River Otter Data Analysis

Cami Hauver Project 1 Data Analytics Course

Questions:

1. How do animal sightings differ between survey locations?

2. Which individual surveys within each location had the most/least animal sightings?

3. Where were river otters sighted, and how often were they sighted compared to other animals?

4. Compare probabilities of other animal sightings to river otter sightings. Are there any possible patterns?

Overall Summary of Animal Sightings across all Survey Locations
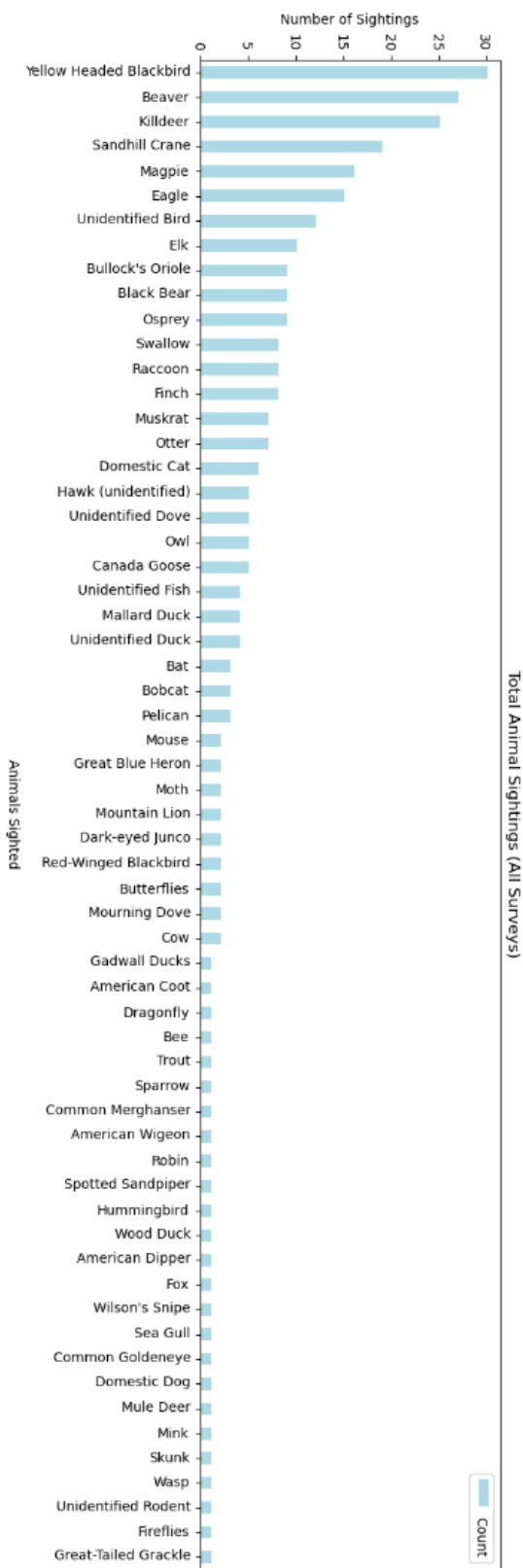
See Figure 1.

Across all Survey Locations (Lower Provo River, Middle Provo River, Strawberry River, and Weber River
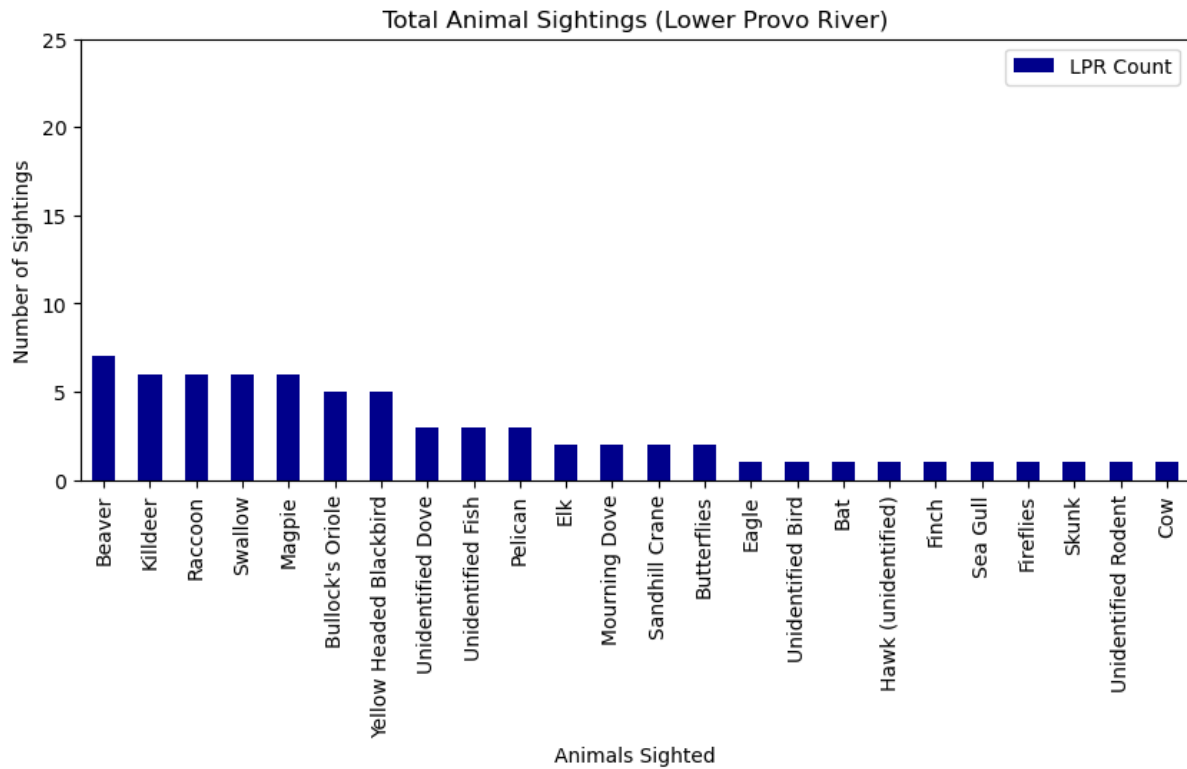
Total animal sightings = 309

Total number of species sighted = 61

Figure 1.

Number of Sightings

| Animals Sighted	Count
Yellow Headed Blackbird	
Beaver	
Killdeer	
Sandhill Crane	
Magpie	
Eagle	
Unidentified Bird	
Elk	
Bullock's Oriole	
Black Bear	
Osprey	
Swallow	
Raccoon	
Finch	
Muskrat	
Otter	
Domestic Cat	
Hawk (unidentified)	
Unidentified Dove	
Owl	
Canada Goose	
Unidentified Fish	
Mallard Duck	
Unidentified Duck	
Bat	
Bobcat	
Pelican	
Mouse	
Great Blue Heron	
Moth	
Mountain Lion	
Dark-eyed Junco	
Red-Winged Blackbird	
Butterflies	
Mourning Dove	
Cow	
Gadwall Ducks	
American Coot	
Dragonfly	
Bee	
Trout	
Sparrow	
Common Merghanser	
American Wigeon	
Robin	
Spotted Sandpiper	
Hummingbird	
Wood Duck	
American Dipper	
Fox	
Wilson's Snipe	
Sea Gull	
Common Goldeneye	
Domestic Dog	
Mule Deer	
Mink	
Skunk	
Wasp	
Unidentified Rodent	
Fireflies	
Great-Tailed Grackle	

Total Animal Sightings (All Surveys)

Figure 2.

Top animals sighted at Lower Provo River Surveys:

1. Beaver
2. Killdeer
3. Raccoon
4. Swallow
5. Magpie

Figure 3.

Animal Sightings per Survey (Lower Provo River)
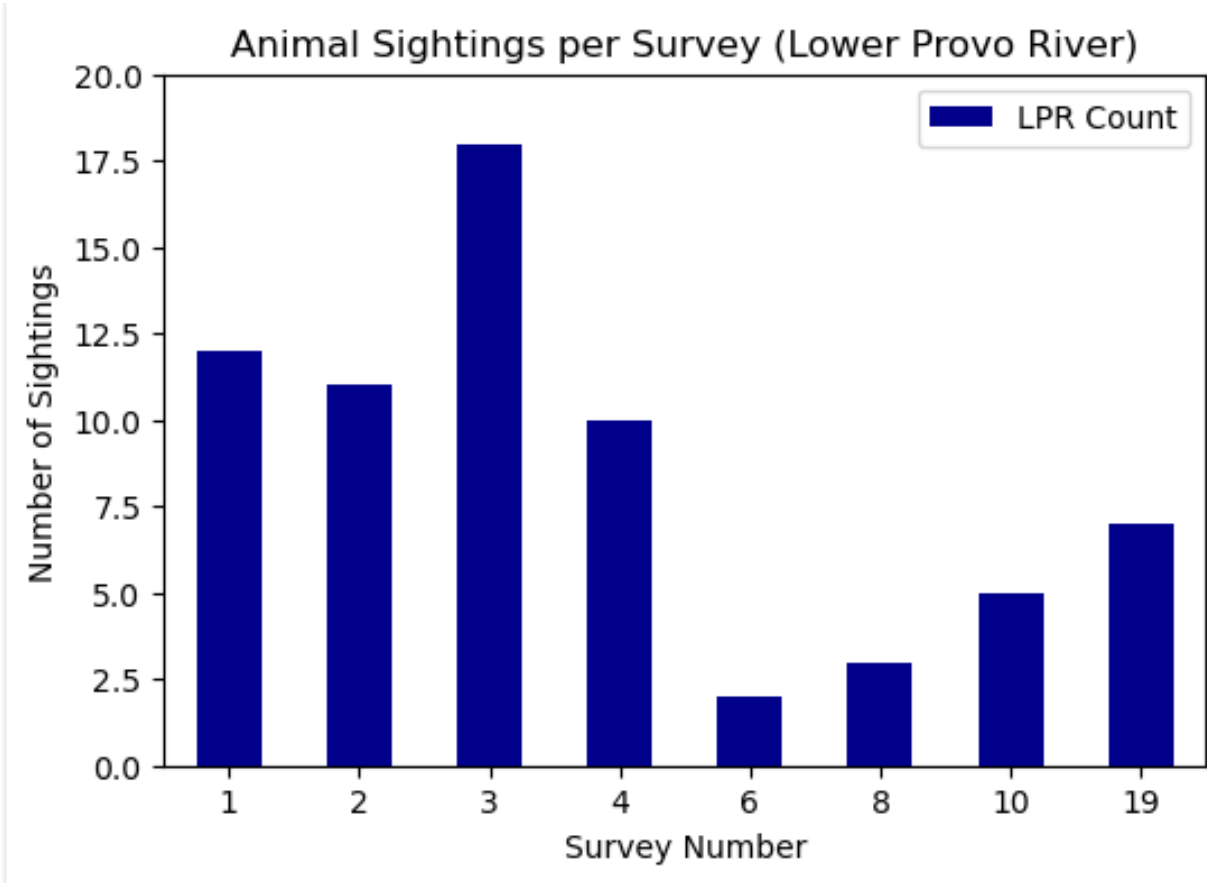
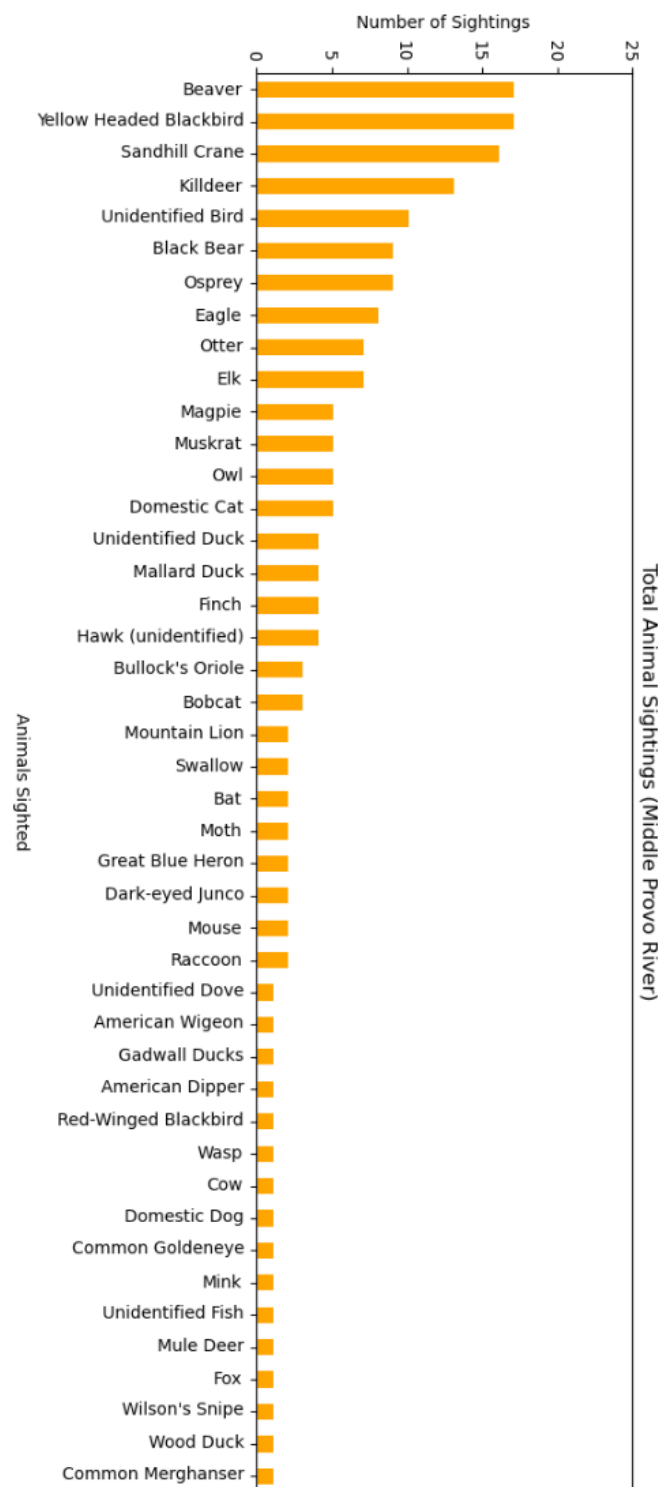Summary statistics of animal sightings per Survey at the Lower Provo River:

Figure 4.

	LPR Count
count	8.000000
mean	8.500000
std	5.318432
min	2.000000
25%	4.500000
50%	8.500000
75%	11.250000
max	18.000000

Lower Provo River Survey #3 resulted in the most animal sightings (18), while Survey #6 resulted in the least animal sightings (2)

Summary for Survey Location: Middle Provo River (Figures 5-7)

Figure 5.

Top animals sighted at Middle Provo River Surveys:

1. Beaver
2. Yellow headed Blackbird
3. Sandhill Crane
4. Killdeer
5. Unidentified Bird

Figure 6.

Animal Sightings per Survey (Middle Provo River)
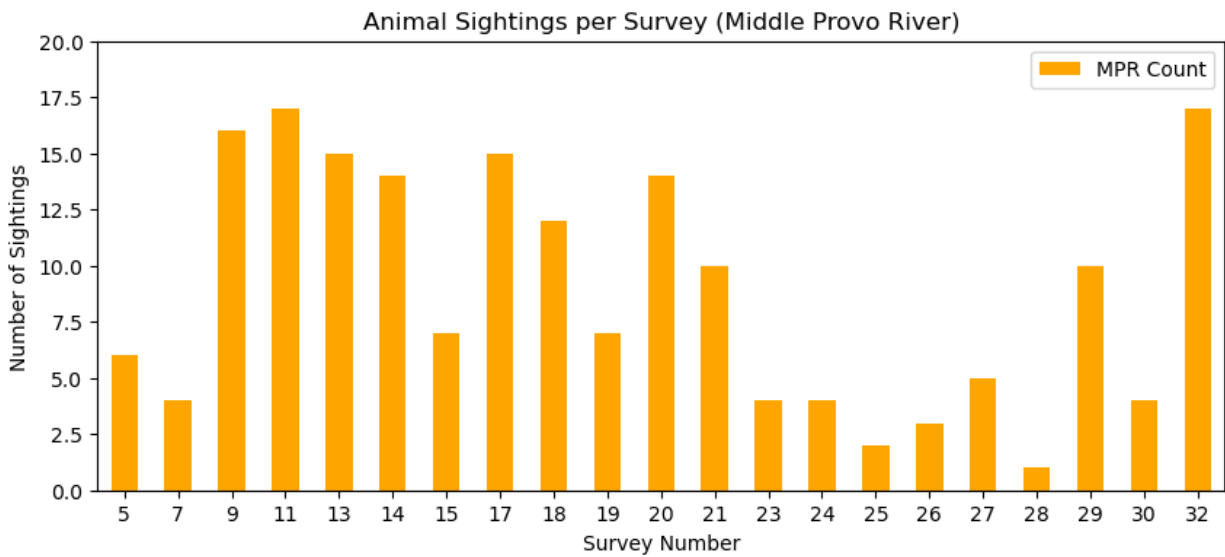
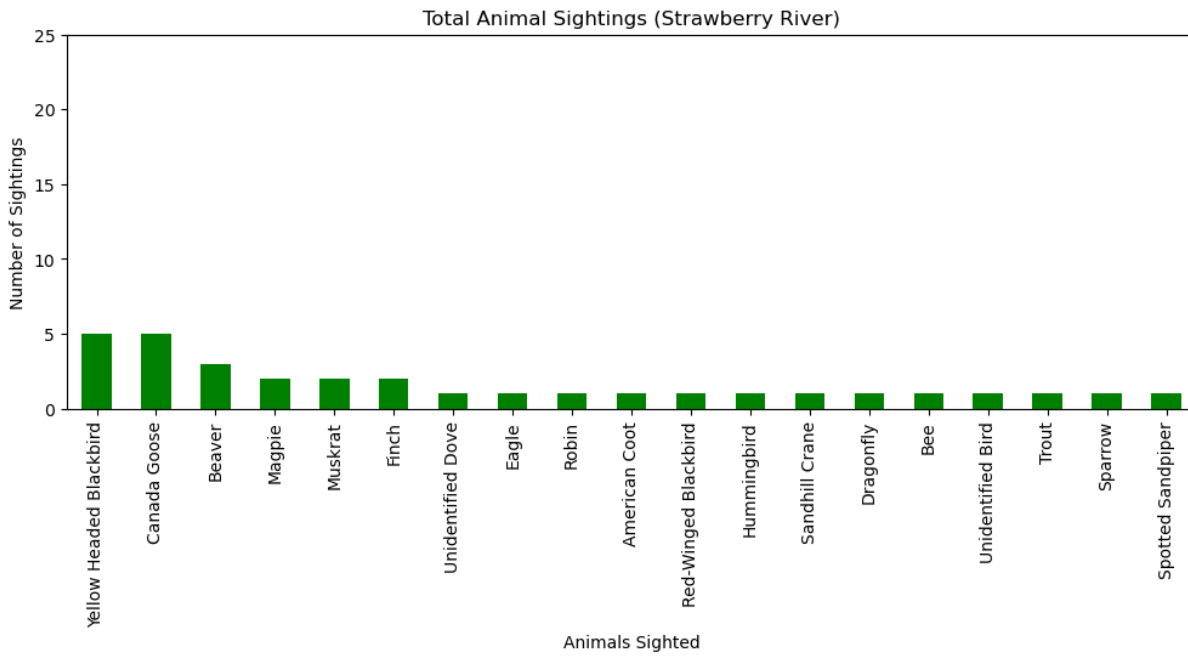Summary statistics of animal sightings per Survey at the Middle Provo River:

Figure 7.

	MPR Count
count	21.000000
mean	8.904762
std	5.439713
min	1.000000
25%	4.000000
50%	7.000000
75%	14.000000
max	17.000000

Middle Provo River Survey #11 and #32 resulted in the most animal sightings (17 each), while Survey #28 resulted in the least animal sightings (1)
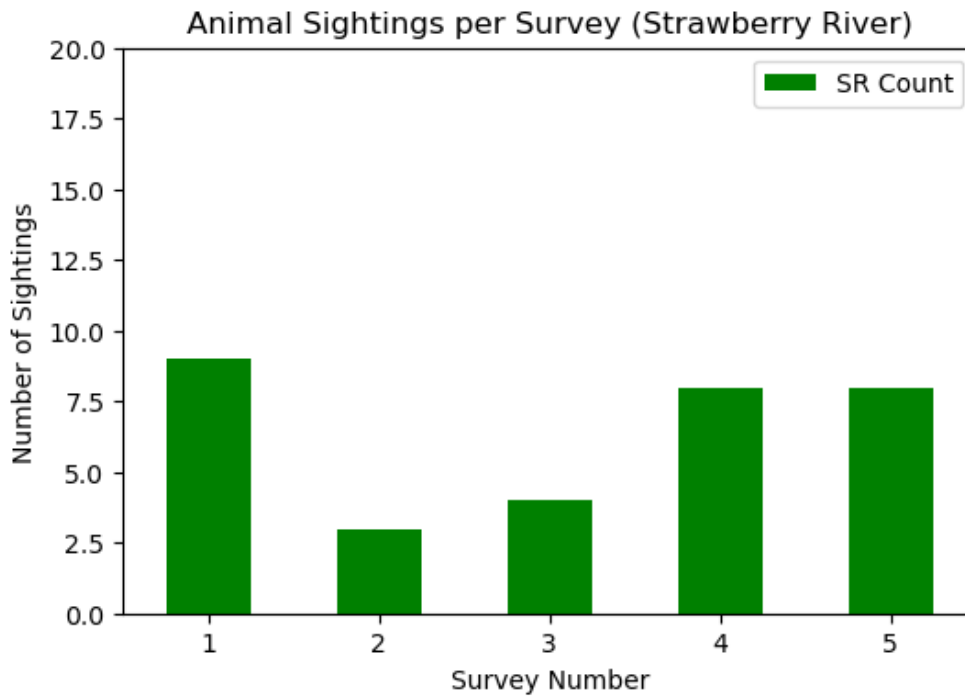
Figure 8.

Top animals sighted at Strawberry River Surveys:

1. Yellow Headed Blackbird
2. Canada Goose
3. Beaver
4. Magpie
5. Muskrat

Figure 9.

Summary statistics of animal sightings per Survey at the Strawberry River:
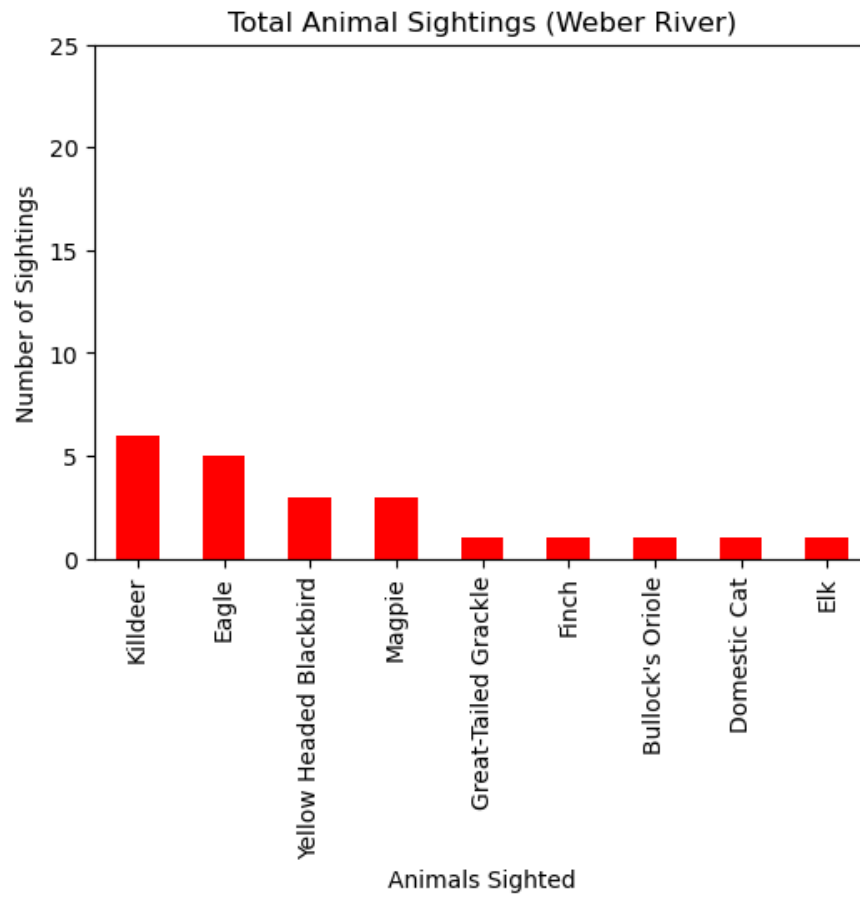
Figure 10.

	SR Count
count	5.000000
mean	6.400000
std	2.701851
min	3.000000
25%	4.000000
50%	8.000000
75%	8.000000
max	9.000000

Strawberry River Survey #1 resulted in the most animal sightings (9), while Survey #2 resulted in the least animal sightings (3)
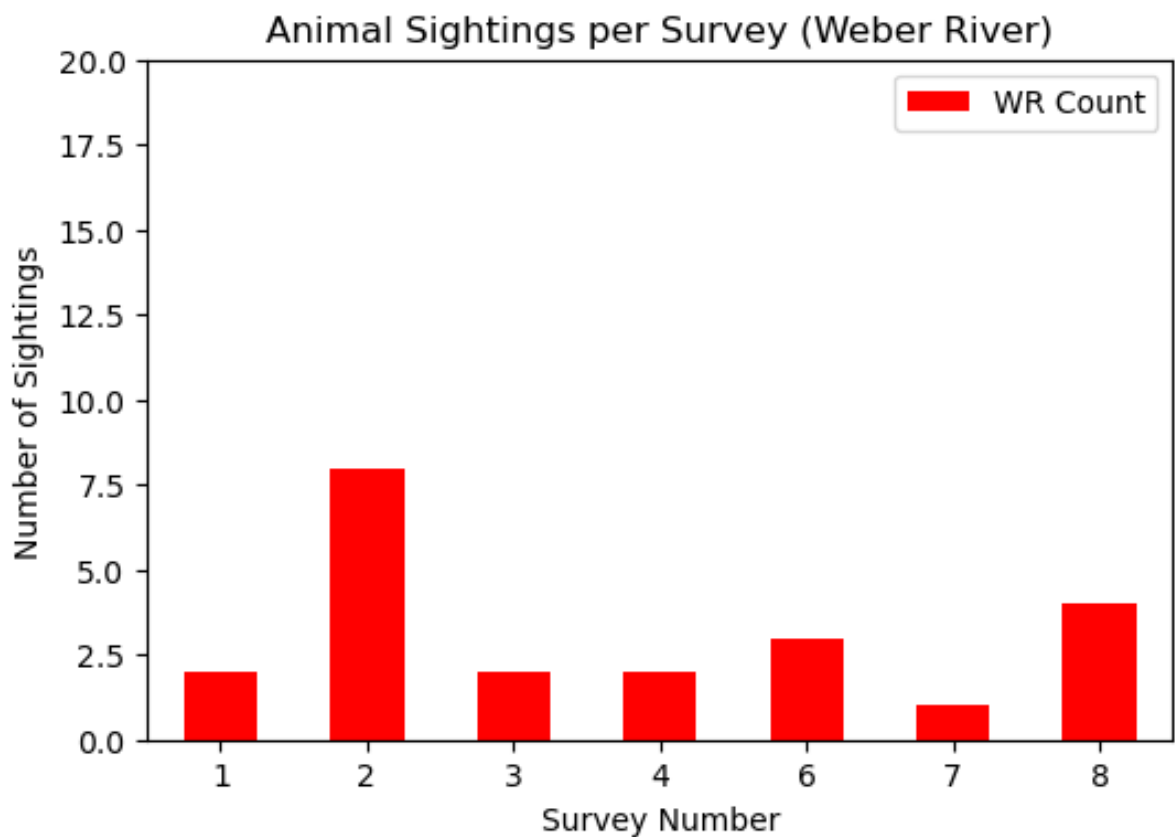
Figure 11.

Top animals sighted at Weber River Surveys:

1. Killdeer
2. Eagle
3. Yellow Headed Blackbird
4. Magpie

Figure 12.

Animal Sightings per Survey (Weber River)

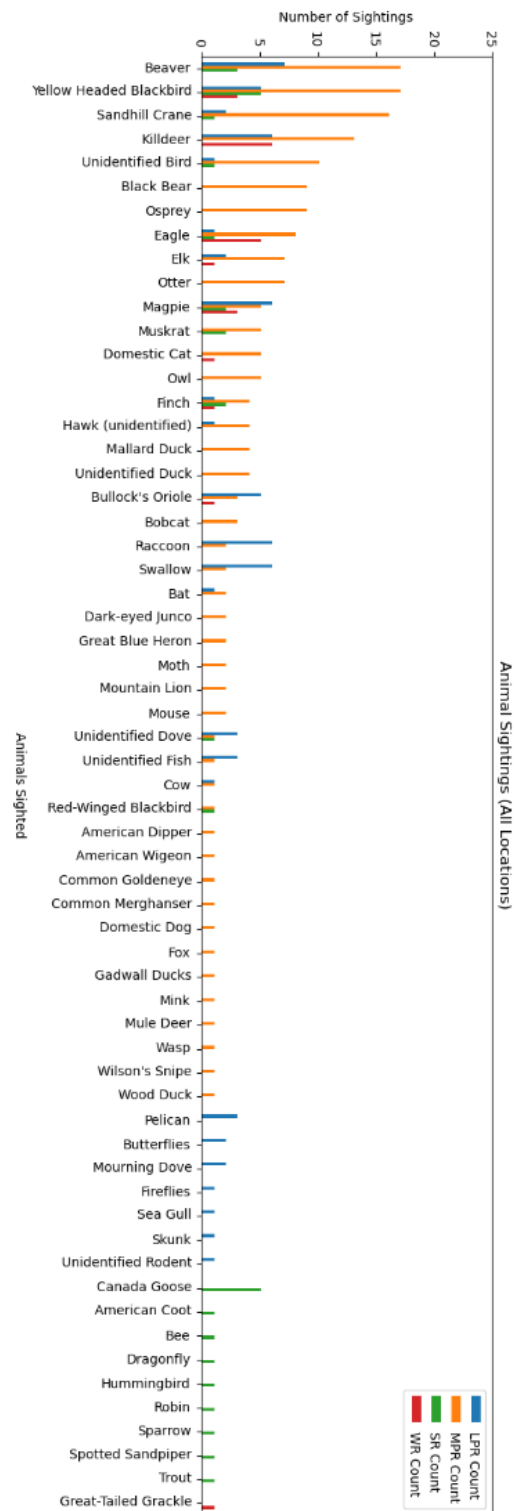Summary statistics of animal sightings per Survey at the Strawberry River:

Figure 13.

	WR Count
count	7.000000
mean	3.142857
std	2.340126
min	1.000000
25%	2.000000
50%	2.000000
75%	3.500000
max	8.000000

Weber River Survey #2 resulted in the most animal sightings (8), while Survey #7 resulted in the least animal sightings (1)

Figure 14.

1) How do animal sightings differ between survey locations?

- Lower Provo River
  - 68 animal sightings
  - 24 different species
  - 8 surveys performed
- Middle Provo River
  - Most animal sightings
    - 187
  - Most diversity
    - 44 different species
  - Most number of surveys performed
    - 21 surveys
- Strawberry River
  - 32 animal sightings
  - 19 different species
  - Least number of surveys performed
    - 5 surveys performed
- Weber River
  - Least animal sightings
    - 22 animal sightings
  - Least diversity
    - 9 different species
  - 7 surveys performed

2) Which individual surveys within each location had the most/least animal sightings?
   - Lower Provo River
     - Most animal sightings
       - Survey #3 (18)
     - Least animal sightings
       - Survey #6 (2)
   - Middle Provo River
     - Most animal sightings
       - Survey #11 and #32 (17)
     - Least animal sightings
       - Survey #28 (1)
   - Strawberry River
     - Most animal sightings
       - Survey #1 (9)
     - Least animal sightings
       - Survey #2 (3)
   - Weber River
     - Most animal sightings
       - Survey #2 (8)
     - Least animal sightings
       - Survey #7 (1)

3) Where were river otters sighted, and how often were they sighted compared to other animals?

Otter Sightings
- 7 sightings out of 187 total = 0.0374 sighting probability on MPR
- 9th most sighted animal on MPR out of 44 different species
- Middle Provo River only
  - Survey #s
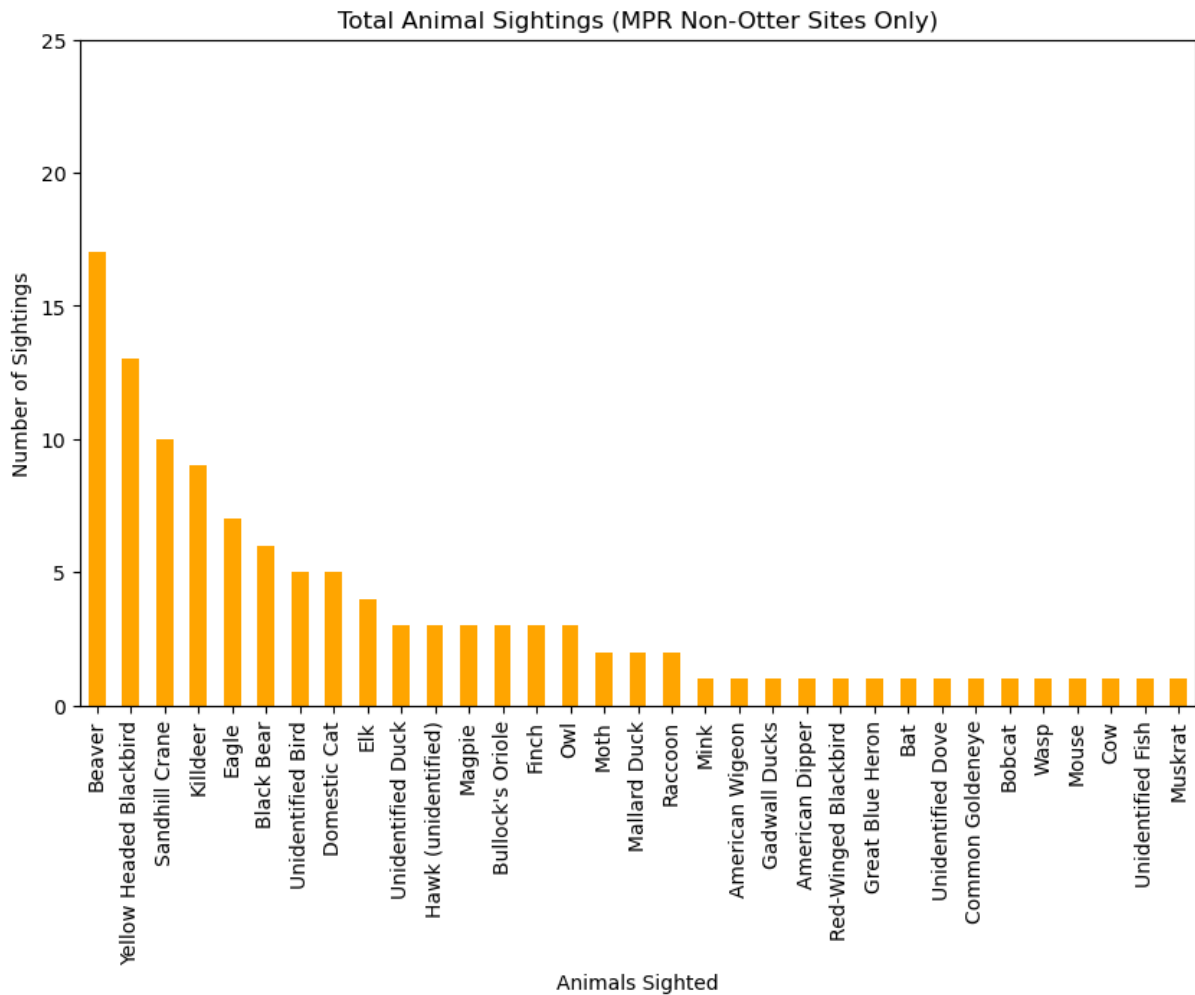   - #5
    - #13
    - #15
    - #17
    - #18
    - #32

Figure 15.

Total Animal Sightings (Otter Sites Only)
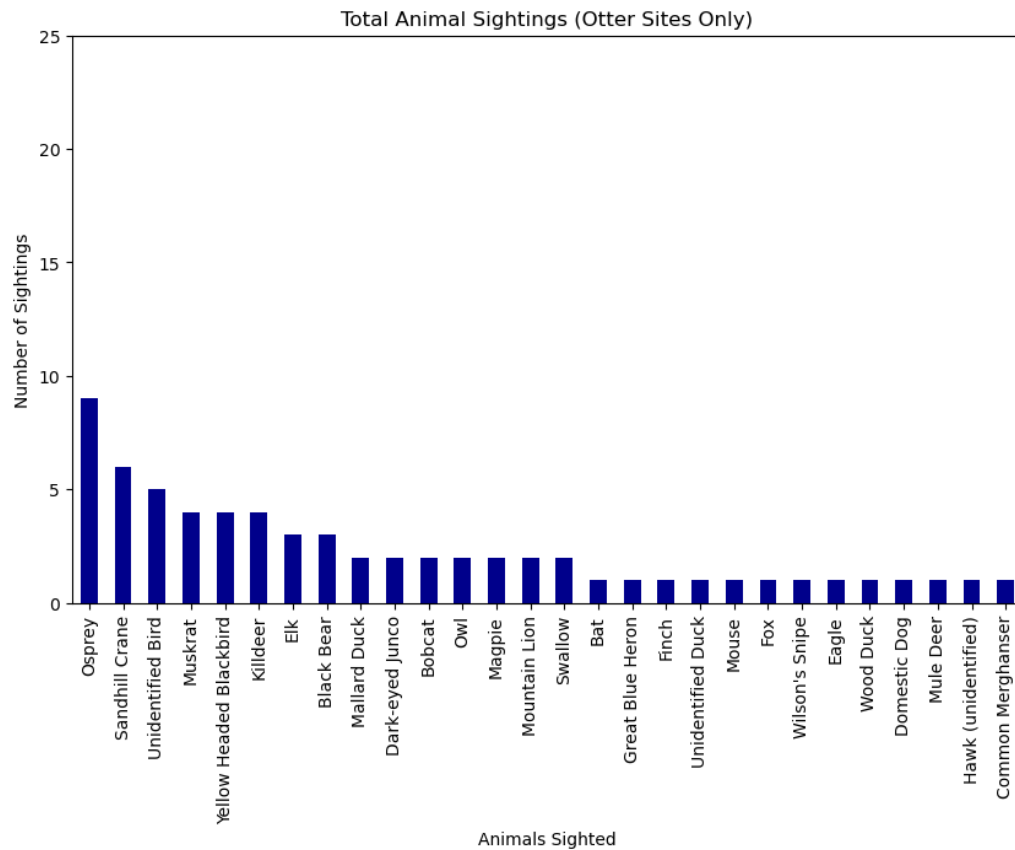
Top animals sighted at Otter Sites:

1) Osprey
2) Sandhill Crane
3) Unidentified Bird
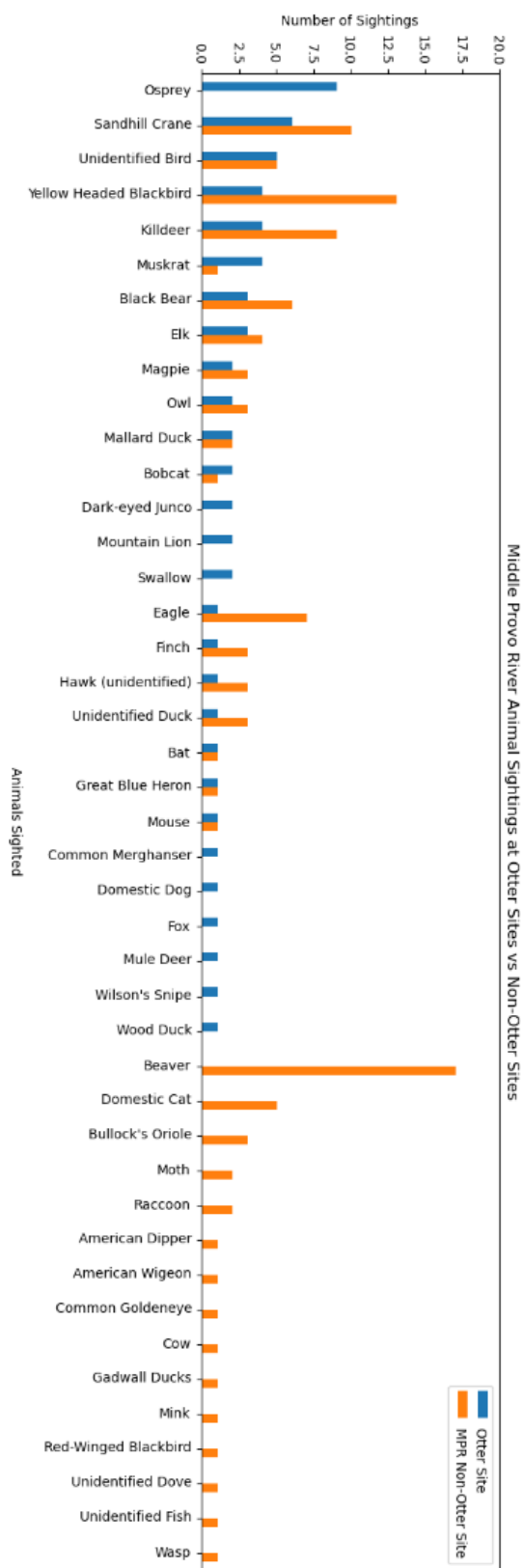
Figure 16.

Top animals sighted at Non-Otter Sites at the Middle Provo River:
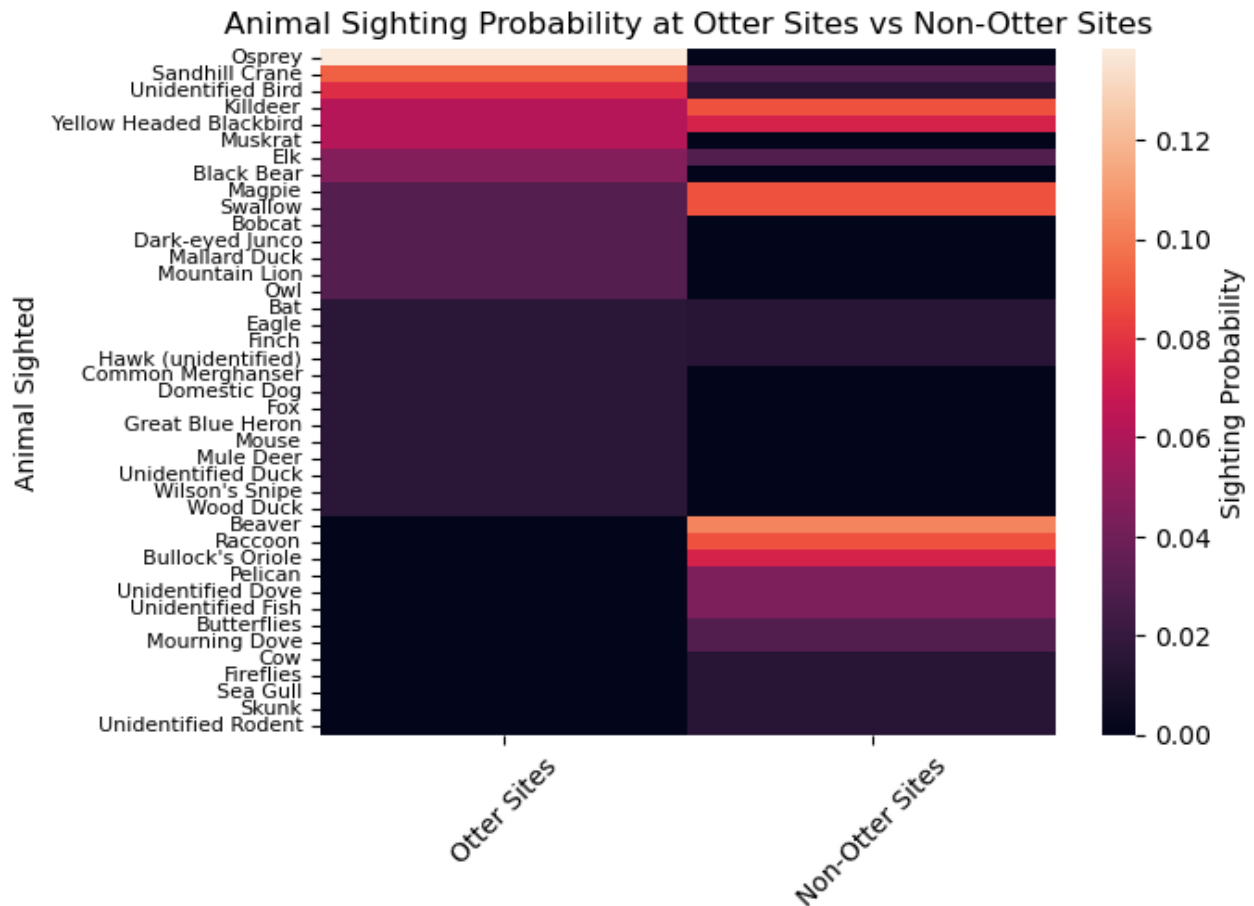
1) Beaver
2) Yellow Headed Blackbird
3) Sandhill crane

Figure 17.

Middle Provo River Animal Sightings at Otter Sites vs Non-Otter Sites

4) Compare probabilities of other animal sightings to river otter sightings. Are there any possible patterns?

Figure 18.

Animal Sighting Probability at Otter Sites vs Non-Otter Sites

- Otter Sites show much higher probability of sighting an Osprey, and secondly Sandhill crane
- Non-Otter Sites at the Middle Provo River show a much higher probability of sighting a Beaver, and secondly raccoon

Possible explanation:

- Perhaps there's habitat overlap between otters and osprey due to possible shared prey

- Perhaps there's habitat separation between otters and beavers due to negative interactions or different environment preferences

Suggestions for further data analysis, data collection:

- Run statistical tests on how animal sighting probabilities at otter sites compare to non-otter sites

    - Create a contingency table

    - Run chi-squared to test for goodness of fit or independence

- Collect data on other environmental factors to identify habitat preferences of river otters

    - Vegetation

    - River characteristics (flow, depth)