

Mineral Ridge

TRAIL GUIDE

U.S. Department of the Interior
Bureau of Land Management
Coeur d'Alene Field Office
3815 Schreiber Way
Coeur d'Alene, Idaho 83815
(208)769-5000



Coeur d'Alene Field Office / Idaho



MINERAL RIDGE

TRAIL GUIDE

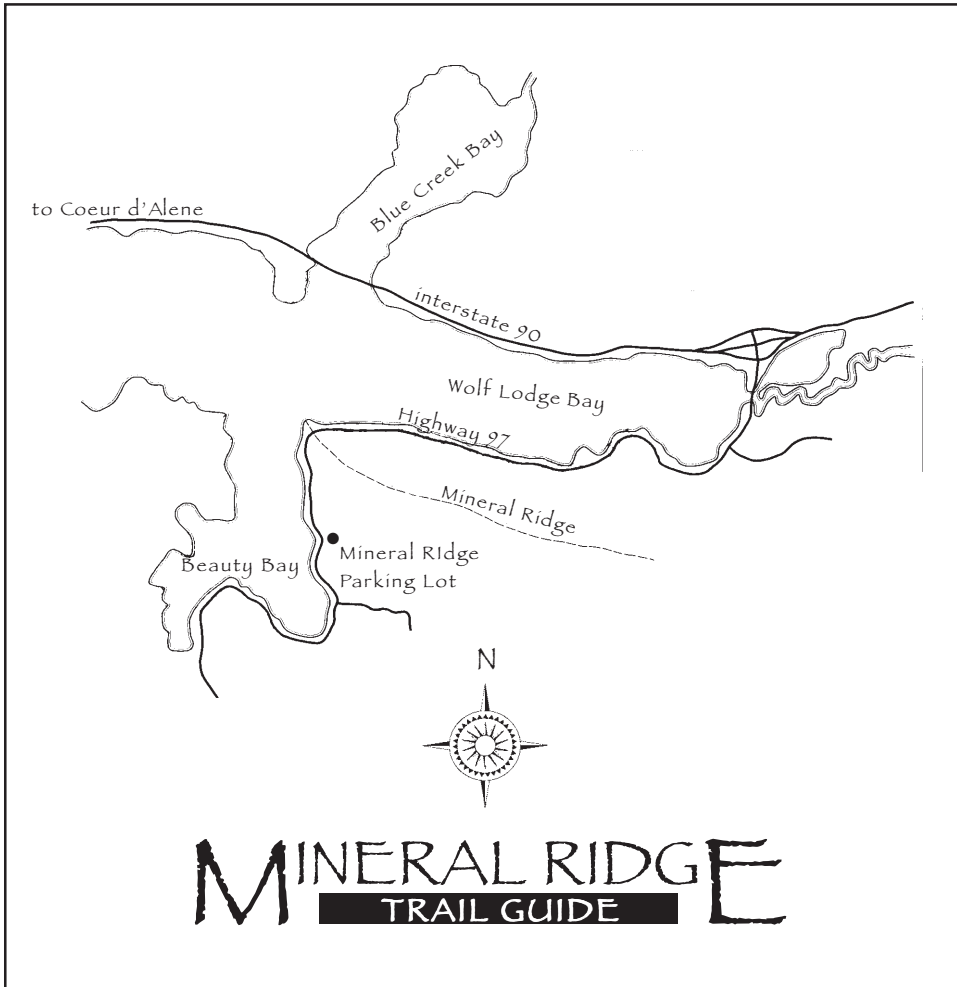
► WELCOME TO MINERAL RIDGE, the first recreation site developed by the Bureau of Land Management in Idaho. Construction began in 1963, with additions and improvements made in later years. On April 13, 1982, the trail was designated as a *National Recreation Trail*.

Mineral Ridge is a “classroom in the forest.” The plant and animal communities are used by local school districts for environmental education. This publication will help you learn about and explore forest biological and physical interrelationships on the 3.3 mile trail.

The booklet is divided into two main sections. The first section is a guide to the trail. Twenty-two stations along the trail are marked with corresponding narrative descriptions in the booklet. Also included in this first section are review questions and answers. The second section is supplemental trail information. Here you will find lists of both plants and animals found at Mineral Ridge. They are designed as checklists so you can keep a record of the species you observe as you walk the trail. Also included in this section is a glossary of Mineral Ridge place names that highlight the area’s mining history.

Enjoy your hike!

MAP OF AREA



MINERAL RIDGE

TRAIL GUIDE

TABLE OF CONTENTS

MAP OF MINERAL RIDGE	ii
STATION 1: Forest Plants	1
STATION 2: Soils	4
STATION 3: Forest Management	5
STATION 4: Litter Hurts	5
STATION 5: Rotten Log	6
STATION 6: Plant Succession	7
STATION 7: The Living Forest	8
STATION 8: Witches Broom & Bark Beetles	9
STATION 9: Effects of Trailing	10
STATION 10: Wildfire	11
STATION 11: Radio Viewpoint	11
STATION 12: Forest Habitat	12
STATION 13: Abandoned Prospect Spur Trail	13
STATION 14: Columbus Tree	14
STATION 15: Douglas-Fir Stand	15
STATION 16: Summit	16
STATION 17: Pit Excavations (Questions 1, 2, and 3)	17
STATION 18: Fire Scar (Questions 4, 5, and 6)	17
STATION 19: Habitat Contrast (Questions 7 and 8)	18
STATION 20: Snags (Questions 9 and 10)	19
STATION 21: Root System (Questions 11, 12, 13, and 14)	19
STATION 22: Silver Tip Viewpoint (Questions 15 and 16)	20
Question 17	21
Question 18	21
HISTORY/GLOSSARY OF PLACE NAMES	23
PLANT CHECKLIST	27
WILDLIFE CHECKLIST	31
REVIEW ANSWERS/SCORING	33

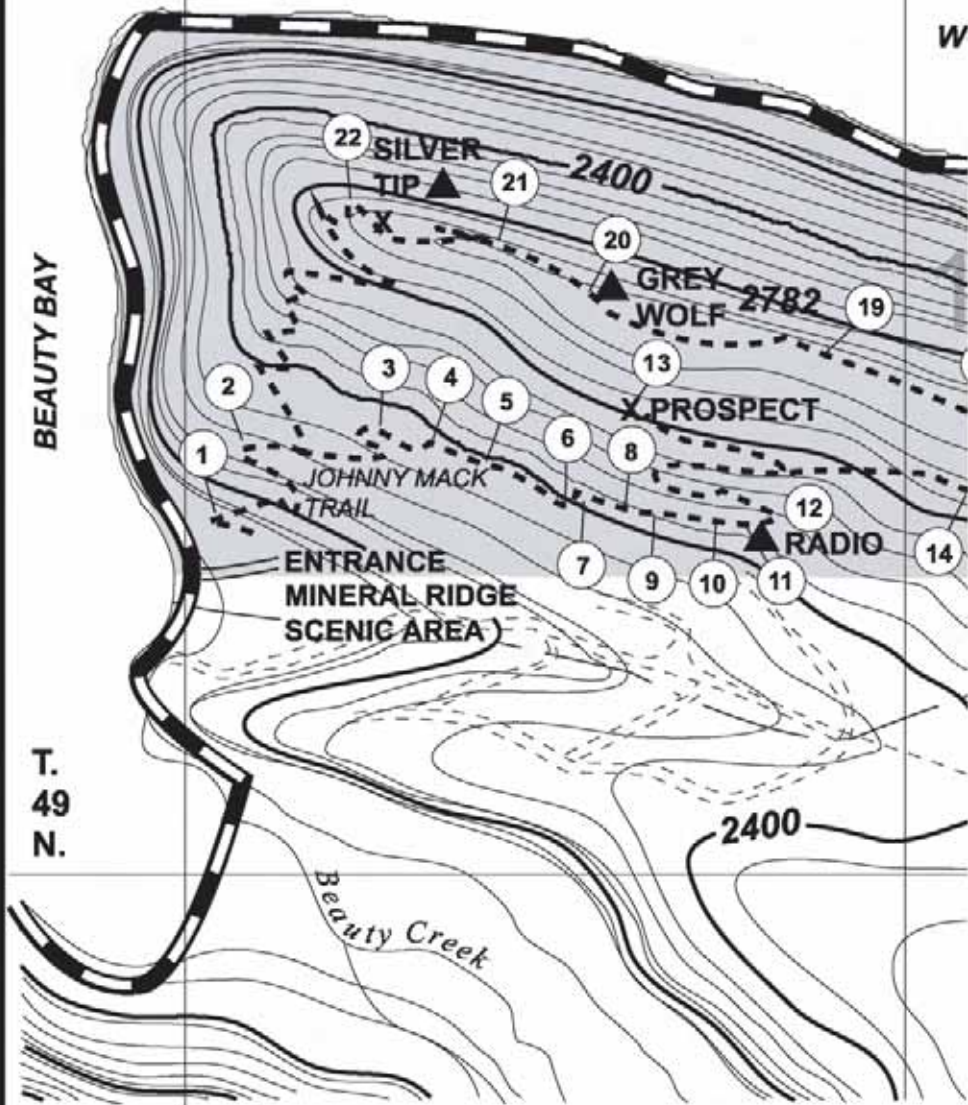
MINERAL RIDGE SCENIC AREA

R. 3 W.

W

BEAUTY BAY

T. 49 N.



the Stations 9 and 12 narratives.

10. List two
- a. _____
- b. _____

11. True _____ False _____

12. True _____ False _____

13. List two
- a. _____
- b. _____

14. True _____ False _____

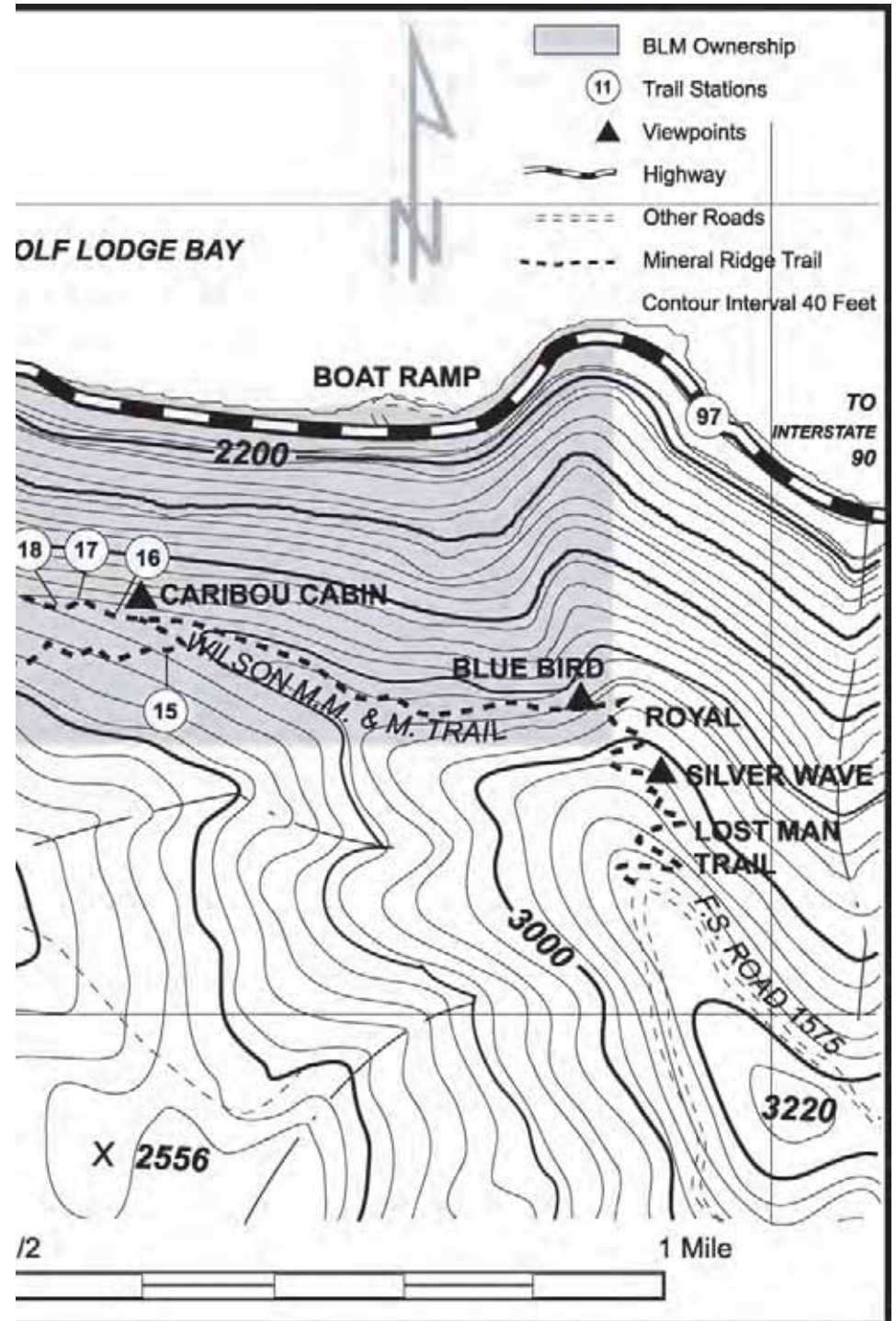
15. True _____ False _____

16. Match correct letter, check plants found
- 1) _____ 2) _____ 3) _____ 4) _____ 5) _____ 6) _____

17. Check plants found
- 1) _____ 2) _____ 3) _____ 4) _____

18. Check if found _____

_____ Your total score



ANSWER SHEET

Record your answers to the nineteen questions here.

1. True _____ False _____
2. True _____ False _____
3. True _____ False _____
4. Beneficial Impacts
 - a. _____
 - b. _____
 - c. _____Adverse Impact _____
5. True _____ False _____
6. True _____ False _____
7. Circle the correct answers
 - Part A a b c d e f g
 - Part B a b c d e f g
8. Circle the correct answers
a b c d e f
9. True _____ False _____

SCORING

▶ 43-55 POINTS: EXPERT

Congratulations! You not only have a good basic understanding of the Mineral Ridge environment, but also have used this knowledge to adopt a sound land use ethic. The plants and animals of Mineral Ridge invite you to return and visit their home again.

▶ 30-42 POINTS: INTERMEDIATE

You are off to a good start! The plants and animals of Mineral Ridge would like you to come back again to learn some more about them and their home.

▶ 18-29 POINTS: NOVICE

You tried! However, the plants and animals that live here would appreciate it if you did some additional studying so you would better understand them and their habitat.

▶ 17 or less: TENDERFOOT

If you did fair on the questions but received five or more penalty points, we hope the information provided here will help you understand why it is important to take care of our natural areas.

If you did poorly on the questions, we hope you picked up a few interesting facts. We invite you to come back again and enjoy Mineral Ridge!

GUIDE TO THE TRAIL

STATION

1

FOREST PLANTS

Diverse, lush vegetation is the first thing you probably will notice about this forest habitat. The basic requirements for plant growth are mineral nutrients, water, carbon dioxide, light, a medium to grow in such as soil and a tolerable temperature range. With these requirements met, plants manufacture chlorophyll, grow, and reproduce.

Trees compose the overstory and shrubs and ground cover plants such as forbs, grasses, moss and lichens compose a vegetation understory. The primary tree species you will notice are ponderosa pine and Douglas-fir. You should be able to see each of these species from this location.

PONDEROSA PINE

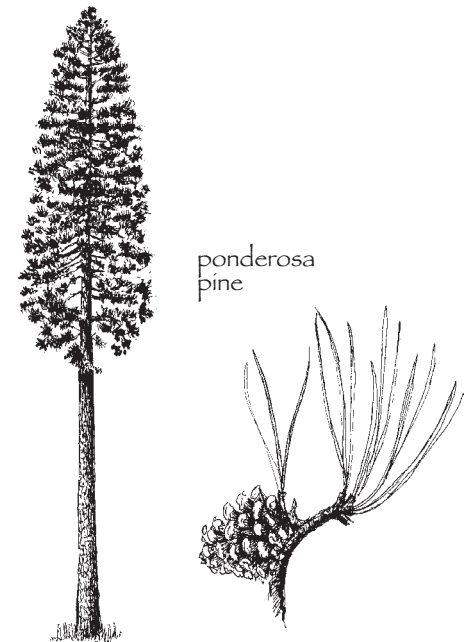
Ponderosa pine is native to North America from British Columbia to Mexico and is the most widely distributed pine in the United States. The species often forms park-like forests and is tolerant of drought as evidenced by its ability to grow on dry sites.

Larger trees, often referred to as yellow pine, have thick, scaly bark making them somewhat fire resistant. Bark is brownish-black on younger trees and is cinnamon-red colored on mature trees. Needles are in bundles of threes or twos, and are 5 to 11 inches long. A tiny bristle is found on each scale of the cone.

It is the most important commercial pine in western North America and is second only to Douglas-fir in total timber production.

DOUGLAS-FIR

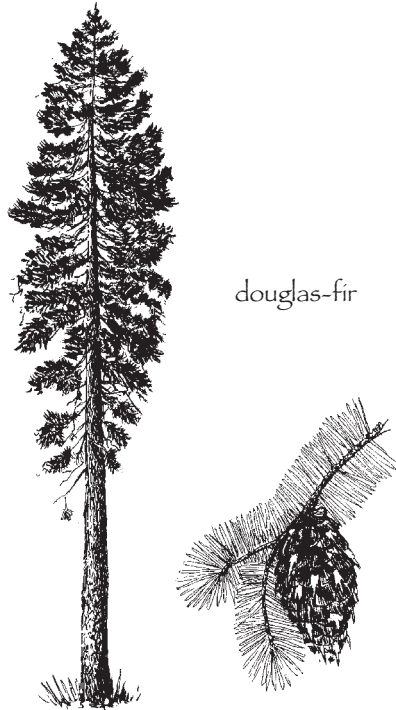
Douglas-fir is native to western North America from Canada to California. Although it is most abundant on moist sites, the tree is drought-resistant and



often found on dry sites with ponderosa pine. Bark on older trees is gray and rough with deep cracks. Cones are about 3 inches long with thin scales. They have little wing-like protrusions from the underside of the scales called bracts. Some people think the bracts look like a mouse crawling into a hole. Needles are short, about one inch long, blue-green, flattened and stand out from all sides of the twig like a bottle brush. When crushed, the needle has a strong, fruity fragrance.

Douglas-fir ranks first in the United States for timber production; its strong, durable wood has many uses.

Common understory shrubs along the trail include ocean-spray, snow-berry, ninebark and wild rose. As you proceed to the next few stations, try to find an example of these four shrubs.



douglas-fir



OCEAN-SPRAY

Usually found with ponderosa pine or Douglas-fir, ocean-spray has a panicle, or flower cluster, of creamy colored blossoms in the spring. The seed pods persist through winter and spring.

Leaves are alternate and doubly serrated. Individual plants can grow over 10 feet tall. The seeds of this shrub were eaten both raw and cooked by native Americans.

SNOWBERRY

Snowberry has small, opposite, smooth-edged leaves and produces small white berries in the fall. The shrub is 3 to 7 feet tall. Although it is found with ocean-spray, snowberry prefers areas with a little more shade.



snowberry

QUESTION

MAXIMUM POSSIBLE SCORE

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 16. Score one point for each of the following correct answers and score one point for each of the plants found. Refer to the Station 1 narrative. | 12 |
| 1. f 2. a 3. c 4. e 5. b 6. d | |
| 17. Score one point for each plant found. | 4 |
| 18. Score one point if you observed evidence of bark beetle damage. | 1 |

Total possible score 45

BONUS AND PENALTY POINTS

- | | |
|-------------------------------------------------------------|-------------------|
| 1. Did you stay on the main trail? | |
| a. For your entire hike | Add 5 points |
| b. At all times after learning of soil erosion at Station 9 | Add 3 points |
| c. A majority of the time or | Add 1 point |
| d. Not often | Subtract 5 points |
| 2. Did you pack out your litter and trash? | |
| a. All of it and picked up other litter found | Add 5 points |
| b. All your own litter | Add 3 points |
| c. Most of it or | Add 1 point |
| d. Very little of it | Subtract 5 points |

Add your bonus points or subtract the penalties from your score to determine your final score.

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 7. Part A. Correct answers are a, b, d, e, f, and g. Score one point for each correct answer and subtract one point for each incorrect answer. Oxygen is a by-product of photosynthesis. Refer to the Stations 1 and 6 narratives. | 6 |
| Part B. The most correct answer is d, but f is also acceptable. Score one point for either of these answers. Refer to the Station 15 narrative. | 1 |
| 8. Correct answers are b, d, and e. Score one point for each correct answer and subtract one point for each incorrect answer. The elevation and slope of both sites are similar. Refer to the Station 15 narrative. | 3 |
| 9. True. Score one point for the correct answer. Refer to the Station 7 and 14 narratives. | 1 |
| 10. Score one point for each of any two of the following correct answers. Refer to the Station 14 narrative. | 2 |
| 1. cover and feeding areas for small animals such as insects
2. food source for insectivores
3. feeding, nesting, roosting, or perching sites for birds
4. den, resting or escape cover for mammals | |
| 11. True. Score one point for the correct answer. Refer to the Station 5 narrative. | 1 |
| 12. False. Score one point for the correct answer. This is a description of the topsoil, not the subsoil. Refer to the Station 2 narrative. | 1 |
| 13. Score one point for each of any two of the following correct answers. Refer to the Station 2 narrative. | 2 |
| a. mechanical support b. food c. water d. air | |
| 14. False. Score one point for the correct answer. Refer to the Station 12 and 15 narratives. | 1 |
| 15. True. Score one point for the correct answer. Refer to | 1 |

WILD ROSE

Three different species of rose grow here. Leaflets of its compound leaves are serrated. Blossoms are pink and produce fruits called hips, which are red and fleshy. Various sizes and amounts of thorns are present depending on the species. Rose hips provide food for birds.



wild rose

NINEBARK

Ninebark is not plentiful but easily distinguished by its distinct shreddy bark. Leaves are alternate, lobed and serrated. The plant has clusters of white flowers and prefers sunny, open hillsides. Ninebark is a medium-sized shrub that can grow 2 to 7 feet tall.



ninebark

Over 100 plant species have been identified on Mineral Ridge. They are not all described in this booklet, but the Plant Checklist at the back of this guide can help you keep a record of those that you do find and identify. Use the plant list with any of the various plant field guides commercially available. If you make a positive identification of a species not included on the list, let us know.

Soils are weathered rock fragments combined with decaying plant and animal remains. Wind-blown loess and volcanic ash can also form part of the soil. Soil furnishes support, food, water and air for growing plants. In return, the soil is held in place and protected from erosion by plant roots. When the plants die, minerals are returned to the soil by bacterial decay and decomposition. As organic matter decomposes, carbon dioxide is released, which combines with water to form a weak acid solution. This acid reacts chemically with some of the soil minerals to further break down rock and soil particles. Decomposition is a basic forest process that will be discussed more as you continue your hike.

SOIL PROFILE



- ① HUMUS: a decomposition layer of plant/animal material
- ② TOPSOIL: contains more organic matter than subsoils and appears darker in color; coarse texture; larger pore spaces allow for more water absorption, so plant roots concentrate here
- ③ SUBSOIL: lighter in color than topsoil layer; finer textured; lacks organic matter
- ④ PARENT MATERIAL: composed of fractured rock; lacks organic matter
- ⑤ BEDROCK

ANSWERS/REVIEW SCORING

QUESTION	MAXIMUM POSSIBLE SCORE												
1. FALSE. Score one point for the correct answer. Prior to 1920, our mining laws allowed people to explore federal lands and purchase the mineral deposits they found. Refer to the Station 13 narrative.	1												
2. FALSE. Score one point for the correct answer. Claims can be staked for some minerals. However, others must be purchased or leased. Refer to the Station 13 narrative.	1												
3. TRUE. Score one point for the correct answer. Refer to the Station 13 narrative.	1												
4. Score one point for each correct answer. Refer to the Station 10 narrative.	4												
<table border="0"> <tr> <td>BENEFICIAL</td> <td>ADVERSE</td> </tr> <tr> <td>1. adds soil nutrients</td> <td>1. destroys valuable timber</td> </tr> <tr> <td>2. thin densely populated trees</td> <td>2. promotes soil erosion</td> </tr> <tr> <td>3. rejuvenates forage plants</td> <td>3. destroys the lands' scenic value</td> </tr> <tr> <td>4. control insect and disease infestations</td> <td></td> </tr> <tr> <td>5. reduce dangerous fire fuels</td> <td></td> </tr> </table>	BENEFICIAL	ADVERSE	1. adds soil nutrients	1. destroys valuable timber	2. thin densely populated trees	2. promotes soil erosion	3. rejuvenates forage plants	3. destroys the lands' scenic value	4. control insect and disease infestations		5. reduce dangerous fire fuels		
BENEFICIAL	ADVERSE												
1. adds soil nutrients	1. destroys valuable timber												
2. thin densely populated trees	2. promotes soil erosion												
3. rejuvenates forage plants	3. destroys the lands' scenic value												
4. control insect and disease infestations													
5. reduce dangerous fire fuels													
5. FALSE. Score one point for the correct answer. Many fires are suppressed. However, fire is a natural part of the forest ecosystem and can be beneficial. Where conditions warrant, fires are allowed to go their natural course. Refer to the Station 10 narrative.	1												
6. TRUE. Score one point for the correct answer. Refer to the Station 10 narrative.	1												

7. __ *mountain chickadee*
8. __ *chestnut-backed chickadee*
9. __ *white-breasted nuthatch*
10. __ *red-breasted nuthatch*
11. __ *pygmy nuthatch*
12. __ *brown creeper*
13. __ *winter wren*
14. __ American robin
15. __ varied thrush
16. __ Swainson's thrush
17. __ hermit thrush
18. __ Townsend's solitaire
19. __ golden-crowned kinglet
20. __ ruby-crowned kinglet
21. __ Yellow-rumped warbler
22. __ Wilson's warbler
23. __ Northern oriole
24. __ *Vaux's swift*
25. __ Rufous hummingbird
26. __ Calliope hummingbird
27. __ *northern flicker*
28. __ *pileated woodpecker*
29. __ *hairy woodpecker*
30. __ *downy woodpecker*
31. __ *northern 3-toed woodpecker*
32. __ western tanager
33. __ evening grosbeak
34. __ pine grosbeak
35. __ red crossbill
36. __ *dark-eyed junco*
37. __ *yellow-bellied sapsucker*
38. __ *Williamson's sapsucker*
39. __ *western-wood pewee*

WATER BIRDS AND WATERFOWL (Can be seen on lake around Mineral Ridge)

1. __ mallard
2. __ canvasback
3. __ common merganser
4. __ hooded merganser
5. __ Canada goose
6. __ tundra swan
7. __ common goldeneye
8. __ American coot

9. __ ringbilled gull
10. __ belted kingfisher
11. __ great blue heron
12. __ killdeer
13. __ spotted sandpiper
14. __ common snipe
15. __ least sandpiper
16. __ black tern

AMPHIBIANS

1. __ northern long-toed salamander
2. __ Coeur d'Alene salamander

REPTILES

1. __ Rocky Mountain rubber boa
2. __ western garter snake
3. __ western skink

FISH

(in Beauty and Wolf Lodge Bays)

1. __ kokanee salmon
2. __ chinook salmon
3. __ cutthroat trout
4. __ rainbow trout
5. __ northern squawfish
6. __ longnose sucker
7. __ brown bullhead
8. __ largemouth bass
9. __ black crappie
10. __ yellow perch
11. __ longnose dace
12. __ tench
13. __ pumpkinseed



FOREST MANAGEMENT

Forest management is a part of maintaining a healthy ecosystem. An obvious use of a forest is timber production and harvest to supply wood products. Although Mineral Ridge is managed for recreational and educational use, the stand of trees in the area above the trail was cut in 1975 to demonstrate the forest management practice of "thinning." Thinning takes out some trees while allowing others to grow. As a result, the remaining trees will get bigger and grow faster. Think for a minute. Can you guess why this is true?

If you guessed that the remaining trees had more light, water and nutrients available to them, you're right. They didn't have to compete with other trees for the important things that make them grow.

Take a second look at the tree stand. The tops or "crowns" of the trees are beginning to touch and crowd one another. Once again they are starting to compete. You'll also notice that some of the trees are dead. They were killed by insects. This is one way nature thins trees.

At another station, you will learn more about forest insects and the importance of dead trees.

6 REQUIREMENTS FOR PLANT GROWTH

- MINERAL NUTRIENTS
- WATER
- SUNLIGHT
- CARBON DIOXIDE
- MEDIUM TO GROW IN
- TOLERABLE TEMPERATURE



LITTER HURTS

Below the trail, in the draw, you can see a rusted metal cylinder. Mineral prospectors probably used it, but its exact purpose is not known. Farther along the trail you can see some actual mineral prospecting sites.

The metal cylinder has been rusting for many years. It will probably take 150 to 200 years for complete decomposition. In this area, a piece of paper can take

up to 3 years to break down into soil elements used by plants. A small, thin piece of plastic can take up to 10 years to decompose. An aluminum can will remain virtually forever since there is little in the soil to break it down. Because the decomposition process works slowly, you can see why we ask all trail users to pack out their own litter and trash. Bureau of Land Management maintenance crews periodically pick up litter along the trail, but we need your help. Please pack out your own trash, and the litter of others.

STATION

5

ROTTON LOG

Remember the decaying layer of organic material on the soil's surface called *humus*? The tree that once stood above the trail at this location and then fell across it is a good example of matter decomposing to become humus, and eventually, soil.

Bacteria, fungus, molds, yeast, worms and insects break down the woody material. These small organisms are important because the wood they decay is the only natural source of soil nutrients.

Plants require three primary minerals for growth — nitrogen, phosphorus and potassium. Other elements such as calcium, magnesium and sulfur are also needed in smaller quantities. However, all of these minerals are of no use to the plant unless water is present. Plant roots absorb water containing the minerals so the plant can photosynthesize its food or store it for later use. Most of these minerals will be returned to the soil when the trees die and decompose. Thus, the forest cycle is continuous.



MINERAL RIDGE

TRAIL GUIDE

WILDLIFE CHECKLIST

Wildlife diversity on Mineral Ridge is shown in this list of animals. It includes species that have been seen here or thought to frequent the area. It is designed as a checklist so you can keep a record of what you observe. Species in italics use snags as part of their habitat.

MAMMALS

UNGULATES (hoofed animals)

1. white-tailed deer

RODENTS AND LAGOMORPHS (gnawing mammals)

1. porcupine
2. mountain cottontail
3. snowshoe hare
4. Colombian ground squirrel
5. golden mantled squirrel
6. *red squirrel*
7. northern flying squirrel
8. *yellow pine chipmunk*
9. *deer mouse*
10. *bushy tail woodrat*
11. longtail vole

CARNIVORES (meat eaters)

1. black bear (also eats plants)
2. coyote
3. *striped skunk*
4. bobcat
5. *pine marten*
6. *long-tailed weasel*

SHREWS

1. vagrant shrew
2. cinereus shrew

BATS

1. *silver haired bat*
2. *big brown bat*
3. hoary bat

BIRDS

RAPTORS

1. sharp-shinned hawk
2. *red-tailed hawk*
3. *osprey*
4. bald eagle (endangered species)
5. *western screech owl*
6. *flamulated owl*
7. *great horned owl*
8. *northern pigmy owl*
9. boreal owl
10. *northern saw whet owl*

GROUSE

1. ruffed grouse

INSECT AND SEED EATERS

1. gray jay
2. Stellar's jay
3. American crow
4. *common raven*
5. Clark's nutcracker
6. *black-capped chickadee*

GRASSES

1. __ bluebunch wheatgrass
2. __ tall oatgrass
3. __ pine grass
4. __ Idaho fescue
5. __ bluegrass

Agropyron spicatum
Arrhenatherum elatins
Calamagrostis rubescens
Festuca idahoensis
Poa spp.

MOSSES

1. __ curved-leaved moss
2. __ curly-moss
3. __ creeping moss
4. __ grey rock-moss
5. __ triangle-leaved moss
6. __ club moss
7. __ twisted moss

Dicranum spp.
Drepanocladus spp.
Hypnaceae spp.
Rhacomitrium spp.
Rhytidiadelphus triquetrus
Selaginella spp.
Tortula spp.

LICHEN

1. __ old man's beard
2. __ crustose lichen
3. __ foliose lichen
4. __ foliose lichen
5. __ reindeer moss

Alectoria spp.
Cladonia spp.
Lobaria spp.
Parmelis spp. (on trees)
Usnea spp.

PARASITES

1. __ dwarf mistletoe
2. __ dwarf mistletoe

Arceuthobium douglasii (on Douglas-fir)
Arceuthobium campylopodum (on ponderosa pine)



PLANT SUCCESSION

The old roadbed that the trail crosses was built years ago for mineral prospecting and has not been used since the 1920s. Although long abandoned, the road is still easily visible. The trees were removed before road construction. Only grasses grew when the road was first used. Shrubs began growing after the road was abandoned, and now young trees are beginning to grow. The ultimate vegetation that any site can support is known as its “climax plant community,” and the process of change toward climax is known as plant succession. Sub-climax species are known as seral species and occupy different seral stages. Because of different habitat requirements, wildlife changes according to each seral stage. People can influence the rate of change and even reverse its direction to earlier stages of plant succession. In this case, people built a road.

Another example of artificial change is timber harvest. Land managers can simulate a certain stage of succession by cultivating plants of a specific seral stage. For example, browse for deer and elk can be created by promoting brushfields on south-facing slopes after timber is removed. This can be done by burning the area periodically to kill young trees that would eventually shade out the shrubs. Managers may also try to change the rate of succession by planting seral tree species that are less susceptible to insect and disease problems.

Through succession, sites always progress to the point that they are populated with climax vegetation. However, climax vegetation is not the same for all sites. It may be a pine forest for one site and a grassland for another site. Each will vary according to the conditions of the surrounding habitat. Still, you will often see many areas with seral plants. Why do you suppose this is true? Think about it as you hike to the next station.

THE LIVING FOREST

THE LIVING FOREST



A forest is composed of various plants and animals living together. Populations of each species, whether they be plant or animal, will have individuals of all ages, from infant to old. Populations of trees may even have dead trees called snags. A healthy forest will have balanced proportions of its inhabitants, and individual plants will have sufficient space to grow without competition for soil nutrients, water, and sunlight. Plant succession will proceed toward climax in the absence of natural disturbances such as fire or human disturbances such as timber harvest. Without disturbances to maintain these balanced proportions, selected species may become too densely populated. Consequently, the chance for infestations of insects, diseases, or

catastrophic wildfire will increase. These processes retard plant succession from achieving climax vegetation.

Habitat is “home” for any living thing and provides food, shelter (also known as cover), water, and living space. Generally, the diverse forest vegetation provides food and cover for the variety of wildlife that inhabits the forest. For example, ruffed grouse and deer primarily eat buds and twigs, whereas finches and sparrows eat seeds. Red squirrels cache tree cones for later use during harsh winters. Standing trees provide habitat for insects and spiders, which are eaten by chickadees. Three-toed woodpeckers and black-backed woodpeckers feed almost exclusively on bark and wood-boring beetles. Nearly all infant birds need animal protein from insects to grow. Forest plants provide security cover for animals to rest or roost, escape cover from predators including people, protective cover from extreme weather, and reproductive cover for giving birth and rearing young. Each animal species has its unique habitat requirements and relies upon different plant species to provide its needs.

49. __ corn gromwell
50. __ lemon weed
51. __ narrow-leaved parsley
52. __ wild lupine
53. __ blue lupine
54. __ white campion
55. __ bluebell
56. __ bluebell
57. __ mitrewort
58. __ cancer root
59. __ sweet cicely
60. __ penstemon
61. __ penstemon
62. __ wild sweetwilliam
63. __ buckhorn plantain
64. __ nippleseed plantain
65. __ cinquefoil
66. __ cinquefoil
67. __ pine drops
68. __ leafless wintergreen
69. __ buttercup
70. __ early buttercup
71. __ sheep sorrel
72. __ skullcap
73. __ stoncrop
74. __ stoncrop
75. __ butterweed
76. __ ragwort
77. __ night flowering catchfly
78. __ false solomon's seal
79. __ starry solomon plume
80. __ nodding ladies tresses
81. __ common chickweed
82. __ twisted stalk
83. __ dandelion
84. __ early meadow rue
85. __ early meadow rue
86. __ goatsbeard
87. __ salsify
88. __ alsike clover
89. __ western trillium
90. __ mullein
91. __ blue violet
92. __ meadow death camas

FERNS

1. __ brittle fern
2. __ sword fern
3. __ bracken fern
4. __ mountain woodfern

Lithospermum philosum
Lithospermum ruderales
Lomatium triternatum
Lupinus perennis
Lupinus wyethii
Lychnis alba
Mertensia longiflora
Mertensia virginica
Mitella stauropetala
Orobancha uniflora
Osmorhiza chilensis
Penstemon eriantherus
Penstemon venustus
Phlox longifolia
Plantago lanceolata
Plantago major
Potentilla glandulosa
Potentilla millegrana
Pterospora andromedea
Pyrola aphylla
Ranunculus eschscholtzii
Ranunculus glaberrimus
Rumex acetosella
Scutellaria angustifolia
Sedum douglasii
Sedum stenopetalum
Senecio intergerrimus
Senecio leibergii
Silene douglasii
Smilacina racemosa
Smilacina stellata
Spiranthes cernua
Stellaria media
Streptopus amplexifolius
Taraxacum officinale
Thalictrum dioicum
Thalictrum occidentale
Tragopogon dubius
Tragopogon major
Trifolium hybridum
Trillium ovatum
Verbascum thapsus
Viola adunca
Zigadenus venenosus

Cystopteris fragilis
Polystichum munitum
Pteridium aquilinum var. pubescens
Woodsia scopulina

20. white spirea
21. snowberry
22. dwarf snowberry

Spirea lucida
Symphoricarpos albus
Symphoricarpos vaccinioides

FORBS

1. yarrow
2. goat chicory
3. pearly everlasting
4. alkanet
5. common bugloss
6. anemone
7. windflower
8. dogbane
9. kinnikinnick
10. arnica
11. arnica
12. arrow-leaf balsam-root
13. brodea
14. wild hyacinth
15. sego lily
16. fairy slipper
17. harebell
18. harebell
19. squaw root
20. yellow paintbrush
21. field chickweed
22. prince's pine
23. spring beauty
24. miner's lettuce
25. spring beauty
26. blue clematis
27. blue-eyed mary
28. western goldthread
29. larkspur
30. fairybells
31. shooting star
32. shooting star
33. western wallflower
34. western wallflower
35. dog-toothed violet
36. wild strawberry
37. rice-root
38. yellowbell
39. gaillardia
40. sweetscented bedstraw
41. wild geranium
42. northern gentian
43. northern gentian
44. foxfire
45. alumroot
46. water-leaf
47. pea vine
48. woodland star

Achillea millefolium
Agoseris grandiflora
Anaphalis margaritacea
Anchusa azurea
Anchusa officinalis var.
Anemone piperi
Anemone drummondii
Apocynum pumilum
Arctostaphylos uva-ursi
Arnica cordifolia
Arnica fulgens
Balamorhiza sagittata
Brodea lactea watts
Brodiaea hyacinthina
Calochortus elegans
Calypso bulbosa
Companula perryi; var *idahoensis*
Campanula rotundifolia
Canopholis americana
Castilleja angustifolia
Cerastium arvense
Chimaphila umbellata
Calytonia lanceolata
Claytonia peffoliata
Claytonia virginica
Clematis columbiana
Collinsia parviflora
Coptis occidentalis
Delphinium depauperatum
Disporum oreganum
Dodecatheon pauciflorum
Dodecatheon puberulum
Erysimum capitatum
Erysimum elatum
Erythronium grandiflorum
Fragaria virginiana
Fritillaria lanceolata
Fritillaria pudica
Gaillardia arisystata
Galium triflorum
Geranium viscosissimum
Gentiana acuta
Gentiana amarella
Gilia aggregata
Heuchera cylindrica
Hydrophyllum capitatum
Lahyrus bijugatus
Lithophragma bulbifera

STATION

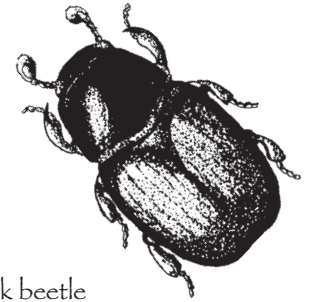
8

WITCHES BROOM & BARK BEETLES

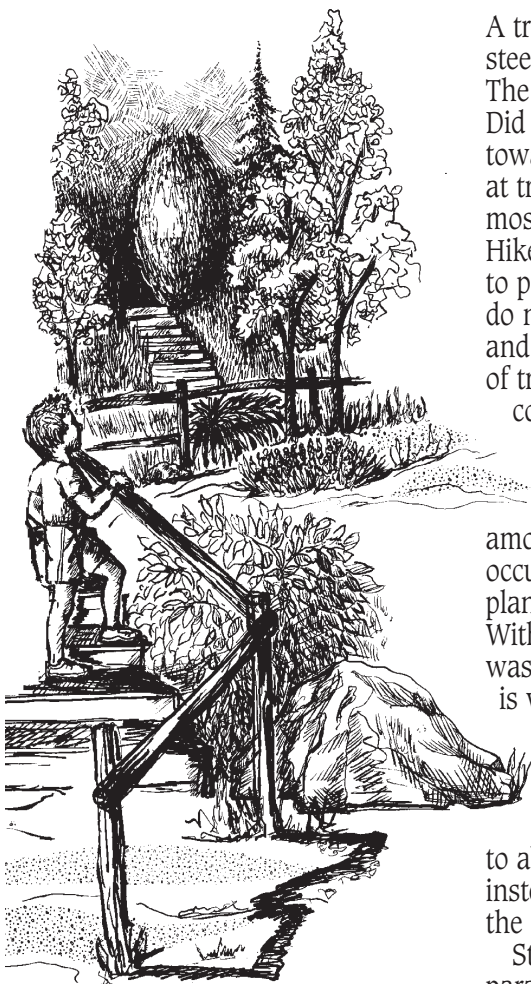
Parasitic insects and diseases can infect trees in the forest. A parasite is a living organism that lives on or in another organism called a "host." Parasites derive their nourishment from their hosts and return nothing. Insects and disease can kill a tree or weaken it and slow its growth. Weakened trees are less able to compete with healthy trees and can be crowded out. They are also more susceptible to infestation by other parasites. Infestations can thin a timber stand or eliminate the climax vegetation and the plant succession cycle is repeated. In this way, vegetation diversity is maintained and we will continue to see seral vegetation. Wildfire also causes vegetation to diversify.

As you stand at this station, take a look around. Can you find an example of a parasite infecting a tree? The large Douglas-fir below the trail and the other trees in this area have deformities that appear as multi-branched broom-like growths on otherwise normal tree branches. The deformity is called *witches broom*, and is caused by dwarf mistletoe, a parasitic plant. The branched formation is caused by the tree's own disease-combating defenses. The tree tries to cure itself by rushing nutrients to the infected area, much as white blood cells are rushed to human wounds. This rush of nutrients causes the sporadic growth pattern. Dwarf mistletoe is a serious parasite in many western conifers and can cause great economic losses.

A parasitic insect found in the area is the bark beetle. Since the start of the trail you have probably noticed many dead ponderosa pine trees. They were killed by a tiny beetle that enters the tree and feeds just under the bark. The feeding action of the beetle eventually will girdle the tree, cutting off the flow of nutrients, immediately killing it. Bark beetles are a common and serious pest. They usually attack weakened or dying trees. Many of the dead pine trees you see on Mineral Ridge were killed in the 1980s after several years of warm, dry weather made the trees vulnerable to beetle attack. As you proceed up the trail, see how many ponderosa pine trees you can find that may have been killed by the bark beetle.



bark beetle



A trail runs down the center of the steep old road that crosses here. The vegetation is trampled and worn. Did you see other examples of trampling toward the beginning of your hike and at trail switchbacks? Trampling is caused mostly by people taking shortcuts. Hikers need to stay on the main trail to prevent trampling, but obviously, some do not heed this request. Soil erosion and sedimentation are the main effects of trampling. Water erosion is the main concern. How much soil erosion occurs depends on the amount of water, steepness of the slope, the soil type, and the kind and amount of plants. When trampling occurs, vegetation is destroyed and plant roots will not hold soil in place. With the ground left unprotected, soil is washed away by rainfall. The situation is worsened because as topsoil is lost, the soil's capacity to absorb water is further reduced. Trampling also causes soil compaction.

Compaction reduces soil's ability to absorb water. In short, water runs off instead of sinking in, further escalating the damage to plants and soil.

Stay on the main trail. It is built to parallel the land's natural contour, and is sloped so that water falling on it quickly flows off into undisturbed vegetated areas rather than being channeled down the trail. Culverts under the trail help the runoff drain in its natural pattern rather than being blocked and diverted onto the trail.

MINERAL RIDGE

TRAIL GUIDE

PLANT CHECKLIST

A wide diversity of terrestrial plant life can be observed on Mineral Ridge. The following list has been compiled as a checklist so you can keep a record of those that you find. Use the list with any of the commercially available field guides to plants. Plants are listed here alphabetically by genus and species. Their Latin scientific names are shown because sometimes more than one plant will have the same common name or a plant may be known by more than one common name.

TREES

1. grand fir
2. western paper birch
3. western larch
4. western white pine
5. ponderosa pine
6. black cottonwood
7. Douglas-fir
8. western red cedar
9. western hemlock

Abies grandis
Betula papyrifera var. *occidentalis*
Larix occidentalis
Pinus monticola
Pinus ponderosa
Populus trichocarpa
Pseudotsuga menziesii
Thuja plicata
Tsuga heterophylla

SHRUBS

1. mountain maple
2. thin-leaved alder
3. serviceberry
4. Oregon grape
5. ocean-spray
6. twin flower
7. orange honeysuckle
8. red twin-berry
9. mountain lover
10. syringa
11. ninebark
12. wild cherry
13. sticky currant
14. peartip rose
15. wood rose
16. nootka rose
17. thimbleberry
18. blue elderberry
19. white spirea

Acer glabrum
Alnus sinuata
Amelanchier alnifolia
Berberis repens
Holodiscus discolor
Linnaea borealis
Lonicera ciliosa
Lonicera utahensis
Pachistima myrsinites
Philadelphus lewisii
Physocarpus malvaceus
Prunus emarginata
Ribes viscosissimum
Rosa woodsii
Rosa gymnocarpa
Rosa nutkana
Rubus parviflorus
Sambucus coerulea
Spirea betulifolia



WILDFIRE

You can see the effects of wildfire on plant succession at this location. The tree canopy is more open and more brush is present. Young trees are just now beginning to grow and eventually will shade out much of the brushy understory.

Fire is a natural part of the forest's ecosystem. When small and not too hot, fire can have beneficial effects. For example, fire can return nutrients to the soil from plants, thin densely populated trees, rejuvenate growth of forage plants for wildlife, control infestations of insects and disease, and reduce plant material that could fuel a large, hot fire. Fire-tolerant trees, such as mature ponderosa pine, can survive repeated occurrences of low-intensity ground fires.

Aggressive fire suppression has allowed excessive plants to accumulate to dangerous levels in many forests. The potential exists for a low-intensity ground fire to become a raging inferno. Not only do they destroy valuable timber, but these fires can increase serious soil erosion by removing ground cover. Also, large, high-intensity fires that race through the forest's crown can leave an unpleasant sight for the visitor. BLM recognizes that fire is a natural part of the forest ecosystem and can have beneficial effects, so not all fires are immediately suppressed. However, too many fires, or very hot fires can be destructive. Please be careful with your campfires and matches.



RADIO VIEWPOINT

You might be wondering about the odd name for this location. After all, there is no radio or tower here. The name refers to the Radio Mining Company, which consisted of five mining claims at the head of Varnum Creek. The company was active in the early 1930s leaving 1,375 feet of underground workings. Other names used on Mineral Ridge, along with an explanation of where they were derived, starts on page 23.

The distance to Station 12 is fairly long. As you proceed, see if you can identify plant species that were introduced at the start of the hike, find a rotting log and explore soil building and decomposition processes, or look for signs of forest insects and disease.

The vegetation in this area is typical of most of the area you have hiked through thus far. This south-facing slope of Mineral Ridge is considered a Douglas-fir habitat type meaning that Douglas-fir is the climax tree species in this area. However, you have seen quite a few ponderosa pine as well. Ponderosa pine will not germinate or grow well in shade. Although the tree grows best in relatively moist, but well-drained soils, it can tolerate dry, shallow, rocky soils. Here the soil is somewhat dry and shallow, suitable for pine but also moist enough to support Douglas-fir. Eventually, the ponderosa pine will be replaced by more shade-tolerant Douglas-fir.

Because the soil is shallow, it's important that you stay on the trail. Remember the extensive damage that trailing and erosion cause. If you left the main trail, look back at the route you took. Is the vegetation trampled? Is the ground bare? Will the trail that you took drain water quickly, or will it act as a channel? Did you help prevent erosion or did you worsen the problem?



SILVER TIP VIEWPOINT

The Silver Tip Mining Association was very active on one of the most extensively developed properties in the Beauty Bay Mining District for a short time. It was incorporated on April 27, 1922, but disbanded seven months later. The property consisted of sixteen unpatented claims located on Varnum Creek, a tributary of Beauty Creek, in lead-zinc-pyrrhotite deposits. Some ore from the property was treated at the Caribou Custom Mill. Mine development consisted of two main adits on opposite sides of the creek.

The viewpoint affords an overlook of both Beauty Bay and Wolf Lodge Bay from about 600 feet above the lake, an elevation of 2,724 feet. It is located 2,905 feet west from Caribou Cabin. From here the Johnny Mack Trail winds 4,170 feet back to the parking lot.

SILVER WAVE VIEWPOINT

This was the name given to the first mining claim located on Mineral Ridge. In 1891, prospectors Marshall, Hoelzle, O'Brien and Moor staked the claim and later drove 700 feet of drift into the hillside below the viewpoint.

The viewpoint affords an excellent panoramic view of the Wolf Lodge Valley and the Coeur d'Alene Mountains to the north from an elevation of 3,020 feet.

WILSON M. M. & M. TRAIL

The Wilson Mutual Mining and Milling Company worked four groups of claims in the vicinity of Wolf Lodge Bay. The largest group was located on the north slope of Mineral Ridge on November 21, 1917, and identified as the Wilson Group. The Wilson M. M. & M. Trail connects Caribou Cabin with the Lost Man Trail and is 2,055 feet long. The Royal and Blue Bird Viewpoints are on the trail.

CARIBOU CABIN

The Caribou Mining Company was incorporated July 5, 1918. The Caribou Group consisted of ten unpatented claims located about two miles up Beauty Creek in lead-zinc-pyrrhotite deposits. Unpatented claims are those where the land being mined still belongs to the public. Underground workings on the claims total about 1,700 feet, primarily in two exploratory drifts. In 1919 a mill on this property was equipped to do custom milling and in 1931 treated ore from several properties in the district for a short time.

GRAY WOLF

Nine unpatented mining claims, located two miles up Beauty Creek in lead-zinc-pyrrhotite deposits, were operated by the Gray Wolf Mining Company. It was developed with one main 990-foot adit. The company was incorporated on May 18, 1917, and forfeited its charter November 30, 1938.

The scenic point honoring this company is located 1,850 feet northwesterly from Caribou Cabin and is situated at an elevation of 2,824 feet, about 700 feet above lake level. A commanding view of Wolf Lodge Bay and vicinity is offered.

LOST MAN TRAIL

The first three claims located in the Johnny Mack Group on a tributary of Varnum Creek were named the *Lost Man Nos. 1, 2, and 3*. *Lost Man No. 1* was recorded on November 1, 1928, and the others 17 days later.

The trail extends from the Royal Viewpoint to the Elk Mountain Road. The trail is 1,955 feet in length. It presents several natural vistas enroute.

MINERAL RIDGE

The Mineral Ridge Mining and Milling Company was incorporated in 1908 and the first claims located here were the *Buckeye* and *Silver Wave* dating back to 1891.

ROYAL VIEWPOINT

These mining claims were operated by the Royal Basin Mining Company which was incorporated December 14, 1910. The property consisted of nine unpatented claims located about two miles above the mouth of Beauty Creek in undifferentiated deposits. The company's workings included three adits, the principal one being about 500 feet long. The company forfeited its charter November 30, 1942.

The Royal Viewpoint is located 2,055 feet east of Caribou Cabin at an elevation of 2,815 feet.



ABANDONED PROSPECT SPUR TRAIL

The short spur trail to the west leads to an abandoned mine.

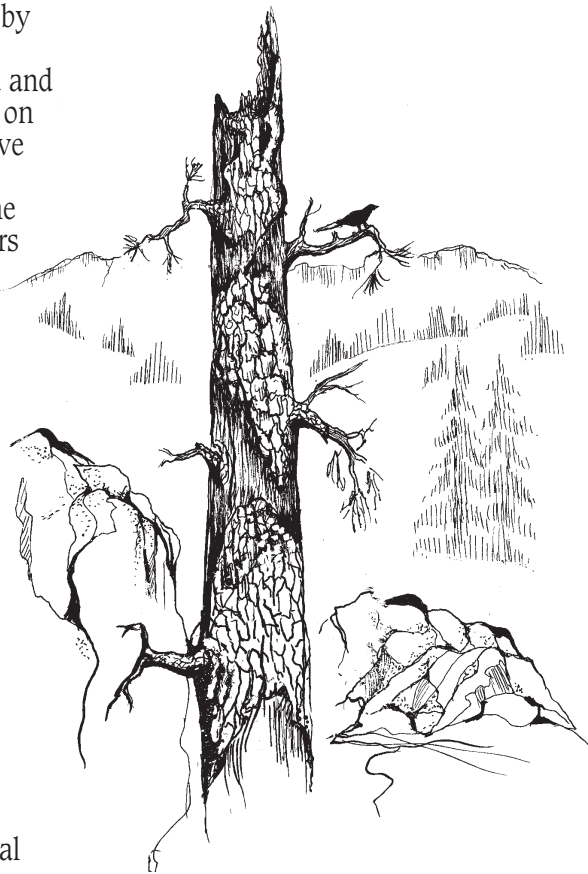
Prior to 1920, the United States mining laws provided that mineral deposits on federal land were open to exploration and purchase to the person who found them. Mining laws became more complex as uses for a wider variety of types of minerals developed. Today, claims can still be staked out or located for "hard rock" minerals such as gold, silver, copper, lead and zinc. Other minerals such as oil, natural gas and phosphate can be leased and the resources extracted. Common minerals such as sand, gravel and building stone are sold by the ton or cubic yard.

Only hard rock mining occurred at Mineral Ridge. Miners came from the East and from the California gold fields when gold was discovered at Prichard, north of Wallace, in 1881. The first recorded claims were filed on Mineral Ridge in 1891.

Many people would call this a mine shaft, but that is incorrect. A shaft is a vertical or inclined excavation. This excavation is horizontal and is properly referred to as a prospect, or if a mine had been developed, an adit. Where an adit is extended through a mountain so it has an opening on each end, it is called a tunnel. A "mine" is an excavation where mineral deposits, or ore, are extracted. Ore was never found and extracted from this site so it is considered a prospect. A prospect is any shaft, pit, drift, or drill hole used to determine if an area warrants development of a mine.

This ponderosa pine was killed by western pine beetles in 1974. It was more than 480 years old and probably the second oldest tree on Mineral Ridge. The tree was alive when Columbus sailed to North America and was nicknamed the Columbus Tree. For several years it stood as a dead tree, or snag. Snags provide valuable habitat for many wildlife species. For small animals, such as insects, snags serve as cover and places for feeding and homes. Insects, in turn, provide food for other animals. Snags are used for feeding, nesting, roosting and perching by a variety of bird species. Some birds use existing cavities in the snags for their nests while others excavate and create nesting cavities in the soft wood.

The importance of snags for perching is exemplified by how bald eagles use snags on Mineral Ridge. Each winter, eagles visit this area to feed on kokanee salmon. Eagles perch on snags along the shoreline watching for salmon. Snags are easier to fly from and land on than living trees. Mammals also use cavities in snags for dens or as resting or escape cover. Areas under loose bark are used by bats for roosting.



HISTORY/GLOSSARY OF PLACE NAMES

The first two recorded mining claims on Mineral Ridge were located on its north slope in 1891 by John Marshall, Emanuel Hoelzle, Michael O'Brien, and Marion Moor. They were staked out and named *Buckeye* and *Silver Wave*. Marshall, Hoelzle, and Charles Williams, carpenters, boat builders, and lifelong friends, worked the claims and explored the ridge ever more intently for telltale signs of valuable minerals. They built a prospector's cabin of hand-hewn logs near the present parking lot in 1900. Together they located the *Beartooth*, *Raccoon*, and *Mascot* mining claims on the hillside above the cabin in 1907. The next year they were instrumental in forming, along with four others, the Mineral Ridge Mining and Milling Company. Like fever, the "mining bug" spread to others who dreamed of making a fortune on "The Ridge." Claims were located throughout the 1930s by J.S. Green, Clyde Pittman, Johnny Mack, the Wilson Brothers, Anderson, Brennan and Ed Burns, spawning such names as *General Pershing*, *Last Chance*, *Sante*, *Bull Elk*, *Black Bear*, *Silver Tip*, *Gray Wolf*, *Last Dollar*, *Hercules*, *Dam-site*, *Stern Winder*, *Lost Man*, *North Star*, *Diamond Hitch*, *Peggy N.*, and *Pack Rat*.

The high price of metal during World War I stimulated mining activity. It dwindled after the war with the collapse of the metal market. In 1923 a reported rich platinum discovery led to intense excitement. This later proved to be a hoax. Small bodies of lead-zinc ore, however, were discovered in the Beauty Bay Mining District, and these continued to attract attention.

The Beauty Bay area's first homesteader was David H. "Colonel" Budlong, who received patent to 160 acres (a portion is now Beauty Bay Resort) on March 8, 1902. The legendary names of the mining companies and individuals who prospected in the Beauty Bay Mining District were located from the records to highlight this interesting era of the area's past.

BLUE BIRD VIEWPOINT

This viewpoint on the Wilson Trail offers a splendid view of Wolf Lodge Creek, Bay, and the surrounding Coeur d'Alene Mountains. Its namesake, the Blue Bird Mining Company, was incorporated on September 2, 1924. The property consisted of nine unpatented mining claims located on Mineral Ridge in arsenopyrite deposits. It had a 65-foot shaft, and an adit about 100 feet long that have since been obliterated. The charter was forfeited in November 30, 1941.

In October 1991, the area experienced unusually high winds exceeding 60 miles per hour. Many trees, including the Columbus Tree, were blown over. Several fell across powerlines igniting fires that were driven by the extreme winds into huge fire-storms. Ironically, the high winds that toppled the Columbus Tree occurred just a few days after Columbus Day on October 12.



DOUGLAS-FIR STAND

Did you notice a change in the vegetation at arriving at this station? This is typical of a Douglas-fir forest stand. Obviously, there has been a change in environmental factors that favors Douglas-fir. What major factor is different? This site is more moist and the soil is deeper so it can hold more water. Also, its exposure is not as directly south as the areas you were just in. There is less sunlight and wind here so there is less evaporation. Also, since Douglas-firs have become established and they grow in a more dense stand than ponderosa pine, the area is more shaded. This makes it cooler, further reducing the amount of sunlight and slowing evaporation.

What can you tell about plant succession on this site and what is the site's probable climax plant species? There are both ponderosa pine and Douglas-fir here. However, notice that the larger, older trees are pines and the younger, more abundant trees are Douglas-fir. Do you see any pine seedlings? Probably not, since ponderosa pine do not reproduce well in shaded areas. Notice that the shade also limits the amount of understory vegetation. Douglas-fir is the climax tree species here.

This is the summit of the Mineral Ridge Trail. You have climbed to an elevation of 2,800 feet, a rise of 660 feet from the parking lot. The main loop trail continues to the west and returns to the parking lot. This brochure corresponds to points on the main trail. The Wilson M. M. & M. trail to the east connects with the Lost Man Trail. The total length of these two trails is less than one mile. However, they do not form a loop and dead end where the

Lost Man Trail intersects the Elk Mountain Road (Forest Service Road Number 1575). Along these spur trails are two viewpoints of Wolf Lodge Bay, Wolf Lodge Creek and the surrounding Coeur d'Alene Mountains. The trails traverse slopes with northerly exposures with moist and cool grand fir, hemlock and cedar habitat types.

You can also see a soil profile of the north slope of Mineral Ridge. This cut is much deeper than the first one you looked at. It also has a thick topsoil layer that is formed in weathered volcanic ash. This ash originated from Mt. Mazama over 6,000 years ago. A huge volcanic eruption blew the top off the mountain to form present day Crater Lake in Oregon. The ash was wind blown hundreds of miles to its present resting place. Because it is light and fluffy, it helps this soil absorb much more water than it would without it.

As you continue your hike, you can review the forest interrelationships of Mineral Ridge. We've added some questions at the back of this booklet to help you learn more about forest ecology. Record your answers on the Answer Sheet (pages 37-38).



QUESTION 17

Remember, there are over 100 terrestrial plant species found on Mineral Ridge. Only six have been highlighted thus far. Here are descriptions of four additional plants. Identify and find an example of each.

1. *SYRINGA* sometimes called mockorange, is the state flower of Idaho. It has showy, fragrant flowers with four white petals. Leaves are opposite and ovate with an acute tip. Edges may be smooth or can have sharp teeth pointing outward. Its bark is somewhat shreddy.
2. *OREGON GRAPE* is a low-growing shrub with shiny evergreen, compound leaves. Leaves are alternate. Leaflets have prickly and serrated edges. It grows on both open and shady hillsides. Older leaves may have red and yellow colorations. It provides forage for deer and elk.
3. *SERVICEBERRY* is a large-spreading shrub that prefers drier, open hillsides. It has small, serrate, elliptical, and alternate leaves. Bark on older branches is grey. The dark, purple berries are edible. It is an important browse plant for deer and elk.
4. *BRACKEN FERN* is common in moist, mountainous areas. Its large compound leaves are broadly triangular in outline and are usually solitary.

QUESTION 18

Along the descent trail you will notice numerous dead, dying or unhealthy-looking ponderosa pine trees. They have been attacked by bark beetles. Find an example of bark beetle damage. Look for holes bored into the bark. There may be balls or globs of pitch oozing from the holes. This is how the tree tries to expel the beetle. On dead trees, look for trails or etchings the insects have left on the debarked trunks.

► *Score your review when you reach the bottom of the trail. Correct answers to the questions can be found on page 33.*

a ponderosa pine. Because the larger older trees here are pines, it is probably the climax tree species for this site. TRUE OR FALSE?

STATION
22

SILVER TIP VIEWPOINT

This location provides one of the more popularly photographed views of Lake Coeur d'Alene. Note the grassy vegetation on this open hillside.

QUESTION 15

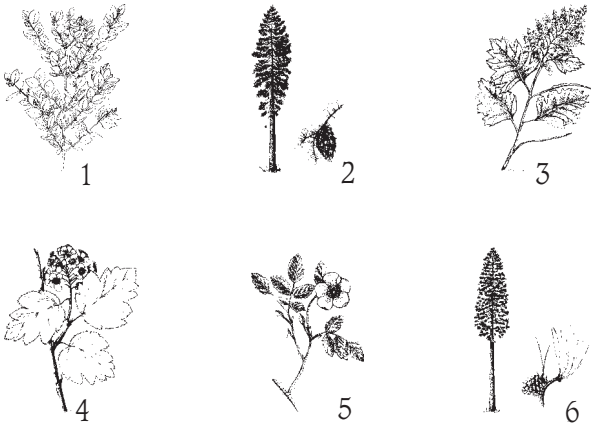
At this location it is especially important to stay on the main trail to prevent soil erosion because of the sparse vegetation, shallow soils and steep slopes. TRUE OR FALSE?

► *Silver Tip Viewpoint is the last numbered station. The trail now descends back to the parking lot. On the way down continue the review by answering the following questions. Read each of the questions before starting out so you will know what to look for as you proceed.*

QUESTION 16

Match the plant drawings below with the correct names. Also find an example of each plant along the trail.

- a. Douglas-fir
- b. Wild rose
- c. Ocean-spray
- d. Ponderosa pine
- e. Ninebark
- f. Snowberry



MINERAL RIDGE

TRAIL GUIDE

REVIEW QUESTIONS

STATION
17

PIT EXCAVATIONS

These pit excavations were dug by prospectors looking primarily for lead and zinc.

QUESTION 1

Prior to 1920, United States laws prohibited mining on federal lands. TRUE OR FALSE?

QUESTION 2

On federal lands, mining claims can be staked for all minerals. TRUE OR FALSE?

QUESTION 3

Valuable minerals were not removed from these diggings. Therefore, they are technically not called a mine but are referred to as a prospect. TRUE OR FALSE?

STATION
18

FIRE SCAR

The old ponderosa pine here was scarred and burned about 55 to 75 years ago.

QUESTION 4

List three beneficial effects and one adverse impact of wildfire.

QUESTION 5

Since fires can be extremely devastating, all fires located on federal lands are suppressed. TRUE OR FALSE?

QUESTION 6

Although fire is a natural part of the forest's ecosystem, visitors to the forest still need to be careful with campfires and matches. TRUE OR FALSE?



HABITAT CONTRAST

You can see a sharp, distinct change in habitats along the narrow ridgetop. Compare the differences in kind and amount of vegetation on the north and south slopes.

QUESTION 7 (A & B)

A. Certain basic requirements must be met for plant growth common to all plants. What are they?

B. What plant growth requirement is the most different between the ponderosa pine and the Douglas-fir habitats?

Choose your answers from the following list:

- a. A medium such as soil to grow in
- b. Mineral nutrients
- c. Oxygen
- d. Water
- e. Carbon dioxide
- f. Light
- g. A tolerable temperature range

QUESTION 8

Comparing the north and south facing slopes, what environmental factors are different?

Choose your answers from the following list:

- a. Elevation
- b. Aspect (exposure)
- c. Slope
- d. Soil depth and structure
- e. Temperature
- f. All of the above



SNAGS

QUESTION 9

Do you see any old, dead standing trees from this location? Standing dead trees are called snags. TRUE OR FALSE?

QUESTION 10

Dead trees can provide habitat for numerous different wildlife species. List two habitat needs that snags can fulfill.



ROOT SYSTEM

By looking at the exposed roots of this fallen tree you can see how plant roots help to stabilize the soil and protect it from erosion.

QUESTION 11

Besides holding the soil in place and protecting it from erosion, plants also add mineral nutrients to the soil through the process of decay and decomposition. Decomposition provides the primary natural source of soil nutrients. TRUE OR FALSE?

QUESTION 12

The subsoil contains most of the organic matter found in the soil. Consequently it is coarse and has large pore spaces enabling it to absorb relatively large amounts of water. TRUE OR FALSE?

QUESTION 13

Not only are plants considered beneficial to the soil, but soil provides necessities for plant growth. In general terms, list two of these vital characteristics.

QUESTION 14

Notice that the larger trees around the ridgetop are ponderosa pines. Therefore, you can logically conclude that this fallen tree with the exposed roots was also