winter, they typically form flocks and often associate with other species, including chipping sparrows, pine and palm warblers (in the southeastern United States.), and bluebirds. When disturbed the entire flock suddenly flies up to a tree, usually perching in the open and calling in aggravation at the intrusion. (2)

Length: 6.3" (2)

3. http://www.birdweb.org/birdweb/bird/dark-eyed_junco

They **forage** on the ground in these groups, scratching with their feet to find food. (3)

The flash of white tail feathers serve as a signal that alerts members of the flock when one is alarmed. (3)

During the breeding season, Dark-eyed Juncos use a variety of forested habitat, but prefer moist conifer or mixed forests with dense understory and forest openings. During the winter, they can be found in open woodlands (3)

During the summer, about half of the Dark-eyed Junco's diet is made up of insects and other **arthropods** (like spiders), the other half consists of seeds. The young eat mostly arthropods. In winter, the diet shifts more to seeds and berries. (3)

The male Dark-eyed Junco sings from a high perch to defend his territory and attract a mate. During courtship, both members of a pair hop about on the ground with their wings drooped and their tails spread, showing off their white outer tail feathers. (3)

The female builds the nest, almost always on the ground. It is often in a **depression**, hidden under grass, a log, a rock, or an upturned tree root. The nest is a cup made of grass, moss, lichen, rootlets, twigs, and bark fiber, and is lined with fine grass, hair, or feathers. (3)

The female **incubates** 3 to 5 eggs for 11 to 13 days. Both parents feed the chicks, which leave the nest at 9 to 11 days. Pairs typically raise 1 or 2 broods per year. (3)

Vocabulary

Forage: To search for food
Arthropods: Eight legged animals such as spiders and crabs
Depression: A dip in the soil
Incubates: Sits and warms the eggs.

DOWNY WOODPECKERS

1. http://www.birdweb.org/Birdweb/bird/downy_woodpecker

Mix of black and white. Its wings, lower back, and tail are black with white spots; its upper back and outer tail feathers are white. Its underside is white, and its head is marked with wide alternating black and white stripes. Males have a red spot at the backs of their heads. (1.)

They are acrobatic foragers that can hang upside-down and reach the outermost tips of branches. (1.)

Downy Woodpeckers typically inhabit broadleaved and mixed forests, especially those with black cottonwood and willow. They are also often found in residential areas, along rivers and streams, and in orchards, city parks, and even agricultural areas as long as there are sufficient trees nearby. They are sometimes found in conifer forests after the breeding season and especially in burned areas. However, Downy Woodpeckers generally prefer deciduous environments in contrast to Hairy Woodpeckers, which may often be found in coniferous forests.(1)

Insects, especially beetles and ants, are the main food of Downy Woodpeckers. They also feed on berries, seeds, and suet. (1.)

Both members of the pair excavate nesting and roosting holes in soft or rotten wood. They often situate their cavity entrance in a spot surrounded by **lichen** or **fungus**, which helps to **camouflage** the hole. Both parents incubate the 4 to 5 eggs for about 12 days, and both feed the young. The young leave the nest after 20 to 25 days but follow the parents around for a few weeks thereafter. Each pair typically raises one brood a year. (1)

2. http://animaldiversity.org/accounts/Picoides_pubescens/

Downy woodpeckers occasionally have female "helpers" at the nest. These helpers are not usually related to the breeding pair. (2)

When an intruder enters a downy woodpecker's territory, the resident woodpecker uses threat displays, such as wing flicking, or fanning their tail, raising their crest and holding their bill high to try to drive the intruder away. If threat displays do not work, downy woodpeckers may attack the **intruder**, **grappling** with them in mid-air. (2)

Downy woodpeckers use vocalizations and body signals to communicate. They produce a variety of sounds, including "pik", rattle, scolding, "wad", "chirp", squeak, screech, and distress calls. The "pik" call introduces the rattle call, and these are used during aggressive interactions. Short calls, the "wad" and "chirp", are uttered by young birds. A

longer note call, the squeak, is also uttered by young downy woodpeckers. The screech and distress calls are used to signal alarm. (2)

In the northern part of their range, downy woodpeckers favor open deciduous forests and woodlands. This includes mixed, secondary-growth forests of oak-hickory or beech-maple-hemlock. They are less common in conifer-dominated forests unless there is a deciduous understory. Downy woodpeckers are also common in cultivated areas such as orchards, and are sometimes found in urban and suburban settings. In the south, they frequent riparian woods or moist, aspen-willow stands. They are also found in the southern Rocky Mountains. (Jackson and Ouellet, 2002)

Drumming is a common non-vocal sound used by downy woodpeckers to communicate. This sound is heard in most frequently in late winter and spring, and is used to establish and defend a territory, to attract a mate and to communicate between mates. (2)

Downy woodpeckers also use body postures to communicate. Postures exhibited by downy woodpeckers often include some combination of bill pointing and waving, wing flicking, crest raising, wing spreading, tail spreading, head turning and head swinging. (2)

For example, in one study in Illinois, males spent more time excavating than females, and females probed bark surfaces more than males. (2)

To hide themselves from predators, downy woodpeckers flatten themselves against the surface of the tree bark and remain motionless. Downy woodpeckers may also dodge a hawk by darting behind a tree branch, or winding their way around the branch to avoid the hawk. (2)

Their primary foods include insects and other arthropods, fruits, seeds, sap and some **cambium tissue**. Beetles, weevils, ants, bugs, plant lice and caterpillars are among the insects eaten. They also consume scale insects and spiders. (2)

Downy woodpeckers glean insects from the surfaces of trees, shrubs and large weeds, probe into **crevices** and dig shallow holes into wood to find food. (2)

Downy woodpeckers drink water by scooping it up with their bill. They drink from water that collects on horizontal limb surfaces, in plants that are attached to trees, puddles, streams, ponds and bird baths (2)

Plant Foods wood, bark, or stems seeds, grains, and nuts fruit sap or other plant fluids (2)

Breeding pairs usually begin forming in late winter and early spring (January to March). (2)

Breeding pairs usually stay together for the length of a summer, and may mate together for more than one breeding season. (2)

The male and female dig a nest cavity together, usually in a dead limb of a living or dead tree. Digging takes 7 to 20 days, and is usually begun about two weeks before egg-laying. The female lays 3 to 8 eggs (average 4.8) at a rate of 1 per day. Both parents incubate the eggs; the male incubates at night and the adults share incubation during the day. The eggs hatch at the same time after 12 days. They are brooded nearly constantly for the first 4 days after hatching, and are fed by both parents. The chicks leave the nest 18 to 21 days after hatching. The parents continue to care for the **fledglings** for at least three weeks, feeding them, leading them to food sources and warning them of potential predators. (2)

Eggs and nestlings are vulnerable to climbing predators such as snakes and squirrels, as well as other woodpeckers, including red-bellied woodpeckers and hairy woodpeckers. By nesting in cavities, downy woodpeckers avoid predation of their eggs and young by animals that cannot get to these cavities. (2)

Hawks, falcons, snakes, squirrels, rats, other woodpeckers (2)

3. http://www.allaboutbirds.org/guide/Downy_Woodpecker/id

Downy Woodpeckers are small versions of the classic woodpecker body plan. They have a straight, chisel-like bill, blocky head, wide shoulders, and straight-backed posture as they lean away from tree limbs and onto their tail feathers. The bill tends to look smaller for the bird's size than in other woodpeckers. (3)

You'll find Downy Woodpeckers in open woodlands, particularly among deciduous trees, and brushy or weedy edges. They're also at home in orchards, city parks, backyards and vacant lots.

Their rising-and-falling flight style is distinctive of many woodpeckers. (3)

Vocabulary

Intruder: A person or animal that comes in without an invitation.
Grappling: Fighting with claws
Drumming: Noise made by woodpeckers by pecking against a tree.
Cambium Tissue: the outer layer of bark
Crevices: Small holes, or slits
Lichen: Low growing plant, fungus
Fungus: Low growing organism
Camouflage: blending in with surroundings
Fledgling: A baby bird which has already learned to fly

BOBCAT

1. http://animals.nationalgeographic.com/animals/mammals/bobcat/

Bobcats are elusive and **nocturnal**, so they are rarely spotted by humans. Although they are seldom seen, they roam throughout much of North America and adapt well to such diverse habitats as forests, swamps, deserts, and even suburban areas.(1)

twice as big as the average house cat. (1)

The cat is named for its tail, which appears to be cut or “bobbed." (1)

Can kill prey much bigger than themselves, but usually eat rabbits, birds, mice, squirrels, and other smaller game. The bobcats hunt by being sneaky, but deliver a deathblow by pouncing as much as 10 feet (1)

Females choose a secluded den to raise a litter of one to six young kittens, which will remain with their mother for 9 to 12 months. During this time they will learn to hunt before setting out on their own. (1)

2. http://animaldiversity.org/accounts/Lynx_rufus/

Bobcat fur can be various shades of buff and brown, with dark brown or black stripes and spots on some parts of the body. The tip of the tail and the backs of the ears are black. They have short ear **tufts**, and **ruffs** of hair on the side of the head, giving the appearance of sideburns. (2)

Good climbers (2)

Mate in the early spring, although the timing is variable. After a gestation of 60 to 70 days, a litter of about 3 kittens is born. The young open their eyes for the first time when they are 10 days old, and they nurse through their second month. Young bobcats leave to be on their own during the winter, when they are about 8 months old. (2)

Bobcats can be found in a variety of habitats, including forests, semi-deserts, mountains, and brushland. They sleep in hidden dens, often in hollow trees, thickets, or rocky crevices.

Can live up to 12 years(2)

3. http://a-z-animals.com/animals/bobcat/

Hunt most during dawn and dusk. During the day, Bobcats sleep and rest in dens in the form of a rock **crevice** or hollow tree with one individual having a number of dens within it's home range. (3)

Distinctive claw marks on trees to alert others of their presence (3)

Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on fresh carrion. (3)

Hunts it's prey by stalking it silently in the dark before pouncing on it with incredible force, and despite their size, Bobcats are known to be able to kill animals that are much larger than themselves (3)

Bobcats are generally quiet and not greatly vocal animals, the fierce growls and snarls that they make when they are hiding often leads people to believe that there is a Mountain Lion in the area. (3)

Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on **carrion**. (3)

Hunts it's prey by stalking it silently in the dark before pouncing on it with incredible force, and despite their size, Bobcats are known to be able to kill animals that are much larger than themselves (3)

Due to the fact that the Bobcat belongs to the same family as the Lynx, they are similar in appearance but not at all the same.(3)

Cougars and Wolves. The small and **vulnerable** Bobcat kittens can be killed by Coyotes and Owls that hunt them kittens while their mother has gone off to hunt. (3)

Vocabulary

Tufts: small bunch of hair or fur
Carrion: dead animals which are decaying, not a fresh kill
Vulnerable: easily hurt.

VOLCANO

Eruption

1857	Last eruption of Mount St. Helens before 1980
March 16, 1980	Small Earthquakes shake the mountain. Slight earthquakes shook the mountain for next few days
March 20, 1980	4.2 magnitude earthquake.
	Earthquakes continued, some days more than one per minute
March 25-27, 1980	Bulge begins to grow on summit. Rate of growth is about 5 feet per day.
March 27, 1980	Volcano erupted sending up steam and ash 6000 feet into the air. Opened a 250 foot crater at the top of the mountain.
March 27-April 21, 1980	Smaller eruptions spewed from crater
On and off until May 16, 1980	Smaller eruptions on and off. Some lasted minutes, others lasted hours. Mountain began to experience rhythmic tremors, like a beating drum, which means that magma is moving inside the mountain.
March 25 on	Bulge grows as big as 450 feet in height in some places.
May 18, 1980 7:00AM	Geologist David Johnston takes readings on the mountain. Nothing new is different.
May 18, 1980 8:32:20 am	• 5.2 magnitude earthquake. Shook the bulge, made it shudder, ripple and churn and collapse in a massive avalanche of broken rock and loose natural material.Avalanche moved at a rate of 180 miles per hour. • Steam and ash that had been bottled up in the mountain blasted out sideways from the hole left by the bulge. Blast reached speeds of 670 miles per hour. Outran avalanche. • Column of ash erupted straight up from the crater. Rose 16 miles into the air. • Pyroclastic flows, hot mixtures of burning materials from inside the volcano, bubbled and frothed out, mixing with the ash and volcanic material that fell back on the mountain from the ash column. Temperature of this flow was more than 480° • Glacier melted from the heat and created a mudflow or lahar down the mountain. Reach speeds of 90 miles per hour sliding down the mountain.
	During the eruption: Wind, thunder and lightning were felt. Very strong.

The Numbers:

Height:	Lost 1313 feet.
Crater:	250 feet on March 27th, enlarged to 1 mile by two miles, and 2100 feet deep Looked like a stadium with an opening on the North side.
Time:	Bulge collapse and slide down mountain: 9 minutes Blast: about 30 seconds Eruption of ash: 9 hours.
Debris Avalanche	24 square miles and 13 miles from the crater, average depth: 150 feet
Spirit Lake	Depth reduced by 200 feet. Floor rose 295 feet.
Blast:	Leveled 230 square Miles of old growth forest: Eight Miles closest to blast: Blown totally bare Next 11 Miles: trees lay like pick up sticks without leaves or branches Fringes of blowdown: trees remained standing and burnt, like sentinels of the devastation.
Mudflow	33 to 66 feet in depth. Covered 23 square miles. Jammed rivers and creeks near the mountain. The Columbia River channel, miles away, rose by more than 20 feet.
Ash Cloud	Scientists estimate explosion was more 400 times more powerful than the atomic bomb explosion in Hiroshima during WWII. Cloud darkened the whole area. Blanketed nearby towns and cities like Portland, Oregon and Spokane and Yakima, Washington. 540 million tons of ash. 22,000 square miles covered. Traces of ash reached as far as Virginia and floated in the atmosphere for two weeks.
Pyroclastic Flow	Small fan shaped zone. Two weeks after the eruption temperature still 570° to 785°
Lava	Amazingly enough, there was no lava. Magma bubbled up inside the crater, but it did not pour out of the crater.
Loss of Life	57 Humans 5000 deer, 1500 elk, 200 black bears, 15 mountain lions, 300 bobcats, 11,000 hares, 1400 coyotes, and uncounted birds, squirrels and small mammals. 12 million fish.
Number of days	59 days from first tremor to eruption

BLACK BEARS

1. **http://www.nwf.org/Wildlife/Wildlife-Library/Mammals/Black-Bear.aspx. Accessed 3/2/15**
2. **http://animals.nationalgeographic.com/animals/mammals/black-bear/ Accessed 3/2/15**
3. **http://www.bearlife.org/black-bear.html Accessed 3/2/15**

Notes for Illustrations

Most are black. Some have white patch on chest. (1.)

There are some which are white. Natives called them spirit bears. (1)

They use their claws like fingers when they eat. (3.)

Details

Claws allow them to climb trees. Non retractable claws. (1.)

Keen sense of smell gives them information about their environment and foods they eat. (2.)

Excellent climbers, even when cubs. (3.)

Grunts, moaning sounds, and growling. (3.)

Some do not hibernate as long or skip the process altogether when food is abundant. (2.)

Like to swim. If there is water where they live they hunt for food. Since bears like to hunt fish they like water. Baby cubs swim early. (3.)

There are some which are white. Natives called them spirit bears. (1)

Diet

Roots, berries, meat, fish, insects, larvae, grass and other succulent plants. They are able to kill adult deer and other hoofed wildlife but most commonly are only able to kill deer, elk, moose and other hoofed animals when these are very young.(1.)

Most of their diet consists of grasses, roots, berries, and insects. They will also eat fish and mammals—including animals which another animal killed. (2.)

Will eat field grasses, roots, tubers, nuts, berries of all kinds, fruits, and other foods. (3.)

They also eat ants, grubs, termites, beetles, and other insects. Black bears also like salmon and other fish and will hunt for small mammals if available where they live. (3.)

Hibernation

When winter arrives, black bears spend the season sleeping in their dens, feeding on body fat they have built up by eating ravenously all summer and fall. They make their dens in caves, burrows, brush piles, or other sheltered spots—sometimes even in tree holes high above the ground. (2.)

During their winter dormant period, though, they do not eat, drink, or pass waste, but may wake up if disturbed. (2.)

Black bear hibernation can last up to 6 or 7 months depending on their habitat and climate conditions. They make use of their body fat and do not eat or pass any wastes. (3.)

Life Span
Black bears can live up to 30 years in the wild but most die before they are in their early 20s. (1)

Reproduction

Baby black bears are born and live in mother's den during winter. (3.)

The mother spends the following year and a half weaning, feeding, and teaching her cubs what to eat and how to survive. After 1.5 years they leave to live on their own. (3.)

Vocabulary

Hibernation: Spend the winter inactive, in a dormant state.

ELK

1. http://animals.nationalgeographic.com/animals/mammals/elk/ Accessed 3/2/15
2. http://naturemappingfoundation.org/natmap/facts/elk_k6.html Accessed 3/2/15
3. http://animaldiversity.org/accounts/Cervus_elaphus/ Accessed 3/2/15

Notes for Illustrations

A bull (male) elk's antlers may reach 4 feet (1.2 meters) above its head, so that the animal towers 9 feet (2.7 meters) tall. (1.)

Details

Elk also called Wapiti

Elk lose their antlers each March, but they begin to grow them back in May in preparation for the late-summer breeding season. (1.)

Bulls bugle during mating season. Strip the velvet off their new antlers using them in violent fights. Males with the bigger antlers, older animals, usually win these battles and get to mate with a small group of females.
(1.)

In the winter, **wapiti** form large herds, though males and females typically remain separate. The herds return to lower valley. Spend winter pawing through snow to browse on grass or settling for shrubs that stand clear of the snow cover. (1)

Elk **ruminate**. They bring their food back up and re-chew to aid in digestion. This is also known as chewing cud. (2)

Bull elk lose the velvet on their antler shortly before the fall rut, in late September and early October. During the rut, they begin to compete for females. Dominant males are able to build larger harems of females and keep other males away. (2)

They defend a kind of "moving territory" around the **harem**. Males advertise this territory, their status, and attract females through bugling. Fights between dominant males and intruders can be intense - sometimes resulting in injury. The seasonal harems usually consist of 1 bull and 6 females plus their yearling calves. (2)

Elk are primarily **crepuscular**, browse mainly at dawn and dusk.
Only male elk grow antlers, which are shed each year. (2)
A young deer is called a fawn. An adult male deer is called a buck. The female is called a doe. (2)

Diet

They feed on grasses, **sedges**, and **forbs** in summer and woody growth in the winter months. Woody plants include cedar, wintergreen, eastern hemlock, sumac, jack pine, red maple, staghorn, and basswood. (2)

Life Span
Can live beyond 20 years. (2)

Reproduction
In early summer, elk migrate to high mountain grazing grounds where the cows (females) will give birth. Each cow typically has a single calf, which can stand by the time it is 20 minutes old. (1.)

During the late summer breeding season the **bugling** of bull elk echoes through the mountains. These powerful animals strip the velvet off their new antlers using them in violent clashes that determine who gets to mate with whom. Males with the bigger antlers, typically older animals, usually win these battles and dominate small herds. (1.)

A female will give birth to 1 calf. The gestation is about 8 months. The young nurse and are weaned in 2 months. (2)

After birth, cows and their calves form nursery groups until calves are ready to join the herd. Bulls are only territorial during the mating season and are otherwise not aggressive toward other elk. (3)

As the fall mating season approaches, bulls form harems, which they defend with their large size and aggressive nature. (3)

In spring, the sexes separate; females leave to give birth, while bulls form their own separate summer herds.

Predators

Natural predators of elk include grizzly bears, gray wolves, American black bears, and mountain lions. Calves may fall victim to bobcats and coyotes. (2)

Vocabulary:
Wapity: Native name for elk
Ruminate: Part of the digestion of some animals with hooves. They have an organ called a rumen where partially digested food is stored. Later, the animal brings up the partially digested food (cud)and continues to chew it.
Cud: Partially digested food
Harem: a group of females attached to a male.
Sedges: a type of grass
Forbs: a flowering herb, not a grass.

DARK EYED JUNCO

1. **http://www.allaboutbirds.org/guide/Dark-eyed_Junco/id**
2. **http://animals.nationalgeographic.com/animals/birding/dark-eyed-junco/**
3. **http://www.birdweb.org/birdweb/bird/dark-eyed_junco**

Notes for Illustrations

Juncos vary across the country (see Regional Differences), but in general they're dark gray or brown birds brightened up by a pink bill and white outer tail feathers that periodically flash open, particularly in flight. (1)

nest on or near the ground in forests. (2)

Form flocks and often group with other species. When disturbed the entire flock suddenly flies up to a tree, usually perching in the open and calling in aggravation at the intrusion. (2)

Details

Flit about forest floors of the western mountains and Canada, then flood the rest of North America for winter. (1)

Dark-eyed Juncos are birds of the ground. They hop around the bases of trees and shrubs in forests looking for fallen seeds. (1)

You'll often hear their high chip notes, while looking for food. Take short, low flights through cover. (1)

They **forage** on the ground in these groups, scratching with their feet to find food. (3)

The flash of white tail feathers serve as a signal that alerts members of the flock when one is alarmed. (3)

Diet

During the summer, about half of the Dark-eyed Junco's diet is made up of insects and other **arthropods** (like spiders), the other half consists of seeds. The young eat mostly arthropods. In winter, the diet shifts more to seeds and berries. (3)

Reproduction

The female builds the nest, almost always on the ground. It is often in a **depression**, hidden under grass, a log, a rock, or an upturned tree root. The nest is a cup made of grass, moss, lichen, rootlets, twigs, and bark fiber, and is lined with fine grass, hair, or feathers. (3)

The female **incubates** 3 to 5 eggs for 11 to 13 days. Both parents feed the chicks, which leave the nest at 9 to 11 days. Pairs typically raise 1 or 2 broods per year. (3)

Predators

Vocabulary

Forage: To search for food
Arthropods: Eight legged animals such as spiders and crabs
Depression: A dip in the soil
Incubates: Sits and warms the eggs.

DOWNY WOODPECKERS

1. **http://www.birdweb.org/Birdweb/bird/downy_woodpecker**
2. **http://animaldiversity.org/accounts/Picoides_pubescens/**
3. **http://www.allaboutbirds.org/guide/Downy_Woodpecker/id**

Notes for Illustrations

Mix of black and white. Its wings, lower back, and tail are black with white spots; its upper back and outer tail feathers are white. Its underside is white, and its head is marked with wide alternating black and white stripes. Males have a red spot at the backs of their heads. (1.)

Details

They are acrobatic foragers that can hang upside-down and reach the outermost tips of branches. (1.)

Downy woodpeckers occasionally have female "helpers" at the nest. These helpers are not usually related to the breeding pair. (2)

When an intruder enters a downy woodpecker's territory, the resident woodpecker uses threat displays, such as wing flicking, or fanning their tail, raising their crest and holding their bill high to try to drive the intruder away. If threat displays do not work, downy woodpeckers may attack the **intruder**, **grappling** with them in mid-air. (2)

Downy woodpeckers use vocalizations and body signals to communicate. They produce a variety of sounds, including "pik", rattle, scolding, "wad", "chirp", squeak, screech, and distress calls. The "pik" call introduces the rattle call, and these are used during aggressive interactions. Short calls, the "wad" and "chirp", are uttered by young birds. A longer note call, the squeak, is also uttered by young downy woodpeckers. The screech and distress calls are used to signal alarm. (2)

Drumming is a common non-vocal sound used by downy woodpeckers to communicate. This sound is heard in most frequently in late winter and spring, and is used to establish and defend a territory, to attract a mate and to communicate between mates. (2)

Downy woodpeckers also use body postures to communicate. Postures exhibited by downy woodpeckers often include some combination of bill pointing and waving, wing flicking, crest raising, wing spreading, tail spreading, head turning and head swinging. (2)

For example, in one study in Illinois, males spent more time excavating than females, and females probed bark surfaces more than males. (2)

To hide themselves from predators, downy woodpeckers flatten themselves against the surface of the tree bark and remain motionless. Downy woodpeckers may also dodge a hawk by darting behind a tree branch, or winding their way around the branch to avoid the hawk. (2)

Their rising-and-falling flight style is distinctive of many woodpeckers. (3)

Life Span
xxxx

Diet
Insects, especially beetles and ants, are the main food of Downy Woodpeckers. They also feed on berries, seeds, and suet. (1.)

Their primary foods include insects and other arthropods, fruits, seeds, sap and some **cambium tissue**. Beetles, weevils, ants, bugs, plant lice and caterpillars are among the insects eaten. They also consume scale insects and spiders. (2)

Downy woodpeckers glean insects from the surfaces of trees, shrubs and large weeds, probe into **crevices** and dig shallow holes into wood to find food. (2)

Downy woodpeckers drink water by scooping it up with their bill. They drink from water that collects on horizontal limb surfaces, in plants that are attached to trees, puddles, streams, ponds and bird baths (2)

Plant Foods wood, bark, or stems seeds, grains, and nuts fruit sap or other plant fluids (2)

Reproduction
Both members of the pair excavate nesting and roosting holes in soft or rotten wood. They often situate their cavity entrance in a spot surrounded by **lichen** or **fungus**, which helps to **camouflage** the hole. Both parents incubate the 4 to 5 eggs for about 12 days, and both feed the young. The young leave the nest after 20 to 25 days but follow the parents around for a few weeks thereafter. Each pair typically raises one brood a year. (1)

Breeding pairs usually begin forming in late winter and early spring (January to March). (2)
Breeding pairs usually stay together for the length of a summer, and may mate together for more than one breeding season. (2)

The male and female dig a nest cavity together, usually in a dead limb of a living or dead tree. Digging takes 7 to 20 days, and is usually begun about two weeks before

egg-laying. The female lays 3 to 8 eggs (average 4.8) at a rate of 1 per day. Both parents incubate the eggs; the male incubates at night and the adults share incubation during the day. The eggs hatch at the same time after 12 days. They are brooded nearly constantly for the first 4 days after hatching, and are fed by both parents. The chicks leave the nest 18 to 21 days after hatching. The parents continue to care for the **fledglings** for at least three weeks, feeding them, leading them to food sources and warning them of potential predators. (2)

Predators

Eggs and nestlings are vulnerable to climbing predators such as snakes and squirrels, as well as other woodpeckers, including red-bellied woodpeckers and hairy woodpeckers. By nesting in cavities, downy woodpeckers avoid predation of their eggs and young by animals that cannot get to these cavities. (2)

Hawks, falcons, snakes, squirrels, rats, other woodpeckers (2)

Vocabulary

Intruder: A person or animal that comes in without an invitation.
Grappling: Fighting with claws
Drumming: Noise made by woodpeckers by pecking against a tree.
Cambium Tissue: the outer layer of bark
Crevices: Small holes, or slits
Lichen: Low growing plant, fungus
Fungus: Low growing organism
Camouflage: blending in with surroundings
Fledgling: A baby bird which has already learned to fly

BOBCAT

1. **http://animals.nationalgeographic.com/animals/mammals/bobcat/**
2. **http://animaldiversity.org/accounts/Lynx_rufus/**
3. **http://a-z-animals.com/animals/bobcat/**

Notes for Illustrations

twice as big as the average house cat. (1)

Bobcat fur can be various shades of buff and brown, with dark brown or black stripes and spots on some parts of the body. The tip of the tail and the backs of the ears are black. They have short ear **tufts**, and **ruffs** of hair on the side of the head, giving the appearance of sideburns. (2)

Details

The cat is named for its tail, which appears to be cut or “bobbed." (1)

Can kill prey much bigger than themselves, but usually eat rabbits, birds, mice, squirrels, and other smaller game. The bobcats hunt by being sneaky, but deliver a deathblow by pouncing as much as 10 feet (1)

Hunt most during dawn and dusk. During the day, Bobcats sleep and rest in dens in the form of a rock **crevice** or hollow tree with one individual having a number of dens within it's home range. (3)

Good climbers (2)

Distinctive claw marks on trees to alert others of their presence (3)

Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on fresh carrion. (3)

Hunts it's prey by stalking it silently in the dark before pouncing on it with incredible force, and despite their size, Bobcats are known to be able to kill animals that are much larger than themselves (3)

Bobcats are generally quiet and not greatly vocal animals, the fierce growls and snarls that they make when they are hiding often leads people to believe that there is a Mountain Lion in the area. (3)

Diet

Bobcats mainly hunt small mammals like Rabbits, Hares and Mice along with Birds close to the ground and the occasional Lizard. During the harsher winter months they are also known to hunt larger animals including Deer and will also feed on **carrion**. (3)

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Life Span
Can live up to 12 years(2)

Reproduction

Females choose a secluded den to raise a litter of one to six young kittens, which will remain with their mother for 9 to 12 months. During this time they will learn to hunt before setting out on their own. (1)

Mate in the early spring, although the timing is variable. After a gestation of 60 to 70 days, a litter of about 3 kittens is born. The young open their eyes for the first time when they are 10 days old, and they nurse through their second month. Young bobcats leave to be on their own during the winter, when they are about 8 months old. (2)

Predators

Cougars and Wolves. The small and **vulnerable** Bobcat kittens can be killed by Coyotes and Owls that hunt them kittens while their mother has gone off to hunt. (3)

Vocabulary

Tufts: small bunch of hair or fur
Carrion: dead animals which are decaying, not a fresh kill
Vulnerable: easily hurt.

Mother Bear's Scariest Day

by

Terry Catasús Jennings

What? There it was again. The mother bear looked at her cub. Maybe the cub didn't feel it. That shaking under its paws. It wasn't like slipping on wet branches. Or sinking into mud. Or stepping on loose soil. No. This was something different. Something she had never felt before. There it was again.

For a few days, the shaky feeling returned a few times each day, but the mother bear went about her business. She was hungry. And so was her cub. They had come out from their winter den a few weeks before. All they wanted to do now was eat.

That changed a few days later. The earth rumbled, and shook. It rose and fell under the mother bear's paws. This time her cub's eyes were wide. The mother bear jumped to her baby, getting really close. Rubbing it with her sides. But the rising and the falling of the earth continued every few minutes.

What was this? She didn't know what to do. Should they go back to the den? Maybe they'd be safer there. Maybe. But she was hungry.

The mother bear led her cub to the water. By the time they reached the river, the shaking and moving of the earth has stopped. They slipped in and swam, fishing for a tasty meal. While they were in the water, they felt waves, like when many bears jumped in the water together and splashed, but that didn't bother her. She caught a fish and headed for the shore. Tearing it in half with her claws, she shared it with her cub.

For a while, the mountain was quiet, but then the shaking started again. A few steps, a shake. A few more steps, another shake. The cub was happy with a full tummy, but the mother bear was not happy. She didn't like the shaking at all. And it kept on happening.

About a week later, there was something new. The top of the mountain looked different. To her it looked like a cloud, a tall cloud. But it was steam and ash which was rising from the mountain. A volcano had erupted. It was above her. It was curious, but it was not threatening.

When the mountain first started shaking, the mother bear was surprised. She didn't like the big earthquake at all, or the little earthquakes that followed. And the eruption—that was different to her too. But it kept happening. It happened for 59 days. The earthquakes became very regular. The eruptions of steam and ash lasted minutes or hours. Then they didn't happen at all. Then they happened again. All of this became so normal that the bears didn't even notice any more. It didn't even seem to bother them that the mountain seemed to be growing.

It should have bothered them. One early morning, as they were chomping on some tasty grass and bugs far from their den, the earth shook more than ever before. In seconds there was a deafening noise. Everything around them turned black. Wind stronger than any storm the mother bear had ever experienced swirled around them and pushed them down the hill. The smell was terrible. Thunder and lightning wrapped around them.

Run! That's all they could do. The mother bear pushed her cub. Run! Run! She ran. The cub ran. Other animals were coming down the mountain. The heat was unbearable. The mother bear felt like her skin was on fire. She and and her cub were caught in a mass of animals trying to outrun the eruption. They lost sight of each other, but even if they had tried to look, they wouldn't have been able. It was too dark. Too hot. The frightened animals around them pushed down the mountain. Run, run, run. Push, push, Push. Sometimes she felt as if her feet didn't even touch the ground. Antlers poked at her sides. It was getting really hard to breathe. And it wasn't from running. Something was falling on them, like snow, but it was gray and hot—ash.

It seemed like days, but it was minutes. Long minutes. But finally the eruption was over. It was still dark. The top of the mountain was gone. A huge dark cloud of ash still poured from the summit. It was still hot. Ash still rained on them.

Many animals had died on their way down the mountain, but the mother bear and her cub found each other. It was hard. They had to search and search. The bears didn't look black any more. They looked almost white, like spirit bears. The elk, and the deer and the bobcat that had survived were all covered in ash. They all still had trouble breathing.

When the mountain settled down, the animals began to search for food and shelter. What could the mother bear and her cub do? They could not return to the slope of mountain that had been damaged by the eruption. Not yet. There was no food. Perhaps there were still caves on the mountain, but the mother bear and her cub didn't even want to check. It was spring. Time to fatten up. They needed to stay in the area that was not damaged by the eruption. They and all the other animals that survived now needed to share the food that was still available. Some day, trees will grow again on the mountain. There will be enough roots, and insects for them to eat. Berry bushes will be plentiful in the landscape. When that happens, the mother bear and her cub will return to the mountain.