Bunchgrass Prairie Nature Trail

Lake Roosevelt
National Recreation Area

National Park Service
U.S. Department of the Interior

Welcome to the Bunchgrass Prairie Web of Life!

Here at Spring Canyon, you are on the edge of a bunchgrass prairie, an excellent example of a **SHRUB-STEPPE ECOSYSTEM** that once covered over 24,000 square miles – almost all of eastern Washington. By the early 20th century the region's rich soils were discovered to be ideal for dry land wheat farming and today very little of the shrub-steppe ecosystem remains. Exotic or non-native grasses and plants now thrive here, most without any natural enemies. These exotics threaten what remains of the original ecosystem, including Lake Roosevelt National Recreation Area's bunchgrass prairie. What remains is a unique diversity of flora and fauna that have adapted to the hot, dry summers and long, cold winters.

Use all your senses. Look for signs of other ecosystem inhabitants– mammals, birds, and reptiles. Find a quiet bench or rock and sit awhile and enjoy the sights and sounds around you. Relax, and discover this special web of life.

Words to Know

SHRUB-STEPPE ECOSYSTEM–large shrubs, a rich mix of wildflowers, and a mixture of native bunchgrasses.

ecosystem–all living and nonliving things in an environment, including their interactions with each other.

steppe–arid land with vegetation, requiring a small amount of moisture, usually in regions of extreme temperature range and **loess** soil.

loesss–silt, clay and dust, originating as glacial sediment, but re-deposited by wind. Wind-blown silt.

How to use this guide

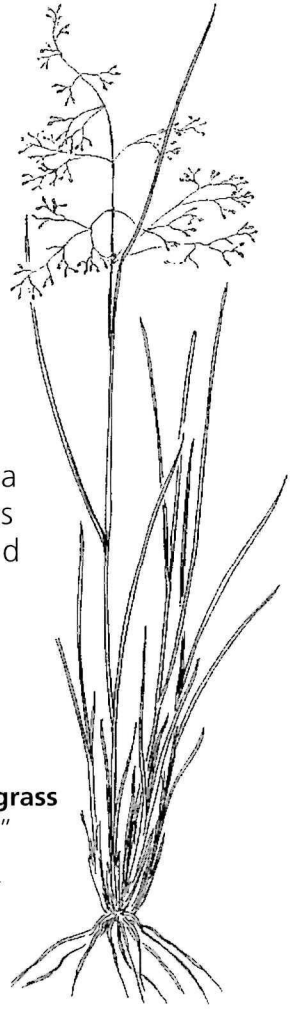
- Take this guide with you as you stroll along the 1/2-mile Bunchgrass Prairie Trail which has a slight elevation gain. Stop at the numbered posts and read the corresponding information in this guide.
- DO NOT remove any objects and or native plants from the grounds. They are protected.
- **CAUTION!** This environment supports *Crotalus viridis oreganus*, the Northern Pacific RATTLESNAKE! Stay alert. Look carefully where you step, sit, or put your hands.
- Watch out for PRICKLY PEAR CACTUS too! Brushing against these small spiked plants can be very painful. It is best to wear loose-legged pants and sturdy walking shoes. Sandals and, especially, bare feet should be avoided.
- When walking or hiking remember to take water with you.
- **STAY ON THE TRAIL**. The dirt around you is a living crust called "biological soil crust," which covers much of the arid desert and coulee country of Eastern Washington. These soil crusts are a unique and fragile feature of the Lake Roosevelt shrub-steppe vegetation community. This black and sometimes knobby looking crust is dominated by cyanobacteria (one of the oldest known life forms), but also includes lichens, mosses, green algae, microfungi and bacteria. These crusts help stabilize and bind soil materials which helps prevent both wind and water erosion. The cyanobacteria is a known nitrogen fixer which aids in plant growth, especially in desert environments.

Once these soil crusts are busted, they may never fully recover, erosion quickly carries away top soil, vegetation, and the biological crust.

Please, Don't Bust the Crust!

western needlegrass
10″ - 16″

1. A solid foundation is necessary for anything to survive hot, dry summers and long, cold winters in eastern Washington. Surrounding you are several types of bunchgrasses that provide such a foundation for this special web of life. These perennial plants have dense basal tussocks (ground leaves) that hold the shifting sandy soils so other plants and animals can find a home. The deep root system serves as long straws to soak up water from deep underground. There are several varieties of bunchgrasses along this trail. **Indian rice grass**, *Oryzopsis hymenoides*, which has a soft, feathery crown, has been gathered, dried and ground into flour for thousands of years.



Indian rice grass
10″ - 20″

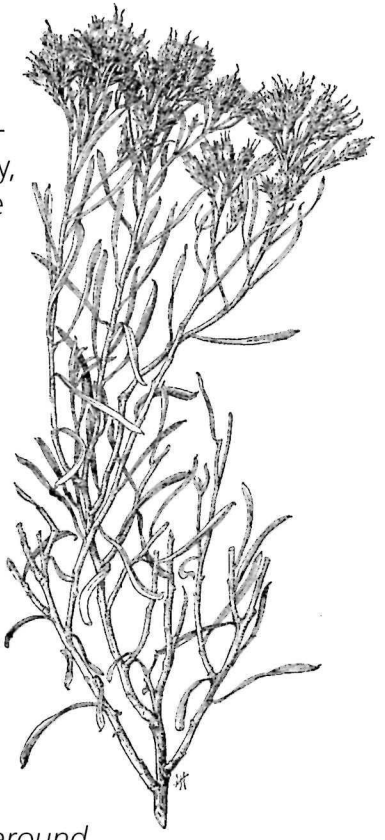
Also commonly seen is **western needlegrass**, *Stipa occidentalis*, which has long twisted awns, or heads, attached to each seed that resemble a cluster of miniature spears. *How would the seed of this plant be scattered?*

An easily recognized bunchgrass introduced from Russia is the **crested wheatgrass**, *Agropyron spicatum* (see drawing on back page). Many of these bunchgrasses are still woven by local Native Americans into large drying mats for their summer berry harvest.

cheat grass
12" - 24"

2. Cheat grass, *Bromus tectorum*, is a low-growing annual grass with long nodding spikelets. Cheat grass is an exotic, or non-native grass from Europe that was used by railroad companies in the late 1800s because it's quick growing and prevents erosion on steep slopes. Do not let its lush green appearance in spring and fall fool you! Since cheat grass seeds germinate in both seasons, and because it has few natural enemies, it successfully competes against native grasses. Cheat grass is now taking over much of the open plateau lands throughout the West. It's sharp, barbed seeds cause infections in livestock and stick in your socks.

3. Horsebrush, *Tetradymia canescens*, is the smaller pale grayish-green shrub with tiny, narrow leaves before you. In spring, its tiny yellow flowers form in groups of four per head. This plant resembles the larger **rabbit brush**, *Chrysothamnus nauseousus*, which varies in size, has darker, thin green leaves, sometimes sticky stems and blooms in late summer or early fall. By looking at rabbit brush's Latin name you discover that this plant doesn't taste very good. *If rabbits don't eat this plant, why do you think it is called rabbit brush?* Both plants, members of the sunflower family, have a waxy coating on their narrow leaves for protection against water loss. *Can you find other plants around you that display examples of desert adaptation?*



rabbit brush
1" - 4"

4. Spring Bloomers. With warming springtime temperatures and drenching rains, these hillsides reawaken with beautiful wildflowers, particularly the bright bluish **purple lupine**, *Lupinus sericeus,* which also attract blue butterflies. Their leaves have tiny hairs to prevent water loss. Springtime is not the only time of year these hillsides are in bloom. Look closely, for throughout the entire summer and fall, you can see at least one species of plant in bloom.

silky lupine
8″ - 20″

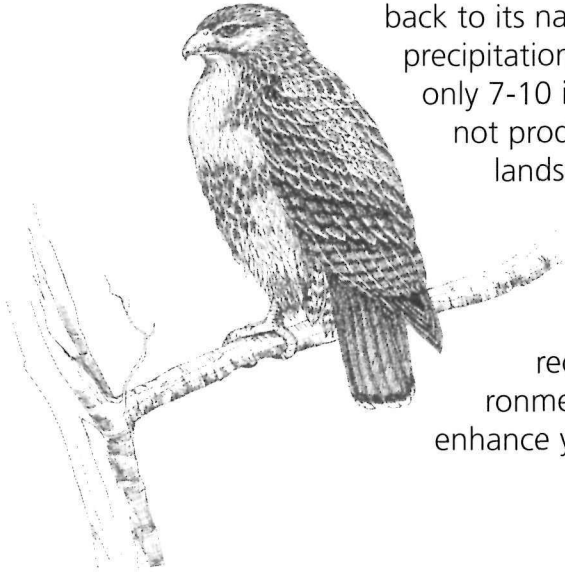
5. Gently straighten the broad leaf of the plant below you and look down its stem and discover how the **arrowleaf balsamroot**, *Balsamorhiza sagittata*, got its name. The hairs and light color of the large leaves help prevent water loss, but when the temperatures get too hot, its leaves die back. Balsamroot grows best when it can catch the afternoon sun and use shady mornings to absorb the dew from cooler air. The yellow heads of this plant resemble a small sunflower, which is a related species. Like many other spring bloomers in the Shrub Steppe, Native Americans traditionally eat the roots of this plant for its nutritious or flavoring properties.

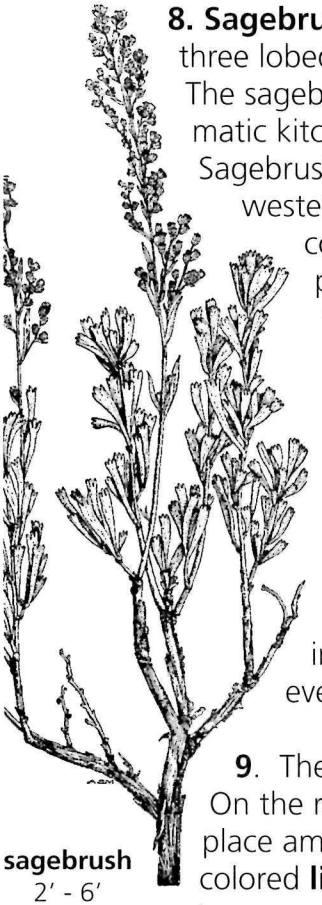
arrowleaf balsamroot
8″ - 32″

6. Gullies and other drainage areas in arid climatic regions will often support plants that could not survive on the more vulnerable hillsides. A relatively greater supply of ground water, shade and protection allow the **wild rose**, *Rosa woodsil*, to grow here. The fragrant pink flowers of spring, along with its red "hips" (the fruit) and ever-present finger "prickers" help to identify this plant. Look down the gully and try to locate the large sweeping leaves of the giant wild rye, *Elymus cinereus*, another of the many bunchgrasses. *Can you find other plants in this small ravine not found elsewhere on the trail?*

wild rose
3' - 7'

7. Look around you. Notice the stark contrast between the campground vegetation and the natural bunchgrass and shrub steppe environment. The National Park Service (NPS) has encouraged tree and lawn growth through regular watering. Many think it is an oasis in the middle of a desert, but left alone the vegetation would soon die and the area revert back to its natural state. The normal precipitation of the shrub steppe is only 7-10 inches a year and would not produce the lush green landscape below that helps cool visitors and provides shade in an otherwise harsh environment. As you recreate, enjoy this environment the NPS provides to enhance your experience.

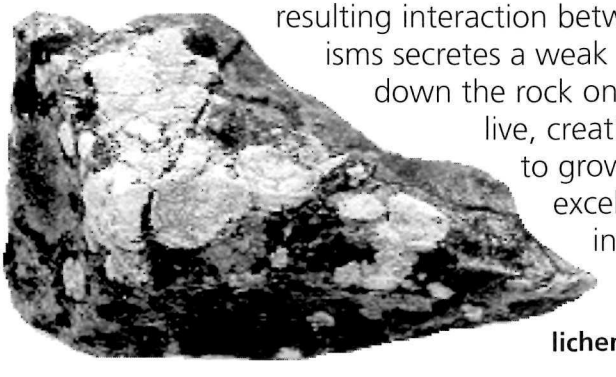




sagebrush
2′ - 6′

8. Sagebrush, *Artemisa tridenta*. Gently rub the three lobed leaves between your fingers and smell. The sagebrush gets its name from the similar aromatic kitchen sage, which is not a related species. Sagebrush is probably the most common shrub of western North America, yet on this trail it is less common perhaps due to slightly more precipitation and different chemicals within the soil. The limited surface area of its smaller leaves, their light color, and profuse "hairiness" all help hold life-giving moisture absorbed by the sagebrush's remarkably extensive and efficient root system. Native Americans learned long ago of the sagebrush's many uses. Today, many native cultures continue to use sagebrush for seasoning in cooking or as a medicinal herb, tea, and even hair tonic.

9. There are many levels within any ecosystem. On the rocks below, a fascinating drama is taking place among the crusty green, brown and orange-colored **lichens**. Lichens are actually made up of two organisms, a host alga and a more parasitic fungus. The alga provides fixed carbon as a by-product of photosynthesis. The fungus provides a habitat for the alga as well as pigments that aid in photosynthesis. Once viewed by biologists as a happy relationship, or symbiosis, there is now compelling evidence to suggest that the fungus act more like a master and the alga as slave. Yet both seem to find benefit in the other. The resulting interaction between the two organisms secretes a weak acid that breaks down the rock on which the lichens live, creating soil for the plants to grow. Lichens are an excellent example of the interwoven needs within each web of life.



lichens on rocks

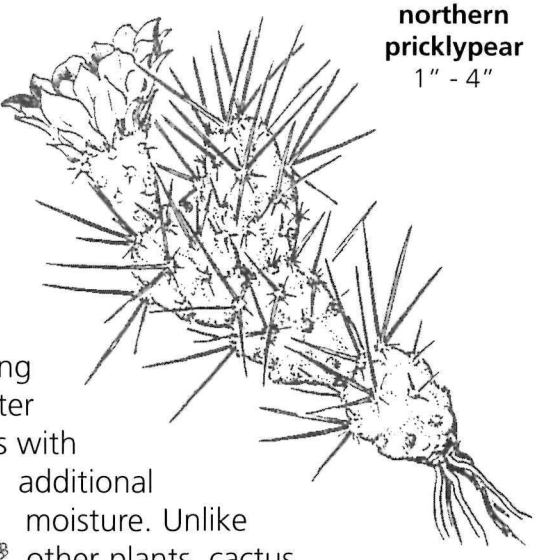
10. Serviceberry, *Amelanchier alnifolia*. In the Appalachian Mountains, early settlers were usually isolated by winter snow and unable to hold church services. Spring was heralded by the coincidental blooming of this bush and arrival of the preacher – thus, gaining its name. The serviceberry is extremely useful. Both wild and domestic animals browse it, while birds, bears, and people eat the berries. The berries ripen in summer and may be eaten raw or used in making jelly, muffins, or pie. A mixture of serviceberry and dried meat, called pemmican, was a staple food of early Native Americans and later trappers and traders.

serviceberry
5′ - 20′

11. Bitterbrush, *Purshia tridentata,* is the most common large shrub within this particular web of life. Because of its size, the bitterbrush is an important hiding place and shade for many small birds and animals. In the fall the bitter berries drop to the ground and the deer begin to feast on the branch tips, making the bitterbrush one of the most important winter browse shrubs. Fire, however, will quickly destroy any bitterbrush in an area. This leaves the smaller members of the food chain unprotected and the larger game animals without food.

bitterbrush
4′ - 6′

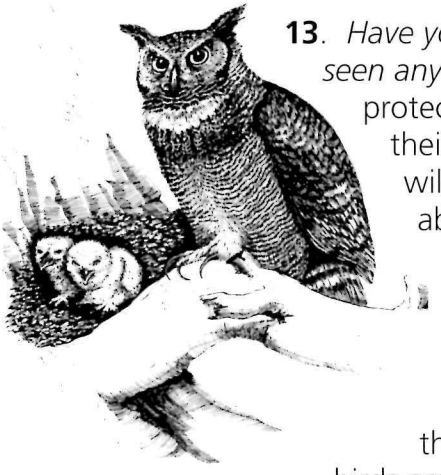
12. Keep an eye out for **Northern pricklypear**, *Opuntia fragilis* and **white-flowered yarrow**, *Achillea millefolium.* Bend down and look closely at the pricklypear cactus, a plant that comes to mind when one thinks of arid regions. Its thick waxy coating over its stems conserves water and, after a rainstorm swells with additional moisture. Unlike other plants, cactus leaves have become protective spikes and the stem produces the food source. The cactus, like many arid plants, may look rugged, but from the name *fragilis*, you realize that this local species breaks easily and grows back slowly!



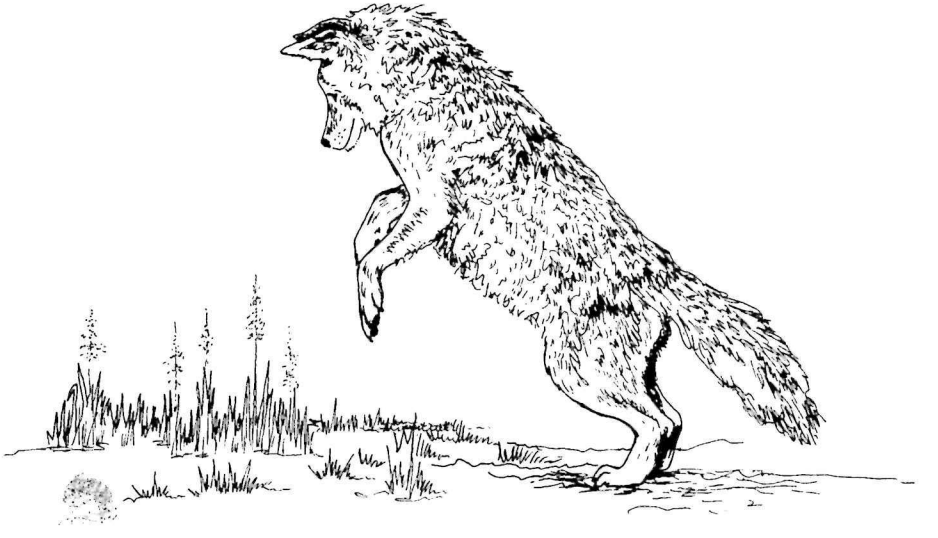
northern pricklypear
1" - 4"

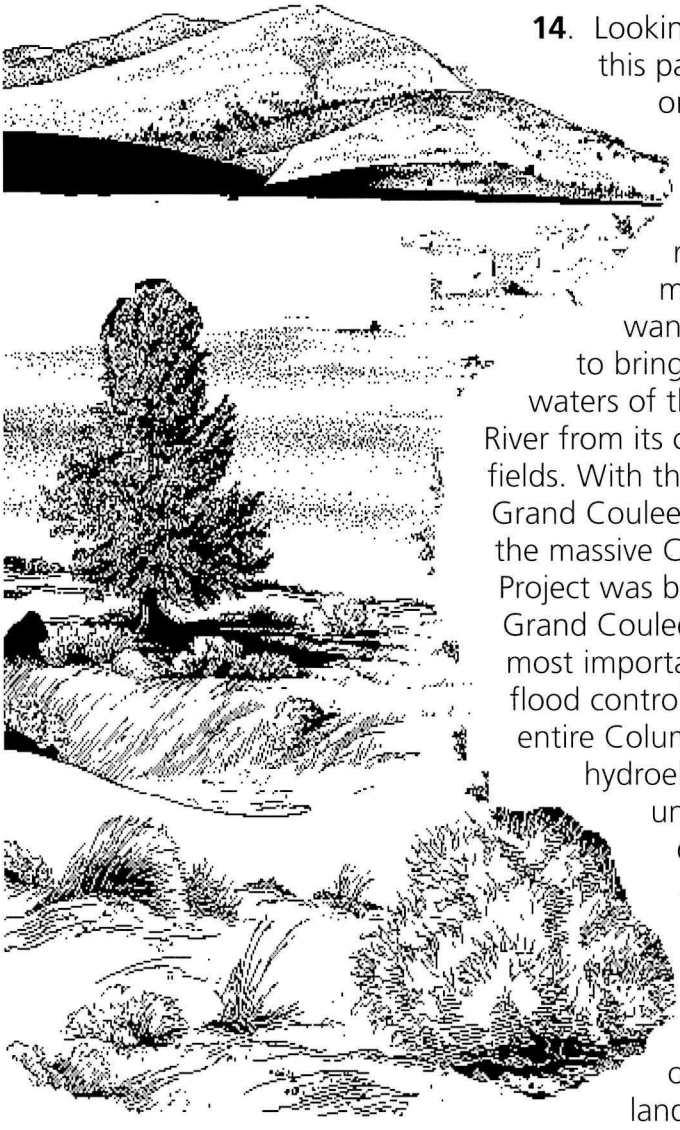
yarrow
4" - 40"

Arid aromatics. Many plants in dry areas produce fragrant oils as a by-product of photosynthesis (using the sun's energy to convert carbon dioxide and water into sugars and oxygen). Native Americans discovered that the juice from the boiled leaves and roots of one herb, the dense, **white-flowered yarrow**, could be used as an all purpose pain reliever – long before aspirin! Please be cautious before making your own herbal remedies. Many plants look the same and some are extremely toxic!



13. *Have you heard any birds? Have you seen any animal tracks?* Here around these protective rocks, many creatures make their homes. Occasionally a coyote will make her den in the rocks above, or a deer may find shelter from winter's cold or summer's heat. Yellow bellied marmots and bull snakes sun themselves on the rocks and birds are on the constant search for food. Red-tail hawks, owls, ravens, meadowlarks, and swallows are only a few of the birds you might observe. Listen for a lonely cricket, the hum of a bee or possibly see the flighty movement of a colorful butterfly. The bunchgrass web of life surrounds you.

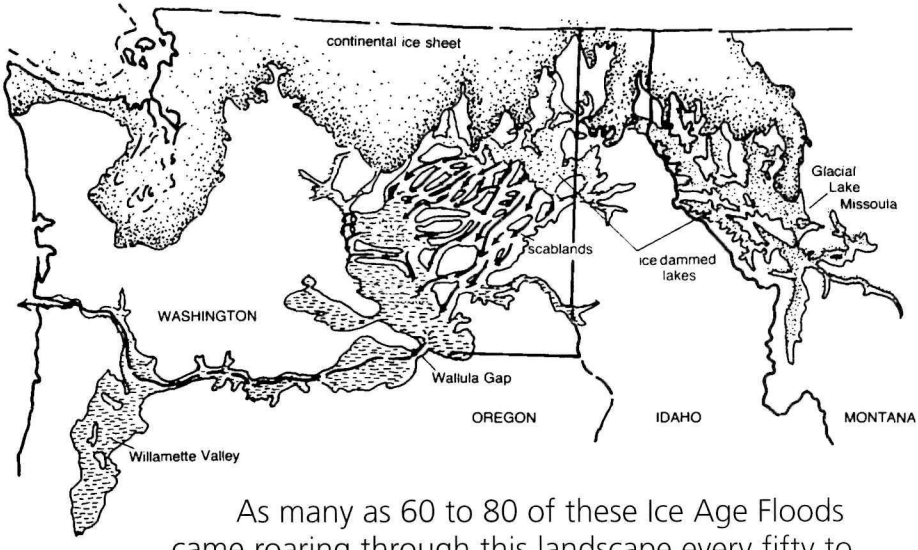




14. Looking down from this parched hillside onto the refreshing waters of Lake Roosevelt below, you may realize why so many people wanted to find a way to bring the life-giving waters of the Columbia River from its canyon to their fields. With the construction of Grand Coulee Dam in 1933, the massive Columbia Basin Project was begun. Today, the Grand Coulee Dam is the most important irrigation and flood control dam on the entire Columbia River and its hydroelectric capacity is unmatched by any dam in North America. On the other hand, half the Columbia River salmon runs were cut off and Indian lands were taken without their permission. The Grand Coulee Dam created Lake Roosevelt – a beautiful reservoir stretching 130 miles from this bunchgrass prairie, through basalt cliffs, remnants of old lava flows, and Ponderosa Pine forests to the diverse woodlands just below the Canadian border. Each portion of Lake Roosevelt has a different ecosystem – a unique web-of-life. We urge you to explore and appreciate Lake Roosevelt's entire watershed.

15. Ice Age overlook. You have come to the end of the guided portion of the bunchgrass trail and find yourself gazing out at the beginning.

Close your eyes and imagine this same location 15,000 years ago. It is the end of the last Ice Age. A huge glacial sheet of ice 500 feet high looms above the northern and western horizons. Massive amounts of melting glacial waters, rocks and dirt are draining into a large lake, the surface of which is 400 feet above where you are now standing. Blocked by an enormous ice dam just beyond where Grand Coulee Dam is today, the melting glacial waters back up, dropping the heavier sediments to the bottom. Suddenly a roar can be heard to the east. The ground begins to shake, the birds and animals take flight. A wall of water – an Ice Age flood – is coming your way. Hundreds of feet high and traveling at 50 miles an hour the scouring power of this water is more powerful than 100 eruptions from Mount St. Helens. The wave of water slams into the ice dam and flows south, carving out the Grand Coulee on its way toward the Pacific Ocean.



As many as 60 to 80 of these Ice Age Floods came roaring through this landscape every fifty to sixty years at the end of the last Ice Age. Today, evidence of the glacial lake can be seen in the terraced hillsides on the other side of the highway to the south. The massive erosional power of the Ice Age Floods can be seen on a drive down the Grand Coulee to Dry Falls near Coulee City.

Artwork courtesy of:

Line Drawings of balsamroot, evening primrose, serviceberry and bitterbrush property of Lake Roosevelt NRA.

Line Drawings of crested wheatgrass, rabbit brush, and sagebrush from *Range Plant Handbook*, United States Department of Agriculture, Forest Service, Dover Publishing ed., 1988.

Line Drawings of remaining grasses and plants used by permission of the University of Washington Press (Seattle, Washington) and were copied from C.L. Hitchcock, A. Cronquist, M. Oweney and J.W. Thompson, *Vascular Plants of the Pacific Northwest, Volumes 1-5,* 1969.

For more information, a variety of nature guides and local histories are available for purchase at the National Park Service Headquarters, 1008 Crest Drive, in Coulee Dam, weekdays 8:00 a.m. to 4:00 p.m.

Other References:

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crested wheatgrass


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