



Canyon Lake Creek Community Forest Interpretive Manual

A Guide for Trip Leaders and Docents

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restoring a legacy for the future



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Produced in cooperation with:
Whatcom Land Trust
Whatcom County Parks and Recreation Department
Western Washington University



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Acknowledgements

Support for this project was provided by a grant from the Arco Foundation through the Western Foundation of Western Washington University.

Special thanks to the Whatcom Land Trust staff, Whatcom Land Trust board members, Whatcom County Parks & Recreation Department, Western Washington University, Washington Native Plant Society – Komo Kulshan Chapter (Al Hanners), Russ Pfeiffer-Hoyt, Russ Paul (Crown Pacific Limited Partnership) and the Western Foundation.

How To Use This Manual

This *Interpretive Manual: A Guide for Trip Leaders and Docents* is designed to be used for group leaders, docents and tour leaders to orient and prepare themselves for leading a trip to Canyon Lake Creek Community Forest. Start with the **Table of Contents** and skim a section that might be of interest. Browse the **Introduction and Background Section** for detailed information on the area. Use the **Interpretation Section** to plan your interpretive program for a tour. There are detailed hike outlines for a simple nature walk around the lake or a full day hiking tour to the ridge. For detailed scientific information, check out the **Resource Section**. We are interested in your feedback. Please let us know how we can improve the *Interpretive Manual*.

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Introduction and Background Section

Canyon Lake Creek Community Forest
Interpretive Manual

Canyon Lake Creek Community Forest – The Stories

The community forest idea reaches back to the historical notion of a community commons – a geographic area that helped unify the community and give it a sense of pride and shared meaning. Whatcom County residents have begun to work together, building a sense of community and restoring a legacy for future generations with the establishment of Canyon Lake Creek Community Forest in 1998.

The history of a special area is told through many stories. These are the stories of Canyon Lake Creek Community Forest.

The Stewardship Story

The idea for Canyon Lake Creek Community Forest was developed in 1993 when an exceptional grove of old growth forest was identified in the watershed and efforts were undertaken by dedicated volunteers from Whatcom Land Trust to protect and preserve this unique forest. A study revealed this to be one of the oldest and largest old growth forests of its kind left in the Pacific Northwest. Several Alaska yellow-cedar trees in this grove are 800-1000 years old with some Pacific silver fir and mountain hemlock trees a youthful 700+ years old.

The Land Trust with the help of the Trust for Public Land, a national conservation organization, began a campaign to purchase just the grove from its owner, Crown Pacific Limited Partnership. Upon closer inspection, the Land Trust was encouraged to think bigger and purchase the grove and surrounding lands to insure greater protection and to plan for future connections to adjacent old growth forest patches. Through the generosity of the Paul G. Allen Forest Protection Foundation, Flintridge Foundation, Panaphil Foundation, an anonymous donor, Whatcom County Conservation Futures Fund and other community donations, \$3.7 million dollars were raised to purchase this important piece of land.

The establishment of Canyon Lake Creek Community Forest brought together three partners (Whatcom Land Trust, Whatcom County and Western Washington University) to acquire, manage, protect and steward this special place. Whatcom County and Western Washington University are co-owners of the property with a restrictive conservation easement* owned by Whatcom Land Trust. The easement permits appropriate public access, environmental education and scientific research. The easement prohibits subdivision of the land, commercial use and ecologically destructive activity.

* A conservation easement is a legal document that guides future uses of a property regardless of ownership. A landowner can donate or sell their rights for a specific future use of the property. Whatcom Land Trust has purchased the conservation rights to Canyon Lake Creek Community Forest to prevent any future development or extraction of natural resources on the property.

The Ecosystem Story

The Canyon Lake Creek Community Forest is a complex, high elevation, north-facing watershed located in central Whatcom County. In addition to the 700-acre rare old growth forest grove, the conservation site includes 45-acre Canyon Lake, 1550 acres of

second growth forest and 105 acres of formerly clear-cut forest lands quickly growing towards restoration.

Many geologists believe that Canyon Lake, estimated to be over 100 feet deep, was created by an earthquake-induced landslide over 150 years ago. The lake still contains the trees that were rooted on the banks of the former Canyon Creek. These western redcedar trees, standing askew in all directions in the lake water, harbor unique plant communities on their tops and edges.

Numerous streams, including Canyon Creek and Toboggan Creek, cross the area creating cascades and waterfalls of mountain water. Several forested wetlands combine with a series of alpine heather meadow-wetland complexes near the southern ridgeline. Ranging in elevation from 2400 – 4600 feet, the Community Forest is nurtured by abundant rain and fog providing ideal habitat for lichens, ferns, moss and fungi and the myriad of Northwest forest life forms.

Although cut at least once for wood products (thus labeled a second growth forest), the lower elevations of the Community Forest contain some trees up to 45 years old. With proper stewardship, this forest will grow and evolve to provide an ecological connection to the old growth forest at higher elevations.

Because of its exceptional antiquity, the old growth forest grove is a reservoir of natural history and a unique benchmark for measuring the ecological health of the entire region. An ancient among old growth forests, with long-lived tree species, natural protection from fires by elevation, north-facing slopes (which are cooler and retain winter snow longer) and plentiful precipitation, the Canyon Lake forest has been uniquely preserved for centuries.

Upon entering this upper elevation ancient grove of trees several miles from the parking lot, one is struck by the diversity of sizes and microhabitats. It is not a uniform forest but one of variety – tall, thick old trees with trunks carpeted in lichen but also patches of sunlight, small shrubs and open spaces. Surprisingly, the oldest trees in the grove are not the largest trees. The Alaska yellow-cedar and mountain hemlock trees grow very slowly. A typical mountain hemlock tree, for example, has a diameter of about 15-17 inches when 200 years old with many trees less than 3 feet in diameter when 800 years old. Pacific silver fir growing in the forest understory can be quite old but small, awaiting their chance for an opening in the canopy of the forest to fill the gap quickly before other species becomes established.

The interactions of climate, topography and fire may have contributed to the longevity of these trees. This grove of ancient trees has missed the last three major fire cycles (approximately 300 years apart) in western Washington possibly due to its north-facing, high elevation and cool air watershed location. The forest's very westerly location as compared to the main Cascade Range also contributes to its unique microclimate.

By studying these unique forests, we may discover how they are able to sustain themselves for over a millennium and, consequently, learn how to better manage all kinds of forests.

The Human Story

Native people of the area, bands of the Nooksack Indian Tribe, lived in the vicinity of the Canyon Creek. Native tribes in this area connected with interior native people in the Columbia River basin to the east via well established trade routes through the North Cascades Mountains. Prehistoric Indians followed ridge crests whenever possible to avoid the dense, tangled brush of the river bottoms. Travel to the east of the Cascades was probably through easier terrain than the Canyon Creek drainage.

Mountain goats were one of the most important animals hunted throughout the North Cascades. Not only were goats hunted for their meat but also for their wool which possesses great insulation properties. Demand was high, especially among the Salishan-speaking peoples of the coast. Goat wool was one of the major trade items throughout the region. Thus, native peoples could have hunted at and traveled through the higher elevations on the upper edge of the Community Forest.

In the mid-1800's, gold miners entered the area and prospected along river valley bottoms. Explorers probed into the foothills and mountains from their arrival ports along the coast. In the 1880's, European settlers began to carve out homesteads and cut down the large valley-bottom forests. Railroad logging of the lower Canyon Lake Creek area removed all the old growth in that vicinity. By the 1930's truck roads reached to Canyon Lake. Forests to the south of the old growth grove were logged in the early 1950's and most of the upper watershed was roaded by 1960-70. Forests to the north, west and east were harvested from 1970-90.

Ownership of the area now within the Community Forest has shifted many times in recent years. Prior to 1980, much of the watershed was owned by Scott Paper Company and Washington Department of Natural Resources. The lands were sold to Crown Pacific Ltd. (now Limited Partnership) in 1989 and then to Trillium Corporation in 1990. Following a major 1993 land exchange between the state and private timber companies, the lands were sold by Trillium Corporation to Crown Pacific Limited Partnership. The lands that now make up Canyon Lake Creek Community Forest were purchased in 1998 with support and encouragement from Crown Pacific Limited Partnership.

Source: *Canyon Lake Creek Community Forest Funding Proposal* – Whatcom Land Trust
The Headwaters Old Growth of Canyon Lake Creek, James K. Agee and Martin Vaughn,
November 1993
North Cascades National Park: A Living Classroom – An Introduction to Mountain People, North
Cascades Institute

Canyon Lake Creek Community Forest – The Partners

One non-profit community conservation organization (Whatcom Land Trust), one government agency (Whatcom County Parks and Recreation Department) and one educational institution (Western Washington University) have come together in a unique partnership to steward a special parcel of land in eastern Whatcom County – Canyon Lake Creek Community Forest.



Whatcom Land Trust

The mission of the Whatcom Land Trust is to preserve and protect wildlife habitat, scenic, agricultural and open space lands in Whatcom County for future generations by securing interests in land and promoting land stewardship. The citizens of Whatcom County are entrusted with an extraordinary natural heritage. Saltwater shorelines, forests, lakes, farms, mountains, and wildlife habitat are all part of a legacy that only they can preserve for future generations. The desire to share this heritage with their children and grandchildren unites all who treasure Whatcom County.

In March 1983, nearly 50 people gathered for a seminar in the basement of the Dutch Mothers Restaurant in downtown Lynden, Washington, an agricultural community in the heart of Whatcom County. Together, they learned about ways a land trust might preserve Whatcom County's agricultural heritage. Having obtained 501 (C) (3) non-profit status, the first "official" board meeting of the Whatcom Land Trust met in November, 1984. Some of the people who were instrumental in the creation of the Whatcom Land Trust continue to donate their time and financial support as active participants in our work.

Whatcom Land Trust holds a conservation easement on the property.

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Whatcom County Parks & Recreation Department

The parks, trails, open spaces, activity centers, and other specialized facilities owned and managed by Whatcom County Parks & Recreation Department provide a wide range of recreational opportunities for all ages. Since its inception in 1965, the Department has

worked in partnership with other agencies and organizations in acquiring and developing parks and reserves that highlight the rich natural and cultural heritage of Whatcom County, from saltwater and freshwater shorelines to mountain and lowland forests to historic homes and farms. Creative and challenging classes are offered through the senior, outdoor recreation and cultural arts programs. All of these lands, facilities and programs combine to enhance and protect a quality of life vital to the citizens of Whatcom County.

Whatcom County Parks & Recreation is the manager of the Community Forest.

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Bellingham, WA 98226
360-733-2900 or 592-51161
parks@co.whatcom.wa.us
www.co.whatcom.wa.us/parks/home.htm



Western Washington University

Western Washington University (WWU) is a partner in teaching and learning with the community, and with those who make financial contributions to the university to support and enhance *The Western Experience* - that special mix of academic excellence, active learning, personal attention to students, a unique residential environment, respect for diversity and beautiful surroundings.

Huxley College of the Environment

Established in 1968, Huxley College of the Environment is one of the oldest environmental colleges in the nation. The College's academic programs reflect a broad view of our physical, biological, social, and cultural world. This innovative and interdisciplinary approach makes Huxley unique. The College has won national and international recognition due to its comprehensive upper-division and graduate degree programs. Students from around the world come to pursue academic programs that are global in their frame of reference, interdisciplinary in their content, and innovative and experimental in their concept.

WWU through Huxley College of the Environment is a co-owner of the Community Forest. Students will utilize the Forest for research and educational projects.

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Canyon Lake Creek Community Forest – The Neighbors

Neighboring Land Management Agencies and their Missions

Washington State Department of Natural Resources

The Washington State Department of Natural Resources (DNR) manages and protects public resources on 5+ million acres of aquatic, forest and agricultural lands in the state. The DNR also fights forest fires, protects at-risk native plant species and generates revenue from state lands to support education and other public functions.

DNR manages about 90,000 acres in the Whatcom County foothills. Just east and adjacent to Canyon Lake Creek Community Forest (CLCCF), 13,700 acres of DNR lands have been designated as a (Northern) Spotted Owl Nesting, Roosting and Foraging (NRF) Management Area and protected for 50 years under the Department's federally sanctioned Habitat Conservation Plan (HCP). Future plans for some of these lands may include acquisition or donation for public open space and wildlife habitat.

Spotted Owl Habitat Management

The intent of the spotted owl conservation strategy is twofold. First, the strategy is intended to provide nesting, roosting, foraging (feeding) and dispersal habitat in order to support increased number of owls, maintain appropriate distribution and encourage owl dispersal. Second, in areas designed to provide NRF habitat, the strategy is intended to create a landscape in which active forest management plays a role in the development and maintenance of characteristics that help to restore viable spotted owl habitat.

The strategy is composed of a research phase, a transition phase, and an integrated management phase. The research phase is designed to develop a more precise description of spotted owl nesting habitat, develop tree planting techniques to create such habitat, and to acquire a better understanding of how all habitat components fit together to provide habitat. Because such information is currently not available, patches of old growth forest able to support nesting spotted owls will be retained in an unmanaged state during the research phase.

Based on current understanding of spotted owl habitat, forests that provide for roosting and feeding areas are not as old and complex as the nesting patches. DNR's management strategy assumes that active forest management techniques can be applied to develop and maintain roosting and foraging habitat from the outset of the HCP. These assertions will be tested as part of the monitoring component of the HCP.

The transition phase will apply the results of the research described above within spotted owl habitat areas. During this period, the goal is to begin moving away from a landscape in which old-forest nesting habitat patches are unmanaged to a landscape in which management can be used to create and maintain nesting structure. This will be a period of transition because active monitoring will be needed to ensure successful application of research results and to modify techniques for local conditions. The end of the transition phase will be marked by DNR's confidence in its ability to provide adequate nesting habitat without maintaining unmanaged nesting habitat patches.

The integrated management phase is the final period of the HCP in which knowledge gained through research, application of this knowledge to larger areas, and monitoring have moved forest management to a point where commercial timber harvest and

maintenance of functional spotted owl nesting habitat coexist throughout spotted owl management areas.

USDA Forest Service

The US Forest Service within the Department of Agriculture manages federally-owned forest and grasslands across the country to meet the needs of present and future generations. The phrase, “Caring for the Land and Serving People” captures the Forest Service mission. The mission is to achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of people. The US Forest Service strives to manage the nation’s natural resources for a variety of uses – recreation, watershed protection, quality drinking water, timber production, wildlife, and forest products.

In July 1990, the Northern Spotted Owl was listed as threatened under the Endangered Species Act by the US Fish and Wildlife Service. Due to intensive logging activity in the old growth forest habitat of the owl at the time, environmental groups filed a federal lawsuit and in Seattle, then US District Judge William Dwyer issued an injunction to cease logging on all federal forests with trees older than 200 years old.

In 1993, President Clinton convened the Northwest Forest Summit in Portland, Oregon with scientists and land managers who eventually developed several options for management of federal timber lands. Option 9 set forth management policy for older forests which included reduced logging and the designation of Late Successional Reserves on federal lands. These lands are not all old growth at present but they are to be managed either to protect existing old growth OR to enhance the development of old growth characteristics over time. While conventional logging is not to be allowed on these lands, some thinning and salvage logging may be allowed in some of the Late Successional Reserves. In some cases, thinning can probably be helpful in accelerating the development of old-growth characteristics

The US Forest Service, within Mount Baker-Snoqualmie National Forest, has designated land further east of CLCCF and adjacent to Washington State Department of Natural Resource’s Habitat Conservation Plan protected lands as a Late Successional Reserve. These Reserves will be managed under the following management objectives:

- maintain or improve existing riparian habitat to protect fish habitat
- maintain plant species diversity
- protect travel routes for riparian dependent species
- insure both good water quality and adequate physical access
- improve connectivity of forest areas between the North and Middle Forks of Nooksack River
- improve forested areas to achieve mature and old growth forest structures

With careful and thoughtful management over time, there are opportunities to make habitat connections between the Late Successional Reserves in the Mt. Baker-Snoqualmie National Forest, the Spotted Owl Nesting, Roosting and Foraging Areas on adjacent Washington Department of Natural Resources lands and the old growth portion of Canyon Lake Creek Community Forest. These connections could, potentially, improve habitat conditions enough to allow for the recovery of old growth forest dependent species – thus fulfilling one of the dreams of the Community Forest.

Crown Pacific Limited Partnership

Founded in 1988 in Portland, Oregon, Crown Pacific Limited Partnership (Crown Pacific) has grown to become one of the nation's leading integrated forest products companies. The firm went public in 1994 and consists of three primary business segments: timberlands, lumber manufacturing and distribution of building products to the professional contractor market.

Crown Pacific timberlands are spread over approximately 524,000 acres in Oregon and Washington. These timberlands are referred to as the Oregon, Hamilton and Olympic operations. The Hamilton operations are based in Hamilton, Washington east of Sedro Woolley in the Skagit Valley. This office manages operations on Crown Pacific lands adjacent to and visible from Canyon Lake Creek Community Forest.

The company actively manages its properties to enhance growing conditions and tree health and to maintain the valuable diversity of Crown Pacific's timber assets, which are made up of several superior species – including ponderosa pine, Douglas fir, western larch, white fir and hemlock – in a variety of age class stands. Approximately 50% of their merchantable trees are older than 50 years. On a majority of the acreage, Crown Pacific practices individual tree selection forestry, removing a portion of trees in an area to allow the remaining trees to grow faster by increasing exposure to sunlight and reducing competition for water and nutrients. In high-growth environments where even-age forestry is appropriate, Crown Pacific aggressively replants after harvesting, using seedling stock that has been bred for increased growth rates and disease resistance. Crown Pacific's timberlands provide a significant resource base for the company's manufacturing operations in both Oregon and Washington.

When questions arose about the age and type of forest on Crown Pacific lands, local Crown Pacific managers were cooperative in commissioning a study of the old growth forest grove. Once the grove was identified as a unique and unusual forest, the company cooperated with Whatcom Land Trust to discuss the future of the property now known as Canyon Lake Creek Community Forest. Local managers worked with the Land Trust to purchase the property through a significant capital campaign. Crown Pacific has also contributed money, materials and crews to decommission the main logging road up to the old growth forest grove and continues to maintain the access road to the Community Forest trailhead.

Crown Pacific has been a reliable cooperative partner in helping to establish and develop the Community Forest from its former lands.

Sources: *Canyon Lake Creek Old Growth Forest – The Conservation Context*, Whatcom Land Trust

www.wa.gov/dnr

www.fs.fed.us/aboutus/mission

www.oregonstate.edu/instruction/bi301/instruct.htm

www.crownpacificpartners.com

Canyon Lake Creek Community Forest – Whatcom County Geography

The context for Canyon Lake Creek Community Forest is revealed by gaining an understanding of the general geography of Whatcom County. The County's geography can be described through the three regions below.

Eastern Mountain Region

- Percentage of county land base - 65%
 - Land ownership - federal government
 - North Cascades National Park (USDI* National Park Service)
 - Mt. Baker-Snoqualmie National Forest (USDA* Forest Service)
 - Mt. Baker Wilderness Area (USDA Forest Service)
 - Pasayten Wilderness Area (USDA Forest Service)
 - Noisy-Diobsud Wilderness Area (USDA Forest Service)
 - Ross Lake National Recreation Area (USDI National Park Service)
 - Mt. Baker National Recreation Area (USDA Forest Service)
 - Habitat – mountainous, rugged, higher elevation terrain
- *USDI = US Department of the Interior
*USDA = US Department of Agriculture

Central Foothills Region

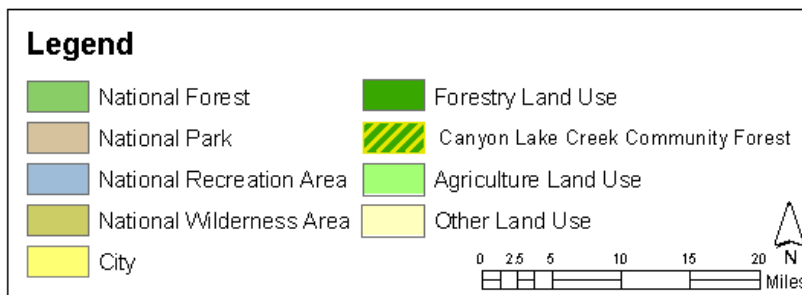
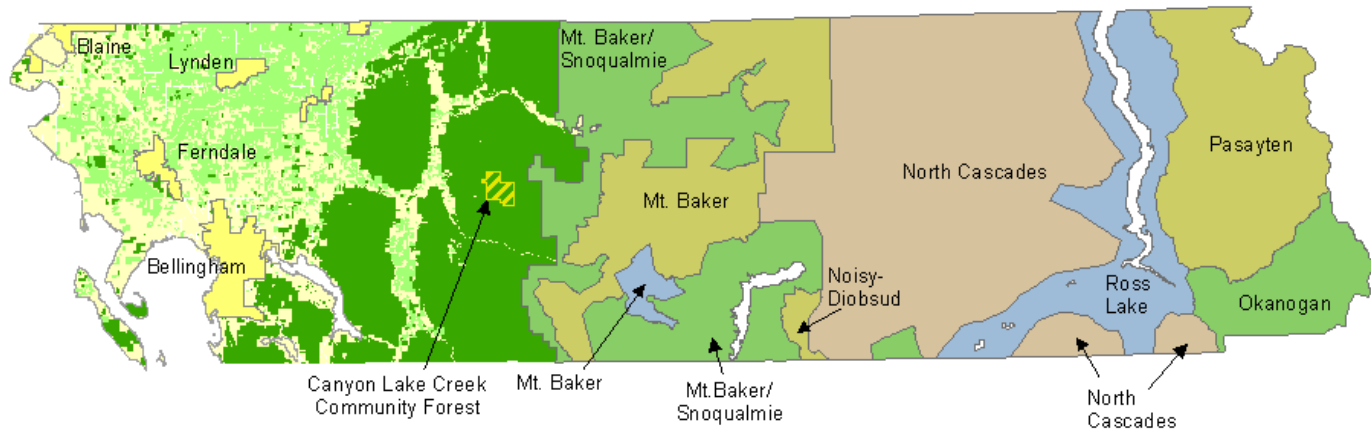
- Percentage of county land base – 17%
- Land ownership – largely commercial forest companies, some farms and large lot residences; state and county lands
- Habitat – foothills, some riparian areas – Nooksack River; commercial forest lands (400,000 acres – 25% owned and managed by Washington State Department of Natural Resources)
- Notes – Canyon Lake Creek Community Forest located here; region trisected by three forks of the Nooksack River; region serves as habitat link between alpine wilderness to the east and Puget Sound marine waters to the west

Western Lowlands Region

- Percentage of county land base – 18%
- Land ownership – largely residential, urban and suburban, developed (2000 - 170,000 population; 2020 – 250,000 projected)
- Habitat – lowlands, wetlands, river systems; fragmented urban areas

Source: *Canyon Lake Creek Old Growth Forest – The Conservation Context*, Whatcom Land Trust

Land Ownership in Whatcom County



Whatcom County PDS
March 2004, sbw.

Canyon Lake Creek Community Forest – Ecological Communities

Canyon Lake Community Forest is ecologically part of the large mountainous area known as the Northern Cascades Mountains ecosystem. This vast ecosystem is spread across a mountain range with a gradient that drops dramatic amounts of precipitation on the west side with little of this precipitation making it to the east side. The Community Forest is located in the western foothills of this system adjacent to the slopes of Mount Baker.

When ecologists study an ecosystem, they use methods to organize and classify their subject based on its complexity. When botanists observe the plant life in this area, they will classify or group plants within the following three groupings. (Note: Although there are scattered Sitka spruce trees near the lake, the lower elevation Sitka Spruce Zone is not included in this matrix as it occurs lower in elevation than the Community Forest. It would be represented at the mouth of Canyon Creek where it empties into the Middle Fork of the Nooksack River.)

Associated with these plant communities are wildlife, general climatic and precipitation conditions and fire characteristics. Use these listings as you explore the Forest. You will notice these ecological communities change as you hike up in elevation towards the upper reaches of the property. See if you can find where an area might begin or end. Boundaries are not distinct and can shift depending on growing conditions, aspect (north or south-facing) and precipitation.

Western Hemlock Zone	
Elevation	800-2500 feet*
Major Tree Species	Western hemlock Douglas-fir – drier, warmer sites Western redcedar – wetter sites Red alder – may invade disturbed areas Black cottonwood – invades disturbed areas Bigleaf maple – invades disturbed sites
Understory Plants	Sword fern, Oregon grape, salal
Wildlife	Pika (unusual at this lower elevation), Douglas squirrel, ruffed grouse, black-tailed deer
Habitat	Mature forests Limited sunlight reaches forest floor, thick covering of smaller plants – mosses, ferns, fungi, lichen Abundant signs of decay and decomposition
Climate	Maritime influences, dry summers, mild winters, wet and cool – September – May
Precipitation	70-80”+ (32” in Bellingham)
Fire	Forest fires on a regional average of 250 years kept the climax species (western hemlock) from replacing Douglas-fir

* CLCCF Trailhead is at approximately 2300 feet in elevation

The Western Hemlock Zone is widespread at low and intermediate elevations in the watershed but is not present within the old growth area at higher elevations.

Pacific Silver Fir Zone	
Elevation	2500 – 4200 feet
Major Tree Species	Pacific silver fir Douglas-fir Western hemlock Mountain hemlock Alaska yellow-cedar
Understory Plants	Deer fern, devil's club, foamflower, salmonberry, willow
Wildlife	Tailed frog, black-tailed deer, Steller's jay, coyote
Habitat	More open areas and smaller trees than lower forest Less dense understory, heavier shrub layer More barren forest floor
Climate	Cool and wet. Wetter and cooler than western hemlock zone Short growing season
Precipitation	80-100" with winter snowpack of 3-10 feet
Fire	· If fires are common, Douglas-fir can be a dominant tree – as fire intervals lengthen, Douglas-fir may pass from the stand · Fire interval of 425 years documented in same zone in Mt. Rainier National Park

Mountain Hemlock Zone	
Elevation	4200 – 6500 feet+
Major Tree Species	Mountain hemlock limited Pacific silver fir, Alaska yellow-cedar
Understory Plants	Mountain huckleberry, rosy-twisted stalk, heather
Habitat	Highest and coolest forests Some closed forest canopies and some parkland habitat (tree clumps and meadows) Deep snow insulates plants and animals from strong winds and extreme cold
Wildlife	Marmot, mountain goat, common raven
Climate	Cold with snow accumulations lasting 6 months or more At higher elevations - closed forest becomes a parkland due to prolonged snowpack Fog common in summer – fog drip an important supplement to annual precipitation
Precipitation	100"+ with snowpacks of 32-50 feet
Fire	Fire is rare due to lengthy period of snowpack melt

+ CLCCF – Highest ridge above the old growth forest area is about 4500 feet in elevation

Source: *The Headwaters Old Growth of Canyon Lake Creek*, James K. Agee and Martin Vaughn, Trillium Corporation and Whatcom Land Trust, November 1993

The Natural History of Puget Sound Country, Arthur Kruckeberg, University of Washington Press, 1991
North Cascades National Park: A Living Classroom – The Variety of Life and Its Processes, North Cascades Institute

What Makes It an Old Growth Forest?

Questions and Answers about Pacific Northwest Old Growth Forests and Canyon Lake Creek Community Forest Old Growth Forest Grove

What makes a forest “old growth”?

In order for a forest to be classified as an old growth forest, four factors need to be present –

1. large, old conifer trees – 180 years+
2. dead trees – standing (snags) and on the ground
3. multi-layered canopy
4. diversity of wildlife and plant species
5. large amount of biomass

1. Large, old conifer trees – In the Pacific Northwest, old growth forests are dominated by conifer (needles and cones) trees at least 180 years old. Many of the tree crowns (tops) are usually so large that they create a “ceiling” or canopy in places. Some trees may have broken tops and other indications of old and decaying wood.
2. Dead trees – standing and on the ground – The presence of large standing dead trees (snags) provide a variety of habitats and niches for wildlife. In the Pacific Northwest, over 100 species of wildlife utilize snags for all or part of their life. Some dead trees can stand for 100-200 more years beyond their life span. The presence of dead and rotting trees on the ground provide more habitat, a source of stored moisture and a storehouse of insects, fungi and nutrients to sustain forest life. Dead trees across and in streams provide structure and habitat for insects and fish.
3. Multi-layered canopy – Dominated by large old trees but with trees of varying heights and ages old growth forest canopies will grow in a patchy pattern that allows sunlight gaps onto the forest’s floor. When a disturbance occurs (wind storm, fire, snag falls), some species may utilize this new light and space to grow quickly, such as Pacific Silver Fir (*Abies amabilis*), despite being on-site for 100+ years.
4. Diversity of species – Over 150 terrestrial vertebrate species have been known to utilize old growth forest habitat. Because of the diversity of niches and hiding places, a large variety of species can find a home in these kinds of forests.
5. Large amount of biomass – Pacific Northwest temperate old growth forests have the largest amount of biomass (the weight and density of living organisms) of any forest on Earth.

What kinds of trees grow in old growth forests?

Conifer trees (trees with needles and cones) usually dominate the old growth forest. Local climate will dictate where certain species will be found. At lower elevations in drier, sunnier conditions, one finds Douglas-fir (*Pseudotsuga menziesii*). At similar elevations but with wetter and shadier conditions, one finds western redcedar (*Thuja plicata*). Sitka spruce (*Picea stichensis*) (not present at Canyon Lake Creek) is found on the wetter and foggier coastal areas. Western hemlock (*Tsuga heterophylla*), our state tree, can grow almost anywhere and thrives in the shade of a maturing Douglas-fir forest. When Douglas-fir trees reach the end of their lives, western hemlock will often become dominant creating a climax forest. At higher elevations, one finds Pacific silver fir (*Abies lasiocarpa*), noble fir (*Abies procera*), mountain hemlock (*Tsuga mertensiana*) and Alaska yellow-cedar (*Chamaecyparis nootkatensis*).

How big and old do they get?

Below is a summary chart of the typical ages and sizes of some of the trees found in Pacific Northwest old growth forests.

Ages and Dimensions of Typical Mature Trees in Pacific Northwest Forests

Species	Age Years	Diameter Inches	Height Feet
Douglas-fir (<i>Pseudotsuga menziesii</i>)	750	70	245
Western redcedar (<i>Thuja plicata</i>)	1000	90	195
Sitka spruce (<i>Picea stichensis</i>)	500	80	240
Western hemlock (<i>Tsuga heterophylla</i>)	400	40	190
Pacific silver fir (<i>Abies amabilis</i>)	400	40	160
Noble fir (<i>Abies procera</i>)	400	50	190
Mountain hemlock (<i>Tsuga mertensiana</i>)	400	35	115
Alaska yellow-cedar (<i>Chamaecyparis nootkatensis</i>)	1000	50	115

Source: "Land of the Giant Conifers," Richard H. Waring, *Natural History*, October 1982, pg. 59

What species of wildlife live in old growth forests?

Old growth forests are the primary habitat for more than 150 species of terrestrial vertebrates, 3000 species of invertebrates, and 1200 species of plants, mosses and lichens. The **northern spotted owl** utilizes these kinds of forests for foraging, breeding, nesting, and raising its young. Controversy with logging these forests in the 1980s and 1990s, led to lawsuits and an eventual listing of the owl as threatened under the Endangered Species

Act. Declining forest habitat meant declining spotted owl populations – declines which continue today in Washington State.



The **marbled murrelet**, (pictured left) a small robin-sized marine bird, uses the large moss-encrusted limbs of old growth trees to breed and raise their young. These birds will fly up to 50 miles daily from salt water to nest. Other bird species utilizing old growth forests include goshawk, Vaux’s swift, pileated woodpecker and Townsend’s warbler. **Black-tailed deer** utilize the shelter of old growth forests during heavy winter snows. The red tree vole and northern flying squirrel use the canopy of these forests.

Why are old growth forests important?

The complexity of Pacific Northwest old growth forests has only been studied over the last 30 years. Commercial forest product companies, university forestry schools and government forest managers used to consider these types of forests “decadent” ecosystems focused on death and dying with limited functions and little to contribute. Researchers have discovered the intricate connections and processes that are unique to these kinds of forests. By studying these kinds of places, we may discover how to design managed forests to not only produce wood but also have the other functions we desire from our forests such as watershed protection, wildlife habitat, water quality and biodiversity.

Old growth forests are more than just trees. Complex, symbiotic relationships developed over centuries between the organisms present in old growth forest ecosystems. Lichen in the forest canopy pull nitrogen from the air which is washed down to the soil and used by the forest's vegetation. Symbiotic fungi attached to roots supply plants and tree with water and nutrients and in return take carbohydrates. Animals eat vegetation and help spread seeds across the forest.



When we try to pick out anything by itself, we find it hitched to everything else in the universe.

John Muir – Conservationist, author and advocate

Canyon Lake Creek Community Forest – Old Growth Forest Grove

Why is the Canyon Lake Creek Community Forest (CLCCF) old growth forest so unique?

Age – This 700-acre parcel within CLCCF is one of the oldest forest stands in the Pacific Northwest. The oldest trees within the parcel are Alaska yellow-cedar and mountain hemlock. Some Alaska yellow-cedar trees on-site were found to exceed 800 years and several may be as old as 1000 years old. These trees are not necessarily the largest trees. One Alaska yellow-cedar tree with an estimated germination date of 1186 A.D. is only 27” in diameter. These trees have grown slowly over the years and have survived wind, snow and fire.

Maps for the Washington State Department of Natural Resources (a former owner of this plot) showed the forest being 400 years old but research in 1993 on the plot showed it to be twice that age! Similar forest remnants in the region include ancient specimens of Alaska Yellow-cedar trees in Mt. Rainier National Park, the Olympic Mountains and Vancouver Island but “none as old as the Canyon Lake parcel.”*

Location – This parcel is located at a higher elevation than most known old growth forests of this kind and the furthest west within the Cascade Range.

Size – This old growth forest grove is one of the largest intact stands of its age.

* For more detailed information, see the report, “*The Headwaters Old Growth of Canyon Lake Creek*”, James K. Agee and Martin Vaughn, November 1993, Whatcom Land Trust

Why have the trees survived here so long?

This ancient forest has survived for over a millennium due to several factors. The north-facing exposure has meant greater retention of moisture from snow later into the growing season. Greater moisture has also been a factor in keeping the forest here free of major catastrophic fires. But this grove of ancient trees has also experienced long term climatic warming and cooling. Unique adaptations may have developed due to this interaction. Research on this plot documents fires (~1170 and 1410 A.D.), advance of the Little Ice Age (1416-1534 A.D.) and warming since about 1715 A.D.

Where else in the Pacific Northwest can these kinds of forests be found?

Old growth forest remnants can be found in the central and western Olympics, North Cascade National Park Service Complex, Mount Rainier National Park, Mt. Baker-Snoqualmie National Forest, Vancouver Island and in southwestern mainland British Columbia.

Are there northern spotted owls and marbled murrelets in this forest grove?

Many people identify old growth forests by the presence of the northern spotted owl and the marbled murrelet. The grove of old growth forest at CLCCF is not large enough at this time for spotted owls to forage, nest and raise young. This grove is smaller than the home range needed to support a breeding pair of owls. With proper management, this grove could expand and become appropriate habitat in the far distant future (100+ years).

Although the old growth grove is about 20 miles from Bellingham Bay and theoretically within the range for nesting, marbled murrelets nesting here is unlikely because of the species composition within the existing forest. Marbled murrelet nesting is limited to forest areas with more than 40 percent of the overstory made up of Douglas-fir, western hemlock, Sitka spruce or western redcedar. This old growth grove is dominated by mountain hemlock and Pacific silver fir which reflects the higher elevation of this forest.

What are the plans for this forest?

The main reason for purchasing this parcel and surrounding acreage of land to create CLCCF was to protect and preserve this unique old growth forest grove. Within relative close proximity on neighboring public lands, there are several other parcels of old growth forests. With good management and cooperative relationships, the clear cut lands between these parcels can be restored through growth and, in time, create linkages to increase the size of this type of habitat. Because this is a community forest, these plans are in your hands.

What can be done to protect this grove for the future?

Visitors to CLCCF will play an important role in the protection of this area. Major threats include fire – human and wild, invasive species and inappropriate use of the area. Access to the Community Forest may be limited in summers with high fire danger. Motorized vehicles, bicycles, dogs, horses and other domestic animals are not allowed in the Community Forest to protect trails, wildlife and to preserve water quality. Removal of vegetation and natural materials is prohibited. Managers of the Community Forest may need assistance in the future for invasive species monitoring and removal in addition to baseline ecological data collection. Encourage visitors who express an interest in protecting this special place to contact one of the Community Forest partners. The public's cooperation will be critical in future management of the Community Forest.

Canyon Lake Creek Community Forest – Facts and Figures

- **What is the size of the Canyon Lake Creek Watershed?**
5410 acres¹
- **How many acres are within Canyon Lake Creek Community Forest?**
About 2300 acres²
 - Size of second growth forest (20-45 years old) – 1550 acres²
 - Size of old growth forest at 3800 feet in elevation (oldest 800-1000 years old) – 700 acres²
- **How big is Canyon Lake?**
45 acres²
- **How old is Canyon Lake?**
Possibly formed in 1872 when a large magnitude 7.1-7.4 earthquake could have triggered the landslide that dammed Canyon Creek and formed the lake.⁴
- **What is the elevation of Canyon Lake Creek Community Forest?**
Ranges from 2400 (parking lot) – 4500 feet (ridge line)
- **How far is the trail to the old growth forest grove?**
Distance from parking lot to beginning of Old Growth Forest Loop Trail – 2.6 miles
- **How far is it to hike the entire trail from the parking lot to the ridge?**
Round trip hiking distance from parking lot through old growth forest grove and descending main trail/retired road – 7.5 miles
- **What is the age of the palm frond fossil setting on the trail near parking lot?**
50 million years old³
- **What was the purchase price for the CLCCF and who helped buy it?**
Purchase price for CLCCF - \$3.7 million + \$350,000 stewardship endowment
 - Donated by Paul G. Allen Forest Foundation – \$1.85 million
 - Anonymous donor – \$1million
 - Whatcom County Conservation Futures program - \$700,000
 - Various community donations
- **Who owns the Canyon Lake Creek Community Forest?**
Jointly owned by Whatcom County Parks & Recreation Department and Western Washington University

- **What is the size of the Canyon Lake Creek Riparian Conservation Easement (below Canyon Lake)?**
2.5 miles long by 400+ feet (200 feet on each side of the creek) wide donated by Crown Pacific (100+ acres)
- **Who owns the Canyon Lake Creek Community Forest Conservation Easement?**
Held by Whatcom Land Trust for purposes of education, research and recreation

References:

- 1 Canyon Lake Creek and Kenney Creek Watershed Assessment, Trillium Corporation, February 1983
- 2 Canyon Lake Creek Community Old-Growth Forest Conservation Easement
- 3 *The Planet*, Western Washington University, Huxley College, Summer 2002, page 3
- 4 Geologic History of Canyon Lake, Dr. George Mustoe, Geology Department, Western Washington University, Canyon Lake Creek Community Forest Interpretive Manual

Canyon Lake Creek Community Forest Geologic History of Canyon Lake

George Mustoe, Geology Department, Western Washington University

The Chuckanut Formation

The bedrock of the Canyon Lake area is composed of sedimentary rocks of the Chuckanut Formation. These beds of sandstone, siltstone, and conglomerate were deposited 50 million years ago during the Eocene Epoch by a meandering river that flowed westward over a broad coastal plain that existed prior to the uplift of the Cascade Range. The headwaters of this river were a range of granitic mountains near the Washington/Idaho border.

Over a period of perhaps 10 million years, the ancient river deposited a blanket of sediment that has a total thickness of nearly 18,000 feet (6,000 meters), one of the thickest bodies of non-marine sedimentary rock in the world. The Canyon Lake watershed is underlain by rocks from the middle portion of this immense body of lithified sediment.

Abundant fossils within the Chuckanut Formation record the story of plants and animals that inhabited the subtropical rain forests that flourished in Northwest Washington during the Eocene. Beds of siltstone distributed throughout the Canyon Lake watershed contain leaf imprints of tree ferns, climbing vines, swamp-dwelling conifers, and a diverse variety of flowering plants. Sharp-eyed hikers may see imprints of driftwood logs in sandstone outcrops along the trail near the head of the valley.



Outcrops in the Canyon Lake area also contain tracks left by a variety of birds and mammals. One of the most exciting discoveries was made in 1990 when logging road construction revealed a sandstone bedding plane that preserved a line of 9 tracks left by a large heron, and tracks from a turtle. A nearby slab contained tracks that were made by a tapir or small horse as it walked along the edge of the ancient river. These fossils were collected by scientists from the University of Washington (UW), and the heron trackway is on exhibit at the UW Burke Museum of Natural History and Culture in Seattle. A full-sized plaster cast of the track is displayed at the Western Washington University Geology Department in Bellingham, along with many other Chuckanut Formation fossils.

Transitions

Beginning about 40 million years ago, the rise of the North Cascades disrupted the lowland flood plain environment. This uplift was related to the collision of the Pacific Ocean plate with North America, and the resulting compression caused folding and faulting of the Chuckanut Formation rocks. The steep inclination of the beds is visible in

outcrops along the trail, and in more distant views of the nearby hillsides. Along ridge crests and near the head of the Canyon Creek valley, steeply-dipping beds of sandstone are prominent topographic features.

The uplift of the region ended the cycle of deposition, and erosion became the dominant geologic process. We have no geologic record from this period but fossils from other sites in the northwest document progressive cooling of the earth's climate. The development of the Cascade Mountains also caused a shift in precipitation, creating a wet western Washington, and a dry rain-shadow for central Washington. In the process, the vegetation changed from lowland subtropical rainforest to the present temperate mixed conifer/deciduous forest. A few plants were able to survive this climatic transition, a good example being alders, which were a common tree 50 million years ago as well as today. In general, however, the composition of the forest changed dramatically. Gone are tree ferns and a host of other subtropical plants. Conifers remain abundant, but they are no longer Dawn Redwood (*Metasequoia*), Bald Cypress (*Taxodium*), Chinese Water Pine (*Glyptostrobus*), and other low-elevation forms. Instead, they have been replaced by Douglas-fir, Alaska Yellow-cedar and other conifers that can withstand harsh winters.

Ice Age Events

Beginning about 1 million years ago, a series of ice sheets swept south along Puget Sound, reaching as far south as Olympia. This cycle of advance and retreat culminated with the great Fraser Glaciation near the end of the Ice Age. At its maximum approximately 11,000 years ago, Western Washington was inundated under a 5,000 foot thick blanket of ice. The ice sheet lay over the lowlands, and did not cover the main Cascade Range higher peaks (though these peaks were the scene of alpine glaciers much more extensive than exists today). However, boulders of granite have been found at elevations as high as 5,000 feet in the Twin Sisters range, southeast of the Canyon Lake area, and these glacial erratics offer proof that during the late Ice Age the region was largely buried by the ice sheet.

Holocene Happenings: Slides and Earthquakes

By 10,000 years ago, the beginning of the post-glacial Holocene era, the continental glacier had retreated north of the United States and Canada border, and the development of the modern landscape began. The steep V-shaped valley occupied by Canyon Lake is a product of stream erosion. The lake is a very recent phenomenon, dating to a large rockslide that came down from the ridge to the south. This slide dammed the valley, impounding upper Canyon Creek to create the present lake. Several features tell us that this event happened not very long ago. From the parking lot, the trail along the lake shore crosses the debris dam, where large boulders of sandstone are plainly visible. Snags that rise from the lake are from trees that were drowned by the rising waters. Carbon dates obtained from wood samples taken from these trees indicate that the lake was formed less than 270 years ago. Possibly the slide was triggered by a large magnitude 7.1 – 7.4 earthquake that struck the North Cascades in 1872, or by a smaller quake whose epicenter was much closer. The local area has a very active seismic history, with numerous small earthquakes having occurred along the North Fork Nooksack River region during the past few decades.

The steep inclination of the Chuckanut Formation bedrock makes the Canyon Lake watershed very susceptible to landslides, and scars are visible at many locations. Many of these slope failures occur during the wet winter season when heavy rains destabilize the soil. Deforestation has been a contributing factor. Recent slides are very evident in the gorge along the outlet stream from Canyon Lake, visible from the road as you approach the lake. Older slides predate logging, and soil exposures along the lake shore trail reveal that the hillside is completely carpeted by landslide debris. The curved trunks of many young trees provide vivid evidence that the soil is slowly creeping down hill, and the size of sandstone blocks buried within this soil is evidence that large rock falls regularly occur.

Mount Baker/Twin Sisters Overlook

The ridge crest at the head of the Canyon Lake valley offers an exceptional view of Mount Baker and the Twin Sisters. The Twin Sisters are unusual mountains, having been created when an immense mass of material from the mantle layer was transported to the surface along a deep fault. We don't know when this happened, except that the Twin Sisters dunitite has been carried up through the sedimentary rocks of the Chuckanut Formation. Glacial features show that the Twin Sisters were in existence before the Ice Age.

Mount Baker is a much younger topographic feature. Although the present volcanic dome is underlain by remnants of an older volcano, Mount Baker as we know it today was created by volcanic eruptions that occurred within the past 10,000 years. The volcano is presently quiescent, but as a reminder of the magma that lies beneath the surface, on cold days you may see steam rising from the crater (which is located on the southeast flank of the mountain rather than at the summit).

References:

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Interpretation Section

Canyon Lake Creek Community Forest Interpretive Manual

Canyon Lake Creek Community Forest Emergencies and Safety

“Be prepared” is a motto worth remembering when guiding a group of people. If an emergency should occur, the group will look to you for guidance and a solution even if you aren’t ready or willing to take on that responsibility.

Trip Description – When describing the trip for publications, newsletters, media releases or a website, be sure to include distance, elevation climb, length of time, type of hike (easy, moderate, strenuous), ages of participants accepted and what condition they should be in. Give them an opportunity to contact someone live to ask further questions before they sign up for the trip. This will allow them to make a decision about the appropriateness of the hike for them and their family. Remember to also include information about road access and conditions. The group should meet ahead of time in a pre-arranged location in order to carpool to the site due to limited parking.

Trip Introduction – Let the group know at the meeting place (carpool location) and at Canyon Lake Creek Community Forest parking lot about the route and trail conditions you will be leading the group on today. Repeat the distance, elevation climb, length of time gone and the type of hike it will be. Tell drivers about the road conditions – in general and what it might be like today given the weather – and remind them about driving safety on a narrow and winding logging road. Make sure that participants are also prepared for the given weather conditions – sun, heat, snow, rain, etc. (Are you prepared to supplement the equipment (or lack thereof) that visitors bring? See *The Ten Essentials* section.) Give participants an opportunity to choose another activity (i.e. the lake loop) at the site if they decide the planned hike will be too much for them.

During the Hike – Be prepared mentally ahead of time by considering what you would do when faced with the following circumstances. Remember you are in charge!

- A visitor has a heart attack along the trail. What would you do? How would you manage the emergency?
- Someone in your group twists an ankle and needs to return to the parking lot. What is your responsibility?
- A cougar appears on the trail above. What do you do? (For specifics about wildlife safety – see the separate section *Wildlife Safety*.)
- One of the vehicles won’t start when you return from the hike. What next?

Planning and thinking about your actions ahead of time will assist you in addressing the situation or emergency in a calm and rational manner. Utilize your visitors’ expertise and stay calm. Give appropriate assignments and monitor the entire group. Take charge and give direction with group input.

After the Hike – At the end of the hike, ensure that all your visitors have returned (did you count them at the beginning and along the way?) and their vehicles have started. If there have been any incidents or emergency medical situations, report the details (did you write the details down?) to Whatcom County Parks and Recreation upon return.

Canyon Lake Creek Community Forest Minimize Human Impacts – Disposal of Human Waste

Source: *Leave No Trace* www.LNT.org or 1-800-332-4100

During Your Visit

A portable toilet is currently provided near the parking lot of Canyon Lake Creek Community Forest from approximately May through October. Although it's definitely preferable that this facility be used when at all possible, there will be times when a hiker is too far away from the toilet to wait. The information provided below should help in those situations. Please be aware that where snow or ice prevents you from burying it, your waste should be carried out in a plastic bag or other container.

Human Waste

Proper disposal of human waste is important to avoid pollution of water sources, avoid the negative implications of someone else finding it, minimize the possibility of spreading disease, and maximize the rate of decomposition.

In most locations, burying human feces in the correct manner is the most effective method to meet these criteria. Contrary to popular opinion, research indicates that burial of feces may actually slow decomposition. Pathogens have been discovered to survive for a year or more when buried. However, in light of the other problems associated with feces, it is still generally best to bury it. The slow decomposition rate causes the need to choose the correct location, far from water, campsites, and other frequently used places.

Catholes

Catholes are the most widely accepted method of waste disposal. Locate catholes at least 200 feet (about 70 adult steps) from water and trails. Select an inconspicuous site where other people will be unlikely to walk. With a small garden trowel, dig a hole 6-8 inches deep and 4-6 inches in diameter. The cathole should be covered and disguised with natural materials when finished.

Perhaps the most widely accepted method of backcountry (away from restrooms or vault toilets) human waste disposal is the cathole. The advantages of catholes include:

- easy to dig in most areas
- easy to disguise after use
- private
- disperse the waste rather than concentrate it (which enhances decomposition)
- easy to select an out of the way location where you can be certain no one is going to casually encounter the cathole

Selecting a Cathole Site

Select a cathole site far from water sources, 200 feet (approximately 70 adult paces) is the recommended range. Select an inconspicuous site untraveled by people. Examples of cathole sites include thick undergrowth, near downed timber, or on gentle hillsides.

Try to find a site with deep organic soil. This organic material contains organisms which will help decompose the feces. (Organic soil is usually dark and rich in color.) If possible, locate your cathole where it will receive maximum sunlight. The heat from the sun will aid decomposition.

Choose an elevated site where water would not normally flow during runoff or rain storms. The idea here is to keep the feces out of water. Over time, the decomposing feces will percolate into the soil before reaching water sources.

Digging a Cathole

A small garden trowel is the perfect tool for digging a cathole. Dig the hole 6-8 inches deep (about the length of the trowel blade) and 4-6 inches in diameter. When finished, the cathole should be filled with the original dirt and disguised with native materials.

Toilet Paper

Use toilet paper sparingly and use only plain, white, non-perfumed brands. Toilet paper must be disposed of properly! It should either be thoroughly buried in a cathole or placed in plastic bags and packed out. Natural toilet paper has been used by many campers for years. When done correctly, this method is as sanitary as regular toilet paper, but without the impact problems. Popular types of natural toilet paper include stones, vegetation and snow. Obviously, some experimentation is necessary to make this practice work for you, but it is worth a try! Burning toilet paper in a cathole is not recommended.

Tampons

Proper disposal of tampons requires that they be placed in plastic bags and packed out. Do not bury them because they don't decompose readily and animals may dig them up.

Urine

Urine has little direct effect on vegetation or soil. In some instances urine may draw wildlife which is attracted to the salts. They can defoliate plants and dig up soil. Urinating on rocks, pine needles, and gravel is less likely to attract wildlife. Diluting urine with water from a water bottle can help minimize negative effects.

Canyon Lake Creek Community Forest Lake Trail – A Guided Hike Outline

You may have been to Canyon Lake Creek Community Forest many times by yourself or leading a group. Maybe you are planning your first guided tour. Relax – below is an outline that will help you plan and present a tour of this special place.

Step #1 – Key Steps for Program Planning

- Program or Tour Promotion
 - In writing up the information for promoting your tour, remember to
 - ___ Include hike information –
 - Distance: 2.0 miles round trip
 - Elevation Gain: Some elevation change
 - Time: 1-1.5 hours
 - ___ What are the appropriate ages for the tour? Upper and lower limits
 - ___ Any special equipment needed (rain gear, sunscreen?)
 - ___ Remind visitors to bring extra food and water
- Prior Planning Prevents Poor Performance
 - ___ Estimate one hour of preparation for one hour of program presentation
- Visit Canyon Lake Creek Community Forest (CLCCF) ahead of time and travel your route
 - ___ Know the meeting area and driving route – what’s the timing factor?
 - ___ Check current conditions
 - ___ Walk the route – What are the hazards? What will be your stops? Where’s the best place to deliver the messages? Remember seasonal differences
- Read the Interpretive Manual
 - ___ Read this Manual to gain a comprehensive understanding of CLCCF
- Gather interpretive supplies and materials
 - ___ Review the list of suggested interpretive props in this Manual
 - ___ What other items might make your program even better?
- Review Emergencies and Safety – what would you do? See *Emergencies and Safety* section
 - ___ Don’t forget to pack the Ten Essentials – even if it’s a short tour

Step #2 – Off Site Introductions (e.g. at your carpool meeting location)

- Introduction – assert yourself and make visitors feel welcome
- Gather group at the designated meeting time
- Take charge and be the leader
 - ___ Greet visitors by name
 - ___ Check off names if needed
 - ___ Answer their questions with reassurance
- Summarize the day’s events
 - ___ Mileage and directions to the Community Forest
 - ___ Road conditions and safety warning

- __ Trail conditions and program details (distance, elevation climb, time)
- __ Equipment needed – check foot gear, rain gear, etc.

Step #3 -- Orientation On-site

- Again, an Introduction
 - __ Suggestion: Do part in the parking lot and part near Canyon Lake Creek
 - __ Your name, title and agency or organization (volunteer or staff – Whatcom County Parks and Recreation, Whatcom Land Trust, WWU, etc.)
 - __ Welcome to CLCCF
 - __ Why you are leading this program? – What’s your connection to the site?
 - __ Trail information and precautions for today
 - __ Length of time on trail – expected return
 - Distance: 2.0 miles round trip
 - Elevation Gain: Some elevation change but minimal
 - Time: 1-1.5 hours
 - __ Visitor introductions – experiment
 - Ask for more than just a name –
 - “What do you want to see/learn today?”
 - “Why did you sign up for this program today?”
 - “Has anyone ever hiked here before?”
 - __ Basic introduction to the Community Forest Partners (see Interpretive Manual – Introduction and Background Section)
 - __ What we’ll see today – don’t give it all away; theme statement here

We can experience thousands of years of biological change and millions of years of geological change in one afternoon at Canyon Lake Creek Community Forest. Humans can change something in a short period of time that took a long time to grow or form.

- __ Designate a caboose – last person in line that will stay at the back and ensure everyone else is in front, can rotate this role

Step #4 – The Program

First Stop – within sight of parking lot if any latecomers

- Goals of the Community Forest – research, education, recreation
- “As a result of this...” briefly mention some of the key regulations and reasons for them (See Interpretive Manual – Top Ten Answers)
- Passive recreation (leave bikes, motorized vehicles and guns at home)
- Leave pets at home
- No camping or fires
- Leave no trace – pack in/pack out philosophy
- Please respect this special place

Bridge – view US Geological Survey gauging station to the west on creek edge; USGS operated a gauging station on Canyon Lake Creek near the present Mosquito Lake Road (at start of access road) bridge from 1948-1955 – may or may not be related; would measure water levels in the creek – gather information for predicting flooding; no longer in use

Suggested Props:

- Canyon Lake Creek Community Forest brochure (inside map)
- Area land ownership map

Second Stop (near bridge on earthen “dam”)

Imagine more than 150 years ago, intense rumbling as the earth shook from a 7.1-7.4 magnitude earthquake and massive amounts of rock, soil and debris were deposited here from a landslide that brought down material from the sides of the (at the time) creek. The landslide blocked Canyon Creek and began to flood the area and form Canyon Lake. This is a unique lake – we’ll discover more as we go.

Change can occur in a second or take a long time.

Third Stop (lake view through trees after bridge)

What are the logs doing in the lake? Allow visitors time to discuss, suggest ideas and figure out the answer. Why haven’t they rotted?

Western redcedar (*Thuja plicata*) trees (species of trees in the lake) are incredibly rot resistant and can last a long time in water or decaying on the ground – some dead cedar trees remain intact for as long as they lived! Trees seen in the lake were originally rooted along the creek bed and valley floor when the creek was dammed and the lake formed. Carbon dates obtained from wood samples taken from these trees indicate that the lake was formed less than 270 years ago. We’ll see a huge living example of this tree further down the trail.

Note the vegetation growing on the logs – there are unique plant communities that have formed on the logs. (Pass around a pair of binoculars among the group to get a close-up view of the plants.) If you were able to get out on the lake in a canoe or kayak (permitted), on some of the logs, you would notice small colonies of sundew (*Drosera rotundifolia*) a carnivorous plant which feeds on insects that land on its sticky leaves.

How will the lake area habitats (lake bottom, lake edge, plant communities on tree logs) change over time? Discuss the speculations.

Suggested Props:

- Binoculars
- Plant identification book with picture of sundew

Fourth Stop (sandy, muddy lake bottom area next to shore)

At the lakeshore is a good area to discuss how fossils might form. If objects were still underwater in the muddy bottom, they might be in an anaerobic (no air) condition. Thus these specimens wouldn't rot or decay but could become fossilized. Only this part of the lake would form fossils due to the anaerobic conditions – and would result in an extremely isolated pocket of fossils in the future.

Show how this process might work on land in a mini-demonstration using a muddy area (remember – no oxygen). Bury a leaf or cone in mud and talk about how the object wouldn't rot if there wasn't oxygen. Over millions of years the object becomes fossilized and its impression is left in the rock that is formed (mudstone? shale? sedimentary?)

You may have seen a rock slab – upland side – with a fossil in it.

What does the presence of tropical and semi-tropical fossils tell us about the past climate and habitats of this area? One theory about the Chuckanut rock formation is this part of the world had a very different climate at one time – warm and tropical – and was covered by a shallow sea. Most geologists think that this change of climate from tropical to present day took place over millions of years (slow change) and not over centuries which we are now experiencing with global climate change (fast change). Species had a chance to evolve and shift unlike conditions today. (For more detailed information, see Geologic History of Canyon Lake and other related scientific journal articles in this Interpretive Manual.)

Look for fossils on the main trail to the old growth forest grove – we'll pass by a beautiful 50 million year old palm frond fossil near the end of our walk today. Please leave all these fossils in place for others to enjoy viewing and for scientific study.

Suggested Props:

- Large spoon or trowel to use for simulating the development of fossils

- Photos photocopied and laminated from geology articles in the Interpretive Manual

Fifth Stop (large western redcedar (*Thuja plicata*) tree on left)

Use this opportunity to discuss the changes in the forest that occur as a result of logging. This specimen could be the largest one in the Canyon Lake Creek watershed. Western redcedar trees are highly valued and were usually some of the first trees cut in a logging operation provided they were accessible. Western redcedar trees grow best with “wet feet” (damp to wet habitats) – areas not always conducive to logging with heavy equipment. Perhaps this is why this tree survived.

As you climb in elevation in the Community Forest (i.e. up the trail to the old growth forest grove), the habitat conditions change leaving the western redcedar trees in lower elevations and encountering Alaska yellow-cedar trees which are found from 2500-6500 feet in elevation. The Alaska yellow-cedar can be distinguished by its drooping, sparse branches that hang limply down the length of the tree. The oldest trees in the Community Forest are Alaska yellow-cedar specimens growing in the old growth forest grove three miles up the main trail. These trees are estimated to be 800-1000 years old – some of the oldest in the Pacific Northwest.

Look for one area along the trail with a large pile of cedar root wads (stump and roots left after pulling tree from the ground) that are gathered above the trail. At some time in the 1960s or 70s when the land was privately owned by a timber company, someone illegally came in and began to remove the cedar trees from the lake, skid (haul or drag) them up from the water, cut the salvageable wood from the tree and leave the root wads in a pile. Note the scars still visible from where the logs were pulled from the lake. There is an ongoing problem on many public forests of timber rustling (stealing specifically targeted tree species from public or private lands) for personal gain. This wood is then sold at a profit for use in building materials (shakes, siding, roofing, etc.) or specialty projects (instruments or furniture).

Suggested Props:

- Plant identification book with photographs of western redcedar and Alaska yellow-cedar to compare their appearance

Use Transition/Foreshadowing between these stops – ask visitors to look on the upland side of the trail for evidence of drastic change (rock slides and snow avalanches). If the steep angle of a slope cannot hold the material fallen or accumulated on the slope, it will loosen over time and come crashing down in an accumulation zone at the base of a slope. Soil that might hold rocks in place can become saturated with water from a storm and flow down a steep slope with its contents.

Likewise, heavy snowfall that cannot be held in place by the vegetation growing underneath, can break loose and scour a hillside until it deposits its contents at the base of a slope. Avalanches that fall consistently in areas can form chutes and prevent certain

kinds of vegetation (i.e. trees) from growing in the chute. The evidence of consistent avalanche activity is vegetation with curved stems and branches that are resilient in the face of tumbling heavy slab of snow.

These natural disturbances are a positive component of the ecological process. They can help to increase the diversity or variety of growing conditions and habitat.

Sixth Stop – large scree area on uphill side of trail

Before your group reaches the large scree area (large, loose rocks strewn across the hillside), caution them to approach quietly and listen for the periodic “EEEEENKK” sounds of the pika (also rock rabbit or cony). Scan the slope with binoculars to see if you spot any pikas. (This is a good opportunity to model good wildlife viewing behavior – approach quietly and patiently using binoculars or a spotting scope to observe wildlife.)

Pikas are small animals (resembling large hamsters) that live amongst the rocks in this area. Pikas, also known as the “hay farmer”, harvests grasses and lay them out in the sun for curing before caching them for use in the winter months. Do you see any of their hay piles? This colony of pikas is unusual because most of these animals live at a higher elevation closer to the limits of tree growth. (For more information, see the Wildlife Identification Cards in the Interpretive Manual.)

Cross over the footbridge to continue the loop trail and connect with the trail along the north side of the lake which eventually returns to the parking lot/trailhead.

As you cross over the creek, the trail will climb steeply up the ridge on the (now) north side of Canyon Lake. Notice the nurse logs that have fallen on the ground and provided a new base of growth for the small trees growing in a straight row on top of the log.

Suggested Props:

- Binoculars or spotting scopes for viewing pikas
- Laminated Pika Wildlife Identification Card (in Interpretive Manual) OR
- Laminated photograph of a pika in its habitat (or a wildlife identification book with an illustration)

Seventh Stop

Once the trail has leveled off some, stop the group and give them some direction for the next link of the hike. Ask the group to hike along in silence from the time you leave the stop until you give them a signal to resume conversations (where the trail meets the main trail/old road to return to the trailhead). Ask your group to think about the following as they walk along the trail.

- What did I discover today about Canyon Lake Creek Community Forest (CLCCF)?
- What is important to me about CLCCF?

- What should CLCCF look like (vegetation, recreation, wildlife, access, etc.) in 50 years?
- What will I personally do to help realize that dream?

This section of the trail is conducive for quiet contemplation and thought. Encourage your group to remain silent even if they don't want to participate in the above exercise.

When the trail merges with the main trail/old road, stop the group and ask for their feedback on the above questions. Some groups will have a lot to share and others may be reluctant. Give the group some time to compose their thoughts – even allowing some silence from the group. Use questioning strategies that will encourage deeper thinking. Remember, however, that some in the group may be getting impatient to return to the trailhead. Follow the main trail/road downhill as you begin your descent back to the parking lot.

Suggested Props:

- Pencil and paper – some visitors may want to write down their answers to the above questions

Eighth Stop – large covered palm frond fossil

Show group the 50 million year old palm frond (leaf) fossil that was mentioned earlier in the program. This fossil shows how much change has occurred in the area. What things have they seen change in their time living in Whatcom County? What things could they expect to see change in the future? (i.e. population growth, road building, development, resource extraction, etc.) This stop could be a continuation of the above discussion or a summary of comments and ideas.

Another positive change in their lifetime will be the restoration of Canyon Lake Creek Community Forest. Whatcom County residents (and others in the Northwest) have an opportunity to support re-establishing Northwest forests and reconnecting critical old growth forest remnants. They can be a part of it happening by supporting one or all of the Community Forest partners, by responsibly visiting the Community Forest and by telling their friends and neighbors what they have learned today.

Suggested Props:

- Laminated photographs of other fossils found in the area from geology journal articles in the Interpretive Manual

Step #5 – Conclusion

The conclusion is an excellent time to determine what key points the visitors remember about your guided tour and to evaluate the effectiveness of your presentation. The conclusion is best done before the group is in sight of the trailhead. The palm frond fossil is a perfect location to conclude the walk.

- Summarize what was seen today
__ Remind visitors what key items were seen or discussed today (even the interpretive moments). Connect these highlights and weave them into a short description of the program that will reflect the original theme

We can experience thousands of years of biological change and millions of years of geological change in one afternoon at Canyon Lake Creek Community Forest. Humans can change something in a short period of time that took a long time to grow or form.

- Find out what was memorable for the group
__ Circle up group and ask – “what is one thing new you learned today?”
OR “If you were writing in your journal, what is something you would want to include from today’s program?” This is an excellent way to evaluate what information was retained by the visitor and what is important to the individual for their visit to Canyon Lake Creek Community Forest.

Thank them for coming and mention you will be available for answering any questions as the group returns to the parking lot and trailhead.

Answer any questions individuals or groups may have about the site or the Community Forest partners (see the Partner Section in the Interpretive Manual). Let your visitors know they can come back on their own. Do they need driving directions? – hand them a CLCCF brochure.

Are there any other upcoming programs they might want to check out? Let your visitors know how they can support the Community Forest partners with their time and/or donations.

Ensure that all participants have returned and their vehicles have started. Don’t forget to fill out any required reports about the day’s guided tour.

Suggested Props:

- Handouts for future events at CLCCF or with one of the Land Partners
- Canyon Lake Creek Community Forest brochures
- Brochures from the Land Partners

Canyon Lake Creek Community Forest Hike to the Old Growth – A Guided Hike Outline

You may have been to Canyon Lake Creek Community Forest (CLCCF) many times by yourself or leading a group. Maybe you are planning your first guided tour. Relax – below is an outline that will help you plan and present a tour of this special place.

Step #1 – Key Steps for Program Planning

- Program or Tour Promotion
 - In writing up the information for promoting your tour, remember to
 - ___ Include hike information
 - Trail to Old Growth Forest and Ridge
 - Distance: 2.6 miles one way to the beginning of the old growth forest grove (trail is then 1.2 miles in length)
 - 3.7 miles one way to the ridge viewpoint via main trail/retired road
 - Elevation Gain: 2150 feet
 - Time: 5-6 hours
 - ___ What are the appropriate ages for the tour? Upper and lower limits
 - ___ Any special equipment needed (rain gear, sunscreen?)
 - ___ Remind visitors to bring extra food and water
- Prior Planning Prevents Poor Performance
 - ___ Estimate one hour of preparation for one hour of program presentation
 - ___ Check current conditions
- Visit CLCCF and travel your route ahead of time
 - ___ Know the meeting area and driving route – what’s the timing factor?
 - ___ Walk the route – What are the hazards? What will be your stops? Where’s the best place to deliver the messages?
- Read the Interpretive Manual
 - ___ Read this Manual to gain a comprehensive understanding of CLCCF
- Gather interpretive supplies and materials
 - ___ Review the list of suggested interpretive props in this Manual
 - ___ What other items might make your program even better?
- Review Emergencies and Safety – what would you do? See *Emergencies and Safety* section
 - ___ Don’t forget to pack the Ten Essentials – especially for day tours

Step #2 – Off-Site Introductions (e.g. your carpool meeting location)

- Introduction – assert yourself and make visitors feel welcome
- Gather group at the designated meeting time
- Take charge and be the leader
 - ___ Greet visitors by name
 - ___ Check off names if needed
 - ___ Answer their questions with reassurance
- Summarize the day’s events
 - ___ Mileage and directions to the Community Forest

- __ Road conditions and safety warning
- __ Trail conditions and program details (distance, elevation climb, length of time)
- __ Equipment needed – check foot gear, rain gear, etc.

Step #3 -- Orientation On-site

- Again, an Introduction
 - __ Suggestion – do part in the parking lot and part up the trail near the regulations sign
 - __ Your name, title and agency or organization (volunteer or staff – Whatcom County Parks and Recreation, Whatcom Land Trust, WWU, etc.)
 - __ Welcome to CLCCF
 - __ Why you are leading this program? – What’s your connection to the site?
 - __ Trail information and precautions for today
 - __ Length of time on trail – expected return
 - Trail to Old Growth Forest and Ridge
 - Distance: 2.6 miles round trip to the beginning of the Old Growth Forest Trail (trail is then 1.2 miles in length)
 - 4.0 miles round trip to the ridge
 - Elevation Gain: 2150 feet
 - Time: 5-6 hours
 - __ Visitor introductions – experiment
 - Ask for more than just a name –
 - “What do you want to see/learn today?”
 - “Why did you sign up for this program today?”
 - “Has anyone ever hiked here before?”
 - __ Basic introduction to the Community Forest Partners (see Interpretive Manual)
 - __ What we’ll see today – don’t give it all away; theme statement here
 - __ Designate a caboose – last person in line that will stay at the back and ensure everyone else is in front, can rotate this role

Step #4 – The Program

First Stop – within site of parking lot if any latecomers

Why CLCCF – give a short history, what makes it special
2300 acres – 700 acres of old growth forest – our destination today
Basic introduction to the Community Forest partners – the role each of them plays
See Partner Section in Interpretive Manual

Goals of the Community Forest – research, education, recreation

“As a result of this...” briefly mention some of the key regulations and why they exist:

- Passive recreation (leave bikes, motorized vehicles and guns at home)
- Leave pets at home
- No camping or fires
- Leave No Trace – pack in/pack out philosophy
- Please respect this special place

Suggested Props:

- Litter bag for use during the hike

Second Stop – Palm Frond Fossil

50 million year old palm frond (leaf) fossil – history of its placement (see *Top Ten Answers* within the Interpretation Section of the Interpretive Manual)

This fossil gives us a clue as to the life here long ago – tropical and marine. This area was once a shallow sea with a warm tropical climate.

Look for fossils along the way that will illustrate more of this evidence (shells, etc.). Please leave the fossils in place (and encourage others to) for all visitors to enjoy.

Just like this fossil represents major change over time, we expect CLCCF will also change over time.

Theme Statement:

At Canyon Lake Creek Community Forest, we find fascinating evidence of geological and climatic change over time. There is also dramatic evidence of human-caused change from the past that we will strive to moderate and perhaps even reverse in the future.

Suggested Props:

- Laminated photographs of other fossils found in the area from the geology journal articles in the Interpretive Manual

Transition/Foreshadowing between stops:

Look at the trees and vegetation as we hike along this route. Notice what you see. See if you can find any patterns.

Explain rock placement on trail/old road is to stop motorcycles and/or ATVs from using the decommissioned road/now trail.

Third Stop – Alder Grove

Pick an area within a red alder (*Alnus rubra*) grove

Help visitors find and locate alders from afar and up close

Red alder (see Red Alder Plant Identification card in the Interpretive Manual)

Keys to identification – mottled, smooth gray bark (may resemble paper birch but birch bark is white and papery); light-gray lichens grow on the bark; leaves with rounded teeth, short rusty hairs on the pale undersides

Significance – grows in disturbed or changed areas (especially after fires, landslides, windthrows, etc.); can fix nitrogen in the soil (i.e. improves conditions over time – a nitrogen fixer improves soil growth especially for other plants); grows rapidly in first few years, shade intolerant, lives about 60-70 years, prepares forest for next generation of trees; previously viewed as a “trash tree”, valuable forest product today for wood veneers and other products

Alders prepare the forest for change and are part of that change.

As we hike along, see if you notice where we begin to lose alders as part of the forest.

Suggested Props:

- Illustration of red alder nitrogen nodules on their roots
- Photographs of products made from alder

Fourth Stop – View of Canyon Lake

With a view of Canyon Lake

Why is this lake here? Why are there trees in the lake?

It's a unique lake formed from a cataclysmic event. We'll answer those questions as we climb higher and get a better perspective looking down on the lake.

Looking down the valley – give an orientation to what is being seen

Nooksack River Valley

Van Zandt Dike

If clear, you will begin to view the Olympic Mountains and the mountains on Vancouver Island

If not clear, it may be due to a variety of reasons (fog, smoke, and air pollution/smog from the Lower Mainland of British Columbia – greater Vancouver, BC).

Suggested Props:

- Area map (i.e. USGS topographic map) to use for orienting visitors to the possible views – what are you looking at?

Fifth Stop – View to the south of the ridges above Canyon Lake

View to the south – what features do you notice about the forest to the south above the Lake? (Guide visitors to notice different types of trees by their crown appearance, pick out certain zones and draw imaginary lines around certain areas.)

Do you notice the silver standing dead trees above the rest of the forest? What are they evidence of? Rapid change from a forest fire!

The Porter Creek (next drainage to the south over the ridge) Fire of 1951

The following log of activity from the Porter Creek Fire of 1951 shows how fires were fought over 50 years ago. This was the last major fire in the immediate area of CLCCF.

- Thursday September 19, 1951 – 3,000-acre fire (grew from a 20-acre Corning Fire caused by logging activity, thought to be under control)
Most US Forest Service fire crews in Forks fighting fire that threatens the town
All western Washington logging operations shut down due to fire conditions
Smoke blocked out the sun in Bellingham, smoke seen from LaConnor
- Friday, September 20, 1951 – evening - fire jumps Clearwater Creek and spreads to within ½ mile of Mt Baker National Forest, adding 100 acres to the fire
- Saturday, September 21, 1951 – urgent call for more fire fighting volunteers
- Sunday, September 22, 1951 – winds increase, fire spreads
- Monday, September 23, 1951 – fire now at 6300 acres; Larson Sawmill (Bellingham) shuts down to send more volunteers to the fire
- Tuesday, September 24, 1951 – ½ inch of rain falls, fire spread slows; now 6400 acres
- Friday, September 27, 1951 – fire under control; aerial flight shows islands of unburned timber within the fire boundary

Notice the unevenness of where the fire burned. You can tell this from the evidence (snags) that was left behind. Fire burns in sporadic ways influenced by wind, terrain, soil moisture and vegetation. This provides diversity to the forest – a variety of ages in the future – some older trees left alive, much younger underbrush burned, some trees burned but not all, some dead trees left standing, some trees scarred but alive only to die later.

Fires will also create snags or standing dead trees. The silver colored dead trees you see above the forest canopy (tree tops) are trees that were killed by the Porter Creek Fire of 1951 or died later from being weakened in the fire. Snags provide some of the richest habitats in the forest. Snags in Northwest forests provide homes and feeding sites for nearly 100 species of birds and mammals. Hosts of insects, larvae, spiders, fungi, mosses, lichens, and microscopic organisms make the snag a vibrant column of life - an important component of the whole forest. In time the snag falls, and as it further decays on the forest floor, it hosts an even greater diversity of life as well as providing a reservoir of moisture and a slow release source of nutrients.

Look for a snag close to the trail for further exploration by visitors or look for an example when exploring the old growth forest grove.

Suggested Props:

- Photocopies of the newspaper coverage of the 1951 Porter Creek Fire – Whatcom Land Trust files
- Binoculars to use to visually trace the fire evidence on the hillside

Sixth Stop – Look for large scar near top of ridgeline to the south

Notice the large soil slump scar to the south along the ridgeline (see photo below – also note the many snags visible at the bottom of the photo).

Note deposition zone at the base – drastic change in the landscape.

This slump is most likely due to the soil being saturated from rain or a rain on snow event. The slump also illustrates the shallow soil depth that can break loose from bedrock depending on the event or angle of slope and cause massive change in a landscape in a short period of time.

What may appear to be a “natural disaster” however, can increase diversity in a habitat. Death for one species becomes an opportunity for another species. Natural disturbance is a vital process that can increase the diversity or complexity of plant and animal habitats. Diversity is important because it provides evolutionary advantages to all life forms.



Seventh Stop – Past first switchback with view of Canyon Lake below

Remember we asked visitors about Canyon Lake and enticed them with “cataclysmic event”?

Look down on the lake now from this excellent birds-eye-view perspective. The lake's placement in the valley looks odd and rather abrupt. Canyon Lake (45 acres) was formed from an earthquake-induced landslide that dammed up Canyon Creek and flooded the land behind it. A large magnitude 7.1-7.4 earthquake in 1872 could have triggered this landslide that formed the lake.

Point out the trees in Canyon Lake. How did they get there? Allow visitors time to discuss, suggest ideas and figure out the answer. Why haven't they rotted?

Trees seen in the lake were originally rooted along the creek bed and valley floor when the creek was dammed and the lake formed. Carbon dates obtained from wood samples taken from these trees indicate that the lake was formed less than 270 years ago. Western redcedar (*Thuja plicata*) trees (species of trees in the lake) are incredibly rot resistant and can last a long time in water or decaying on the ground – some cedar trees remain intact dead for as long as they lived!

Suggested Props:

- USGS topographic map to use for orienting – where are we? trace the path of Canyon Creek from headwater source to the Nooksack River

Transition/Foreshadowing between stops

Notice how the trees have changed composition (different species) as we rise in elevation. We've left some species at lower elevation and gained some new species at this higher elevation. Make a note of what changes you observe as we have climbed in elevation. We'll discuss them at the next stop

Suggested Props:

- Tree identification book

Eighth Stop – near start of Old Growth Forest Trail

What have you noticed about the area as we have climbed in elevation? How might growing conditions be different at this area than when we first started?

Have visitors call off a list of conditions; use good questioning strategies to elicit more detail from their responses

(Possible answers include – temperatures lower, shorter growing season, soils different, more snow longer, more intense solar radiation, different growing conditions)

All of these conditions combine to make life different at this elevation. We're about to enter into a unique forest where some species in this forest have adjusted to these conditions for 800-1000 years! About to enter a truly unique ancient forest!

Let's enter this forest in silence as a group. Imagine what this entire area (northwest Washington) must have looked like 500 – 700 – 1000 years ago using this forest grove as a guide. It may not have looked that much different and yet we can change it today in the

blink of an eye. Look around you and observe closely what makes this a forest. We'll talk about it further down the trail.

[Additional Comments: your group may notice the former logging operation on the slopes north of the Community Forest. The scars are quite evident. This was a spar logging operation. Cables were strung from a main point on the ridgeline (notice all the drag lines in the soil point to one central spot above). These draglines may remain for a very long time as the topsoil was likely scraped to bedrock with the action of dragging logs to the top of the ridge for removal.

The cables were anchored with other wires using large old trees as anchor points. Within the old growth forest grove next to the trail, you will notice at least two old growth trees that were used as anchor points. One of the trees was girdled (cut around the entire tree) and did not survive but is still standing; another tree survived – notice the cuts into the base of the tree to hold the cable.]

Once inside the old growth forest grove, ask visitors what they observe. Some prompting questions might include:

- What do you notice about this forest?
- What is different about this forest than the forest as the beginning of the hike or along the trail?
- Is the forest uniform – for example, are they all the same species of trees? all the same height? Is there the same level of light throughout this forest grove?
- What are some of the plants that you notice?
- Have you ever seen a forest like this?
- If you've visited an old growth forest before, how is this one different?

Encourage your visitors to use their eyes but also their other senses to discover the elements that make this forest special.



Use the information below along the trail within this forest grove to give visitors a sense of what makes this forest special and unusual.

What makes a forest “old growth”? (For more detailed information, see the Old Growth Forest section in the Interpretive Manual)

Large, old trees – in the Pacific Northwest, old growth forests are dominated by conifers at least 180 years old with large overstory trees that provide moderate to high forest canopy closure; some trees may have broken tops and other indications of old and decaying wood

Dead trees – standing and on the ground – the presence of large standing dead trees (snags) provide a variety of habitats and niches for wildlife (in the Pacific Northwest over 100 species of wildlife utilize snags for all or part of their life); some dead trees can stand for 100-200 more years beyond their living life span; the presence of dead trees on the ground provide more habitat, a source of stored moisture and a storehouse of insects, fungi and nutrients to sustain forest life

Multi-layered canopy – trees of a varying height, dominated by large old trees, with some open patches that allow sunlight gaps onto the forests floor; when a disturbance occurs (wind storm, fire, snag falls), some species may utilize this new light and space to grow quickly (Pacific Silver Fir) despite being on-site for 100+ years

Diversity of species – over 150 terrestrial vertebrate species have been known to utilize this type of habitat; because of the diversity of niches, a large variety of species can find a home in these kinds of forests.

Biomass – Pacific Northwest temperate old growth forests have the largest amount of biomass (the weight and density of living organisms) of any forest on Earth.

Suggested Props:

- Hand Lenses
- Magni-cubes – small plastic boxes with magnifiers in the lid
- Rice paper and charcoal for tree bark rubbings

Ninth Stop – deep within the Old Growth Forest Grove

What makes the Canyon Lake old growth forest so unique? (For more detailed information, see the Old Growth Forest section in the Interpretive Manual)

Age – This parcel is one of the oldest forest stands in the Pacific Northwest. Some Alaska Yellow-cedar trees were found to exceed 800 years and several may be as old as 1000 years old. These trees are not necessarily the largest trees. These trees have grown slowly over the years and have survived wind, snow and fire.

Location – This parcel is located at a higher elevation than most known old growth forests of this kind and the furthest west within the Cascade Range.

Other interpretive opportunities in the old growth forest grove might include:

- Pointing out nurse logs – trees that have fallen on the ground that now help to grow new trees anchored in their rotting trunk
- Identifying trees from their bark and needles; binoculars may be needed to observe details higher in the canopy.
- Experiencing the quiet reverence of this ancient grove – what events in history have occurred while these trees were growing
- Contrasting the stark transition of the clearcut area as the old growth trail leaves the grove for the ridge trail – what is different? what changes?

- Counting the growth rings on the large old stumps – how old were they when they were cut or fell? How might they compare to the trees outside this grove?
- Observing the small streams that cross the trail – is there life in them? (Look for small macroinvertebrates (insects) in the water.)

Suggested Props:

- Small dip nets and ice cube tray to collect and view stream macroinvertebrates
- Macroinvertebrate identification chart

Tenth Stop – top of the ridge with views of Mt. Baker and the Twin Sisters Range

As you step from the dark cool old growth forest through the stark clearcut area and out onto the ridge, hope it is a clear day. At this point, Mt. Baker* is only ten miles away and the Twin Sisters Range ten miles south of the Mt. Baker summit on the Whatcom-Skagit County line. (*Named for Joseph Baker, a young officer under Captain George Vancouver’s command – Baker pointed out the beautiful snow-capped mountain from their anchorage near current day Protection Island in Puget Sound)

The true picture of a Cascades Mountain Range volcano becomes apparent when viewing Mt. Baker from this perspective. (For more information on Mt. Baker and its volcanic history, see the *Mt. Baker: Living with a Volcano* fact sheet in the Interpretive Manual)

Look towards the west and see all three forks of the Nooksack River come together in the river valley below.

In spring or early summer if your group has the time, you may want to explore an interesting and delicate seasonal wetland father along the trail to the southwest.

Suggested Props:

- USGS topographic map
- Outline diagram of mountains on the horizon for identification
- Binoculars
- Mt. Baker volcanic cross section from *Mt. Baker: Living with a Volcano* in the Interpretive Manual

The Return Trip

Optional pathways for return include –

- Return through the old growth forest grove trail
- Follow the ridge trail to the north, keep left at the fork and left at the intersection with the main trail/decommissioned road as you descend to complete the loop where you started the old growth forest grove trail

It may be difficult to keep together and descend as a group to the beginning of the trail below. Individuals will have different hiking styles and paces. You could conclude the

program up on top with a summary of the day's learning, impressions of the group and a message for the future. Another option would be to stay with the majority of visitors as they descend and interpret several points that now have a different perspective due to the descent. A third option would be to stay near the head of the group as you descend and interpret at 1-3 more stops along the way.

Remember to include some form of conclusion with the majority of the group. This step is important to remind visitors of what they learned today and the importance of their involvement with the Community Forest.

Suggested Props:

- USGS topographic map for orientation to the western views

Step #5 – Conclusion

The conclusion is an excellent time to determine what key points the visitors remember about your guided tour and to evaluate the effectiveness of your presentation. The conclusion is best done before the group is in sight of the trailhead.

- Summarize what was seen today
 - __ Remind visitors what key items were seen or discussed today (even the interpretive moments). Connect these highlights and weave them into short description of the program that will reflect the original theme
 - __ Theme: *At CLCCF, we find evidence of change over millions, thousands and hundreds of years. We want to facilitate biological change here into the future to help restore and expand the remnant old growth forest.*
- Find out what was memorable for the group
 - __ Circle up group and ask – “what is one thing new you learned today?”
 - OR “If you were writing in your diary, what is something you would want to include from today’s program?” This is an excellent way to evaluate what information was retained by the visitor and what is important to the individual for their visit to Canyon Lake Creek Community Forest.

Thank them for coming and mention you will be available for answering any questions as the group returns to the parking lot and trailhead.

Answer any questions individuals or family groups may have about the site or the Community Forest partners (see the Partner Section in the Interpretive Manual). Let your visitors know they can come back on their own. Do they need driving directions? – hand them a CLCCF brochure.

Are there any other upcoming programs they might want to check out? Let your visitors know how they can support the Community Forest partners with their time and/or donations.

Ensure that all participants have returned and their vehicles have started. Don’t forget to fill out any required reports about the day’s guided tour.

Canyon Lake Creek Community Forest The Ten Essentials

As a trip leader, your group will look to you for leadership and safety. It is important for you to be prepared for a variety of circumstances and to set the example for the group. Consider including the items below on your next guided hike at Canyon Lake Creek Community Forest.

- **Navigation**
 - ✓ Topographic map & compass
 - ✓ GPS Unit
 - ✓ Canyon Lake Creek map
 - ✓ Altimeter (optional)
- **Food and Water**
 - ✓ Extra food (without the need for cooking) and water. Drinking unfiltered water on-site is not advisable. It is recommended to drink 5-12 fl. oz. every 15-20 minutes during strenuous activity like hiking.
- **Clothing**
 - ✓ Extra clothing (for self and visitors) + rain gear, wool socks, sweater, gloves and hat
- **Light**
 - ✓ Flashlight with spare bulb and batteries
- **Fire**
 - ✓ Waterproof matches and fire starter (candle) – emergencies only
- **Sun Protection**
 - ✓ Sunglasses and sunscreen
- **First Aid**
 - ✓ Standard first aid kit with supplies for blisters
- **Knife**
 - ✓ Folding pocket knife
- **Signal**
 - ✓ Whistle and pocket signal mirror
 - ✓ Cell phones may work on the ridge but you may encounter dead spots at the parking lot and/or on the hike up. Do not rely on cell phones for all your emergency communication needs.
- **Emergency Shelter**
 - ✓ Plastic tube shelter or bivouac sack

Canyon Lake Creek Community Forest

Who? What? How? When?

Top Ten Answers to Resource Questions at the Community Forest

Because Canyon Lake Creek Community Forest (CLCCF) is a relatively new area and the public is just beginning to visit the Forest, a general sense of what is permitted and not allowed has not been conveyed to visitors. Despite signage near the entrance parking lot, many visitors may not know about regulations used in managing the Community Forest. You can assist the three community partners – Whatcom County Parks and Recreation Department, Western Washington University and Whatcom Land Trust – in better managing the Forest through your approaches to visitors who are violating these regulations.

Approach visitors in a friendly manner

“Hi – how are you doing today? I’m a volunteer with Whatcom Land Trust/Whatcom Parks and Recreation /etc. leading a hike here today. I don’t know if you know it or not but _____ isn’t allowed in the forest because.....”

Use an interpretive or educational approach to encourage cooperation. Remember, you have no law enforcement role. Explaining regulations in an informative manner can help visitors to understand why a rule is in place. The information below will give you information that can be used to answer visitors’ questions.

1. Why can’t I bring my motorcycle/ATV here?

Canyon Lake Creek Community Forest was established for three main purposes – research, education and passive recreation. The Community Forest also has potential for providing ecological linkages between patches of old growth within the Forest to patches outside the Forest. There is concern among managers that motorcycles and ATVs would cause damage to the trails and thus to the habitat being restored and protected in the Community Forest.

Why not my mountain bike? There is concern among managers that mountain bike use will interrupt and potentially cause conflict with passive recreational users.

2. Why can’t I camp here?

Public lands that provide camping generally have maintenance facilities nearby. Because of the remoteness of CLCCF, it is too expensive to provide regular maintenance (trash pickup, restroom cleaning, drinking water) that would be required with a campground. Developing a campground or camping areas would also have the potential to degrade an area that is meant to be an example of a landscape being restored. Campfires that escape are also a concern especially with evidence that some of the old growth areas in the Community Forest have not burned in over 1000 years!

3. How come dogs or other pets aren't allowed even on a leash?

Dogs and other pets are not permitted on the trails or in cross country areas at CLCCF because they can disturb, chase or kill wildlife. There is also potential to frighten or disturb other Community Forest visitors. Pet waste can soil the hiking trails, contaminate fresh water streams and can be infected with diseases. Diseases can be passed between pets and wildlife.

4. Why can't I ride my horse (or bring my llama) here?

Horse feed and manure contain non-native seeds that can overwhelm native plants if they gain a foothold in an area that is stressed by disturbance such as the Community Forest. Horse travel on trails can also cause erosion and resource damage that is difficult and expensive to repair. Trails in the Community Forest are limited and do not connect with other horse trails for extended travel. And finally, transporting horses to the site presents safety issues with the narrow logging access roads, two-way traffic and large horse trailers. Llamas are not permitted, although they have less impact than horses, for some of the same reasons as dogs and horses.

5. Can I fish in the lake? What kind of fish are there?

Fishing is permitted in Canyon Lake provided you have a fishing license and use non-motorized access or fish from the shore. The lake has historically been stocked by the Washington State Department of Fish and Wildlife. Fish reported to be in the lake are cutthroat trout.

6. How old is that palm fossil on the trail and where did it come from?

The beautiful 50 million year old palm frond fossil, housed under a small shelter past the CLCCF parking lot near the start of the trail along the north side of the lake, was originally discovered in 1998 in the Canyon Lake Creek watershed by crews from Crown Pacific, the previous owner of the property. It was removed and placed at the company's regional office in Hamilton. After the Community Forest was created and the land formally transferred, Russ Paul, regional manager from Crown Pacific, and his crew returned the six-ton slab to the site in 2002.

Fossils can be found throughout the Community Forest. Tropical and semi-tropical fossils are an indication that the climate in this area was very different millions of years ago. Look for other fossil specimens while visiting the Community Forest. Please observe and admire these fantastic rocks which tell fascinating stories. Removal, damage or destruction of fossils eliminates a valuable geological record and an opportunity for future Community Forest visitors to be awed by their presence.

7. Who logged this place?

The lands that make up the Community Forest were originally owned by a variety of wood products companies – Scott Paper Company, then Trillium Corporation and finally Crown Pacific. These lands were used to harvest trees for wood products and then grow more trees for future harvest. Lands surrounding the

Community Forest are owned by Crown Pacific and Washington State Department of Natural Resources and are still used for growing and harvesting trees. The Community Forest will not be harvested in the future but instead will be used for research, education and passive recreation.

Timber harvesting practices and requirements have changed dramatically over the last 15 years. Some of the views from trails in the Community Forest reflect outdated harvesting practices that are no longer used. Future research efforts in the Community Forest may include developing restoration techniques that can be used to heal the scars left from past harvesting practices.

8. Why can't I use a motorized boat on the lake?

Because Canyon Lake is so small and is such a unique feature of the Community Forest, only non-motorized water craft – canoes, kayaks and inflatable boats – are allowed on the lake. Motorized boats would also disturb the solitude that many visitors came to enjoy at the Community Forest.

9. Why are there trees in the lake?

A landslide dammed up Canyon Creek and formed the current lake as a result of an earthquake at least 150 years ago (possibly longer). The trees in the lake were growing in the creek bottom or edges when the landslide occurred. Those trees have been dead for at least 150 years! There are also unique plant communities growing on the logs in the lake such as the carnivorous sundew plant. When hiking up to the old growth forest area, you can look down onto the lake from above and see the story unfold below you.

10. Why did the Land Trust want to buy something so far away from town?

The CLCCF is a reserve of 2300 acres with about 650 acres of old growth forest within its borders. This old growth forest remnant contains some of the oldest trees in the state (Alaska yellow-cedar that is 800-1000 years old). Patches of old growth forests are also present east of the site in the Mount Baker-Snoqualmie National Forest and some to the north on lands managed by Washington Department of Natural Resources. With patience and proper management, it may be possible to encourage a restored linkage between these parcels and other nearby old growth patches and eventually “re-grow” old growth forests and their ecological communities.

Whatcom Land Trust has been identifying lands in the county that are core habitat reserves (such as the Community Forest) that will form a “seed bank” for future wildlife populations in the region. The Land Trust has also identified connecting corridors of land that should be conserved to provide connections between core reserves. These corridors help to “tie” together important ecological lands.



Bobcat (*Lynx rufus*)

Description: The bobcat is on average 25-30” long, 15-35 lbs. with a 5-6” tail tawny to gray in color with generally visible dark spots. Their ears may show tufts and cheek ruffs but these are shorter than their cousin the lynx (rarer, larger and found in more remote areas). The eyes are large and far apart and aimed directly ahead to maximize their ability to see in three dimensions.

Ecology: Bobcat frequent brushy, broken or logged terrain. Like all cats, they often scratch wood (tree bark). These gashed can 2-5 feet up the tree but rarely remove bark. They will also scratch dirt or leaves to cover their scat. Rodents, rabbits and hares make up the majority of their diet as well as carrion (dead animals).

Life History: Litters of 1-4 young are born in the spring and grow quickly. They are weaned by 10-12 months.

Canyon Lake Creek Community Forest Wildlife Identification Cards



Coyote (*Canis latrans*)

Description: Coyotes are generally dog-like in their appearance, 32-54” long with a tail of 11-17”, and weighing 20-50 lbs. They are distinguished by a long bushy tail that droops when running (wolves carry their tail horizontally or raised when running). Nose and ears are pointed and coloration varies from gray to reddish-gray. Coyotes can appear larger in the winter due to the thicker coat.

Ecology: Coyotes mark their territory with feces and urine. Look for coyote scat (dog-like with hair prominent – even berries in the fall) in the center of the trail. They are leaving their mark for neighboring coyotes and other predators. Coyotes feed on rodents, small mammals, ground nesting birds and vegetation.

Life History: Coyotes are usually wary due to their intense human persecution – the most bountied, poisoned and targeted predator we have. They can hunt alone or in packs. Litters of 4-9 are born in the early spring but only 20% will survive their first year.

Canyon Lake Creek Community Forest Wildlife Identification Cards



Black Bear (*Ursus americanus*)

Description: Black bears may be a variety of colors (cinnamon, brown, blue/gray or white (BC) but generally in the Cascades are a deep black with a tan nose, 4-6 feet long with a 4” inconspicuous tail and weigh 150-200 lbs.

Ecology: Black bears are omnivorous eating more vegetable matter (grasses, berries, plants) than meat. They will tear apart logs to eat ants, grubs and other insects. Active during April – October or November depending on elevation, they will go into a deep sleep, called torpor, from the late fall into early spring.

Life History: Two or three cubs are born in January with typically one surviving. The mother wakes in the den to give birth and then nurses them usually in her sleep over the next few months. The mother may lose up to 40% of her body weight nursing the cubs. The cub(s) will stay with her for over a year dispersing before a second winter.

Canyon Lake Creek Community Forest Wildlife Identification Cards



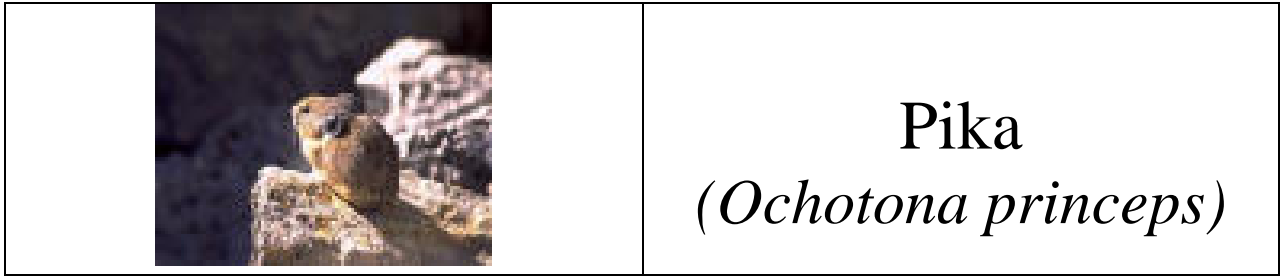
Cougar (*Felis concolor*)

Description: Our largest wild cat, the cougar is ruddy brown (deer-like), 4-5 feet long with a 2½ feet long tail with weight ranging from 80-175 lbs. There are no spots or ear tufts (like the smaller bobcat) except for the kittens.

Ecology: Cougars hunt alone and feed on deer, elk and other smaller animals. Hunting deer and elk are not without risk – they can be thrown or trampled hard enough die. Adults live solitarily during the year except for mating season and females with young.

Life History: A male’s territory will overlap several female territories. When cougars are found close to human habitation, many of these cougars may be young males dispersing from their mother’s home territory and are challenged to find an unoccupied home territory. These young cougars are inexperienced and curious about human activity.

Canyon Lake Creek Community Forest Wildlife Identification Cards

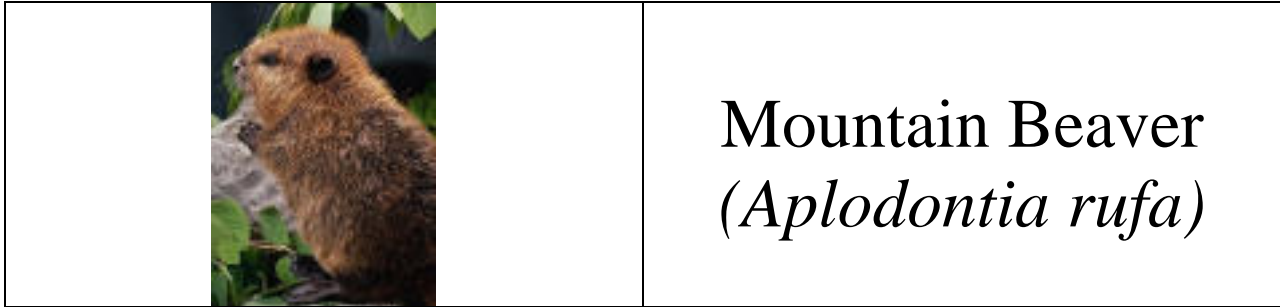


Description: Although resembling a rodent, pikas are more closely related to rabbits and hares. Measuring 6-8” long if stretched out, they appear 5-6” long in typical postures and weigh 4-6 oz. The tail is not visible; ears are short and round. Fur is cinnamon to buff brown in color.

Ecology: Generally living in subalpine areas, pikas will live in scree (rock) slopes at lower elevations as long as their food is plentiful. Known as the “hay farmer or haymaker”, the pika harvests grasses and lays them out to cure in the sun. Once dried, the hay is gathered up and cached for use later in the winter. Look for pika in the scree slope along the Canyon Lake shore trail. Listen for their “eeeeenkkk” sounds among the rocks.

Life History: Pikas breed in during March and April. Females usually bear 1-2 litters, with 2-4 young in each. When the young are born, they have no hair and are blind, but within a short time, they grow rapidly and are able to open their eyes. Pikas usually live for about 4-7 years.

Canyon Lake Creek Community Forest Wildlife Identification Cards



Description: Mountain beavers, also known as boomers, are 12-17” long, 2-3 lbs. in weight, reddish to dark brown in color with a compact body and a small 1” tail. They are the oldest known group of living rodents – and are not beavers! Their long whiskers and long front claws help them to dig for their food – fungi, insects, roots and vegetation.

Ecology: Boomers prefer wet, scrubby thickets and forests in backyards and mountain foothills. Evidence of their presence can be seen in the tunneling and earthmoving scars left behind. Their digging makes them less than popular with gardeners and foresters. Look for their scat along the trails at lower elevation.

Life History: The mountain beaver lives underground in a burrow and usually comes out at night. Because of this they may live in the vicinity but never be seen by humans. Their burrow openings are about 6” in diameter and may be in groups of several in a small area. Clipped vegetation is another sign.

Canyon Lake Creek Community Forest Wildlife Identification Cards



Common Garter Snake (*Thamnophis sirtalis*)

Description: The common garter snake has a black dorsal (back) ground color, top and sides of the head are black with stripes along the sides and top of yellow-green or turquoise. A series of small red blotches or crescents may occur on the sides. Other garter snakes may include the western terrestrial and Northwestern subspecies.

Ecology: These are the most commonly encountered snakes in many parts of its range. Garter snakes are active during the day and most frequently seen amid moist vegetation where they search for frogs, toads, salamanders, and earthworms. Occasionally they take small fish and mice. They hibernate in great numbers in community dens in this area. Ill-tempered when first captured, they will bite or expel musk, but tames quickly and soon becomes docile. Look for them sunning on the open hot areas of the trail to the old growth forest.

Life History: Garter snakes mates mostly late March to early May, occasionally in the fall, and gives birth live to 7-80 young born late June to August. The young are 5-9" long; mature in 2 years.

Canyon Lake Creek Community Forest Wildlife Identification Cards



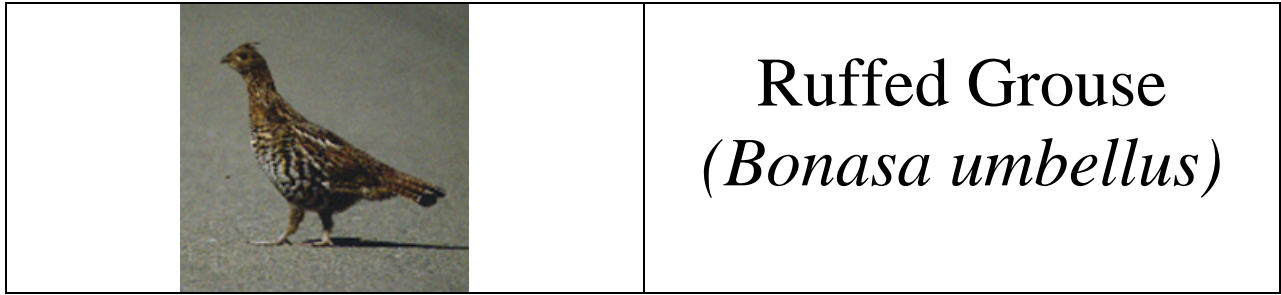
Northwestern Salamander (*Ambystoma gracile*)

Description: Northwestern salamanders are relatively large, heavy-bodied with prominent grooves on the side of its body. Their brown skin is moist and smooth; lighter colored glandular areas are behind the eyes, along the sides and on the top of the tail.

Ecology: They are seldom seen due to their use of underground burrows. Adults may be seen on the surface after rainy nights during the winter or spring so under moist logs and in crevices. Adults eat slugs and other soft-bodied invertebrates.

Life History: Breeding occurs in February and March in the lowlands but not until May or June at higher elevations. Eggs are laid in wetlands with the firm gelatinous egg masses attached to underwater stems, reeds or branches. Look for their presence along the Canyon Lake Trail – egg masses in the water in early summer or adults under moist logs summer through fall.

Canyon Lake Creek Community Forest Wildlife Identification Cards

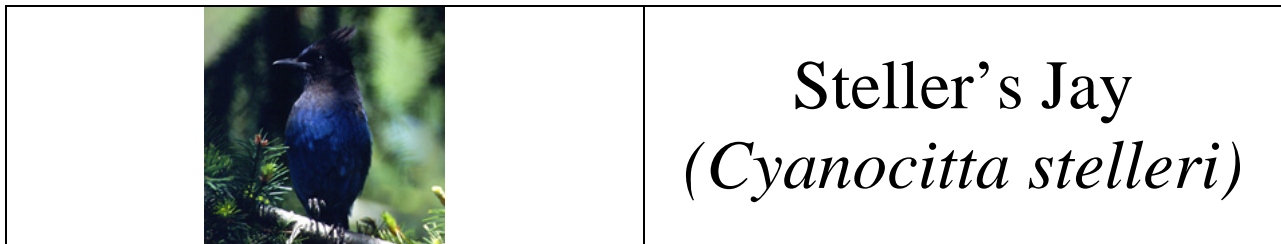


Description: Ruffed grouse are a ground-dwelling bird with a short, strong bill, feathered nostrils and short, rounded wings. Black ruffs on the sides of its neck give this bird its name. The male's tail is multi-banded with a wide, dark band near the tip (blue grouse tail is lighter near the tip); in the female the band is incomplete. The bird's length is about 15-17".

Ecology: Ruffed Grouse are found in mixed woods and hardwood forests often in small groups especially in winter and during breeding seasons. The male carries out its courtship display on a fallen log puffing out its body feathers and fanning its tail feathers. The drumming of its wings in the air can be heard great distances away. Ruffed grouse can easily be flushed as they forage on the ground for seeds, berries and buds. Look for these birds along the trail up to the Old Growth Forest grove.

Life History: One male may mate with several females and does not participate in caring for the young. The female builds a nest on the ground in dense cover, usually next to a log, rock, or at the base of a tree or shrub. The female lays and incubates 9-12 eggs. The well-camouflaged young leave the nest shortly after hatching.

Canyon Lake Creek Community Forest Wildlife Identification Cards



Description: The Steller's Jay is a striking bird with deep blue and black plumage and a long, shaggy crest. The front of its body is black, and the rear is deep blue. The black extends midway down its back and down its breast. It has faint, dark barring on its wings. Adults have blue vertical "eyebrows" above each eye. Listen for its harsh, loud *shaack* call in the lower elevation forested areas.

Ecology: Steller's Jays are omnivorous (eating plant and animal material) eating seeds, nuts and berries as well as bird eggs, small rodents and reptiles.

Life History: These birds form monogamous bonds and remain together year-round. The female incubates 4-5 eggs for 16-18 days with the young leaving the nest after 16 days. The adults continue to provide some food for up to a month after the young have fledged.

Canyon Lake Creek Community Forest Wildlife Identification Cards



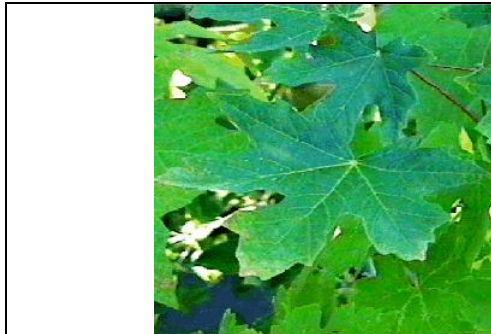
Red Alder (*Alnus rubra*)

Characteristics: Red alder is a deciduous tree that grows up to 75 ft tall. Its bark is thin, gray, and smooth, often with white patches of lichen. It has 5-inch long toothed leaves. Flowers are clusters of long brown catkins, and seeds are born in small cones.

Ecology: Red alder is aggressive, short-lived (about 50 years), and grows in moist woods, along streambanks, and in recently disturbed sites, especially those that have been burned or harvested. Red alder adds nitrogen to soil in disturbed sites, helping other plants grow.

Uses: Native Americans have traditionally used red alder wood to smoke salmon, and the inner bark to make a red dye for coloring, hence the name “red alder.” The inner bark was also used as a medicine to cure tuberculosis and other sicknesses. Red alder wood is used commercially for furniture, veneers, and pulp.

Canyon Lake Creek Community Forest Plant Identification Cards



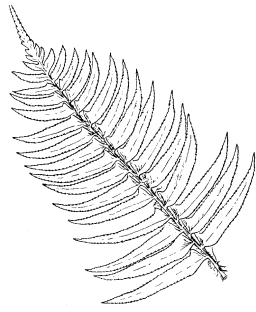
Bigleaf Maple (*Acer macrophyllum*)

Characteristics: Bigleaf maple is a large, deciduous, multi-stemmed tree, with ridged, often moss-covered, bark. These maples can grow up to 100 ft tall. Their most notable features are their 12-inch wide leaves. Leaves have smooth edges, but are deeply-lobed and look like a hand. Its fruits are brown winged seeds.

Ecology: Bigleaf maples grow on dry to moist sites, often on sites disturbed by fire or logging. Sometimes you will see clusters of licorice ferns hanging from the trunks of older bigleaf maples.

Uses: Native American peoples treated sore throats with medicine prepared from the bigleaf maple. Commercially, bigleaf maple wood is used to make furniture and for firewood.

Canyon Lake Creek Community Forest Plant Identification Cards



Sword fern (*Polystichum munitum*)

Characteristics: A large fern with tall leaves divided into many opposite leaflets; sword fern leaflets have jagged edges, and a small lobe at the bottom that looks like a sword hilt.

Ecology: Sword fern is common in moist shady forests but can survive in hotter and drier conditions.

Uses: Sword fern fronds were used by Native Americans to line traditional pit ovens, as layers between food in storage boxes, as floor coverings and as bedding. Some native peoples dug sword fern rhizomes (roots), and roasted them over a fire or steamed them in a pit oven before peeling and eating them.

Canyon Lake Creek Community Forest Plant Identification Cards



Red Elderberry (*Sambucus racemosa*)

Characteristics: Elderberry is a tall shrub with large leaves divided into 5-7 leaflets. Its flowers grow in creamy white clusters, and produce large bunches of small, bright red berries.

Ecology: Red elderberry grows along stream banks, in swampy thickets, and in moist forests.

Uses: Native Americans traditionally cooked elderberries to make sauce, a tangy jelly, or wine. NOTE: Elderberries should always be cooked before eating, because the raw berries cause nausea!

Canyon Lake Creek Community Forest Plant Identification Cards



Salal (*Gaultheria shallon*)

Characteristics: Salal is a common shrub with large alternate evergreen leathery leaves that grows to varying heights (1-10 feet tall) depending on conditions. Red or pinkish flowers will turn into dark purple/black berries

Ecology: Salal grows in drier forest understory habitats but will also tolerate exposed sunny locations. In some areas, it can also develop into impenetrable thickets

Uses: Native Americans eat the berries fresh and dry them into cakes. The berries were used to sweeten other foods and to thicken salmon eggs. Today, the berries are used for jams or preserves.

Canyon Lake Creek Community Forest Plant Identification Cards



Oval-leaved Huckleberry (*Vaccinium ovalifolium*)

Characteristics: Oval-leaved huckleberry is an erect shrub growing from 1 – 6 feet with bright green branches and alternating deciduous leaves. The pinkish to yellowish-green bell shaped flowers produce bright red round berries. Other species of *Vaccinium spp.* may be seen at higher elevations in the Community Forest. Fall leaf colors (shown here) are scarlet red and orange.

Ecology: This huckleberry grows in coniferous forests often at forest openings or edges in soils rich with decaying wood; often on stumps or logs.

Uses: The purple/black berry is used as fish bait in streams, eaten fresh or dried like raisins or stored soaked in grease or oil.

Canyon Lake Creek Community Forest Plant Identification Cards

Canyon Lake Creek Community Forest Manual

Prop Pack Suggestions

General

Fanny pack with front zippered storage pockets
Vest with pockets and pouches for easy retrieval
Official name tag
Official baseball hat
Water bottle
First Aid Kit
Sunscreen
Survival kit - The Ten Essentials
Cell phone or emergency radio
Large plastic garbage bag (rain cover or litter pickup)

Field Guides

Amphibians of Washington and Oregon, Leonard, et al
Birds of the Puget Sound Region, Morse, et al
The Butterflies of Cascadia, Pyle
Plants of the Pacific Northwest Coast, Pojar and MacKinnon
Reptiles of Washington and Oregon, Storm and Leonard

Props

Binoculars
Magnicubes
Hand lenses
Small aquatic dip net (aquatic insects)
Ice cube tray (to view macroinvertebrates)
Forceps (handling delicate items)
Bandanas (blind folds, clean-up, etc.)
Animal skull replicas (pika, bobcat, coyote)
Animal scat replicas (bobcat, coyote, cougar)
Tailor's tape measure (vinyl or cloth)
CLCCF tree cookies scanned images - laminated (showing growth rings)
Area Maps (USGS topo maps, Mt. Baker-Snoqualmie National Forest map)
Artist paper + charcoal nubs (rubblings of fossils or bark)
Pocket thermometer
Puppet (black bear)

Source for Prop Pack Supplies:

Acorn Naturalists
155 El Camino Real
Tustin, CA 92780
1-800-422-8886 Voice
1-800-452-2802 Fax
www.acornnaturalists.com

Learning More – Resource Section

Canyon Lake Creek Community Forest
Interpretive Manual

Amphibian Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**

Common Name	Scientific Name	Date Sighted
Northwestern Salamander	<i>Ambystoma gracile</i>	
Long-toed Salamander	<i>Ambystoma macrodactylum</i>	
Pacific Giant Salamander	<i>Dicamptodon tenebrosus</i>	
Rough-skinned Newt	<i>Taricha granulose</i>	
Western Red-backed Salamander	<i>Plethodon vehiculum</i>	
Ensatina	<i>Ensatina eschscholtzii</i>	
Tailed Frog	<i>Ascaphus truei</i>	
Western Toad	<i>Bufo boreas</i>	
Pacific Tree Frog	<i>Pseudacris regilla</i>	
Red-legged Frog	<i>Rana aurora</i>	
Cascades Frog	<i>Rana cascadae</i>	
Bullfrog	<i>Rana catesbeiana</i>	

Notes: *emphasis Potentially Occurring (not confirmed sightings); **emphasis Watershed (not necessarily Community Forest)

Bold = Confirmed Sighting

Source: *Canyon Lake Creek and Kenney Creek Watershed Assessment*, February 1993, Trillium Corporation and *The Headwaters Old Growth of Canyon Lake Creek*, James K. Agee and Martin Vaughn, November 1993

Please report any new or interesting sightings to one of the Land Partners or on-line at www.whatcomlandtrust.org under How to Help.

Invertebrate Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**

Common Name	Scientific Name	Date Sighted
Clodius Parnassian	<i>Parnassius clodius</i>	
Red Admiral	<i>Vanessa atalanta</i>	
Western Tiger Swallowtail	<i>Papilio rutulus</i>	

Notes: **emphasis* Potentially Occurring (not confirmed sightings); ***emphasis* Watershed (not necessarily Community Forest)

Bold = Confirmed Sighting

Source: Visitor observations

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Reptile Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**

Common Name	Scientific Name	Date Sighted
Northern Alligator Lizard	<i>Elegaria coerulea</i>	
Sharptail Snake	<i>Contina tenuis</i>	
Ringneck Snake	<i>Diadophis punctatus</i>	
Rubber Boa	<i>Charina bottae</i>	
Northwestern Garter Snake	<i>Thamnophis ordinoides</i>	
Common Garter Snake	<i>Thamnophis sirtalis</i>	

Notes: **emphasis* Potentially Occurring (not confirmed sightings); ***emphasis* Watershed (not necessarily Community Forest)

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Source: *Canyon Lake Creek and Kenney Creek Watershed Assessment*, February 1993, Trillium Corporation and *The Headwaters Old Growth of Canyon Lake Creek*, James K. Agee and Martin Vaughn, November 1993

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Mammal Species Potentially Occurring*
in the Canyon Lake Creek Watershed**

Common Name	Scientific Name	Date Sighted
Virginia Opossum	<i>Didelphis virginiana</i>	
Pacific Water Shrew	<i>Sorex palustris</i>	
Masked Shrew	<i>Sorex cinerea</i>	
Dusky Shrew	<i>Sorex monticola</i>	
Trowbridge's Shrew	<i>Sorex trowbridgii</i>	
Vagrant Shrew	<i>Sorex vagrans</i>	
Shrew Mole	<i>Neurotrichus gibbsii</i>	
Big Brown Bat	<i>Eptesicus fuscus</i>	
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	
Hoary Bat	<i>Lasiurus cinereus</i>	
California Myotis	<i>Myotis californicus</i>	
Long-eared Myotis	<i>Myotis evotis</i>	
Little Brown Myotis	<i>Myotis lucifugus</i>	
Fringed Myotis	<i>Myotis thysanodes</i>	
Long-legged Myotis	<i>Myotis volans</i>	
Snowshoe Hare	<i>Lepus americanus</i>	
Pika	<i>Ochotona princeps</i>	
Mountain Beaver	<i>Aplodontia rufa</i>	
Douglas Squirrel	<i>Tamiasciurus douglasii</i>	
Townsend's Chipmunk	<i>Eutamias townsendii</i>	
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	
Beaver	<i>Castor canadensis</i>	
Deer Mouse	<i>Peromyscus maniculatus</i>	
Bushy-tailed Woodrat	<i>Neotoma cinerea</i>	
Long-tailed Vole	<i>Microtus longicaudus</i>	
Creeping Vole	<i>Microtus oregoni</i>	
Townsend's Vole	<i>Microtus townsendii</i>	
Muskrat	<i>Ondatra zibethicus</i>	
Southern Red-backed Vole	<i>Clethrionomys gapperi</i>	
Porcupine	<i>Erethizon dorsatum</i>	
Coyote	<i>Canis latrans</i>	
Black Bear	<i>Ursus americanus</i>	
Raccoon	<i>Procyon lotor</i>	
Short-tailed Weasel	<i>Mustela erminea</i>	
Long-Tailed Weasel	<i>Mustela frenata</i>	
Mink	<i>Mustela vison</i>	
Marten	<i>Martes americana</i>	
River Otter	<i>Lutra canadensis</i>	
Striped Skunk	<i>Mephitis mephitis</i>	
Spotted Skunk	<i>Spilogale putorius</i>	
Bobcat	<i>Lynx rufus</i>	

Mammal Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**
(continued)

Common Name	Scientific Name	Date Sighted
Lynx	<i>Lynx canadensis</i>	
Cougar	<i>Felis concolor</i>	
Black-tailed Deer	<i>Odocoileus hemionus columbianus</i>	
Elk	<i>Cervus elaphus</i>	

Notes: **emphasis* Potentially Occurring (not confirmed sightings); ***emphasis* Watershed (not necessarily Community Forest)

Bold = Confirmed Sighting

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Bird Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**

Common Name	Scientific Name	Date Sighted
Common Loon	<i>Gavia immer</i>	
Pie-billed Grebe	<i>Podilymbus podiceps</i>	
Horned Grebe	<i>Podiceps auritus</i>	
Eared Grebe	<i>Podiceps nigricollis</i>	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	
American Bittern	<i>Botaurus lentiginosus</i>	
Great Blue Heron	<i>Ardea herodias</i>	
Green-backed Heron	<i>Butorides striatus</i>	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	
Canada Goose	<i>Branta Canadensis</i>	
Wood Duck	<i>Aix sponsa</i>	
Green-winged Teal	<i>Anas crecca</i>	
Mallard	<i>Anas platyrhynchos</i>	
Harlequin Duck	<i>Histrionicus histrionicus</i>	
Common Merganser	<i>Mergus merganser</i>	
Hooded Merganser	<i>Lophodytes cucullatus</i>	
Ruddy Duck	<i>Oxyura jamaicensis</i>	
Turkey Vulture	<i>Cathartes aura</i>	
Osprey	<i>Pandion haliaetus</i>	
Bald Eagle	<i>Haliaeetus leucocephalus</i>	
Golden Eagle	<i>Aquila chrysaetos</i>	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	
Cooper's Hawk	<i>Accipiter cooperii</i>	
Northern Goshawk	<i>Accipiter gentillis</i>	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	
American Kestrel	<i>Falco sparverius</i>	
Merlin	<i>Falco columbarius</i>	
Ringed-necked Pheasant	<i>Phasianus colchicus</i>	
Spruce Grouse	<i>Dendragapus canadensis</i>	
Ruffed Grouse	<i>Bonasa umbellus</i>	
Mountain Quail	<i>Oreortyx picus</i>	
Virginia Rail	<i>Rallus limicola</i>	
Sora	<i>Porzana Carolina</i>	
American Coot	<i>Fulica caribaea</i>	
Black-bellied Plover	<i>Pluvialis squatarola</i>	
Greater Yellowlegs	<i>Tringa melanoleuca</i>	
Lesser Yellowlegs	<i>Tringa flavipes</i>	
Long-billed Curlew	<i>Numenius americanus</i>	
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	
Wilson's Phalarope	<i>Phalaropus tricolor</i>	

Bird Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**
(continued)

Common Name	Scientific Name	Date Sighted
Ringed-billed Gull	<i>Larus delawarensis</i>	
Glaucous-winged Gull	<i>Larus glaucescens</i>	
Common Tern	<i>Sterna hirundo</i>	
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	
Band-tailed Pigeon	<i>Columba fasciata</i>	
Mourning Dove	<i>Zenaidura macroura</i>	
Common Barn-owl	<i>Tyto alba</i>	
Western Screech Owl	<i>Otus kennicottii</i>	
Great Horned Owl	<i>Bubo virginianus</i>	
Northern Pygmy Owl	<i>Glaucidium gnoma</i>	
Northern Spotted Owl	<i>Strix occidentalis</i>	
Barred Owl	<i>Strix varia</i>	
Vaux's Swift	<i>Chaetura vauxi</i>	
Rufous Hummingbird	<i>Selasphorus rufus</i>	
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	
Hairy Woodpecker	<i>Picoides villosus</i>	
Northern Flicker	<i>Colaptes auratus</i>	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	
Olive-sided Flycatcher	<i>Nuttallornis borealis</i>	
Western Wood-Pewee	<i>Contopus sordidulus</i>	
Willow Flycatcher	<i>Empidonax trailii</i>	
Hammond's Flycatcher	<i>Empidonax hammondi</i>	
Pacific-slope Flycatcher	<i>Empidonax difficulus</i>	
Horned Lark	<i>Eromophila alpestris</i>	
Purple Martin	<i>Progne subis</i>	
Tree Swallow	<i>Tachycineta bicolor</i>	
Violet-green Swallow	<i>Tachycineta thalassina</i>	
Northern Rough-winged Swallow	<i>Stegidopteryx serripennis</i>	
Barn Swallow	<i>Hirundo rustica</i>	
Gray Jay	<i>Perisoreus canadensis</i>	
Steller's Jay	<i>Cyanocitta stelleri</i>	
Clark's Nutcracker	<i>Nucifraga Columbiana</i>	
American Crow	<i>Corvus brachyrhynchos</i>	
Common Raven	<i>Corvus corax</i>	
Black-capped Chickadee	<i>Parus atricapillus</i>	
Chestnut-backed Chickadee	<i>Parus refescens</i>	
Bushtit	<i>Psaltriparus minimus</i>	
Red-breasted Nuthatch	<i>Sitta Canadensis</i>	
Bewick's Wren	<i>Thryomanes bewickii</i>	
House Wren	<i>Troglodytes aedon</i>	

Bird Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**
(continued)

Common Name	Scientific Name	Date Sighted
Winter Wren	<i>Troglodytes troglodytes</i>	
American Dipper	<i>Cinclus mexicanus</i>	
Golden-crowned Kinglet	<i>Regulus satrapa</i>	
Ruby-crowned Kinglet	<i>Regulus calendula</i>	
Western Bluebird	<i>Sialia mexicana</i>	
Townsend's Solitaire	<i>Myadestes townsendi</i>	
Hermit Thrush	<i>Catharus guttatus</i>	
American Robin	<i>Turdus migratorius</i>	
Varied Thrush	<i>Ixoreus naevius</i>	
Bohemian Waxwing	<i>Bombycilla garrulous</i>	
Cedar Waxwing	<i>Bombycilla cedrorum</i>	
Northern Shrike	<i>Lanius excubitor</i>	
European Starling	<i>Sturnus vulgaris</i>	
Solitary Vireo	<i>Vireo solitarius</i>	
Hutton's Vireo	<i>Vireo huttoni</i>	
Warbling Vireo	<i>Vireo gilvus</i>	
Orange-crowned Warbler	<i>Vermivora celata</i>	
Yellow-rumped Warbler	<i>Dendroica coronata</i>	
MacGilvary's Warbler	<i>Oporornis tolmei</i>	
Common Yellowthroat	<i>Geothlypis trichas</i>	
Wilson's Warbler	<i>Wilsonia pusilla</i>	
Western Tanager	<i>Piranga ludoviciana</i>	
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	
Lazuli Bunting	<i>Paserina amoena</i>	
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	
Chipping Sparrow	<i>Spizella passerine</i>	
Vesper Sparrow	<i>Pooecetes gramineus</i>	
Savannah Sparrow	<i>Passerculus sandwichensis</i>	
Fox Sparrow	<i>Passerella iliaca</i>	
Song Sparrow	<i>Melospiza melodia</i>	
Lincoln's Sparrow	<i>Melospiza lincolni</i>	
Golden-crowned Sparrow	<i>Zonotrichia arricapilla</i>	
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	
Dark-eyed Junco	<i>Junco hyemalis</i>	
Western Meadowlark	<i>Sturnella nelgecta</i>	
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	
Brown-headed Cowbird	<i>Molothus ater</i>	
Northern Oriole	<i>Iceterus galbula</i>	
Red Crossbill	<i>Loxia curvirostra</i>	

Bird Species **Potentially** Occurring*
in the Canyon Lake Creek Watershed**
(continued)

Common Name	Scientific Name	Date Sighted
House Finch	<i>Carpodacus mexicanus</i>	
White-winged Crossbill	<i>Loxia leucoptera</i>	
Evening Grosbeak	<i>Hesperiphona vespertina</i>	

Notes: **emphasis* Potentially Occurring (not confirmed sightings); ***emphasis* Watershed (not necessarily Community Forest)

Bold = Confirmed Sighting

Source: *Canyon Lake Creek and Kenney Creek Watershed Assessment*, February 1993, Trillium Corporation and *The Headwaters Old Growth of Canyon Lake Creek*, James K. Agee and Martin Vaughn, November 1993

Listing order based on Washington Ornithological Society Field Card of Washington Birds

Please report any new or interesting sightings to one of the Land Partners or on-line at www.whatcomlandtrust.org under How to Help.

Canyon Lake Creek Community Forest Canyon Lake Plant Communities

Characteristics of Canyon Lake

The flooded area is 3400 feet long, 45 acres and a maximum depth of about 100 feet. The water deepens abruptly at the shoreline and second growth trees and shrubs overhang much of the water's edge. Most aquatic plants are limited to a few narrow strips near the shore. Exceptions are pondweed (*Potamogeton epihydrous*) and even fewer, floating pondweed (*Potamogeton natans*) growing on logs far from shore. Upland plants, especially oval-leafed huckleberry (*Vaccinium ovalifolium*) grow at the tops of tall stumps. The huckleberries probably grew from seeds dropped by birds perching there.

Habitats of special interest occur at both ends of the lake and are detailed in **Tables I and II**.

Log and Log-bog Habitats at Northwest End of Canyon Lake

The floating/stranded log and log/bog complex illustrates the transition from a pioneer plant habitat to a mature log/bog plant habitat. A number of species are the same or quite similar to those observed in other lakes – Lily and Lizard Lakes, Pine Lake, Lost Lake of Larrabee Park and Cabin Pond of Hannegan Road. *Tofieldia* (*Tofieldia glutinosa*), a species usually found in sub-alpine meadows, is unusual. (See **Table I**)

Other Northwest End Habitats of Canyon Lake

The lake access and boat launch area has been disturbed by foot traffic and several species of alien, weedy plants are present. In contrast, a small wetland immediately northwest of the boat launch area is still undisturbed and has a population of sedges. Only three species of aquatic plants are found in a narrow strip offshore. (See **Table I**)

Delta Habitat at the Southeast End of Canyon Lake

Canyon Creek flows into Canyon Lake at the southeast end where it is building a young delta that is sparsely populated by plants. Sediments evidently were deposited on top of logs and the water depth increases abruptly at the edge of the surface delta. The main Canyon Creek channel is on the southwest side where gravel forms the delta. There is a minor tributary of Canyon Creek on the southeast side, and there mud forms most of the delta.

Coastal mugwort (*Artemisia suksdorfii*) and pink monkey-flower (*Mimulus lewisii*), a sub-alpine species, have colonized the delta.

In 2000, spring water starwort (*Callitriche verna*) was observed. This species has not been reported in Whatcom County since Leona Sundquist found it in Lake Whatcom nearly 25 years ago. The starwort was growing at the water's edge, both offshore and onshore. Those plants on land evidently were stranded in mud when the lake level dropped. The plants offshore were growing in mud on top of a sunken log at a depth of 3 - 4 feet, and in association with a pondweed (*Potamogeton epihydrous*). Neither the log nor the plants could be found in 2001. (See **Table II** for details)

Differences between 2000 and 2001 Lists

Differences between the 2000 and 2001 plant lists for Canyon Lake were due to substantial changes in the delta in Canyon Lake since year 2000. In 2000, the main flow of the creek was in the western channel. At the time of a field visit in 2001, the western channel no longer carried most of the flow. The abrupt edge of the delta on land greatly changed and the large population of spring water-starwort (*Callitriche terrestis*) in 2000 had disappeared.

The west side of the lake was studied for the first time in 2001. The 2000 study of maturation of habitats on floating and stranded logs was not repeated.

Acknowledgements

Plant habitat descriptions and plant lists were compiled by Al Hanners and Marie Hitchman of the Washington Native Plant Society.

Canyon Lake Creek Community Forest Canyon Lake Plant List

TABLE I

Plants of the Northwest End of Canyon Lake

Field Observation 8/4/00 – 8/5/00

Legend for Table I

- Northwest Habitats
 - A Floating and stranded logs, and floating log/bog islands.
 - B Damp, undisturbed shoreline immediately northwest of boat launch area.
 - C Drier, disturbed, boat launch area.
 - D Lake near shore

- Approximate first appearance of plant species only in Habitat A, a transitional continuum from pioneer conditions to mature log/bog conditions.
 - 1 Pioneer
 - 2 Early Transitional
 - 3 Late Transitional
 - 4 Maturity

- Approximate abundance in designated habitat.
 - a abundant
 - c common
 - o occasional
 - s scarce

		A	B	C	D
ARACEAE					
Lysichiton americanum	skunk cabbage	4s			
ASTERACEAE					
Chrysanthemum leucanthemum (Lecanthemum vulgare) (Alien)	ox-eye daisy			c	
BETULACEAE					
Alnus rubra	red alder	3s	c	o	
BORAGINACEAE					
Myosotis laxa	small-flower forget-me-not	2o			
CAPRIFOLIACEAE					
Lonicera involucrata	black twinberry			o	

CYPERACEAE		2s			
Carex canescens			c		
Carex deweyana		2c	c		
Carex lenticularis		1c			
Carex leptalea		2s			
Carex limosa			o		
Carex stipata					
DROSERACEAE					
Drosera rotundifolia	round-leaved sundew	1ca			
EQUISETACEAE					
Equisetum fluviatile	water horsetail				c
ERICACEAE					
Rhododendron groenlandicum (Ledum groenlandicum)	Labrador tea	3c			
GROSSULARIACEAE					
Ribes lacustre	swamp currant			o	
IRIDACEAE					
Iris pseudacorus (Alien)	yellow flag			o	
JUNCACEAE					
Juncus ensifolius		2s			
LAMIACEAE (Labiatae)					
Lycopus uniflora	northern bugleweed	2o			
Prunella vulgaris (Alien)	heal all			c	
LILIACEAE					
Tofieldia glutinosa	tofieldia	3s			
NYMPHAEACEAE					
Nuphar luteum ssp polysepalum	yellow pond lily				o
ONAGRACEAE					
Epilobium watsonii	Watson's willow- herb			o	

PINACEAE					
Tsuga heterophylla	western hemlock		c	c	
POLYGONACEAE					
Rumex obtusifolius	broad-leaved dock	3s			
POTAMOGETONACEAE					
Potamogeton natans	floating pondweed				o
RANUNCULACEAE					
Ranunculus repens (Alien)	creeping buttercup			o	
ROSACEAE					
Geum macrophyllum	large-leaved avens			o	
Potentilla palustris	marsh cinquefoil	2o			
Rubus parviflorus	thimbleberry			o	
SALICACEAE					
Salix lucida var. lasiandra	Pacific willow			o	
Salix sitchensis	Sitka willow	4s		o	
MOSS					
Calliergon giganteum		1c			
Sphagnum sp.		3c			

Canyon Lake Creek Community Forest
Canyon Lake Plant List

TABLE II

Plants of the Delta – Southeast End of Canyon Lake

Field Observation 8/4/00

Legend for Table II

- A Southwest side of delta, gravel deposited by main channel of Canyon Creek
- B Southwest side of delta, mud deposited by minor tributary of Canyon Creek
- C Lake close to the abrupt delta shoreline at a muddy log on the muddy side of the delta

- a abundant
- o occasional
- s scarce

		A	B	C
ASTERACEAE				
Anaphalis margaritacea	pearly everlasting	s		
Artemisia suksdorfii	coastal mugwort	s		
Chrysanthemum leucanthemum (Leucanthemum vulgare) (Alien)	ox-eye daisy	o	o	
BETULACEAE				
Alnus rubra	red alder	o		
CALLITRICHACEAE				
Callitriche verna	spring water-starwort		a	a
CYPERACEAE				
Scirpus microcarpus	small-flowered bulrush		o-a	
JUNCACEAE				
Juncus ensifolius			o	
ONAGRACEAE				
Epilobium watsonii	Watson's willow-herb		o	
POLYGONACEAE				
Rumex obtusifolius	broad-leaved dock		o	

POTAMOGETONACEAE				
Potamogeton epihydrous				o
SALICACEAE				
Salix lucida var. lasiandra	Pacific willow		o	
Salix sitchensis	Sitka willow	o		
SCROPHULARIACEAE				
Digitalis purpurea	foxglove		o	
Mimulus lewisii	pink monkey-flower		s	
Veronica americana	American brookline		s	

Canyon Lake Creek Community Forest Canyon Lake Plant List

Field Observation 8/7/01 & 11/10/01

Legend

On logs – floating and stranded logs, the habitats ranging from pioneer to mature.

In lake – submergent and emergent plants

On bluff – within the “splash” zone near the shoreline

On land – delta above the shoreline, the soil ranging from muddy to gravelly.

- c - common
- o - occasional
- s - scarce

		SW Side			SE Delta	
		On Logs	In Lake	On Bluff	On Land	In Lake
APIACEAE						
Heracleum lanatum	cow parsnip			s		
ARACEAE						
Lysichiton americanum	skunk cabbage	o				
ASTERACEAE						
Arnica amplexicaulis	streambank arnica				s	
Artemisia suksdorfii					o	
Chrysanthemum leucanthemum	ox-eye daisy				o	
(Lecanthemum vulgare)	Canada thistle				s	
Cirsium arvense	bull thistle				s	
Cirsium vulgare	coltsfoot				o	
Petasites palmate						
BETULACEAE						
Alnus rubra	red alder	o		c	o	
BORAGINACEAE						
Myosotis laxa	small-flower forget-me-not				s	

CALLITRICHACEAE Callitriche heterophylla	different-leaved water-starwort		c			c
CAPRIFOLIACEAE Lonicera involucrate	black twinberry			c		
CYPERACEAE Carex canescens Carex lenticularis Carex leptalea Carex limosa Carex mertensii Carex stipata		s c c s s s			s s	
DROSERACEAE Drosera rotundifolia	round-leaved sundew	o				
ERICACEAE Rhododendron groenlandicum (Ledum groenlandicum) Vaccinium ovalifolium	Labrador tea oval-leaf huckleberry	o s				
GROSSULARIACEAE Ribes bracteosum Ribes lacustre	stink currant swamp currant			s s		
JUNCACEAE Juncus ensifolius Juncus oxymers	tapered rush pointed rush	c			o	
LAMIACEAE (LABIATAE) Lycopus sp. Prunella vulgaris	bugleweed heal all	o o			s	
LILIACEAE Lilium columbianum Tofieldia glutinosa	tiger lily tofieldia	s c				

LYCOPODIACEAE						
Huperzia selago (Lycopodium selago)		o				
Lycopodium annotinum		s		c		
NYMPHAEACEAE						
Nuphar luteum ssp polysepalum	yellow pond lily		o			
POLYPODIACEAE						
Athyrium felix-femina	lady fern	s		c		
Gymnocarpium dryopteris	oak fern			s		
PORTULACACEAE						
Montia parvifolia	small-leaved montia				s	
Montia sibirica	Siberian miner's lettuce			s		
RANUNCULACEAE						
Aquilegia Formosa	red columbine	s				
ROSACEAE						
Aruncus sylvestris	goatsbeard			s		
Geum macrophyllum	large-leaved avens				s	
Rubus parviflorus	thimbleberry			s		
Rubus pedatus	five-leaved bramble			s		
Robus spectabilis	salmonberry			c		
RUBIACEAE						
Galium trifidum	small bedstraw	s				
SALICACEAE						
Salix lucida var. lasiandra	Pacific willow			s	o	
Salix sitchensis	Sitka willow			o	o	
SAXIFRAGACEAE						
Heuchera micrantha	small-flowered alumroot				s	
Saxifraga ferruginea	rusty saxifrage				s	
Tolmiea menziesii	youth-on-age				s	

SCOPHULARIACEAE					s	
Mimulus guttatus	yellow monkey-flower				s	
Mimulus lewisii					s	
Veronica Americana	American brooklime					
VIOLACEAE						
Viola macloskeyi	small white violet	o				
MOSS						
Calliergon giganteum		c				
Fontinalis antipyretica	water moss	s				
Sphagnum sp.		c				
PLANT-LIKE ANIMAL						
Freshwater sponge		s				

Canyon Lake Creek Community Forest Historical Timeline

Date	Events
10,000 BP	Continental glacier retreats north of the US/Canada border - development of modern landscape begins (<i>Mustoe 2003</i>) Note: BP = Before Present
1170 BP	Large scale disturbance, possibly a fire, moves through Canyon Lake Creek, instigating a new growth of trees (<i>Agee 1993</i>) Note: BP = Before Present
1186 BP	Present old growth Alaska yellow-cedar start growing in Canyon Lake Creek valley (<i>Agee 1993</i>) Note: BP = Before Present
1410	Patchy forest fire moves through Canyon Lake Creek favoring Alaska yellow-cedar and to some extent mountain hemlock (<i>Agee 1993</i>)
1560	Localized disturbance in Canyon Lake Creek, possibly a wind disturbance since a large pulse of Pacific silver fir start at about the same time (<i>Agee 1993</i>)
1750	Climate begins to warm from Little Ice Age
1790s	S'-yah-whom was the chief of a 500 member tribe centered on Samish Island; settlers later adapt his name as Sehome
1791	Captain Francisco Elisa (Spain) surveys the coastal islands naming them Isla y Archipelago de San Juan or San Juan Islands
1792	Captain George Vancouver arrives at Cape Flattery, begins to map Washington coast continuing until 1794; first mention of Mt. Baker, named for his 3 rd lieutenant who first called it to his attention
1805	Lewis and Clark Expedition reach Pacific Ocean via the Columbia River
1858	A party of Whatcom residents namely Land, Tennant, Bennett, Wood and Cagney go on an expedition to explore the South Fork of the Nooksack River. Frederick F. Lane keeps a diary for the party. After coming to the camp of Hump-chalum, tyee (chief) of the Nooksack (near present day Deming), the party splits up. Land heads back to Whatcom with half of the party. The rest of the group heads up the Middle Fork (near Canyon Lake Creek) to prospect further. No one kept records.
1868	Edmund Coleman, on his way to summit Mt. Baker, writes about the chief of the Mountain Nooksacks: "Ump-tla-um (also written Hump-cha-lum) is a venerable looking man; and though, somewhat short in stature, looks every inch a chief. He is benign and intelligent in aspect." His winter quarters were located on the west bank of the South Fork. His sphere of influence included the country of the three forks of the Nooksack River. And the environs of Mt. Baker and the Sister Range. (<i>Jeffcott 43</i>)
1872	Magnitude 7.1 - 7.4 earthquake strikes North Cascades possibly causing landslide that blocks Canyon Creek and forms Canyon Lake (<i>Mustoe 2003</i>)
1884	Mt. Baker expedition by five Whatcom County residents - Bales, Denehie, Lowe, Graham and Crossman. Went up the South Fork and returned by way of the Middle Fork but other than mentioning the plentiful mountain goats, no description of landscape matching Canyon Lake is given
1900's	Railroad logging begins in the Canyon Lake Creek basin
1903	The three growing towns of Fairhaven, Whatcom and Sehome merge and become Bellingham

- 1915 Parcel of land in the Basin purchased by Madeline M. Flick from Northern Pacific Railroad
- 1930 Logging roads now reach up into the lower elevation below Canyon Lake
- 1935 Civilian Conservation Corps (CCC) builds 40-foot wide forest protection road over old railroad grade
- 1942 Ownership of watershed by Soundview Pulp and Paper, Buffelen Co., Madeline M. Flick, Whatcom County and Washington State
- 1947 First aerial photos show Canyon Lake Creek unlogged
- 1951 Soundview Pulp and paper merges with Scott Paper Co., property ownership transferred to Scott Paper
- 1955 Aerial photography shows logging starting around Canyon Lake
- 1974 Nooksack Indian Tribe recognized by federal government as a self governing tribe
- 1989 CCLCF land ownership passes from Scott Paper Co. to Crown Pacific
- 1992 Washington State Department of Natural Resources trades land in area to Trillium Corporation
- 1993 Most of Canyon Lake Creek Watershed comes under the ownership of Trillium Corporation; last clear cut done in Canyon Lake Creek basin
- 1993 Technical Report by Dr. James Agee (UW) is released that describes the old growth parcel on-site as “one of the oldest forest stands in the PNW and one the largest intact stands of its age” (*Agee*)
- 1996 The Trust for Public Land negotiates an Option to Buy the majority of old growth forest in Canyon Lake Basin from Trillium.
- 1996 Trillium Corporation sells (eventual Community Forest) land to Crown Pacific, along with the Option to Trust for Public Land.
- 1997 Whatcom Land Trust, Trust for Public Land, and Whatcom County agree to purchase all of Crown’s ownership in the Canyon Lake Creek Basin, approx 2,260 acres.
- 1998 Whatcom Land Trust raises nearly \$3.7 million to purchase Canyon Lake Creek Community Forest from Crown Pacific and signs a conservation easement to protect the land; Whatcom County and Western Washington University become co-owners
- 2000 Logging road to upper elevation of the Community Forest is decommissioned to a hiking trail with assistance of Crown Pacific; trail along southern edge of Canyon Lake is completed
- 2001 Canyon Lake Creek Community Forest officially opens to public access for research, education and passive recreation

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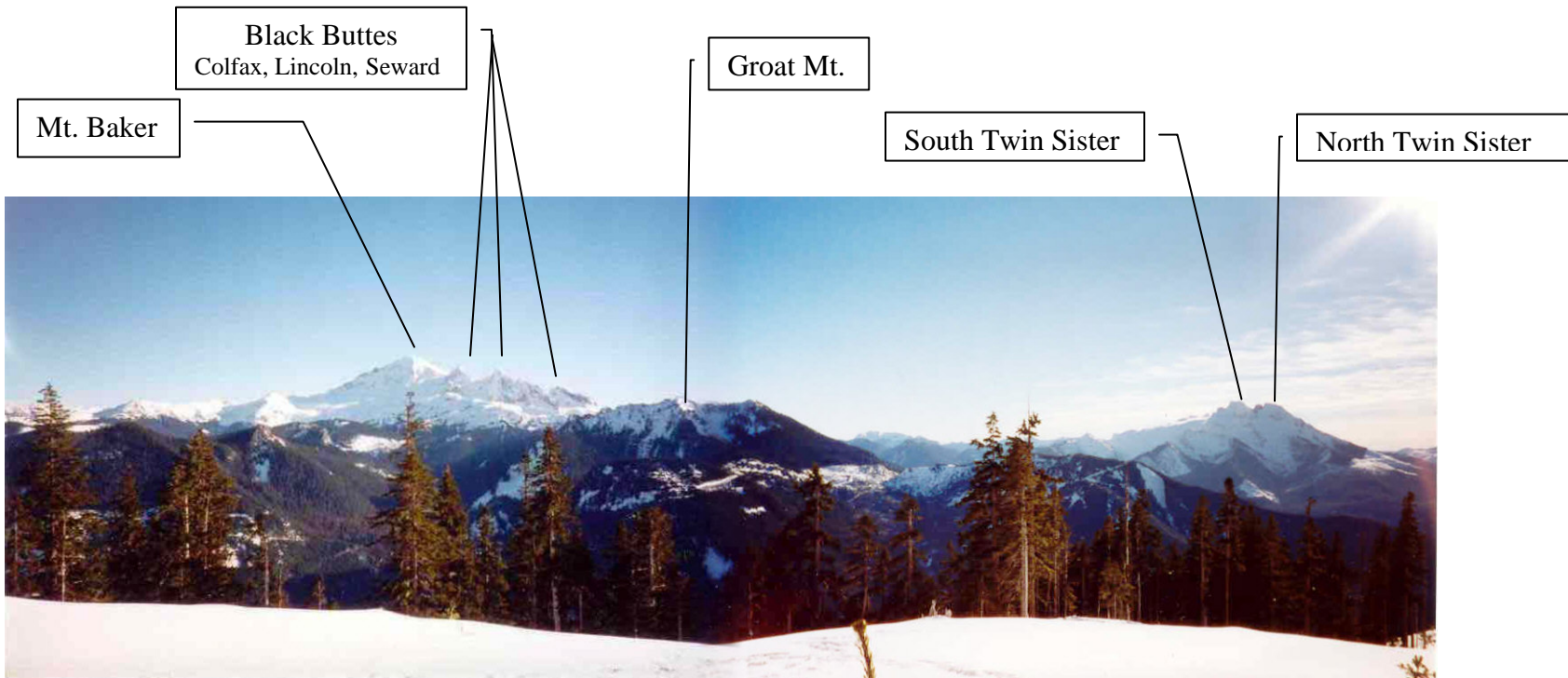
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Canyon Lake Creek Community Forest

Eastern Panoramic View from Ridgetop above Old Growth Forest



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