

Fire Ecology

Exam No. 2

November 2, 1977

- (30) 1. Using letters from the legend on the right, indicate where the following species would be most prevalent. Letters from the legend may apply to several species or none.

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| <u>a,f</u> | 1) Mountain mahly (<u>Muhlenbergia montanensis</u>) | a. Ponderosa Pine - Central Rockies |
| <u>a</u> | 2) Fringed sagebrush (<u>Artemisia frigida</u>) | b. Oak-Brush-Rocky Mountains |
| <u>i</u> | 3) Pointleaf manzanita (<u>Manzanita pungens</u>) | c. Cedar-Hemlock |
| <u>h</u> | 4) Pinegrass (<u>Calamagrostis rubescens</u>) | d. Pinyon-Juniper |
| <u>g</u> | 5) Chamise (<u>Adenostema fasciculatum</u>) | e. Douglas-fir |
| <u>j</u> | 6) Sugar Pine (<u>Pinus lambertiana</u>) | f. Ponderosa Pine-Southern Rockies |
| <u>b</u> | 7) Gambel's oak (<u>Quercus gambelii</u>) | g. California chaparral |
| <u>g</u> | 8) Black sage (<u>Salvia mellifera</u>) | h. Ponderosa Pine-Pacific Northwest |
| <u>e</u> | 9) Aspen (<u>Populus tremuloides</u>) | i. Arizona chaparral |
| <u>h</u> | 10) Bitterbrush (<u>Purshia tridentata</u>) | j. Ponderosa Pine-California |
| <u>d</u> | 11) Big sagebrush (<u>Artemisia tridentata</u>) | |
| <u>g</u> | 12) Scrub oak (<u>Quercus dumosa</u>) | |
| <u>a</u> | 13) True mountain mahogany (<u>Cercocarpus montanus</u>) | |
| <u>i</u> | 14) Shrub liveoak (<u>Quercus turbinella</u>) | |
| <u>e</u> | 15) Geranium (<u>Geranium richardsoni</u>) | |

- (10) 2. Before the arrival of white man to North America, how did young juniper trees get established and then become suppressed?

- (10) 3. Why are fires inevitable in California chaparral and how has the plant community adapted to fire?

Less dense woods, dry
High fuel buildup, volatile
Vigorous sprouters
Vigorous seedlings

- (8) 4. Frequent fires (i.e. 5 years) in chaparral of northern California are not considered desirable. Assuming that you could burn every 5 years, why might this frequency be undesirable?

① Shift sprouting & non-sprouting → sprouting species
② Erosion
③ Fire control?

- (6) 5. What are the primary values of the Gambel Oak community?

Retard snow-melt
Minimize erosion
Game browse

(15) 6. Considering the total resource, what are the principle reasons for using fire in ponderosa pine plant communities?

- ① Prepare mineral seedbed
 - ② Reduce fuel loads
 - ③ Remove litter to increase yield of herbs
 - ④ Control diseases, insects
 - ⑤ Thin stands; remove thickets
 - ⑥ Kill seedlings
 - ⑦ Accessibility to game + livestock
 - ⑧ Stimulate browse regeneration
- Fertilization
Prevent Encroachment of Undesirables
Pruning of lower branches
Increase water yield?

(7) 7. Discuss the ecological relationships between Western Red Cedar, Western Hemlock, and Grand-fir.

Climax species in Northwest

D.F. Seral to these species

W. Red Cedar grows along wet streams

W. Hemlock grows on moist sites - North, east, ~~the~~ lowlands.

Grand-fir most drought tolerant - grows on upland, rolling hills.

- (12) 8. In what ways do aspen and lodgepole pine depend on fire? Which of these vegetation types is most important for livestock and wildlife, and why?

Aspen

Success easily

Fire controls disease

Soil temp stimulates growth

Most important for game + livestock
lower elevations 350

Lodgepole

Serotinous cones

Wide range of adaptability - frost pockets; cold, dry areas.

Disease control

Upper elevations