

# IROAM

## RANGELAND CURRICULUM

### TEACHER GUIDE



## Section 3: Rangeland Plants

1. Introduction to Rangeland Plants and Plant Classification
2. Plant Scavenger Hunt
3. Skills Challenge: Plant Identification

### Learning Objectives

- Students will learn how to tell the difference between forbs, shrubs, grasses, and grass-like plants.
- Students will collect and identify characteristics of rangelands plants.

### Idaho General Education Performance Standards

- LS4-MS-2, LS4-MS-3, LS2-5-2, LS2-5-2, LS4-MS-4, LS2-5-3, LS2-MS-4, LS2-MS-6, PS1-5-2, PS1-5-3, LS1-5-1, LS2-5-4

### 1. Introduction to Rangeland Plants

Most management decisions on rangelands are made by first knowing the various plants inhabiting them. Knowing the types of plants in an area can help people monitor whether changes on the rangeland are positive or negative. Correctly identifying rangeland plants requires knowledge of plant characteristics and plant types.

### Plant Classification

**Time:** 40-45 minutes

#### Supplies:

- “Growth Form” worksheet
- “Life Span” worksheet
- “Plant Morphology” worksheet

Range plants can be classified and grouped in many different ways, including growth form, life span and origin. We use the morphology of range plants, which describes the physical form and/or external structures of a plant, to help us correctly identify what plants are growing on the rangeland.

### Growth Form

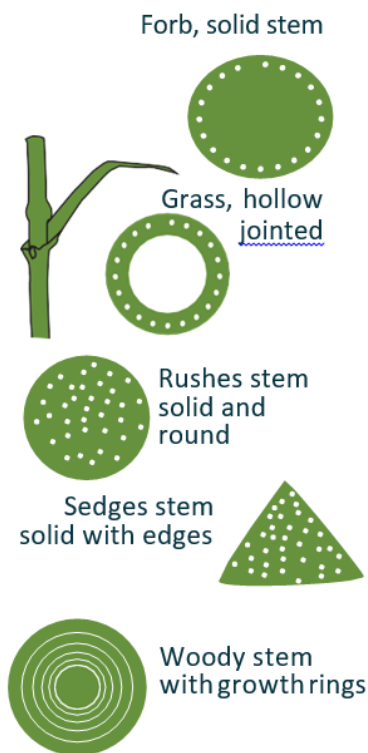
We will learn four plant types, or growth forms, that are used to describe rangeland plants. The growth forms include grasses, grass-like, forbs and shrubs. Rangeland plants can also be described in terms of how much woody tissue they contain (woody vs. herbaceous). This is important because it affects forage value, watershed characteristics of the landscape, habitat characteristics, and fire fuel loads.

#### Do:

- Using the images below, have students fill out and/or draw plant characteristics in the following table to emphasize the differences between the four growth forms.







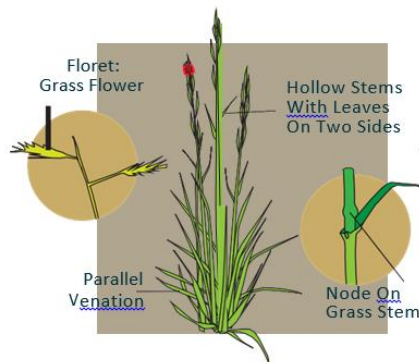
**Forbs** are plants such as dandelions with showy flowers, netted veins in the leaves, non-woody stems that are also solid, and a taproot. Sometimes we call forbs “broadleaf” plants – they include wildflowers and weeds. Forbs have leaves and stems that die back to the ground each year.

**Grasses** have hollow, jointed stems that are **herbaceous**, parallel veins in the stems and leaves, and fibrous roots. Grasses do not have colored flowers and they produce grain-like seeds. Sometimes plants we would not think of as grasses, such as wheat and corn are actually grasses.

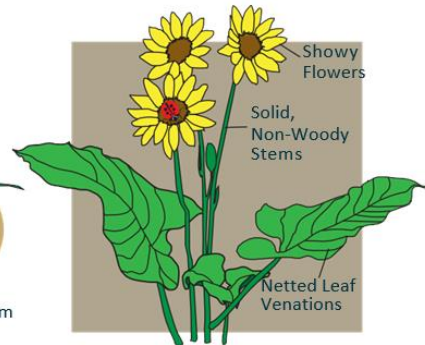
**Grass-like** plants look like grasses but have solid stems without joints. They have parallel veins in the leaves. Sedges and rushes are in this group of plants. One of best ways to tell the difference between sedges and rushes is the shape of the solid stems; Sedges have edges (are triangles), and rushes are round.

**Shrubs** are woody plants that re-grow leaves and flowers on the same stems year after year. Shrubs usually have broad leaves, seeds, and berries that are forage for wildlife. Shrubs differ from trees because they typically have several main stems instead of one main trunk.

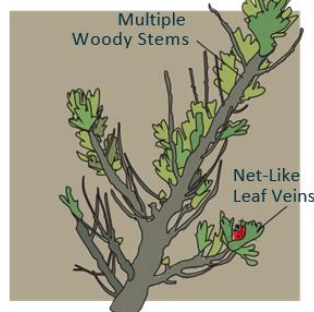
#### GRASS} The Poaceae Family



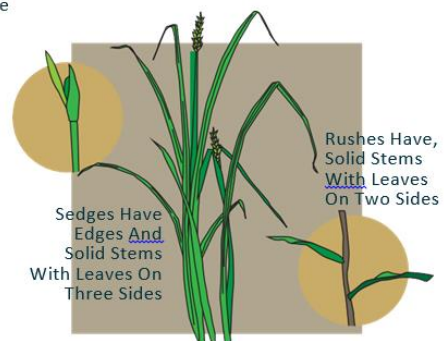
#### FORBS} Wildflowers and Weeds



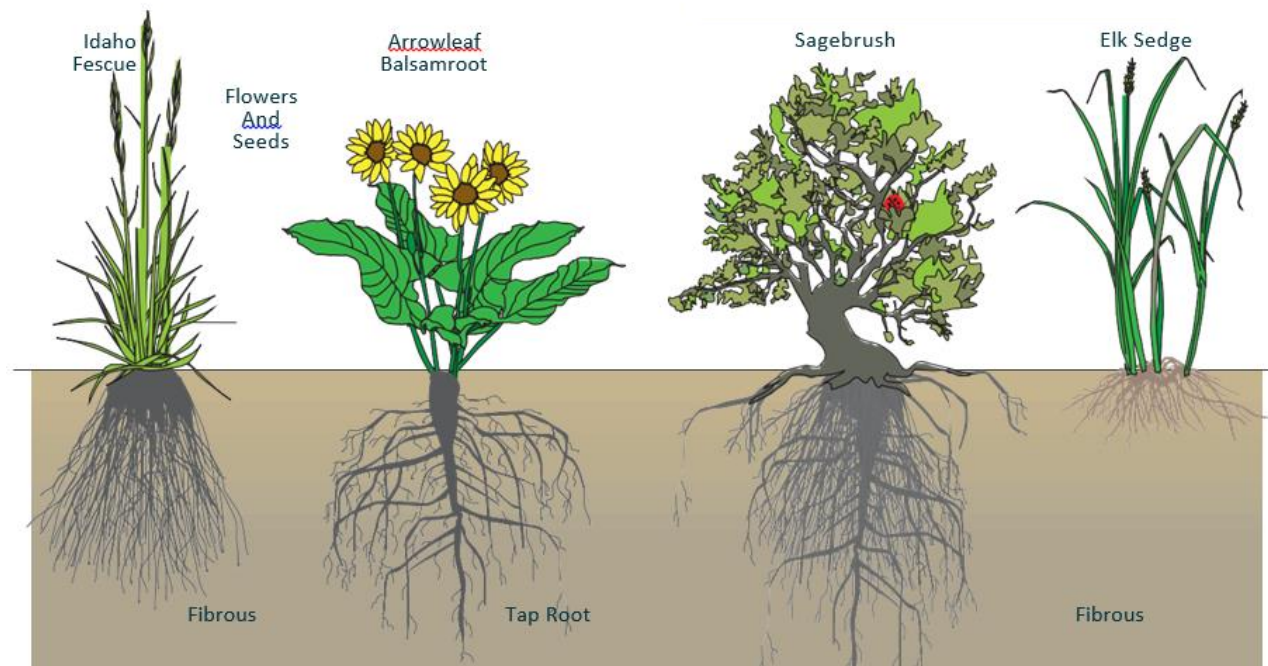
#### SHRUBS} Woody Plants Smaller than a Tree



#### GRASS LIKE} Sedge And Rush |



## ROOTS} Deliver Food and Water



Plant Characteristics	GRASSES	GRASS-LIKES	FORBS	SHRUBS
<b>STEMS</b> --is the stem herbaceous or woody?				
<b>LEAVES</b> --are the leaf veins parallel or netted?				
<b>ROOTS</b> --are the roots fibrous or a tap root				
<b>FLOWERS</b> --are the flowers showy?				

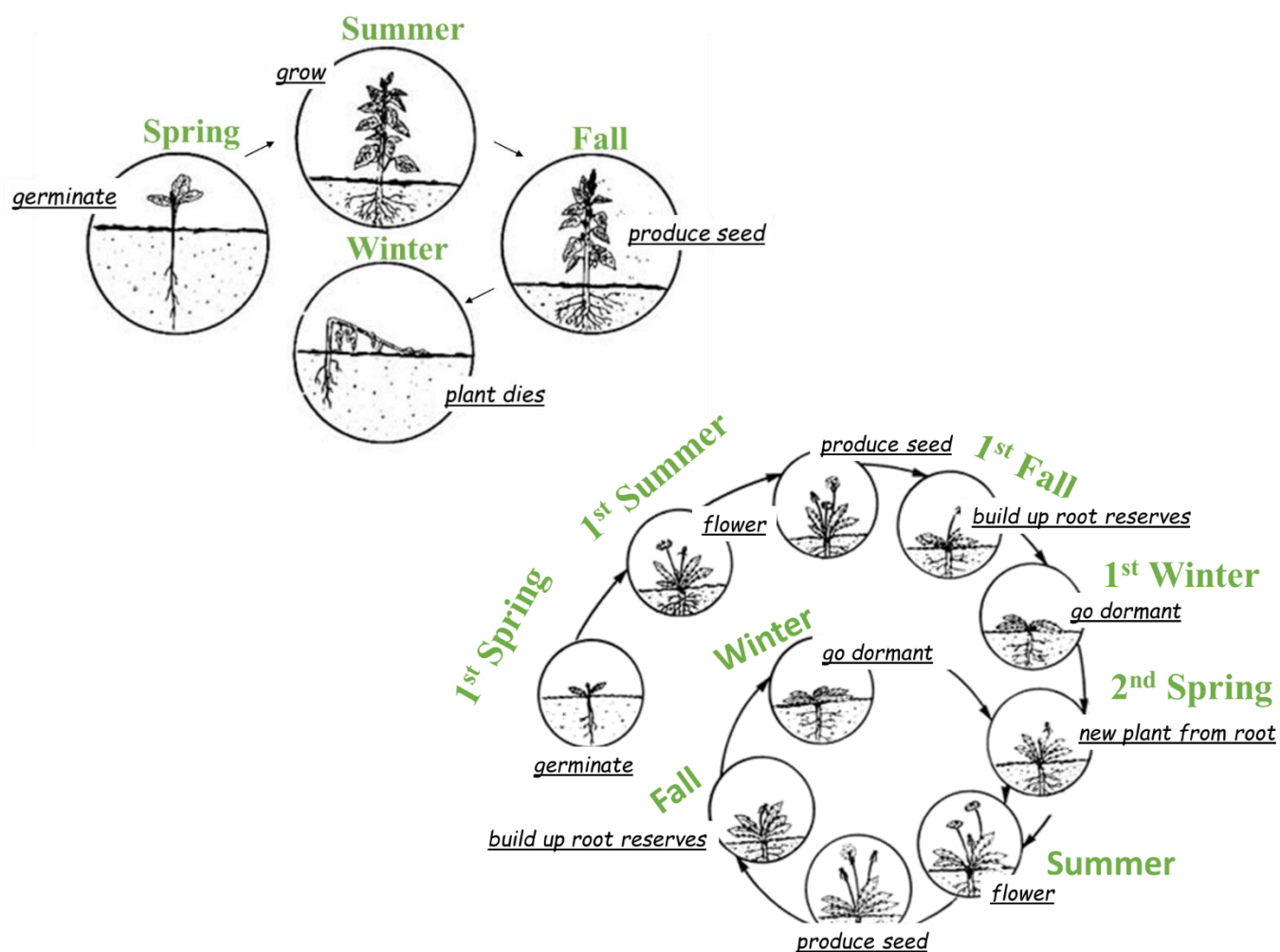
## Life Span

The lifespan of a plant refers to the length of time from the germination and sprouting of the plant to the natural death of the plant. In other words, this is how long it takes the plant to grow, flower, produce seeds, and die. Rangeland plants can be classified as **annuals**, **biennials**, or **perennials**. We will focus on annuals and perennial right now.

### Do:

Using the illustrations of the annual and perennial life span have students draw the life cycle for annuals and perennials.

- **Annual** plants live only one growing season. Summer annuals germinate in the spring, complete all growth by the end of the summer, and then die.
- **Biennial** plants live for two growing seasons. During the first growing season, these plants normally form a basal cluster or rosette of leaves. During the second year, they send up a seed stalk that flowers before the plant dies back to the ground at the end of the growing season.
- **Perennial** plants live for several years, and some live up to hundreds of years. The plants produce leaves and stems from the same crown for more than two years. Most range plants are perennials.



## Origin

The “origin” of a rangeland plant is the area where it developed and evolved. Knowing the origin of a plant is important because it can affect the way the plant responds to the environment or help predict the spread of species. Rangeland plants can be characterized as either **native** or **introduced** (sometimes introduced species are also called exotic).

- **Native** plants originated where they now occur without the help of humans. They are well adapted to the local climate, soils, animals, and microbes.
- **Introduced** plants are plants occurring outside their natural home range. They have typically been introduced by humans.

Natives and introduced plants may be considered **invasive species**. Invasive plant species spread and establish over large areas and are often more competitive than other plants (e.g., they use the water and nutrients in the soil before desirable species have a chance to grow). Many invasive plants produce a lot of seeds that survival in the soil longer than most desirable plant species and cause economic and/or environmental harm.



Two examples of invasive species on Idaho rangelands are cheatgrass (an invasive, introduced, annual grass), and juniper (an invasive, native, perennial tree).

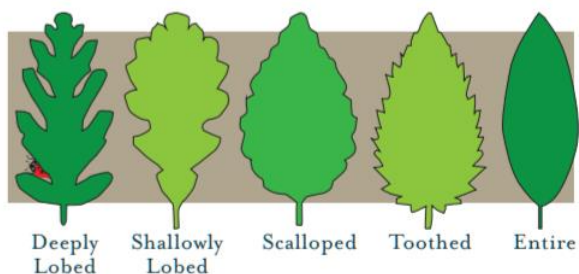
## Plant Morphology

When identifying rangeland plants, it is important to pay careful attention to the plant’s **morphology**. Here are some of the basic morphological characteristics you should use when identifying plants. *It is much easier to identify plants when their various parts can be described accurately!*

### Do:

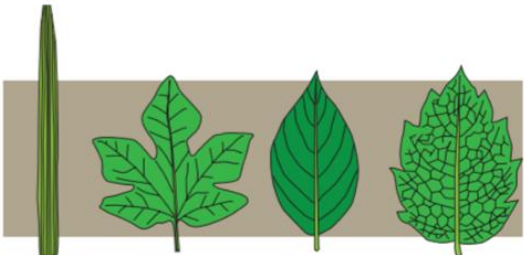
- Review the following characteristics and have students draw each characteristic for practice.

### Leaf Edges (or margins)



Deeply Lobed	Shallowly Lobed	Scalloped	Toothed	Entire

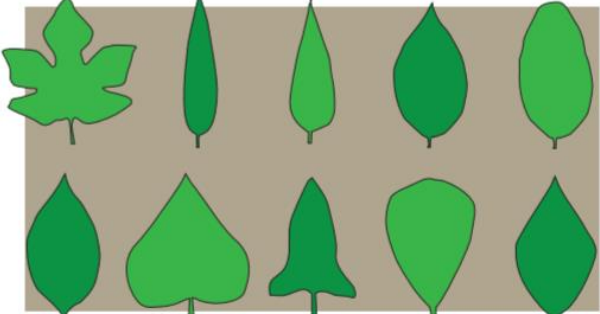
### Leaf Venation



Parallel	Palmate	Pinnate	Netted

### Leaf Shapes

Palmate
Linear
Lanceolate
Egg-shaped
Oval

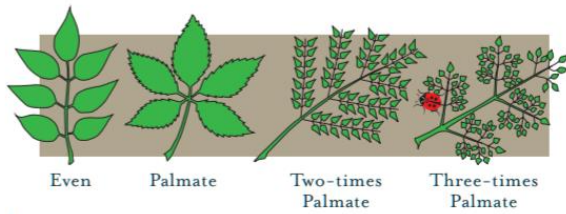


Elliptic
Heart-shaped
Arrow-shaped
Spoon-shaped
Diamond-shaped

Palmate	Linear	Lanceolate	Egg-shaped	Oval
Elliptic	Heart-Shaped	Arrow-Shaped	Spoon-Shaped	Diamond-Shaped

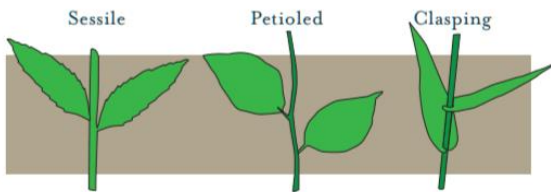


## Leaf Type



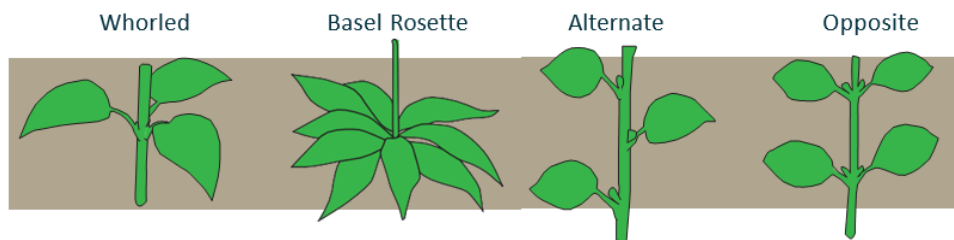
Even	Palmate	Two-times Palmate	Three-times Palmate

## Leaf Attachment



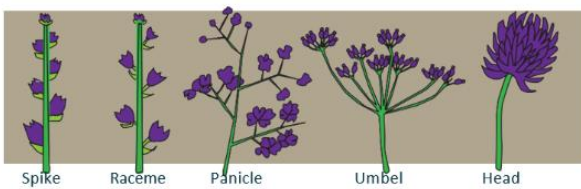
Sessile	Petioled	Clasping

## Leaf Arrangement



Whorled	Basel Rosette	Alternate	Opposite

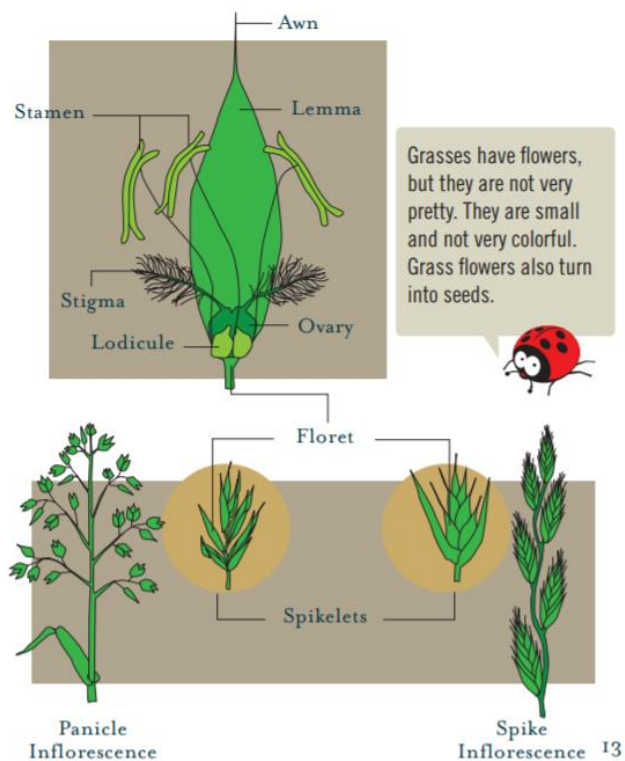
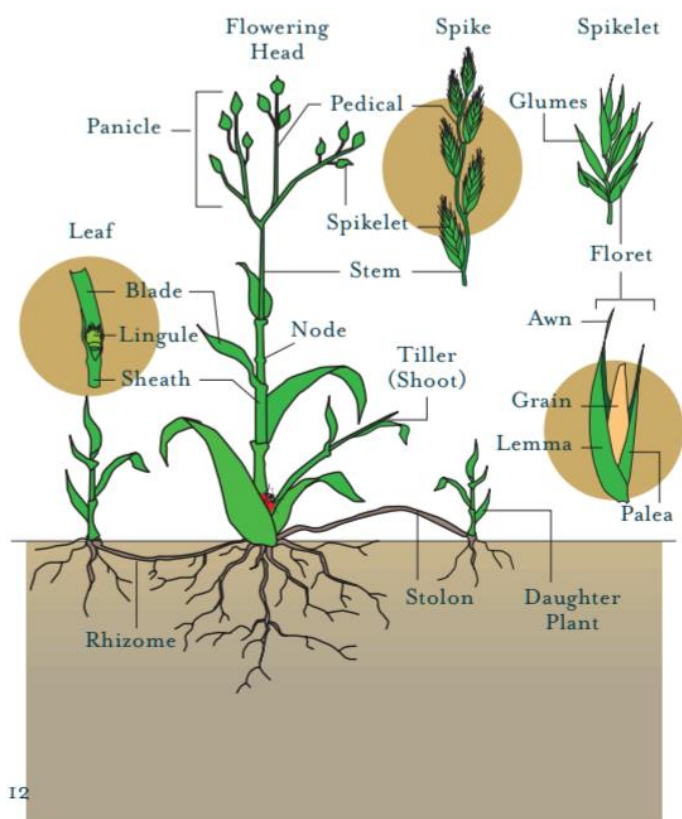
## Inflorescence Types



Spike	Raceme	Panicle	Umbel	Head



**Grasses** have their own set of morphological characteristics.



## 2. Plant Scavenger Hunt

**Time:** 30 minutes-1 hour

### Supplies

- Plastic bags (e.g., Ziploc sandwich bags)
- Markers to number the bags
- Scavenger Hunt List

### Directions:

Introduce the scavenger hunt activity. Students will need to find the items listed on the scavenger hunt guide (or as many as possible in the time allotted... this could also be a homework assignment). Students may use any books or other resources to help gather these items.

### Do:

Collect as many of the scavenger hunt items as possible in the allotted time (*some of the characteristics are really hard to find so don't worry too much if you can't complete the list!*). When collecting examples, be gentle with the plants and don't take more than needed! You may also use one item to fulfill up to three characteristics but NO more than that!

- Once an item is collected place in a Ziploc bag and using a marker write the identifying characteristic(s)
- Once complete return items to your coach for a discussion.

### Reflect:

Review what the students found and discuss how plant characteristics help identified plants.

## PLANT CHARACTERISTICS *Scavenger Hunt*

GROWTH FORM	LEAF SHAPE
<input type="checkbox"/> Grass	<input type="checkbox"/> Linear
<input type="checkbox"/> Forb	<input type="checkbox"/> Egg-Shaped
<input type="checkbox"/> Shrub	<input type="checkbox"/> Heart-Shaped
LIFE SPAN	LEAF ARRANGEMENT
<input type="checkbox"/> Annual	<input type="checkbox"/> Alternate
<input type="checkbox"/> Perennial	<input type="checkbox"/> Opposite
LEAF EDGES	<input type="checkbox"/> Whorled
<input type="checkbox"/> Lobed (deep or shallow)	INFLORESCENCE TYPE
<input type="checkbox"/> Toothed	<input type="checkbox"/> Spike
<input type="checkbox"/> Entire	<input type="checkbox"/> Panicle
LEAF VENATION	<input type="checkbox"/> Umbel
<input type="checkbox"/> Parallel	<input type="checkbox"/> Head
<input type="checkbox"/> Palmate	GRASSES ONLY
<input type="checkbox"/> Pinnate	<input type="checkbox"/> Awn
<input type="checkbox"/> Netted	<input type="checkbox"/> Node
LEAF ATTACHMENT	BONUS
<input type="checkbox"/> Sessile	<input type="checkbox"/> Palmate Leaf
<input type="checkbox"/> Petioled	<input type="checkbox"/> Even Leaf

### 3. Skills Challenge: Plant Identification

Identifying plants is an important job in rangeland management and knowing what plants are growing where is a primary factor when making land management decisions. Land managers work closely with botanists (botanists study plants and how they work) to make sure they identify plants correctly. Once they know what the plant is, they can then explore ways to manipulate them to achieve the goals on the rangelands.

Identifying plants can be a challenge but with practices it can also be fun! Identification starts with observing the plant characteristics—as described above—and then distinguishing between different plants. Every plant is unique, the questions is, can you find how they are unique?

#### Do:

Study the plants from the plant list (on the next page). Learning to identify plants by sights is an excellent skills to have! Links to herbarium mounts for each plant can be found at [idrange.org](http://idrange.org)

#### Plant Apps (available on Apple and Android products)



Idaho Wildflowers Search



Idaho Grasses



PictureThis

#### Words to Explore\*:

- **Herbaceous:** Non-woody plant growth
- **Monitor:** The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. This process must be conducted over time in order to determine whether or not management objectives are being met.
- **Morphology:** The form and structure of an organism, with special emphasis on external features.
- **Woody:** A term used in reference to trees, shrubs or browse that characteristically contain persistent ligneous material.

\*Definitions from the Society for Range Management Glossary of Terms

#### Additional Resources

- Visit the <https://idrange.org/education-2/i-roam-curriculum/> for each topic to see videos and other additional educational links and materials.
- Visit: [plants.usda.gov](http://plants.usda.gov) for more information on each plant.



## I-ROAM Plant List

		GROWTH		
COMMON NAME	SCIENTIFIC NAME	FORM	LIFE SPAN	ORIGIN
Grass and Grass-like				
1. Baltic Rush	<i>Juncus balticus</i>	Grass-like	Perennial	Native
2. Basin Wildrye	<i>Leymus cinereus</i>	Grass	Perennial	Native
3. Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>	Grass	Perennial	Native
4. Cheatgrass (or Downy Brome)	<i>Bromus tectorum</i>	Grass	Annual	Introduced
5. Crested Wheatgrass	<i>Agropyron cristatum</i>	Grass	Perennial	Introduced
6. Elk Sedge	<i>Carex garberi</i>	Grass-like	Perennial	Native
7. Foxtail Barley	<i>Hordeum jubatum</i>	Grass	Perennial	Native
8. Idaho Fescue	<i>Festuca idahoensis</i>	Grass	Perennial	Native
9. Indian Ricegrass	<i>Achnatherum hymenoides</i>	Grass	Perennial	Native
10. Kentucky Bluegrass	<i>Poa pratensis</i>	Grass	Perennial	Introduced
11. Medusahead Rye	<i>Taeniatherum caput-medusae</i>	Grass	Annual	Introduced
12. Needle-and-Thread	<i>Hesperostipa comata</i>	Grass	Perennial	Native
13. Purple Threeawn	<i>Aristida purpurea</i>	Grass	Perennial	Native
14. Sandberg Bluegrass	<i>Poa secunda</i>	Grass	Perennial	Native
15. Squirreltail	<i>Elymus elymoides</i>	Grass	Perennial	Native
Forbs				
16. Arrowleaf Balsamroot	<i>Balsamorhiza sagittata</i>	Forb	Perennial	Native
17. Curlycup Gumweed	<i>Grindelia squarrosa</i>	Forb	Perennial	Native
18. Goathead (or puncturevine)	<i>Tribulus terrestris</i>	Forb	Annual	Introduced
19. Indian Paintbrush	<i>Castilleja sp.</i>	Forb	Perennial	Native
20. Lupine	<i>Lupinus sp.</i>	Forb	Perennial	Native
21. Russian Thistle (or Tumbleweed)	<i>Salsola tragus</i>	Forb	Annual	Introduced
22. Sego Lily	<i>Calochortus nuttallii</i>	Forb	Perennial	Native
23. Tall Larkspur	<i>Delphinium occidentale</i>	Forb	Perennial	Native
24. Tapertip Hawksbeard	<i>Crepis acuminata</i>	Forb	Perennial	Native
25. Western Yarrow	<i>Achillea millefolium</i>	Forb	Perennial	Native
26. Wild Onion	<i>Allium sp.</i>	Forb	Perennial	Native
Woody				
27. Antelope Bitterbrush	<i>Purshia tridentata</i>	Woody	Perennial	Native
28. Big Sagebrush	<i>Artemisia tridentata</i>	Woody	Perennial	Native
29. Curl-leaf Mountain Mahogany	<i>Cercocarpus ledifolius</i>	Woody	Perennial	Native
30. Juniper (Utah, Rocky Mountain, or Western)	<i>Juniperus sp.</i>	Woody	Perennial	Native
31. Quaking Aspen	<i>Populus tremuloides</i>	Woody	Perennial	Native
32. Rabbitbrush (gray or rubber)	<i>Chrysothamnus sp.</i>	Woody	Perennial	Native
Noxious Weeds				
33. Canada Thistle	<i>Cirsium arvense</i>	Forb	Perennial	Introduced
34. Hoary Cress (or Whitetop)	<i>Cardaria draba</i>	Forb	Perennial	Introduced
35. Rush Skeletonweed	<i>Chondrilla juncea</i>	Forb	Perennial	Introduced
36. Spotted Knapweed	<i>Centaurea stoebe</i>	Forb	Perennial	Introduced