

**W O N D E R
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Y O U
W A N D E R**



*A Self Guided
Educational Tour
Through the Homer
Demonstration Forest
Interpretive Trail*



4014 Lake Street, suite 201
Homer, Alaska 99603
907-235-8177 ext. 5
www.homerswcd.org

#1) What is the Homer Demonstration Forest?

The Homer Demonstration Forest is a 360 acre portion of the Diamond Creek watershed that has been designated by the State of Alaska as an area reserved for forestry education, research and recreation.

This area started as a casual inquiry by the Homer Soil and Water Conservation District to reserve a block of state forested land for permanent timber management demonstration, and through interactions with state and federal foresters idea expanded to the development of a State-owned demonstration forest that would service as an outdoor classroom for the community of Homer and the people of Alaska.



Through the work of many advocates, such as local resident Dave Bran, and agencies like the Natural Resources Conservation Service, the Homer District made the dream a reality in 1986 with the designation of the Homer Demonstration Forest.

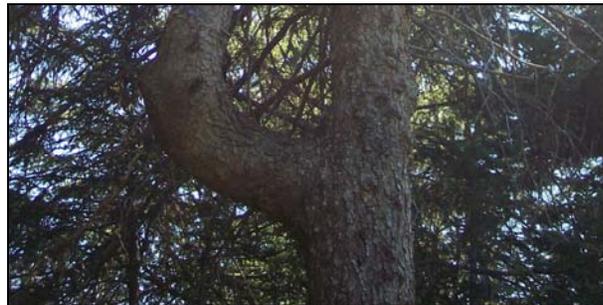
As you walk the self-guided Nature Trail today, please take note of the numbered posts along the way and refer to this guide for discussions of the natural wonders found in the HDF.

Note: Please remain on developed trails while in the HDF. Leaving maintained trails can result in serious personal injury as well as damage to sensitive flora and fauna (plants and animals).

#2) Trees have Elbows?

Yes, they do! You'll notice on the left side of the trail that several of the nearest spruce trees have what appear to be 'elbows' or growths that protrude from the tree at almost perfect right angles. These trees also have several leaders. The terminal leader is the tallest, strongest stem of the tree, or sometimes the largest trunk if the tree has more than one stem. On a healthy tree, this leader will grow straight up. However, the trees you see here have been attacked by terminal feeders. These are insects, such as the spruce bud midge, that eat the shoots and buds of the terminal leaders on spruce trees, causing the tree to have to re-route its growth elsewhere. In this case, it developed new terminal leaders that grow in the elbow shape.

Another interesting thing about these trees is where they are growing from. Almost every tree in this vicinity is growing out of an old decaying stump, or a dead log. These stumps and logs are often called nursery trees. They are dead and decaying trees that are letting their nutrients disperse back into the ecosystem. Often, new trees will sprout from this rich source of nutrients, and grown right on top of an old tree. You'll notice this interesting growth pattern in several other places along the trail. Try and spot the remnants of nursery stumps or logs as you walk through the forest!



#3) Snow Survey Site

At this marker you will find several white wooden posts a little ways off the trail. They are located to your left and you should be able to see two to three of them in a line. These are markers for a snow measurement site used by Natural Resource Conservation Service since 1973.

Each winter NRCS collects data on the depth, density, and layering of the snow pack at this site and several others throughout the Kachemak Bay region. This data is collected monthly to allow NRCS determine how much water will be moving both above and below the ground when it melts in the spring. This in turn allows land managers to predict prospective fire danger and identify potential water supply problems.

More information about NRCS and snow surveys in Alaska can be found online at: <http://www.nrcs.usda.gov/>

#4) Rings, Not Just for Hobbits Anymore

Trees grow from the outside out. That is, each year wood fiber is added to a tree *on* its outside cork cambium layer, which is located just under the bark. Examining a cross section of a tree reveals the history of its growth written in the annual rings that are formed as the tree grows year after year. Valuable information about past climates, fire intervals, insect infestations and local growing conditions can be learned from tree rings. For example, some studies have shown that the Kenai Peninsula has a recurring fire interval of about 168 years.

By looking closely at the stump near the right side of the trail, you can see that each ring is actually comprised of a light and a dark part. The light ring reflects fast spring growth



when new cells are large and fat. They have a lot of open space in their centers and therefore appear light in color and are known as *early wood* or *springwood*. As the summer wears on, available moisture declines, the growth rate slows and the new cells become smaller, denser and more tightly packed, and thus become darker in appearance. This is *late wood* or *summer wood*. So, each pair of light and dark rings accounts for one year in a tree's life. By counting each light and dark pair from the center of the tree to the bark, the age of the tree can be determined.

#5) The REAL Tree House

Standing, fallen, broken, and otherwise dead trees are called snags. Often times snags are considered major fire hazards, and are regularly removed by landowners and managers. However, it is becoming more widely understood that snags are valuable habitat for forest creatures. Birds and small rodents such as the downy woodpecker and the red squirrel will often use the protective hollows of snags for building nests. If you listen carefully, you may hear a squirrel chattering nearby. These snag-dwelling animals often feed on insects and help regulate tree-damaging insect populations, such as the spruce budworm. Consequently, snags can be a vital part of the forest ecosystem, and the US Forest Service now requires that a certain number be left standing in many logging operations.

Though snags can sometimes be unsightly tangles of brush or fallen trees, see if you can spot a bird's nest, an adolescent squirrel, or a woodpecker's hole in an old decaying stump. Though it may not seem like it, chances are that wildlife is much closer to you than you think!

#6) ReLeafing the World



The Global ReLeaf program was created in 1990 by the American Forests organization. The mission of this program is *"to educate the public on the value of trees and the need to properly select, plant and maintain them"*, by *"working with community groups with local tree planting projects and by providing informational materials and presentations."*

In 1999, the Homer Demonstration Forest joined the Global ReLeaf family when the Homer community planted 20,000 seedling Lutz spruce trees (*Picea lutzii*) at this site. The intent of this planting was to demonstrate reforestation techniques for areas affected by the spruce

bark beetle (*Dendroctonus rufipennis*) epidemic of the late 1980's and early 1990's. Although the survival rate was low due to a particularly harsh winter, you can still identify some of these trees by the orange flagging tape they were tagged with. While walking around today, try and see how many you can spot.



#7) Arboretum – The Experimental Tree Farm



You are now standing in front of the Homer Demonstration Forest Arboretum. This site was developed to be an outdoor laboratory where trees, shrubs, and woody plants are grown for study. Some of these plants are native to Alaska, and some are not.

The mission of the arboretum is to promote the knowledge and appreciation of trees, shrubs, and other plants for enjoyment, inspiration and recreation; for scientific research; and for educational and aesthetic purposes. The fence was erected with the help of Homer middle school students to prevent moose and other animals from foraging. Feel free to enter for a closer look, but please be sure to close the gate firmly behind you.

While walking around, notice which trees are thriving best. Maybe these species should be considered the next time you are planting in an area with similar conditions. Also, if there are species you would recommend for planting here please contact the Homer District office with your suggestions (contact information is on the back of this guide).

#8) Wanted : *Dendroctonus rufipennis*

For those of you who don't speak Latin, the above name is that of the spruce bark beetle, a predator of Lutz, Sitka and white spruce trees everywhere. In fact, most of the trees you see to your right were killed by spruce bark beetles. These pesky little insects, brown and only a quarter inch long, bore into a thin living layer of the tree known as the *phloem*. This tissue is essential to the tree's life as it transports food, glucose made in the leaves via photosynthesis, to all the other plant cells. When this food transport is disrupted or cut off, the tree becomes weakened or slowly dies.

Spruce bark beetles have hit the Kenai Peninsula hard. Since the mid-1970's (with peak infestations in the late 80's and early 90's) they have killed mature spruce trees on more than one million acres and have impacted about 50% of the peninsula's forested land. The resulting dead trees represent a loss of timber resources, and are now considered a hazard: falling across roads or on houses and as fuel for forest fires. However, while dead trees may be ugly, they also open up the forest for succession, provide vital nutrients for new trees to use during their growth cycle, and though people may not like them, spruce bark beetles are native to Alaska!

#9) Degrees Below

To your left, about 20 feet off the trail, you might be able to see what looks like a small solar panel on a post. In fact, that's exactly what it is. This solar panel is the power source for soil temperature measuring equipment. These instruments were installed by the Natural Resources Conservation Service, and provide soil temperature data throughout the year.

Soil temperature plays a vital role in Alaskan forest ecology because it determines which species can survive in particular locations. In some parts of Alaska, the soil is too cold or is partially frozen all year round. This is called permafrost, and completely prevents forests from taking root. In Homer, the ground only freezes during the winter, and so can sustain healthy tree and plant growth.

By monitoring soil temperature we can learn more about the not-so-obvious growing conditions of forested areas in the HDF. It also allows us the opportunity to document changes in soil temperature over time, which may prove to be an important tool in projecting forest growth in the face changing climatic conditions.

#10) The Edge Effect

As you meander into a thicker stand of trees, look out to your right. You may notice that a 'line' has been drawn, dividing grassland and forest. This site was logged several years ago to clear out dead trees killed by the spruce bark beetle epidemic. It was feared that the trees might interrupt power lines or other structures if they fell. While human safety is a concern, the logging has effectively changed the habitat in this area. What was once solid forest now has a distinct 'edge'.

An edge occurs any place where two different habitats meet sharply. Edges can be natural, as in edges caused by fire, or weather conditions (tornados), or man-made, such as this one. Their effects can be either positive or negative, depending on the circumstances. While edge habitat is essential to some creatures who require a variety of resources, edges disrupt other animals that rely on large, unbroken tracts of land. Often, edges break solid acres of forest into several sections, creating gaps in between the stands of trees. This limits the amount of territory available for animal survival, and can separate breeding populations. While species such as white-tailed deer need the edge to survive, other species, such as woodpeckers, need a solid forested land area to survive. As you walk through the forest, consider the wildlife from your home and whether they could survive on “the edge.”



#11) Big and Bad

Around here, the saying goes that if it has big leaves, then don't touch it! Like most places, Alaska has its fair share of poisonous and unpleasant plants. Two of the biggest pains are 'pushkie,' also known as cow-parsnip (*Heracleum lanatum*), and devil's club (*Oplonanax horridum*).



Pushkie has giant green leaves and hollow stalks covered with fine hairs. It is a member of the parsley and carrot family (*Apiaceae*), and some people think it looks like a giant Queen Anne's Lace. If you come into contact with it you may suffer severe burns, especially with exposure to sunlight. This is a result of photosensitizing chemicals in the plant's juices.

Devil's club also has large green leaves similar to pushkie, but its stalk is woody and covered with vicious looking thorns. As a member of the ginseng family (*Araliaceae*), it also has a long history of human use. Aboriginal peoples throughout the region praise it to this day for its medicinal and protective benefits it offers. More recent arrivals too have been known to swear by this plant. Fishermen used to hang devil's club stalks above their vessel cabin doors to ward away evil spirits and bring good luck.



Bud Kovalchik

#12) When the Sun Shines In

Like your washing machine, the forest works in cycles. The process of different stages moving from one to the next is called succession and is the life force of vegetation in the forest.

For example, a fire, insect outbreak, windstorm or other *disturbance* can wipe out the existing forest vegetation. Then, pioneer plants that require a lot of light, space and nutrients, such as Canadian bluejoint grass, alder and fireweed, colonize the newly opened land. As they grow, these early successional plants add nutrients back into the soil, and pave the way for other less-speedy plants to grow. Young trees like birch, spruce and willow grow up through the grasses, herbs and shrubs, and eventually become the predominant vegetation in a middle stage of succession. As the trees grow taller and move into later successional stages, they block out the light that reaches the ground. This limits the growth of the understory plants and favors the dominance of spruce trees. When mature trees die and fall down or are removed by human harvesting, they leave large gaps in the overstory that allow direct sunlight to hit the ground once again. These disturbances allow succession to begin again in these areas. Thus, the cycle continues, creating a mosaic of habitat types and successional stages across the landscape that supports a higher diversity of wildlife.

As you walk through the HDF, look for places where one kind of vegetation predominates, and see if you can determine what part of the forest cycle that area is in. Another thing to consider is what has caused each current stage. See if you can identify what may have caused a particular species to succeed over others.

#13) The Trail Continues On

At this point in the tour, you should come to a wide, well-packed trail intersecting the smaller path you've been touring on. If you'd like to return to your vehicle, take a left on this larger trail and follow it until the trail becomes inclined and turns to woodchips. Follow those chips up to toward the road and to your vehicle.

If you're looking for a bathroom, follow the trail a bit to your left, and you will find several signs leading you to an outhouse. These outhouses don't have any plumbing other than natural biological processes, so please make sure that only organic material ends up down the outhouse hole. Also, toilet paper is limited, so please use it sparingly and make sure it also ends up in the ground, rather than ON the ground.

When you're ready to continue the tour, take a right on the well packed trail. This will bring you to and follow it until you come to other wooden markers on the left hand side of the trail depicting other places of interest. As you continue along, you will come to a small hill. At the top of this hill, continue walking and be on the lookout for a wooden sign on your right that talks about the Demonstration Forest Trail.

#14) Fencing Them Out

Moose are well renowned for eating anything and everything if it is green and leafy, especially garden plants. In the wild, however, local moose rely on willows for the majority of their diet—about 40 pounds of greenery each day.

Off the trail a bit, look for a large fence. Though this may appear to be some kind of enclosure meant to keep something in, in actuality it was designed as a enclosure to keep moose out. It was installed by the Alaska Department of Fish and Game in 1992 after all of the willow (the thigh-high bushes you see in front of you) was cut to the same height. This is a study to measure how much and how fast the willow would grow if undisturbed by moose, and the fence protects a small patch of the shrubs.

Today, scientists regularly visit this site to observe the growth differences inside and outside the fence. These observations help determine not only the growth patterns and rates of the willow, but also the dietary habits of local moose.



#15) Invasive Species

There are some plant species that are not native to this area, yet they thrive and flourish. These species do not have naturally existing predators to keep their populations in check. These plants often produce many seeds and/or reproduce with long runners and can grow quickly and invade the habitat of native plants, hence the name “invasive species.”

Believe it or not, invasive species are already a big problem in Alaska. The increased population and growth of suburbs and neighborhoods has caused an increase in imported plant and shrub sales. Alaska’s Soil and Water Conservation Districts are attempting to use education as the key to lock invasive species away as a problem forever, but it is essential that every citizen and visitor to Alaska help them by learning to recognize troublesome plants.

Some common invasive species known to be in the Homer area are Orange hawkweed (*Hieracium pretense*), Canada thistle (*Cirsium arvense*) and Fall dandelion (*Leontodon autumnalis*).



Fall dandelion (*Leontodon autumnalis*)



Canada thistle (*Cirsium arvense*)



Orange hawkweed (*Hieracium pretense*)

#16) Tree Tags

As you look around this location you will notice quite a few orange flagged trees that designate the Global ReLeaf seedlings. If you look closely for something different though you will also notice trees flagged with yellow tape;



these are Lodgepole pines (*Pinus contorta*). In most cases, these trees are further identified with numbered metal tags. These trees were planted in 1980 as an effort to judge the viability of the species in the area. As an elementary school project, this planting is observed regularly to determine the survivability of the species.

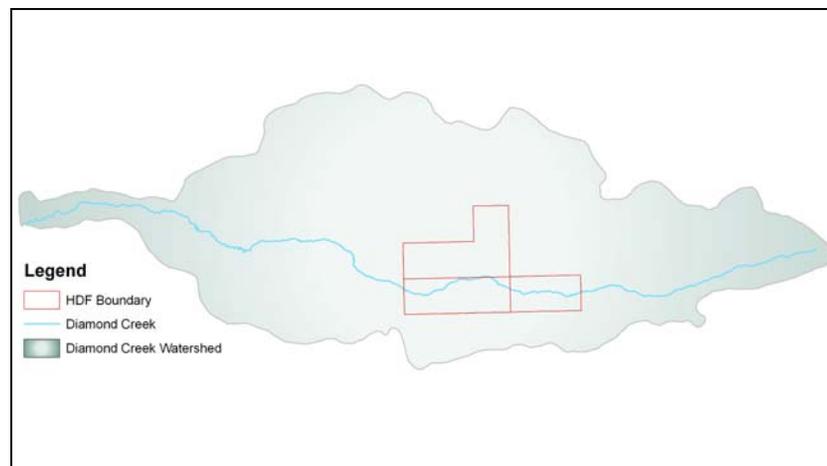
Moose in this area seem to be attracted to the bark and young branches of these pines. It's not exactly understood what it is that attracts them to these particular trees, but a possible explanation may be that needles are less abrasive to the gums of moose, and thus makes them more desirable than the plentiful spruce in the area. Unfortunately, this has proven to be a serious impediment to their survival in the HDF.

#17) Into the Watershed

You're now entering the Diamond Creek Watershed collection site. What does this mean? Essentially, you're about to come to a creek. You've been in the Diamond Creek Watershed throughout your visit to the Demonstration Forest. A watershed is any area where all the water flows to a common water body. In this case, Diamond Creek is that water body.

In the fall of 2005, Homer City Council made a list of community improvements that prioritized this watershed. Their plans for it are to conserve the existing landscape and incorporate its benefits for land use planning into the future of Homer.

As you approach the creek, you will enter into a mixed muskeg and grassland habitat, so be on the lookout for moose and other creek-side life such as dippers and ducks. Also, please stay on the boardwalk. This habitat is very sensitive and is easily destroyed by human foot traffic.





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