

# R.A.P Activity Sheet

Overview: RAP or the Rangeland Analysis Platform is a web-based application that was designed for landowners, managers, and conservations to look at vegetation data. Today you will be using this platform to analyze the pastures on your paired demonstration ranch that have been treated with prescribed fire and livestock.

Demonstration Ranch (circle)

Duff

Rocking Chair

Hoover K. Bar

Head of River

Tools required for activity: Computer, Lab sheet, Pencil/pen, Reliable internet connection, Microsoft Excel, Zip-files of Ranch

## Part 1

1. Open up browser on computer and type in <https://rangelands.app/>.
2. Click” Launch App.”
3. In the Map Layers window click “Upload Shapefile”.
4. Upload the zip file provided by your instructor to RAP.
6. Now, you should see an outlined map of your ranch appear with lines separating the different pastures. Next, find your ranch in Table 1 down below. You will see two different columns labeled (Pasture with recent Fire) and (Pasture with no Fire or Fire >5 years old). You will be using the 2 pastures found in each column from your ranch to complete the rest of this activity.
7. Locate those same 2 pastures on the map in RAP. You can do so by clicking on each pasture and their name and treatments will appear. Once you have found them, move on to step 8.

Table 1: Consecutive ranches and pastures for Part 1

Ranches	Pasture with recent Fire	Pasture with no Fire or Fire >5 years old
Duff	Pasture 6	Pasture 8
Rocking Chair	South Pasture 2	South East Pasture 1
Head of River Ranch	Edies	Colt
Hoover K. Bar	Big Valley	O’Cheskey

\*Rocking Chair Ranch has some pastures with same name but different treatments

8. Next, navigate to the **Map layers window** on the left hand side of your screen. You should see 4 switches: Cover, Biomass, Excluding croplands, and Fire boundaries. Turn on the **Biomass** switch and Turn off the cover, excluding croplands, and fire boundaries switch. Next to the Biomass switch you have the option to change the Biomass type to Perennial or Annual Forb and Grasses. Change the biomass type to **Perennial Forb and Grasses**(The map should now look **Green**). Next, find the years tab and here you can change the years from around time of fire. Notice how the Green gets darker/lighter in your 2 pastures. Form a hypothesis and write it down below about what you think is happening in your pastures.

9. Next, navigate back to **Map layers window** and turn off the Biomass switch and turn on the **Cover** switch. Change the cover type to **Tree cover** (The map should look **Orange**). Next, find the years tab and change the years from around time of fire. Notice how the orange gets darker/lighter in your 2 pastures while changing the years from around time of fire. Form a hypothesis and write it down below on what you think is happening in your pastures.

10. Next navigate back to **Map layers window** and click off all switches. Click on Satellite so you can see natural terrain. Next, click the **draw features** on Map layers window and then click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **1st pasture with fire** and double click your mouse once you have finished creating a shape around your pasture.

11. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

12. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table A down below.

Table A: Pasture with recent Fire

**Pasture Name:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrubs	

Trees	
Bare Ground	

13. Once you have collected the data for Table A close out of that excel sheet. Go back to the RAP platform. To clear the previous shape that you drew click **draw features again**. If you click clear map you will have to re-upload the zip file of your ranch. On **Map layers window** click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **2nd pasture with no fire or fire >5 years old** and double click your mouse once you have finished creating a shape around your pasture.

14. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

15. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table B down below.

Table B: Pasture with no Fire or fire >5 years old

**Pasture Name:**

Cover types	Cover data % 2021
Perennial	
Grasses	
Shrubs	
Trees	
Bare Ground	

16. Create a simple bar graph either by hand or in Excel to compare the cover data collected from Table A and Table B. The **title** of the graph should be labeled as “Percent Cover of Plant Functional Groups: Two Fire Treatments”. The **x-axis** should be labeled with the cover types and the **y-axis** should have the Cover data % 2021.

17. Look back at your hypotheses from steps 9 and 10. Were you correct or incorrect? Which pasture had more Perennial grass? Which pasture had more shrubs and trees? Is fire or no fire better? Write your answers down below.

## Part 2

1. Find your ranch in Table 2 down below. You will see two different columns labeled (Pasture with Livestock + Fire) and (Pasture with cattle). You will be using the 2 pastures found in each column from your ranch to complete the rest of this activity.
2. Now, locate those same 2 pastures on the map in RAP. You can do so by clicking on each pasture and their name and treatments will appear. Once you have found them, move on to step 3.

Table 2: Consecutive ranches and pastures for Part 2

Ranches	Pasture with Livestock + Fire	Pasture with cattle
Duff	Pasture 5	Pasture 2
Rocking Chair	Entrance pasture	West Pasture
Head of River	River Bend 1	Cliffs
Hoover K. Bar	Big Valley	Draw

3. Next, navigate to the **Map layers window** on the left hand side of your screen. You should see 4 switches: Cover, Biomass, Excluding croplands, and Fire boundaries. Turn on the **Biomass** switch and Turn off the cover, excluding croplands, and fire boundaries switch. Next to the Biomass switch you have the option to change the Biomass type to Perennial or Annual Forb and Grasses. Change the biomass type to **Perennial Forb and Grasses**(The map should now look **Green**). Next, find the years tab and here you can change the years from around time of fire. Notice how the Green gets darker/lighter in your 2 pastures. Form a hypothesis and write it down below about what you think is happening in your pastures.

4. Next, navigate back to **Map layers window** and turn off the Biomass switch and turn on the **Cover** switch. Change the cover type to **Tree cover** (The map should look **Orange**). Next find the years tab and change the years from around time of fire. Notice how the orange gets darker/lighter in your 2 pastures while changing the years from around time of fire. Form a hypothesis and write it down below on what you think is happening in your pastures.

5. Next, navigate back to **Map layers window** and click off all switches. Click on Satellite so you can see natural terrain. Next, click the **draw features** on Map layers window and then click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **1st pasture with Fire+Livestock** and double click your mouse once you have finished creating a shape around your pasture.

6. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

7. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table C down below.

Table C: Patch burn grazing

**Pasture Name:**

**Livestock species:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrubs	
Trees	
Bare Ground	

8. Once you have collected the data for Table C close out of that excel sheet. Go back to the RAP platform. To clear the previous shape that you drew click **draw features again**. \* If you click clear map you will have to re-upload the zip file of your ranch. On **Map layers window** click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **2nd pasture with Cattle** and double your mouse once you have finished creating a shape around your pasture.

9. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

10. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table D down below.

Table D: Cattle Grazing

**Pasture name:**

**Livestock species:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrubs	
Trees	
Bare Ground	

11. Create a simple bar graph either by hand or in Excel to compare the cover data collected from Table C and Table D. The **title** of the graph should be labeled as “Percent Cover of Plant Functional Groups: Two Grazing Treatments”. The **x-axis** should be labeled with the cover types and the **y-axis** should have the Cover data % 2021.

12. Look back at your hypotheses from steps 3 and 4. Were you correct or incorrect? Which pasture had more grass? Which pasture had more trees? Is fire+livestock better or just cattle better? Write your answers down below.

### Part 3

1. Find your ranch in Table 3 down below. You will see two different columns labeled (Pasture with multi-species grazing) and (Pasture with single species grazing). You will be using the 2 pastures found in each column from your ranch to complete the rest of this activity.
3. Now, locate those same 2 pastures on the map in RAP. You can do so by clicking on each pasture and their name and treatments will appear. Once you have found them, move on to step 3.

Table 3: Consecutive ranches and pastures for Part 3

Ranches	Pasture with multi-species grazing	Pasture with single species grazing
Duff	Pasture 7	Pasture 6
Hoover K. Bar	High lonesome	Draw tap

3. Next, navigate to the **Map layers window** on the left hand side of your screen. You should see 4 switches: Cover, Biomass, Excluding croplands, and Fire boundaries. Turn on the **Biomass** switch and Turn off the cover, excluding croplands, and fire boundaries switch. Next to the Biomass switch you have the option to change the Biomass type to Perennial or Annual Forb and Grasses. Change the biomass type to **Perennial Forb and Grasses**(The map should now look **Green**). Next, find the years tab and here you can change the years from around time of fire. Notice how the Green gets darker/lighter in your 2 pastures. Form a hypothesis and write it down below about what you think is happening in your pastures.

4. Next, navigate back to **Map layers window** and turn off the Biomass switch and turn on the **Cover** switch. Change the cover type to **Tree cover** (The map should look **Orange**). Next find the years tab and change the years from around time of fire. Notice how the orange gets darker/lighter in your 2 pastures while changing the years between 2016-2021. Form a hypothesis and write it down below on what you think is happening in your pastures.

5. Next, navigate back to **Map layers window** and click off all switches. Click on Satellite so you can see natural terrain. Next, click the **draw features** on Map layers window and then click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **1st pasture with Multiple livestock species** and double click your mouse once you have finished creating a shape around your pasture.

6. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

7. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table E down below.

Table E: Multi-Species grazing

**Pasture name:**                      **Livestock species:**

Cover types	Cover data % 2021
Perennial Grasses	

Shrubs	
Trees	
Bare Ground	

8. Once you have collected the data for Table C close out of that excel sheet. Go back to the RAP platform. To clear the previous shape that you drew click **draw features again**. \* If you click clear map you will have to re-upload the zip file of your ranch. On **Map layers window** click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **2nd pasture with a single livestock species** and double click your mouse once you have finished creating a shape around your pasture.

9. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

10. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table F down below.

Table F: Single Species grazing

**Pasture name:**

**Livestock species:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrubs	
Trees	
Bare Ground	

11. Create a simple bar graph either by hand or in Excel to compare the cover data collected from Table C and Table D. The **title** of the graph should be labeled as “Percent Cover of Plant Functional Groups: Multiple vs Single Species Grazing”. The **x-axis** should be labeled with the cover types and the **y-axis** should have the Cover data % 2021.

12. Look back at your hypotheses from steps 3 and 4. Were you correct or incorrect? Which pasture had more grass? Which pasture had more trees? Is multi-species grazing better or just a single species grazing better? Write your answers down below.



## Part 4

1. Find your ranch in Table 4 down below. You will see two different columns labeled (Grassland ecological site) and (Juniper woodland ecological site). You will be using the 2 pastures found in each column from your ranch to complete the rest of this activity.
4. Now, locate those same 2 pastures on the map in RAP. You can do so by clicking on each pasture and their name and treatments will appear. Once you have found them, move on to step 3.

Table 4: Consecutive ranches and pastures for Part 4

Pastures	Grassland ecological site	Juniper woodland ecological site
Duff	Pasture 7	Pasture 4
Rocking Chair	Pecan	Middle
Head of River	Dry Creek	Dam
Hoover K. Bar	Big Valley	Rock House Draw

3. Next, navigate to the **Map layers window** on the left hand side of your screen. You should see 4 switches: Cover, Biomass, Excluding croplands, and Fire boundaries. Turn on the **Biomass** switch and Turn off the cover, excluding croplands, and fire boundaries switch. Next to the Biomass switch you have the option to change the Biomass type to Perennial or Annual Forb and Grasses. Change the biomass type to **Perennial Forb and Grasses**(The map should now look **Green**). Next, find the years tab and here you can change the years from 2016-2021. Notice how the Green gets darker/lighter in your 2 pastures. Form a hypothesis and write it down below about what you think is happening in your pastures.

4. Next, navigate back to **Map layers window** and turn off the Biomass switch and turn on the **Cover** switch. Change the cover type to **Tree cover** (The map should look **Orange**). Next find the years tab and change the years from 2016-2021. Notice how the orange gets darker/lighter in your 2 pastures while changing the years. Form a hypothesis and write it down below on what you think is happening in your pastures.

5. Next navigate back to **Map layers window** and click off all switches. Click on Satellite so you can see natural terrain. Next, click the **draw features** on Map layers window and then click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **1st Grassland Ecological Site pasture** and double click your mouse once you have finished creating a shape around your pasture.

6. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

7. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table G down below.

Table G: Grassland Ecological Site

**Pasture:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrub	
Tree	
Bare Ground	

8. Once you have collected the data for Table G close out of that excel sheet. Go back to the RAP platform. To clear the previous shape you drew click **draw features again**. \* If you click clear map you will have to re-upload the zip file of your ranch. On **Map layers window** click on the draw a shape tool which is located right next to hand tool. You will then click on your screen to outline the whole perimeter of your **2nd Juniper-woodland ecological site pasture** and double click your mouse once you have finished creating a shape around your pasture.

9. Once you create your shape a drop-down bar will appear. Click on the arrow ^ and a graph of the different cover types should appear. There are also three columns that should be apparent (Cover, Annual biomass, and 16-day biomass). You will click on the Cover column and download the Excel data.

10. Find the excel data that you downloaded. At the top of the excel sheet find PFG, SHR, TREE, and BG. You will use the 2021 data collected from these cover categories to fill out Table H down below.

Table H: Juniper Woodland Ecological Site

**Pasture:**

Cover types	Cover data % 2021
Perennial Grasses	
Shrub	
Tree	
Bare Ground	

11. Create a simple bar graph either by hand or in Excel to compare the cover data collected from Table G and Table H. The **title** of the graph should be labeled as “Percent Cover of Plant Functional Groups: Two Ecological Sites”. The **x-axis** should be labeled with the cover types and the **y-axis** should have the Cover data % 2021.

12. Look back at your hypotheses from steps 3 and 4. Were you correct or incorrect? Why do you think one pasture had more grass and one pasture had more trees? What treatments did each pasture have?