

Colorado Bighorn Sheep Monitoring 2021 Report



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Completion Date: March 1, 2022

Cover Photos By: Citizen scientists as part of the Colorado Bighorn Sheep Monitoring

project.

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Recommended Citation: Mountain Studies Institute. (2022). Colorado Bighorn Sheep Monitoring 2021 Report. Retrieved from www.mountainstudies.org/bighorn.

Acknowledgements:

We would like to thank all the volunteer citizen scientists for their work gathering and uploading data presented in this report.

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1. Executive Summary

This document presents updates on the Colorado Bighorn Sheep Monitoring Program (CBSMP), specifically this report highlights program efforts and observations of bighorn sheep in the San Juan Mountains. The observations analyzed in this report are recorded by citizen scientists and uploaded to iNaturalist (a widely used online platform for public data collection). Data show that bighorn sheep sometimes occupy domestic sheep grazing allotments and adjacent land. Mountain Studies Institute (MSI) recommends that the data in this report and all available data is considered by managing agencies when evaluating the suitability of domestic sheep grazing allotments.

The CBSMP has received funding from Backcountry Hunters and Anglers (BHA), Rocky Mountain Bighorn Society (RMBS), Great Old Broads for Wilderness, Patagonia, and MSI, as well as in-kind contribution from the United States Forest Service. MSI is an independent not-for-profit mountain research and education center established in 2002 in Silverton, Colorado. MSI develops science that people can use to address environmental issues facing the San Juan Mountains. Additional project information and observations can be viewed at www.mountainstudies.org/bighorn. For more information, please contact Artemis Eyster at artemis@mountainstudies.org.

2. Purpose

The Colorado Bighorn Sheep Management Plan 2009-2019 states that, "Interaction between bighorn sheep (*Ovis canadensis*) and domestic sheep is a significant management issue for bighorn populations in Colorado" (George, 2009, p. 63). Furthermore, the U.S. Forest Service (USFS) cited a lack of bighorn sheep herd data in initially delaying their decision on the future of domestic livestock grazing in the Weminuche Wilderness (Simino, 2021). To assist land management agencies in addressing this data gap, the CBSMP was created.

The purpose of the CBSMP is to train and equip citizen scientists to collect data that can help the USFS and Colorado Parks and Wildlife (CPW) record observations of bighorn and domestic sheep in Colorado with an initial emphasis on the southwest corner of the state, especially the San Juan Mountains. This report highlights the program efforts and volunteer observations on the San Juan National Forest (SJNF), Rio Grande National Forest (RGNF), and Grand Mesa Uncompange Gunnison National Forests (GMUGNF).

3. Methods

3.1 Data Collection

Starting in 2018, MSI and our partners have trained volunteer citizen scientists to submit observations of bighorn and domestic sheep to iNaturalist.org. Photos are either automatically linked with a time stamp and coordinates of where the photo was taken or uploaded to iNaturalist and manually assigned the appropriate date and location. In

addition to reporting sightings online, observers are asked to immediately report critical sightings (such as bighorns near domestic sheep) to the appropriate CPW wildlife biologists. A trailhead sign with a contact number and information on how to submit observations is attached in Appendix C. This example of a sign is from the SJNF, but the same sign was used in the RGNF and GMUNF with the appropriate contact number for those regions. Though the program started in the San Juan Mountains, it is now statewide. Study design, scope, and language (such as on trailhead signs) were developed in collaboration with CPW and USFS specialists to collect objective data.



Photo 1. An observation (#3 in Appendix A) from the Colorado Bighorn Sheep Monitoring Program shows a bighorn among domestic sheep.

3.2 Agency Participation

The SJNF, RGNF, GMUGNF, and CPW collaborate with the CBSMP including providing language and recommendations for locations of trailhead signs. USFS partners printed and placed some of the trailhead signs, and MSI staff and CBSMP volunteers posted others as a collaborative effort. Please see Appendix B for additional information on where signs are installed, updated, or pending installment.

CPW is responsible for responding to critical sightings reported by citizen scientists. The trailhead signs list the phone numbers of the four regional CPW terrestrial biologists so that volunteers can immediately report critical sightings, such as bighorn sheep in proximity to domestic sheep.

3.3 Volunteer Participation

Since starting this program in 2018, MSI and our volunteer partners continue to recruit and train volunteers from the community. Volunteer training was virtual in 2020 and 2021 due to Covid-19. The online training video is publicly available at MSI's project landing page at www.mountainstudies.org/bighorn.

4. Results

Observations, core bighorn ranges, grazing allotments, trail information, and public land types are available on an interactive map found at www.mountainstudies.org/bighorn. While this map is updated periodically, all observations, updated in real time, are publicly available at iNaturalist.org under the "Colorado Bighorn Sheep Monitoring" project page. Results are also summarized and delivered to the public, regional districts, CPW, and project partners via this report.

While the CBSMP didn't start until 2018, iNaturalist data of bighorn sheep observations exist prior to 2018. The geographic boundaries of the CBSMP in the iNaturalist platform include all observations within the state of Colorado. In total, the CBSMP project has had over 1,020 observers who have contributed more than 1,580 observations across Colorado. The number of observations has grown in recent years, as shown below in Table 1.

Table 1. CBSMP observations available on iNaturalist. This data was exported from iNaturalist on December 22, 2021. Eight observations were excluded due to absence of observation date information.

Year(s)	1971- 2014	2015	2016	2017	2018	2019	2020	2021	Total
All observations	196	49	83	103	179	254	311	405	1580
Observations in SW CO	8	1	5	6	15	30	56	80	201

This report focuses on the 201 observations made in southwest Colorado (bounded by latitude 38.2 and longitude -106.25 and Colorado state lines to the south and west). Observations are numbered in Figure 1 if they are determined to be significant. Significant observations include (1) bighorn sheep on or adjacent to (<0.1 miles) a domestic sheep allotment, (2) domestic sheep on bighorn summer range, or (3) a noteworthy observer comment (e.g., noting domestic sheep near bighorn sheep, stray domestic sheep, or foraying bighorn sheep). Bighorn forays are defined as "any short-term movement of an animal away from, and back to, its herd's core home range" (Pils & Wilder, 2018, p. 6). Using these criteria, 20 observations were determined to be significant and numbered geographically by longitude (from west to east) and displayed in Appendix A.

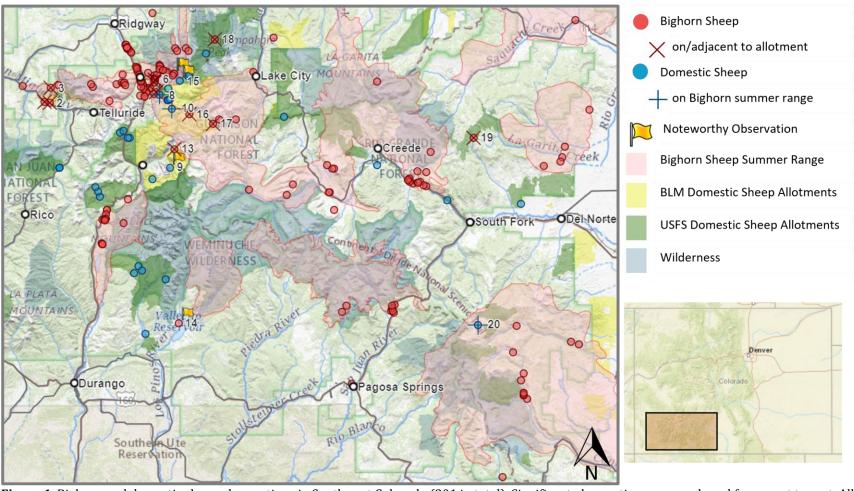


Figure 1. Bighorn and domestic sheep observations in Southwest Colorado (201 in total). Significant observations are numbered from west to east. All numbered observations are detailed in Appendix A. To view all Colorado observations on an interactive map visit MountainStudies.org/Bighorn or see live updates at iNaturalist.org/projects/colorado-bighorn-sheep-monitoring.

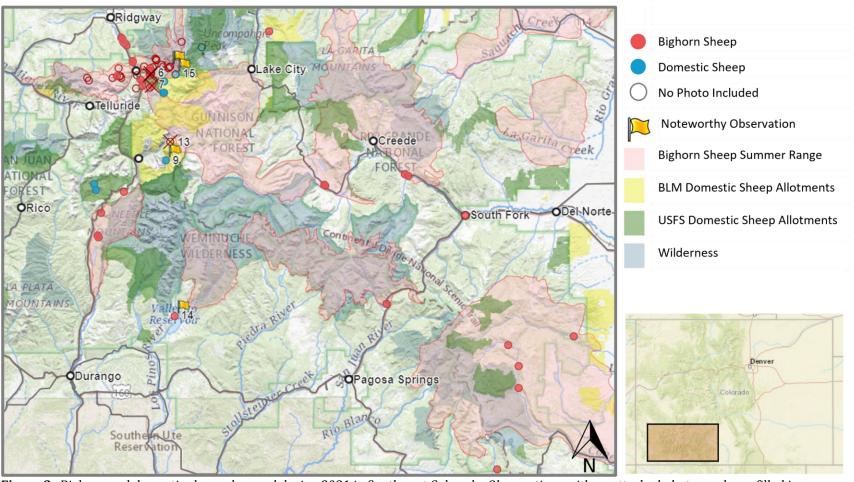


Figure 2. Bighorn and domestic sheep observed during 2021 in Southwest Colorado. Observations with an attached photograph are filled in.

There are twelve observations of bighorn sheep on or adjacent to an active domestic sheep allotment (Table 2). The distribution of observations on Bear Creek allotment is shown in Figure 3. Other significant observations include three observations of domestic sheep on bighorn summer range and five noteworthy observations recorded in 2021 (See full table in Appendix A). Three of these observations (Map# 11, 12, and 15) reported potential contact between bighorns and domestics in the Cow Creek drainage (part of the Uncompahgre Wilderness) adjacent to the Bureau of Land Management (BLM) American Lake sheep allotment and the USFS Uncompahgre Peak/North Henson sheep allotment. The other noteworthy observations include a stray domestic sheep and a foraying bighorn sheep. Specifically, the stray domestic sheep (Map# 9) was observed on the Deer Park allotment on October 30, 2021, where the last date of permitted grazing was September 20, 2021 (dates obtained from SJNF available on MSI's website). Lastly, a dead bighorn ram was found on November 17, 2021, on the western side of Vallecito Reservoir ~5km outside of delineated bighorn sheep range in the direction of the Weminuche grazing allotments (Map# 14).

Table 2. Bighorn sheep observed on or adjacent to (<0.1 miles) domestic sheep allotments.

Managing	Grand Mesa, Uncompahgre and Gunnison National Forests			Burea	Rio Grande National Forest		
authority	Ouray R	anger District	Norwood Ranger District	Gunnison Field Office		Uncompahgre Field Office	Divide Ranger District
Allotment name	Bear Creek	Big Blue/Fall Creek/Little Cim	Ruffner	On/near Grizzly Gulch	Maggie Gulch	Lee Lands	Mesa
Number of observations	4	1	1	2	1	2	1

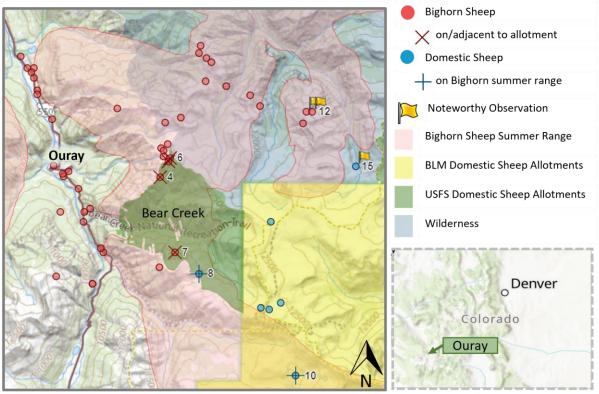


Figure 3. Significant observations of bighorn and domestic sheep east of Ouray, CO. Four observations report bighorn sheep on the Bear Creek allotment. See Appendix A for additional details on the numbered observations shown.

5. Conclusions and Next Steps

Collected opportunistically by volunteers, these results represent a limited picture of bighorn and domestic sheep distribution and interactions. Even so, the significant observations highlight the importance of considering bighorn and domestic sheep interactions in determining science-based land use policy and management. Data show that bighorn sheep sometimes occupy domestic sheep grazing allotments and adjacent land. MSI recommends the USFS and BLM consider the data in this report and all available data in evaluating the suitability of grazing allotments.

MSI intends to continue expanding citizen scientist monitoring as it has proven effective in gathering useful data. Future efforts will involve placing trailhead signs at trailheads including, but not limited to, those shown in Appendix B, further public outreach, and volunteer recruitment. MSI is currently in the process of developing a Memorandum of Understanding with the GMUGNF and CPW to gain permission to post trailhead signs in the Ouray Ranger District and is seeking approval to place trailhead signs from the BLM on lands under their jurisdiction.

6. References

- George, J. L. (Ed.). (2009). Colorado Bighorn Sheep Management Plan 2009-2019. Colorado Division of Wildlife, Department of Natural Resources. Retrieved from https://cpw.state.co.us/Documents/WildlifeSpecies/Mammals/ColoradoBighornSheepManagementPlan2009-2019.pdf
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- Simino, J. (2021). Weminuche EIS Response. Columbine Ranger District File Code: 1950. November 5, 2021.

Appendix A: Significant Observations

Table A: Significant observations in SW Colorado belong to one of three categories. (1) Bighorn sheep on or adjacent to (<0.1 miles) an active domestic sheep allotment (highlighted pink), (2) domestic sheep on bighorn summer range (highlighted blue), and (3) containing noteworthy observer comments (no highlighting). The allotment details are labeled based on the reported location of each observation.

ID	Date	Species	Allotment details	Photo	Link to Observation and Observer Comments
1	3/18/2016	Bighorn sheep	Adjacent to Lee Lands (BLM: Uncompahgre)	No	http://www.inaturalist.org/observations/2959030 The female bighorn sheep was grazing between the road and the side of the mountain.
2	4/23/2020	Bighorn sheep	Adjacent to Lee Lands (BLM: Uncompahgre)	Yes	https://www.inaturalist.org/observations/43001388
3	7/12/2020	Bighorn sheep	Ruffner S&G (USFS: Norwood Ranger District)	Yes	https://www.inaturalist.org/observations/53183252 A single bighorn sheep near a band of domestic sheep and one domestic goat. Location is within the boundary of the USFS Ruffner domestic sheep grazing allotment.
4	7/10/2021	Bighorn sheep	Bear Creek S&G (USFS: Ouray Ranger District)	Yes	https://www.inaturalist.org/observations/86860570 2 rams, both about the same horn size. Observed from 1.5 mi away. They were meandering northward and were not visible the next morning.
5	7/23/2021	Bighorn sheep	Bear Creek S&G (USFS: Ouray Ranger District)	No	https://www.inaturalist.org/observations/88616932 Single ewe bedded on ridgetop between Portland Creek drainage and subbasin of Bear Creek drainage. Unclear if she was associated with herd of 15 feeding in Portland Creek basin.
6	9/10/2021	Bighorn sheep	Bear Creek S&G (USFS: Ouray Ranger District)	No	https://www.inaturalist.org/observations/95211010 5 ewes. No domestics nearby.
7	7/10/2021	Bighorn sheep	Bear Creek S&G (USFS: Ouray Ranger District)	Yes	https://www.inaturalist.org/observations/86859175 Ewes and lambs, total of 16 counted on 7/10 evening but they were moving quickly and the entire herd was never visible at once. The next morning 7/11 I was able to see the entire herd out feeding, and then counted 18 individuals. I suspect some of these 18 were the 9 I saw on the south face of the same ridge two days earlier, but if so they definitely picked up some individuals that were not visible 7/8-7/9 (I had excellent views of the entire face they were on 7/8-9). The individuals seen on 7/10-11 were moving from west to east. Pic above is digiscoped through an 80x spotting scope at roughly 1.25

					mi. I was at ~12,500' on top of ridge between Horsethief and Bear Creek Trails.
8	8/31/2020	Domestic sheep	Bear Creek S&G (USFS: Ouray Ranger District)	Yes	https://www.inaturalist.org/observations/58206107 Domestic sheep herd about 2 mi nw of Oh Point, above S Fork Bear Creek. Herd started at top of ridge but then moved down into trees above creek. I was 1 mile se of herd
9	10/30/2021	Domestic sheep	Deer Park (BLM: Gunnison Field Office)	Yes	https://www.inaturalist.org/observations/100257271 A single stray domestic sheep on the Gunnison BLM Deer Park grazing allotment.
10	8/31/2020	Domestic sheep	Picayne/Mineral Pt. (horse) (BLM: Gunnison Field Office)	Yes	https://www.inaturalist.org/observations/58204898 Domestic sheep along Engineer Pass Rd, on slope below Horseshoe Lake.
11	7/31/2021	Bighorn sheep		No	https://www.inaturalist.org/observations/89649517 12 ewes/lambs, presumably same herd seen the morning before. They had moved slightly upslope and appeared to be about to move over the ridge into Wildhorse Creek drainage area. As of 7/30 evening, there was a herd of domestic sheep about 1.5 miles away in the upper Cow Creek drainage. These bighorns appeared to be moving out of the Cow Creek drainage into the Wildhorse Drainage, away from the domestics. Also they were far above the domestics in terms of elevation and did not seem in imminent danger of coming into contact. Also there was quite a bit of habitat relatively inhospitable to domestics - very little of the Middle Canyon or Blackwall Mountain area is likely to be good for domestics.
12	7/30/2021	Bighorn sheep		No	https://www.inaturalist.org/observations/89648825 7ewes/lambs. Presumably part of the same group as seen on same face 7/31 morning. Domestic sheep herd seen 7/30 evening, about 1.5 miles away in upper Cow Creek.
13	6/27/2021	Bighorn sheep	Maggie Gulch (BLM: Gunnison Field Office)	No	https://www.inaturalist.org/observations/84786940 Saw two crossing the road

14	11/23/2021	Bighorn sheep		Yes	https://www.inaturalist.org/observations/101779954 Carcass of mature bighorn ram found next to Vallecito Reservoir shoreline on November 17, 2021. Left horn was freshly broken off approximately 2 inches from skull. Ram may have been hit by car on CR 501 and ran to shoreline before expiring.
15	7/30/2021	Domestic sheep		No	https://www.inaturalist.org/observations/89650691 Herd of domestic sheep seen in this patch of trees in upper Cow Creek. Herd was clearly on the west side of the drainage. I saw dozens of individuals but did not have entirety of herd in view. Movement seemed to be minimally upslope (to the west/northwest) and minimally downcanyon (to the north/northwest). The herd was not visible 7/31 morning, but I was in a slightly different location that afforded me an even more obstructed view of the patch of trees they were in. This location puts them 1.5 miles from a group of 12 bighorns on the uppermost slopes of the northernmost part of the Blackwall Mountain ridge (these bighorns were moving from Cow Creek side of Blackwall Mtn to the Wildhorse Creek side).
16	7/13/2016	Bighorn sheep	Grizzly Gulch (BLM: Gunnison Field Office)	Yes	https://www.inaturalist.org/observations/49554308
17	8/10/2016	Bighorn sheep	Across Lake Fork from Grizzly Gulch (BLM: Gunnison Field Office)	Yes	http://www.inaturalist.org/observations/3946786
18	7/30/2020	Bighorn sheep	Big Blue/Fall Creek/Little Cim (USFS: Ouray Ranger District)	Yes	https://www.inaturalist.org/observations/55196429 6 Bighorn Sheep (likely ewes) obvious with my binoculars but unfortunately not captured with my iPhone camera. In photo, animals were located center left south (left in photo) of southern most snow patch and dark horizontal cliff line and just in foreground of the dark cliff sloping toward Silver Mountain.
19	7/25/2012	Bighorn sheep	Mesa (USFS: Divide Ranger District)	No	http://www.inaturalist.org/observations/581504
20	7/28/2020	Domestic sheep	Adjacent to Cropsy (USFS: Conejos Peak Ranger District)	Yes	https://www.inaturalist.org/observations/54700616

Appendix B: Trailhead Sign Locations

Table B: Trailhead sign status in CPW contact areas (Durango, Monte Vista, Montrose, and Gunnison).

Trailhead	Status	Updated
Durango A	rea	
Columbine RD San Juan NF Sign Locations:		
1. Molas Pass Colorado Trail TH	2021 sign	9/3/2021
2. Andrews Lake Crater Lake Trail TH	2021 sign	9/3/2021
3. Purgatory Flats Trail TH	2021 sign	9/3/2021
4. Elk Creek Trail TH at train tracks	2021 sign	9/12/2021
5. Needle Creek Trail TH at train tracks	2018 sign - needs to be updated	
6. Missionary Ridge Lime Mesa Trail TH	2018 sign - needs to be updated	
7. Lemon Reservoir Endlich Mesa Trail TH	2018 sign - needs to be updated	
8. Lemon Reservoir Transfer Park TH	2021 sign	9/2/2021
9. Vallecito Reservoir Pine River Trail TH	2021 sign	9/2/2021
10. Vallecito Reservoir Vallecito Creek Trail TH	2021 sign	9/2/2021
11. Vallecito Reservoir East Creek TH?	2021 sign	9/2/2021
12. Middle Mountain Cave Basin Trail TH	2021 sign	9/2/2021
13. Middle Mountain end of road at Tuckerville	2021 sign	9/2/2021
14. Bayfield Office Front Desk	2018 sign - needs to be updated	
15. Durango PLC Front Desk	2018 sign - needs to be updated	
Areas for Future Consideration:	·	
Little Molas CG and Colorado Trail TH	No sign	
Ice Lake Basin TH	No sign	
La Plata Canyon Kenebec Pass TH	No sign	
Hermosa Creek Lower Hermosa TH	No sign	
Little Sand Trail? (591)	No Sign	7/15/2021
Poison Park Trailhead	Yes	7/15/2021
Middle Fork of the Piedra	Yes	7/15/2021
Monte Vista	Area	
Conejos Peak RD Trailheads:		
Red Lake TH	2018 Old Sign	8/30/2021
Chama Basin	Yes	9/16/2021
Treasure Creek	Unknown	
Elk Creek TH	Yes	9/16/2021
Three Forks	Unknown	
South Fork Conejos	Unknown	
Twin Lakes	Unknown	
Tobacco Lake	Unknown	
Conejos Peak	Unknown	
Adams Fork	Unknown	
Crater Lake	<u>Unknown</u>	
CDNST	Yes	9/16/2021
Conejos Area:		
Ruybalid Trail	No sign	
South Fork of the Conejos TH	No sign	
Duck Creek TH	No sign	
Crater Lake TH	No sign	

Cummit Dook TIL/Traccura Crook)	Nesign	1				
Summit Peak TH (Treasure Creek)	No sign					
Los Pinos TH	No sign					
Additional Trails per Dale Gomez:	2021 6:	7/10/2021				
Hope Creek Trailhead	2021 Sign	7/10/2021				
Ivy Creek Trailhead	2021 Sign	7/10/2021				
Hanson's Mill Trailhead (leading to Wheller Monument)	2021 Sign	7/10/2021				
<u>Creede Area:</u>	1	1				
Pole Creek TH, trail# 820	No sign	1				
Lost Trail TH, trail# 821	No sign					
Spring Creek TH, road #547	No sign					
Carson TH, road# 518	No sign					
Bristol Head TH, road# 532	No sign					
Miners Creek TH, road# 803	No sign					
Rat Creek TH, road# 505	No sign					
West Willow TH at Equity mine, road# 503	No sign					
Kiosks:						
Alamosa Canyon	Unknown					
Conejos Canyon	Unknown					
Trailhead	Status	Updated				
Montrose Are	ea					
Ouray District Trailheads:		_				
1. Dexter Creek TH (CO 14)	No sign - Awaiting Approval					
2. Horsethief TH (CO 14)	No sign - Awaiting Approval					
3. Cutler Creek TH (CO 14A)	No sign - Awaiting Approval					
4) Courthouse Trail (Cow Creek Rd)	No sign - Awaiting Approval					
5) Stealey Mtn TH (Cow Creek Rd)	No sign - Awaiting Approval					
6) Cow Creek TH (Cow Creek Rd)	No sign - Awaiting Approval					
7) Bear Creek trailhead (Hwy 550)	No sign - Awaiting Approval					
8) Base of Engineer Pass Road (Hwy 550)	No sign - Awaiting Approval					
9) Wetterhorn Basin TH (End of W Fork Rd)	No sign - Awaiting Approval					
10) West Fork of the Cimarron	No sign - Awaiting Approval					
11) Middle Fork of the Cimarron	No sign - Awaiting Approval					
Norwood District Trailheads:						
1) Whipple Mtn TH off of Last Dollar Road (near the high						
point)	2021 sign	9/3/2021				
2) Deep Creek/Whipple Mtn TH off of Last Dollar Road						
(parking area, just north of the airport)	2021 sign	9/3/2021				
3) Eider Creek TH off of CR617 (Mill Creek Rd)	2021 sign	9/3/2021				
4) Deep Creek TH off of CR617 (Mill Creek Rd)	2021 sign	9/3/2021				
5) Jud Wiebe TH off of Aspen St in Telluride	2021 sign	9/3/2021				
Gunnison Area						
BLM Potential Sign Locations:	T	_				
Continental Divide Stony Pass CDT TH	No Sign - Awaiting Approval					
Cunningham Gulch Highland Mary Lakes TH	No Sign - Awaiting Approval					

Appendix C: Example Trailhead Sign



Citizen Science—You Can Help





Share Your Observations!

Please report any sightings of bighorn sheep, especially if near domestic sheep, to CO Parks & Wildlife at 970.375.6714. Provide exact location and photos if possible. Upload photos to the free iNaturalist app or to iNaturalist.org.



Detailed observation instructions



For more info





Tip: Take a photo of this sign to keep the information

Figure C: A trailhead sign in the San Juan National Forest.