

CHAPTER 3

Assessing Aspen Health

Darin Stringer



Figure 9. A healthy grove contains a range of sizes and ages of aspen, with few or no conifers. Groves with a dead and declining overstory should contain an abundant understory of young aspen. A vigorous native plant understory indicates an optimal condition. (Photo: Darin Stringer)

Why should I assess my aspen?

Knowing the extent, location, and condition of aspen on your land is a key first step toward enhancing this resource. As discussed in Chapter 2, many aspen groves in Oregon are especially at-risk and may be lost without swift action. Completing an assessment of your aspen provides information that will help you:

- Better understand the condition of the grove
- Determine what types of treatments, if any, are needed
- Create a baseline that will help you see trends over time and evaluate the effectiveness of management actions

What is a healthy condition for my aspen grove?

The condition of an aspen grove depends on a variety of site factors, including soils, aspect, elevation, topography, past and current management, and wildlife use. Climate conditions, such as precipitation and temperature, also influence aspen. Indicators of productive sites for aspen include deep, dark, organic topsoil; presence of tall aspen; and presence of vegetation indicative of abundant soil moisture.

On very productive sites, where soils and moisture are optimal, aspen trees can become quite

large and vigorous. In contrast, sites with thin, rocky soils and limited moisture often contain trees that are much smaller, stunted, or unhealthy. General indicators of healthy aspen (Figure 9) include the following:

- **Aspen overstory:** An overstory of vigorous to declining aspen.
- **Young aspen understory:** Newly regenerated trees below or around the edges of a more mature overstory of aspen. Where overstory aspen are declining and dead, lack of a vigorous understory indicates very poor aspen health.
- **Aspen dominance:** An overstory and understory made up primarily or completely of aspen, with few competing conifers present. Conifers should generally comprise less than 10 percent of tree cover, although this percentage may be higher in riparian areas within ponderosa pine and mixed-conifer stands. Aspen should be free of juniper. Other native hardwoods are considered a healthy part of the plant community.
- **Native plant understory:** A diverse understory plant community free of noxious weeds. The understory should include a mix of native shrubs, grasses, sedges, rushes, and forbs (non-grass flowering plants). These conditions benefit wildlife and suggest grazing levels appropriate for aspen regeneration.

How do I assess my aspen?

With these standards in mind, you can locate and assess the condition of aspen on your land using the Aspen 3-Step Assessment Method. This chapter will guide you through steps 1 and 2. Chapter 4 covers step 3.

1. Locate and map aspen groves

Many landowners know where the larger aspen groves are on their property. To locate additional aspen, consider the site factors mentioned in Chapter 2 and start in these areas. For example, aspen often grow near springs, seeps, or streams; in areas of wet or poorly drained soils; or in meadow edges, rocky outcrops, and other areas where snow accumulates (Figure 10). U.S. Geological Survey (USGS) 1:24,000-scale topographic maps (also known as 7.5-minute quadrangles), U.S. Forest Service (USFS) maps, and Bureau of Land Management (BLM) maps

ASSESSMENT: THE ASPEN 3-STEP

1. Locate and map aspen groves on your land
2. Assess condition of the grove(s)
3. Determine the need for actions to improve aspen health (Chapter 4)

often show locations of springs and other water, which will aid in your search. The former can be purchased at some outdoor sporting goods stores (e.g., REI), while the latter are available at local agency offices (see Chapter 7).

The color aerial photos available on Google Earth (<http://www.earth.google.com>) are an

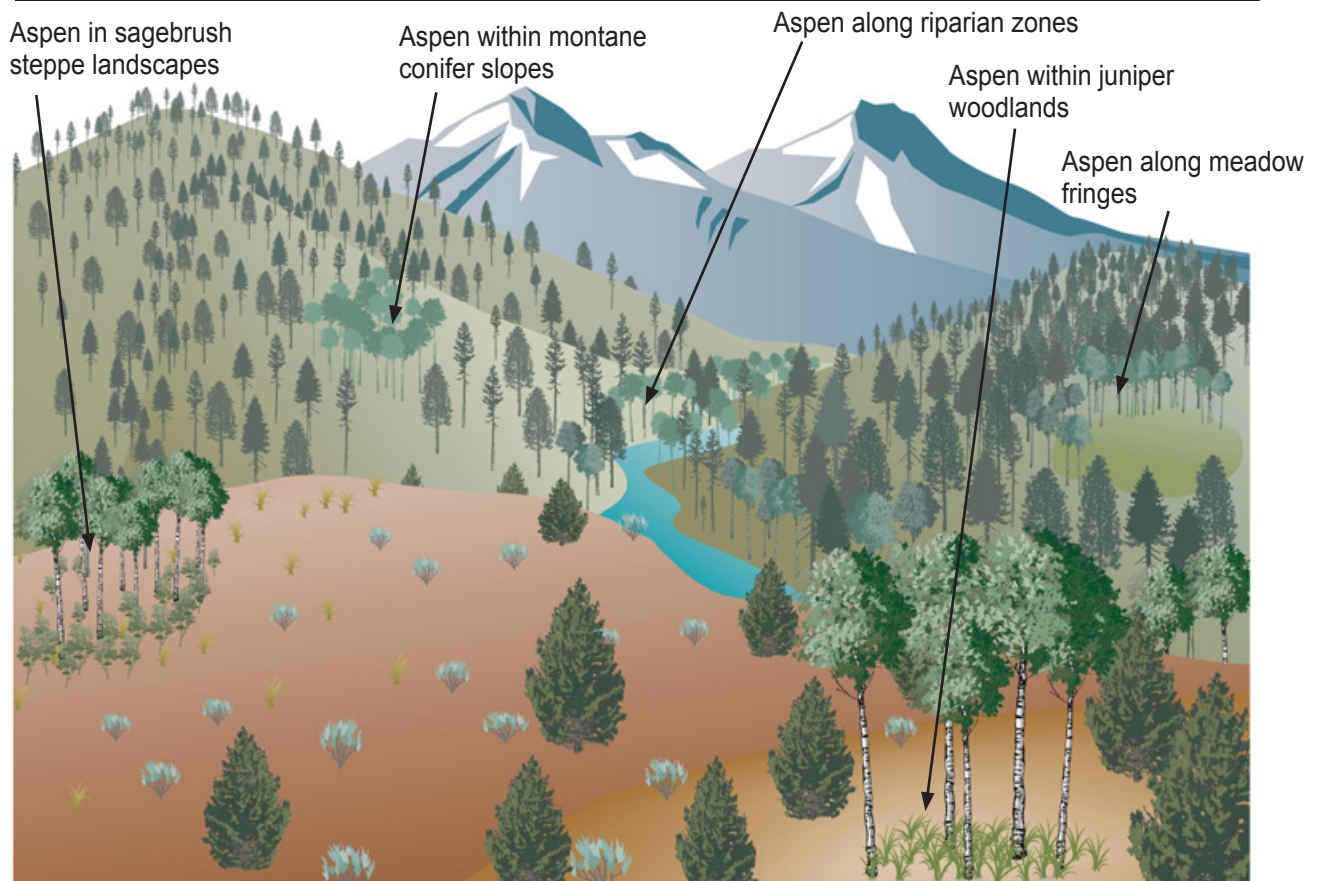


Figure 10. To locate aspen on your property, look around springs and seeps, streams, areas of wet and poorly drained soils, meadow edges, rocky outcrops, where road runoff accumulates, depressions, and areas where snow accumulates. (Illustration: Gretchen Bracher)

excellent way to search for patches of aspen. With this high-resolution imagery, you can locate groups of aspen and sometimes individual trees. Compared to conifers, aspen groves have a distinct lighter green color (Figure 11). However, aspen can be difficult to see if overtopped by conifers. Aspen that are heavily encroached may be difficult to locate using aerial imagery.

When you find an aspen tree, it's often not alone! Many aspen trees are actually remnants of a formerly larger aspen grove, now broken up into patches and individual trees. This condition is fairly common along riparian stringers, other draws, and in conifer-dominated stands. If you find aspen in a draw, search upstream and downstream along the creek. In forested settings, search in a circular pattern around the tree for at least 300 feet.

Mark the locations of aspen on an ownership map, USGS, USFS, or BLM map, aerial photo, or printed Google Earth image. Alternatively, you can use a GPS unit to map the grove as a point or delineate the perimeter with a series of points. You can download these coordinates to a personal computer and use them to make digital maps and calculate acreages.

Once you have located aspen on your land, proceed to Step 2 to assess its condition.

2. Assess condition of the grove

We have developed the following two aspen assessment methods for use by private landowners:

- A complete (FULL) assessment involves installing two monitoring plots (permanent markers) within and near the aspen grove.



Figure 11. In aerial photos, aspen and other vegetation associated with wet areas (inside the yellow boundary) are easily distinguishable from surrounding coniferous forest, which appears darker green. (Photo: Google Earth)

You will take photographs and collect information in these plots to assess tree health, site resources, and site conditions (access, water resources, noxious weeds, etc.). We recommend completing a FULL assessment before implementing management actions, as it will provide a detailed baseline for evaluating changes following such actions. It takes 1 to 2 hours to complete a monitoring plot.

- A simplified (RAPID) assessment doesn't involve permanent plots. The RAPID assessment is a good option for landowners who want to survey their aspen quickly and for ownerships containing many aspen groves. The RAPID assessment usually takes less than 30 minutes to complete.

The remainder of this chapter consists of instructions, forms, and examples to help you complete your FULL or RAPID assessment.

Aspen Assessment Instructions, Forms, and Samples

To help you assess aspen on your property, this section contains the following:

- Steps for completing the FULL Assessment (pages 12–13)
- FULL Assessment form (pages 14–15)
- Sample completed FULL Assessment form (pages 16–17)
- Aspen Regeneration Transect Diagram (page 18)
- Steps for completing the RAPID Assessment (page 19)
- RAPID Assessment form (page 20)
- Sample completed RAPID Assessment form (page 21)
- Visual aids (page 22)
- Aspen Condition Classification Chart (page 23)

A list of supplies and equipment needed to complete the FULL and RAPID Assessments is found in Appendix IV (page 79).

TIPS FOR SUCCESSFUL ASSESSMENT

- Having two people makes the process go much faster and is more fun.
- Make sure you have all gear and supplies before entering the field. Use the checklist on page 79.
- Thoroughly walk the aspen grove before drawing your map, to avoid having to redo your work.
- Take the time to install reference points for your photo points. You will thank yourself when trying to relocate the posts. Photo point posts are often difficult to find after treatments. If posts are damaged or removed, the reference points will be invaluable for relocating the plot.
- To better judge scale in your photos, use a 6-foot t-bar post painted with alternating 1-foot-long bars of brightly colored paint. Position this “scale bar” 10 feet from the photo point, so the picture will show the bar in the foreground.
- Look at each photo on the camera screen (most digital cameras have one) to make sure the quality is adequate.
- Before leaving the aspen grove, check the assessment form to make sure you have filled it out completely.
- Download and label your digital pictures immediately to avoid losing or misidentifying images.

Steps for completing the FULL Assessment

See Appendix IV (page 79) for equipment and supplies needed to complete the FULL Assessment.

1. After locating the grove, walk through it and observe its size and shape. Note the condition of the aspen (both overstory and understory), features of interest (roads, springs, streams, other wet areas, fences, noxious weeds), and other noteworthy characteristics. Pay special attention to grazing influence on aspen suckers. Identify the perimeter of the grove by finding the trees or suckers on the outer edge. Flagging this edge is recommended.
2. Draw the boundary of the grove on Map 1 (page 2 of the monitoring form). If desired, you can use a global positioning system (GPS) with mapping capability to accurately map the size and shape of the grove. Transfer the mapped boundary on the GPS screen to Map 1. Garmin GPS units that allow “tracks” to be recorded are one example.
3. Fill out the “General Aspen Grove Information” on page 1 of the assessment form. Estimate the grove size in acres (a GPS can be helpful). Record location by using the legal description, latitude/longitude/UTM coordinates from your GPS, or local features (e.g., “½ mile up Rd. 200 on the right next to spring”).
4. Determine the location for a permanent outside photo point. This is a place outside the aspen grove that will provide a good vantage point for taking photos. It is helpful to place this point close to a tree or stump. Pound a 6-foot t-post into the ground at the photo point. Etch the words “Outside Photo Point,” the date, and the name or number of the grove on an aluminum tag. Tie the tag to the post with thin wire or a zip tie. Tie a piece of colorful flagging to the t-post and spray paint the post to help identify it. Record the GPS position on page 1 of the assessment form. Draw the approximate position of the outside photo point on Map 1 (page 2).
5. Take a picture/s of the aspen grove while standing behind the post with your camera directly over the post.
6. Point a compass in the direction each photo is taken and record the azimuth (degrees in direction) of each photo on page 1. On Map 1, draw arrows from the photo point showing the direction (azimuth) for each picture taken (see sample completed map). It is important to identify each photo so you can name it properly when you download the photos. One method is to record the picture number assigned by the camera. Another option is to write the photo point number, azimuth, and date on a sheet of notebook paper or dry erase board and take a picture of this information after taking each photo point photo. When you download the photos, you will have two pictures for each: the photo of the grove and the photo of the recorded information.
7. Choose a nearby tree or stump to serve as a reference point to help you locate the outside photo point in the future. On another aluminum tag, etch the distance and azimuth from this point to the previously installed outside photo point (e.g., “30' @ 150° to outside photo point”). Record this information on page 1 of the assessment form. Nail this tag to the reference tree (at 4.5 feet) or stump. Spray paint a horizontal stripe above and below the tag with highly visible tree marking paint to help identify the tag during future monitoring.
8. Determine the location for the permanent inside photo point (photo point within the aspen grove). This point should provide a good view of changes over time and should be representative of the grove (e.g., a spot where conifers are to be removed).
9. Pound a 6-foot t-post into the ground at the inside photo point. Repeat step 4 above to label the post with a tag to identify the inside photo point.
10. Follow the instructions in steps 5 and 6 above to take photos from the inside photo point. Be sure to identify the photos as described in step 6.
11. Follow the instructions in step 7 above to create a reference point for your inside photo point.

12. Draw other notable features on Map 1 (page 2) of the assessment form (see the map key).
13. On Map 2 (page 2) of the assessment form, draw boundaries between different aspen condition classes and label with the codes from the Aspen Condition Classification Chart (page 23).
14. In the box below the map, describe the grove. See the sample on page 17 for details on how to complete the map and describe the grove. Try to include the following in your description:
 - Vegetation conditions
 - Condition of mature aspen and regeneration “suckers.” Do they look healthy? Are they mature or younger? Note any damage such as defoliation, disease, animal browse, or antler rubbing.
 - Level of conifer encroachment, species, and sizes of conifers
 - Grazing level and browse/damage to aspen suckers (use visual aids on page 22)
 - Noxious weeds
 - Access to the grove
 - Known or suspected wildlife use
15. Download your photos and rename them for future reference. For example, the first image taken in north direction of the outside photo point could be labeled “Grove 1-Outside Plot-North.”
16. Go to Chapter 4 to determine whether treatments are needed. Record the suggested management actions at the bottom of page 2 of the assessment form.

Additional measurements

The following measurements will allow you to quantify aspen suckers and their condition. To make these measurements, install one or two transects (tree measurement plots along a line) as follows:









1. From the inside photo point, choose a random direction for a transect line, or place the line intentionally through an area where you wish to monitor aspen suckers. One way to get a random line is to look at a watch with a second hand and multiply the seconds by 6. Standing at the inside photo point, turn the dial on your compass to this value, and use it as the direction for your transect line. The transect length should be 50 or 75 feet; use 50 feet if the grove is too small to contain a 75-foot transect. If your random direction puts the transect outside the grove, repeat the process until you get a line that is fully contained within the grove. Record the azimuth and length of the transect line on page 1 of the monitoring form.
2. Attach the end of a measuring tape to the t-bar at the inside photo point. Lay out the measuring tape along the transect line.
3. Pound a 6-foot t-post into the ground at the end point (either 50 feet or 75 feet). Etch an aluminum tag with the words “end point-transect 1” (or “end point-transect 2” if you do two plots) and tie it to the stake. Tie a piece of colorful flagging to the t-bar to help you locate the post.
4. Walk along the transect from the inside photo point to the transect end point and count aspen suckers within 1 yard on each side of the transect line (see diagram and photo on page 18). If any part of the plant intersects an imaginary line that extends 1 yard from the transect line, count the tree. If multiple stems arise from a single base stem (as occurs with clipped suckers), record all intersecting stems as one plant. Classify suckers according to the following size classes:
 - Less than 1.5 feet tall
 - 1.5 to 4.5 feet tall
 - More than 4.5 feet tall to 2 inches dbh (diameter at 4.5 feet)
 Record the total number of trees in each size class on page 1 of the assessment form.
5. Take a photo at the inside photo point facing the transect line. Take another photo at the end point facing the transect line back toward the inside photo point. Follow the instructions in step 6 of “Steps for completing the FULL assessment” to identify photos.

Aspen FULL Assessment Form (page 1 of 2)

General Aspen Grove Information			
Date:		Assessor:	
Aspen grove ID (name or #):			
Average slope (%):			
Grove size (acres):			
Outside Photo Point			
GPS position (lat/long or UTM):			
Reference point:		Azimuth/Distance to photo point (feet):	
Photo (azimuth/name):		Notes:	
Photo (azimuth/name):			
Photo (azimuth/name):			
Inside Photo Point			
GPS position (lat/long or UTM):			
Reference point:		Azimuth/Distance to photo point (feet):	
Photo/north (azimuth/name):		Notes:	
Photo/east (azimuth/name):			
Photo/south (azimuth/name):			
Photo/west (azimuth/name):			
Photo/overhead (name):			
Aspen Regeneration Transect 1			
Transect azimuth:		Transect length (feet):	
<i>Tree size class</i>	<i># trees</i>	<i>Browse (light, mod, severe)</i>	<i>Damage (light, mod, severe)</i>
# Trees (< 1.5')			
# Trees (1.5–4.5')			
# Trees (>4.5' tall to <2" dbh)			
Photo (endpoint →):		Photo (plot center →):	
Aspen Regeneration Transect 2			
Transect azimuth:		Transect length (feet):	
<i>Tree size class</i>	<i># trees</i>	<i>Browse (light, mod, severe)</i>	<i>Damage (light, mod, severe)</i>
# Trees (< 1.5')			
# Trees (1.5–4.5')			
# Trees (>4.5' tall to <2" dbh)			
Photo (endpoint →):		Photo (plot center →):	
Notes:			

Aspen FULL Assessment Form (page 2 of 2)

Map 1

Key for Map 1	
	Stream
	Spring
	Reference point
	Outside photo point
	Inside photo point
	Road (4-wheel +)
	Transect line
	Grove boundary

Map 2

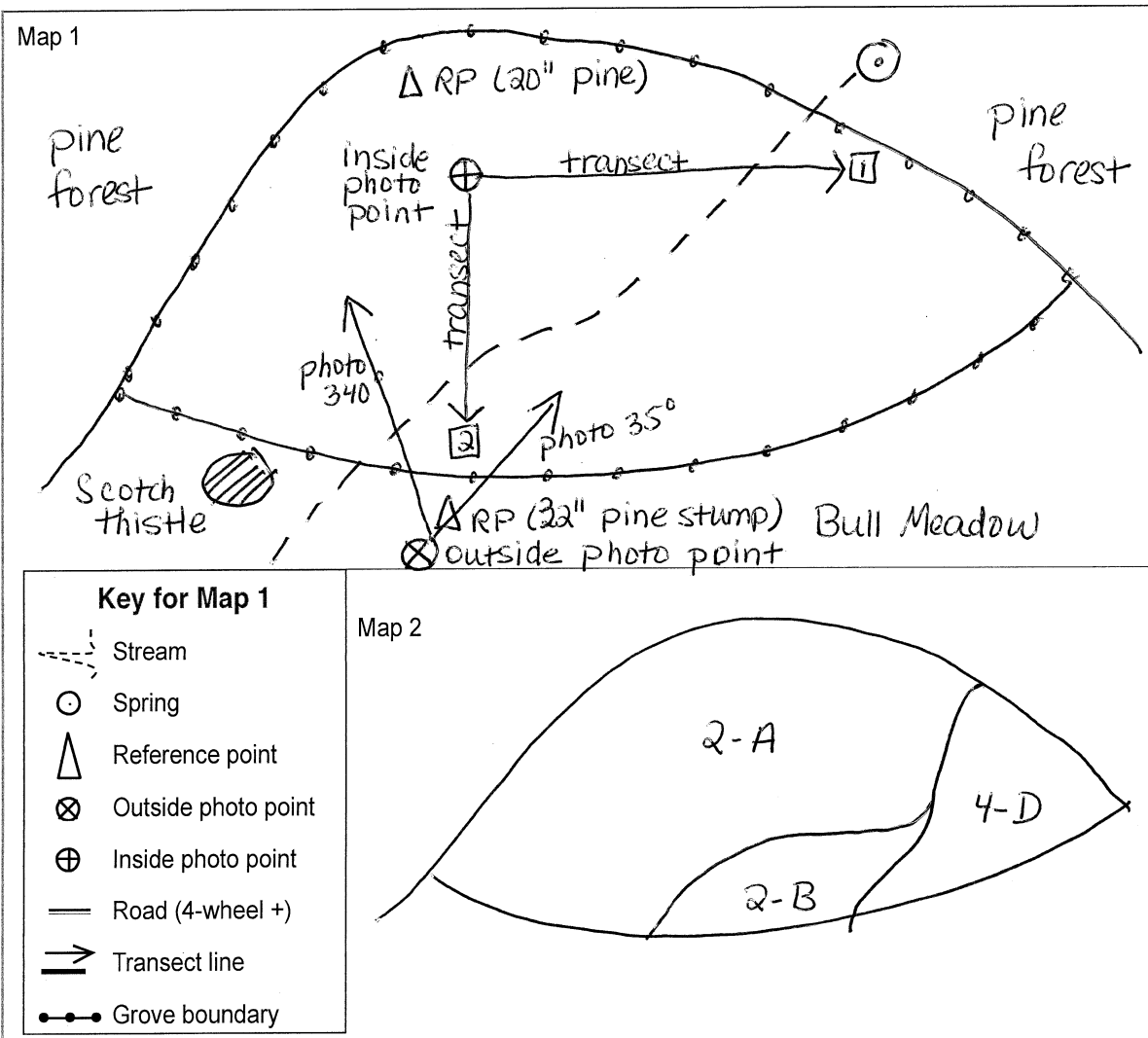
Describe aspen grove:

Needed management actions (from Aspen Management Options Flowchart, page 25):

Sample completed page 1 of FULL Assessment Form

General Aspen Grove Information			
Date:	9-10-09	Assessor:	John Appleseed
Aspen grove ID (Name or #):	1 - along northern end of Bull Meadow		
Average slope (%):	5-20%		
Grove size (acres):	3 acres		
Outside Photo Point			
GPS position (lat/long or UTM):	702485	4886184	
Reference point:	32" pine stump	Azimuth/Distance to photo point (feet): 200°/27'	
Photo (azimuth/name):	35° IMG035	Notes: Photo point is in meadow near a large ponderosa pine stump.	
Photo (azimuth/name):	340° IMG036		
Photo (azimuth/name):			
Inside Photo Point			
GPS position (lat/long or UTM):	702474	4886199	
Reference point:	20" pine tree	Azimuth/Distance to photo point (feet): 170°/20'	
Photo/north (azimuth/name):	368° IMG037	Notes: Photo point is just south of a large aspen log in a grassy opening along the creek.	
Photo/east (azimuth/name):	90° IMG038		
Photo/south (azimuth/name):	180° IMG039		
Photo/west (azimuth/name):	270° IMG040		
Photo/overhead (name):	IMG041		
Aspen Regeneration Transect 1			
Transect azimuth:	95°	Transect length (feet): 75'	
Tree size class	# trees	Browse (light, mod, severe)	Damage (light, mod, severe)
# Trees (< 1.5')	24	moderate	Light
# Trees (1.5-4.5')	9	moderate	severe
# Trees (>4.5' tall to <2" dbh)	∅	—	—
Photo (endpoint →):	IMG 050	Photo (plot center →): IMG 051	
Aspen Regeneration Transect 2			
Transect azimuth:	190°	Transect length (feet): 50'	
Tree size class	# trees	Browse (light, mod, severe)	Damage (light, mod, severe)
# Trees (< 1.5')	20	Light	Light
# Trees (1.5-4.5')	3	Light	Light
# Trees (>4.5' tall to <2" dbh)	5	Light	Light
Photo (endpoint →):	IMG 157	Photo (plot center →): IMG 158	
Notes: This is the largest grove on the ranch and is accessed only during dry season. There is a seasonal creek running through the grove. No livestock use this area. Elk browse above snow level. Suckers are growing well but sparse along transect 2.			

Sample completed page 2 of FULL Assessment Form



Describe aspen grove: A 3-acre grove. Overstory is mostly mature & declining aspen. About 1 acre (along east end) has many conifers overtopping the aspen, suckering is heavy except in areas 2-B & 4-D. Browse is light to moderate (mostly elk).

Needed management actions (from Aspen Management Options Flowchart, page 25):
 Remove all conifers from area 4-D. Assess suckering in 2 years in areas 4-D & 2-B. Consider big game fence if regeneration is poor. Remove Scotch thistle before flowering.

Aspen Regeneration Transect Diagram

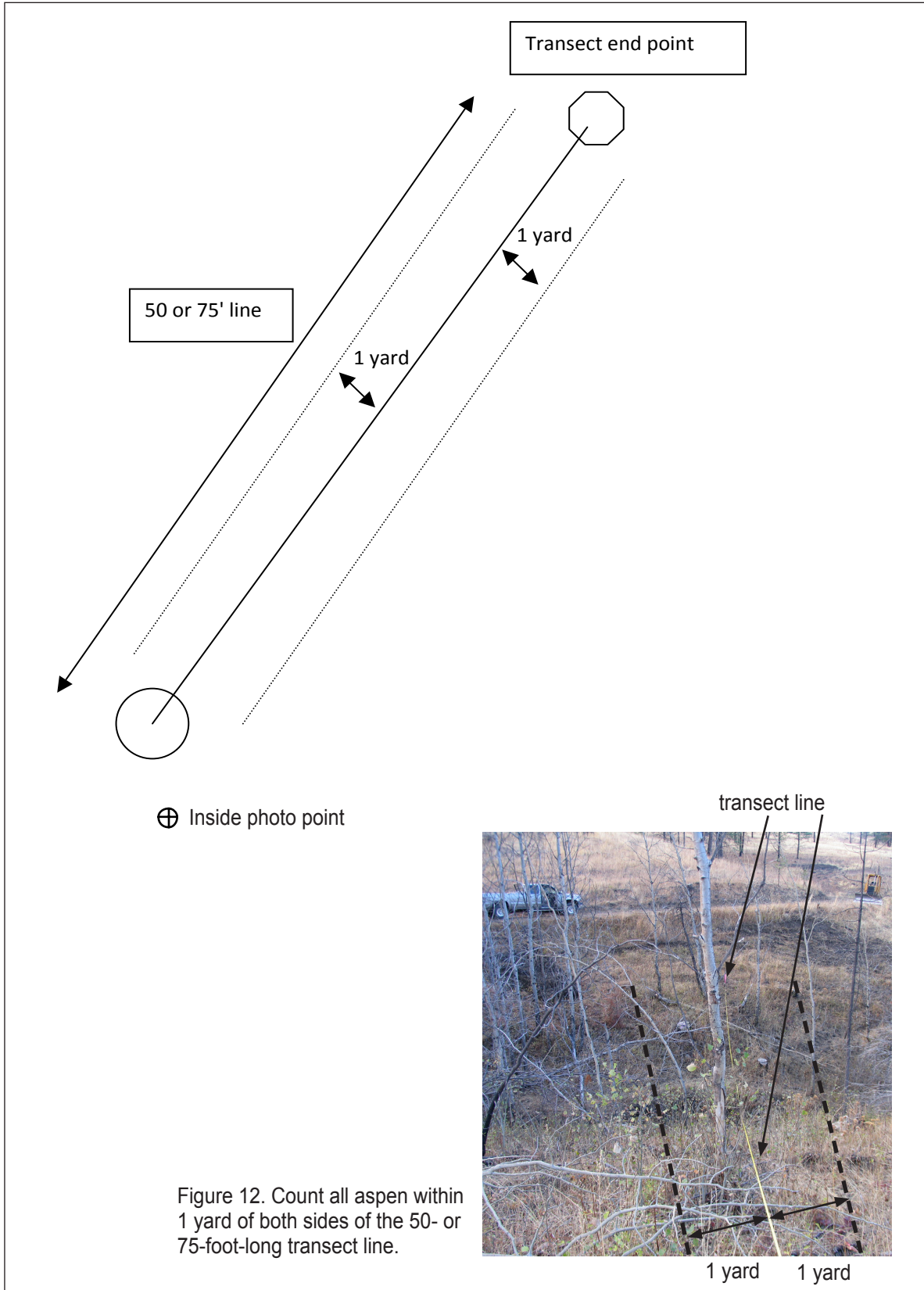







Figure 12. Count all aspen within 1 yard of both sides of the 50- or 75-foot-long transect line.

Steps for completing the RAPID Assessment

See Appendix IV (page 79) for equipment and supplies needed to complete the RAPID Assessment.

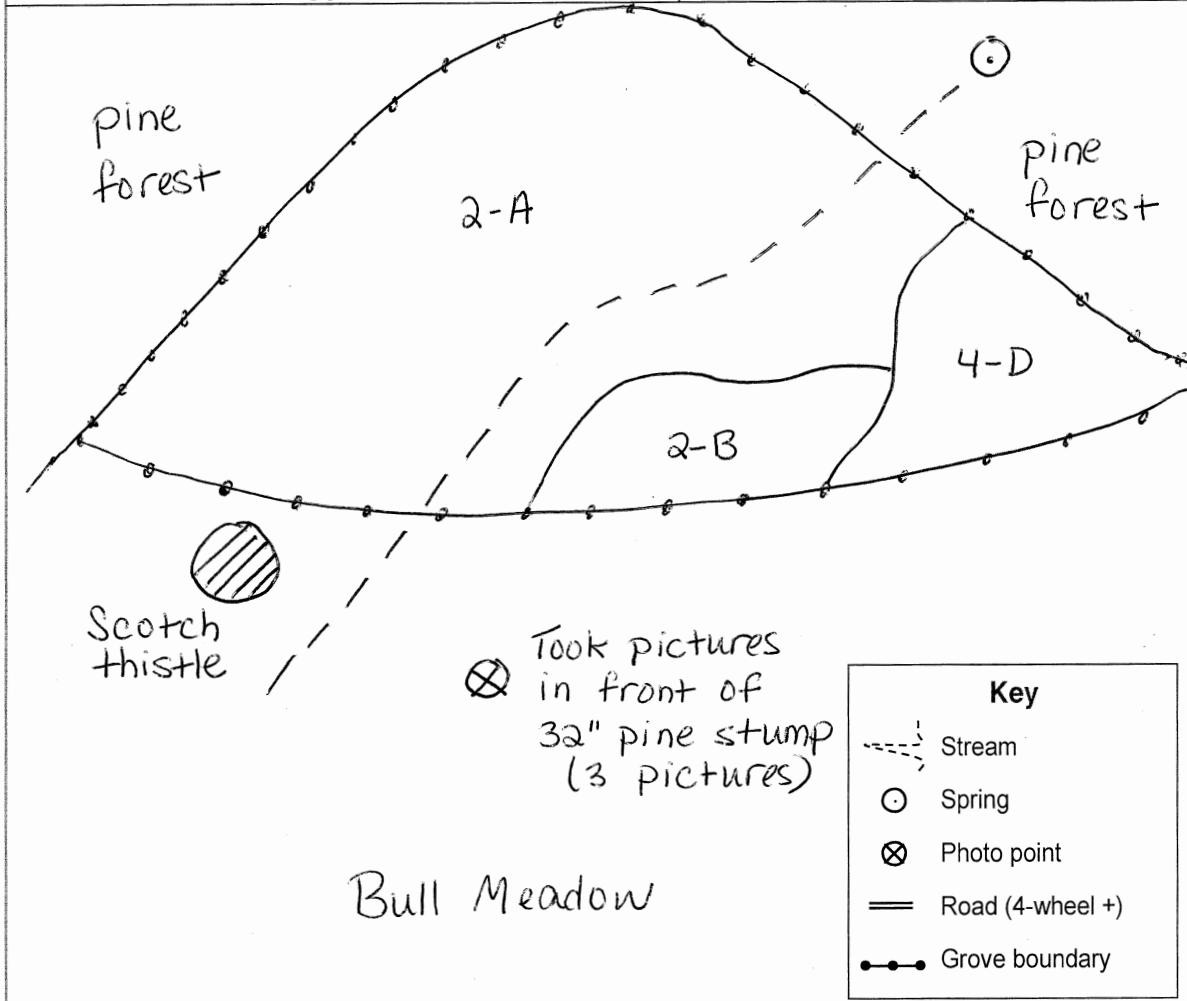
1. After locating the grove, walk through it and observe its size and shape. Note the condition of the aspen (both overstory and understory), features of interest (roads, springs, streams, other wet areas, fences, noxious weeds), and other noteworthy characteristics. Pay special attention to grazing influence on aspen suckers. Identify the perimeter of the grove by finding the trees or suckers on the outer edge. Flagging this edge is recommended.
2. Draw the boundary of the grove on the assessment form. If desired, you can use a global positioning system (GPS) with mapping capability to accurately map the size and shape of the grove. Transfer the mapped boundary on the GPS screen to the form. Garmin GPS units that allow “tracks” to be recorded are one example.
3. Fill out the “General Aspen Grove Information” on the assessment form. Estimate the grove size in acres (a GPS can be helpful). Record location by using the legal description, latitude/longitude/UTM coordinates from your GPS, or local features (e.g., “½ mile up Rd. 200 on the right next to spring”).
4. Draw other notable features on the assessment form (see items in the map key).
5. Take photos and label the position and direction where images were taken on the map. Make sure to rename your photos to avoid confusion during future monitoring.
6. On the map, draw boundaries between different aspen condition classes and label with the codes from the Aspen Condition Classification Chart (page 23).
7. In the box below the map, describe the aspen grove. See the sample map on page 21 for details on how to complete the map and describe the grove. Try to include the following in your description:
 - Vegetation conditions
 - Condition of mature aspen and regeneration “suckers.” Do they look healthy? Are they mature or younger? Note any damage such as defoliation, disease, animal browse, or antler rubbing.
 - Level of conifer encroachment, species, and sizes of conifers
 - Grazing level and browse/damage to aspen suckers (use visual aids on page 22)
 - Noxious weeds
 - Access to the grove
 - Known or suspected wildlife use
8. Go to Chapter 4 to determine whether treatments are needed. Record suggested management actions at the bottom of the assessment form.

Aspen RAPID Assessment Form (page 1 of 1)

General Aspen Grove Information	
Date:	Assessor:
Aspen grove ID (name or #):	
Average slope (%):	Grove size (acres):
<div style="float: right; border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">Key</p> <p> Stream</p> <p> Spring</p> <p> Photo point</p> <p> Road (4-wheel +)</p> <p> Grove boundary</p> </div>	
Describe aspen:	
Needed management actions (from Aspen Management Options Flowchart, page 25):	

Sample Completed RAPID Assessment Form (page 1 of 1)

General Aspen Grove Information	
Date: 9-1-09	Assessor: John Appleseed
Aspen grove ID (Name or #): 1 north end of Bull Meadow	
Average slope (%): 5-20	Grove size (acres): 3



Describe aspen: A 3-acre grove with overstory mostly of mature & declining aspen. About 1 acre (4-D) has many conifers overtopping aspen. Suckering is heavy except in areas 2-B & 4-D. Browse is light to moderate (mostly by elk).

Management actions (from Aspen Management Options Flowchart, page 25):

Remove all conifers from area-4-D. Assess suckering in 2 years in areas 4-D & 2-B. Consider big game fence if regeneration is poor. Remove Scotch thistle before flowering.

Visual Aids (use with both RAPID and FULL Assessments)

Level of browse



Figure 13. Light/moderate browse damage. Although the tree has been browsed, it continues to grow in height. (Photo: Darin Stringer)



Figure 14. Severe browse damage of new suckers after a beaver cut the main stem. This tree has a hedged or pruned look and cannot grow above the ungulate browse level. (Photo: Darin Stringer)

Level of other damage



Figure 15. Light damage by antler rubbing. (Photo: Darin Stringer)



Figure 16. Severe damage by trampling. (Photo: Darin Stringer)

Aspen Condition Classification Chart (use with both RAPID and FULL Assessments)

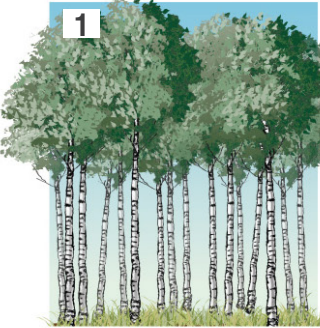
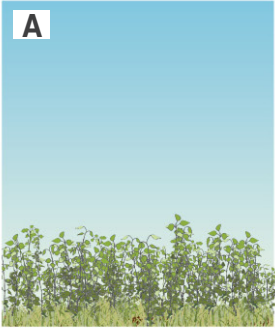
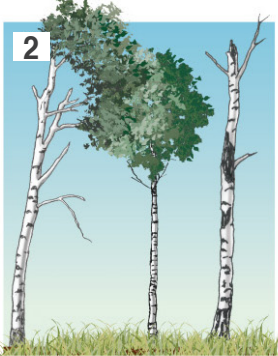

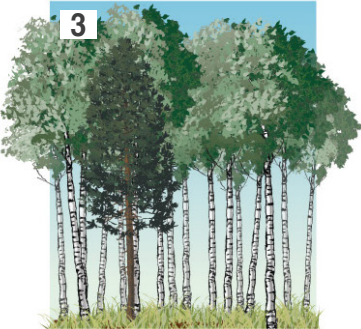
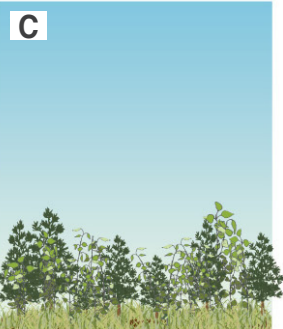
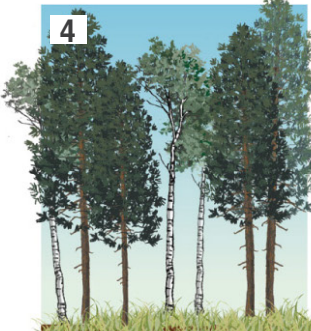
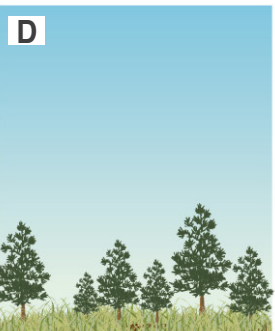
	Overstory	Understory	
<p>Code 1 Healthy, well-stocked aspen overstory</p>			<p>Code A Heavy to moderate aspen regeneration</p>
<p>Code 2 Aspen overstory declining or absent</p>			<p>Code B Light or no aspen regeneration</p>
<p>Code 3 Aspen overstory with light conifer encroachment</p>			<p>Code C Conifer and aspen regeneration</p>
<p>Code 4 Aspen overstory with moderate to heavy conifer encroachment</p>			<p>Code D Conifer regeneration with no aspen</p>

Figure 17. Aspen Condition Classification Chart. Use this chart to classify aspen as part of the FULL or RAPID Assessment. To use this chart, match the condition of the overstory and understory of your grove with the illustrations above. For example, a grove with a healthy overstory and moderate aspen regeneration would be labeled as 1-A on your map (page 2 of the FULL Assessment and page 1 of the RAPID Assessment).