

# Field Study of Noticeability of Range Improvements and Apparent Naturalness of Upper Big Pryor Mountain

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According to the Forest Service's planning rule the FS must "*identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System*" as part of Forest Plan revision. Chapter 70 of the 2015 FS directives gives instructions on how to do this.

The first step, Wilderness Inventory, is to identify areas which may have wilderness characteristics. The second step, Evaluation, is to determine how well the areas satisfy criteria based on the Wilderness Act. This study addresses a key consideration in both of these steps: whether developments or improvements are "*substantially noticeable*" or that the area retains "*apparent naturalness.*" Does it "*generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable*"?<sup>1</sup>

On Big Pryor Mountain the consideration is primarily with range improvements (fences and water developments). In preparing a draft Wilderness Inventory map for the Pryors, Custer Gallatin National Forest (CGNF) relied on a GIS model of range improvement to quantify "substantially noticeable" development density. We have evaluated that model elsewhere.<sup>2</sup> The intent of this study is to approach the question with field observations.

## **Scope of the Study:**

This study focuses on those parts of Big Pryor Mountain excluded in the draft Wilderness Inventory map released by CGNF. (See Map 1 in Appendix A.) This study further focuses mostly on the parts of Big Pryor Mountain included in the proposal for Recommended Wilderness Areas by the Pryors Coalition and supporting organizations.

Due to time limitations the study does not include the part of Big Pryor included on the CGNF Wilderness Inventory map, or on some areas of the western part of Big Pryor. However we believe the results and conclusions of the study apply equally well to those areas.

The results and conclusions of the study may also be applicable to potential wilderness areas on East Pryor Mountain and in the Punch Bowl and Dryhead Canyon area. The results may also be relevant to other parts of CGNF such as the Ashland and Sioux Ranger Districts where computer-calculated densities were used to quantify substantial noticeability of range improvements.

## **Field Study Protocol:**

### Transect Path:

We made observations and took photographs along a 16 mile path of roads<sup>3</sup> on Big Pryor. We began at the junction of routes #24923 and #2814 just inside the CGNF Wilderness Inventory area. The path proceeds north (out of the CGNF Wilderness Inventory area) along #2814 and #2850 (Stockman Trail) to Bainbridge Cabin. A two mile excursion west from Bainbridge on #2850 was limited by time constraints. The main path then followed #2091 from Bainbridge and then #2095A to its end. Returning to #2091 the path continued east and south to #2088 then north to the top of Big Pryor Plateau (near Crater Ice Cave). The junction of #2091 and #2088 is just inside the CGNF Wilderness Inventory.

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<sup>1</sup> Land Management Planning Handbook 71.22a, 71.22b, and 72.1 (1)

<sup>2</sup> Letter from the Pryors Coalition to CGNF, August 25, 2017.

<sup>3</sup> We use the word "roads" in its common language meaning: a route used by wheeled motor vehicles. We understand that these routes are designated Management Level 1 (ML1) as closed roads, but are authorized as "motorized trails" by the FS.

### Procedure:

Beginning from GPS point #1 at the junction of #24923 and #2814 we stopped every 0.5 miles as measured by the vehicle odometer. (See Google Earth maps in Appendix A.) At each point we recorded the GPS coordinates and took eight photographs labeled “A” through “H”. The first photo was always straight ahead the direction the vehicle was pointed along the road. Each subsequent photo was 45 degrees to the right from the previous one. Thus the directions were: A 0°, B 45°, C 90°, D 135°, E 180°, F 225°, G 270°, H 315° clockwise from straight ahead. (A few “extra” photos are included and labeled “X”. They are discussed in the text below.)

An important characteristic of the procedure is that photos were taken according to a predetermined protocol. Thus they provide a substantial and representative sample of the views from the roads. A subjective selection of photos would not do this. The bias introduced by confining the survey to roads is discussed below.

### Camera:

The camera selected was a Nikon SLR with a “normal” (60 mm) fixed focal length lens. This was chosen so all photos would be comparable without variations in telephoto and/or wide angle settings. A shorter focal length, wide angle, would include more in each photo, but make features appear more distant, smaller and less noticeable. (Some of the “X” photos are with a different camera and focal length.)

### Date of Survey:

The survey was completed on August 23, 2017, but due to some problems with a few photo points several points were revisited and new photos were taken on September 14, 2017. The original (August 23) points were relocated by using the same vehicle odometer as on August 23 based on a nearby known point. This explains why the weather is different in some photos.

## **The Question:**

The question the field study is intended to answer is “To what extent are range improvements (fences, stock ponds and tanks) noticeable, and do they detract from the apparent naturalness and wilderness character of the area. We consider it helpful to define three terms:

Visible: An object is considered “visible” if it can be seen reasonably by an observant person with the naked eye. Objects that require binoculars or very careful scrutiny to locate are not considered “visible.”

Noticeable: An object is considered “noticeable” if it somehow calls a careful observer’s attention to itself by size, shape and/or color differing from the natural landscape.

Substantially Noticeable: An object is considered “substantially noticeable” if a casual observer would likely be aware of its presence. (“Substantially noticeable” must differ in meaning from “noticeable” or the word “substantially” is meaningless. Kim Reid suggests “more dominant than the surrounding natural landscape.”<sup>4</sup> )

## **Data and Results:**

The photo set is the most important part of this study. A flash drive with the complete set of photos is an integral part of this report. A quick look (2 seconds per photo) takes only 10 minutes. This will give a good perspective of the landscape as seen from the roads. Appendix B includes data in the form of tables describing range improvements observed in the photos and statistics on the frequency of range improvement visibility.

### Water Developments:

We did not see many water developments (stock ponds or tanks) either from the 35 survey points or from the 16 miles of road between them. Other known stock ponds and tanks were not visible. Two water developments were visible from three survey points. (See photos 12E, 13E, 17H) This is 1.1% of the survey photos.

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<sup>4</sup> CGNF Allotment Infrastructure & Wilderness Inventory, Kim Reid, July, 2017

1. Bainbridge Cabin and Stock Pond. See photos 12E (clearer in 12X1, 12X2, 12X3) and photo 13E. This pond may be considered substantially noticeable. But the cabin is part of the “*historical landscape*” and thus permitted within the Wilderness Inventory (Planning Handbook, 71.22b (11)). The Bainbridge pond may be considered a “*relic of past occupation*” along with the cabin. The pond also appears natural which is the Handbook standard. In any case it is outside both our proposed Bear Canyon and Big Pryor RWAs. Thus it does not preclude inclusion of those areas in the Wilderness Inventory. (Planning Handbook, 71.22b (10))

2. A stock tank is barely visible in photo 17H, but is not “noticeable. Its “visibility” is largely due to the cattle clustering around it.

#### Fences:

We did not see fences from most survey points. They were seen in 13 photos from 8 survey points. This is 4.8% of the survey photos.

1. Fences might be considered “substantially noticeable” where the roads pass through gates and from a couple hundred feet before and after the gate. This is seen at four points 03, 12, 30, and 32. (photos 3D,E; 12A,B; 30A,B,H; 32E,F) Gates at points 30 and 32 are in the same fence crossing #2091 and #2088 – only 800 ft. apart. Since the roads are boundaries of our proposed RWAs, the gates are not within the RWAs. Only the fence in one direction from the gate extends into the RWA. The fences rapidly become obscure with distance. See for example photos 03D, 12B, 30H and 32F.

2. Fences are visible from a few other photo points. (See photos 05F, 07H, 16B, and 20H.) In none of these situations were they “noticeable.”

a. Photo 05H shows a 100 ft. square enclosure which is probably not used anymore and could be removed easily.

b. The fences in 07H and 20H are only 300 ft. and 400 ft. away from the photo points, yet are not prominent.

No range developments were visible in 94.1% of the photos (256 photos). Fences, stock ponds or tanks were visible in 5.9% of the photos (16 photos). Most of these visible range developments did not raise to the level of “substantially noticeable.”

#### **Sampling Bias:**

An ideal study protocol would choose sampling points scattered uniformly over the entire landscape. It would not be practical to get to all such points off the roads. By confining our study to points along roads we have introduced a sampling bias. There are several ways that bias may have skewed our results.

1. It is clear from a map of water developments and roads that a predominance of stock ponds and tanks are near roads. (See Map 4 in Appendix A.) This is probably because it was easier to build them there, and/or because the original roads were made for access to these water developments. Either way this means that our survey points along roads would result in an overestimate of the abundance and noticeability of such developments compared to a survey including points off-roads.

2. All of the fences on Big Pryor are also near roads and are short. Most are perpendicular to the road and end in ½ mile or less. (See Map 4 in Appendix A.) This is because the roads are mostly in open areas where fences are needed to control cattle. These fences usually end at nearby canyon cliffs or heavy timber that function as cattle fences. The exception is the ~ 2 mile north-south fence crossing #2091 and #2095A. Yet this is not really an exception since no point on this fence is more than 1/3 mile from the #2095A and this fence and a spur fence also end at cliffs.

3. The roads in the Pryors are dominantly on open ridgelines rather than in heavy forest and rugged canyons. These open locations provide longer views and thus increase the visibility and noticeability of range developments. Future wilderness visitors when traveling through forests and rugged canyons would rarely be able to see range developments.

Thus the sampling bias caused by restricting the survey to roads causes a substantial *over* estimate of the number, visibility and noticeability of the range improvements. All the roads surveyed (with the exception of #2095A) are boundaries of proposed RWAs. According to the Land Management Planning Handbook, 71.22b (10), a development along the boundary “must not, of itself, preclude inclusion in the inventory. It is appropriate to extend boundaries to the edges of development.” The areas of Big Pryor away from the roads, including the interior of our proposed RWAs, are largely free of fences stock ponds and tanks.

### **Observations between survey points:**

Reliable statistics must be based on the photos taken according to the protocol at the survey points. But some comments are warranted regarding observations made between survey points.

#### Fences:

There were 3 fence gates in the 16 mile path that did not show in the photos. Since no point on the path was more than ¼ mile from a survey point, this indicates that fences and gates are not visible from significant distances. Gates were observed between points 9 & 10, between 16 & 17, and between 20 & 21. (Photo 20H shows the fence near this third gate.)

Given that fences are permitted in designated Wilderness where cattle grazing is allowed, we do not think the few fences on Big Pryor degrade the wilderness character of the landscape. A good example is the longest (~2 mile) fence on the mountain running north-south across the plateau. It is never more than 0.3 mile from #2095A. It is visible, but not really “noticeable” from the point where the road is only 0.1 mile from the fence. Elsewhere it is rarely even visible due to distance, topography or vegetation.<sup>5</sup>

#### Water Developments:

There were 3 stock ponds/tanks visible from the 16 mile path that did not show in the survey point photos.

- a. A double water tank was visible west of the road between points 4 and 5. (See photo 04X.) Due to topography it was not visible from either point 4 or 5. We consider this water tank marginally noticeable, but certainly not substantially noticeable in the grand sweep of the natural landscape.
- b. “Three Bears”<sup>6</sup> stock pond south of #2091 between GPS points 28 and 29. (See foggy photo 28X.) This pond may be considered “substantially noticeable” for a short distance along the survey path. This pond is not visible from either point 28 or 29.
- c. A stock pond near GPS point 18 can be seen from 2095A (but not from point 18). (Sorry no photo.)

### **Conclusions:**

#### Step 1: Wilderness Inventory:

A review of the systematic photos taken for this study clearly shows that “*improvements* [stock ponds, tanks and fences] ... *are not substantially noticeable in the area as a whole.*” Thus most of Big Pryor Mountain, and certainly the RWAs proposed by the Pryors Coalition, merit inclusion in the Wilderness Inventory.

#### Step 2: Evaluation:

Furthermore a review of the hundreds of photos shows that this remarkable and diverse landscape “*generally appears to be affected primarily by the forces of nature, with the imprints of man’s work substantially unnoticeable (apparent naturalness)*”. The photos also show “*the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.*” These are the first two criteria (of four) in the evaluation of Wilderness characteristics. (Planning Handbook 72.1, 1 & 2) Photos taken away from the roads (and RWA boundaries) in the often more rugged areas in the interior of the proposed RWAs would show even more such opportunities.

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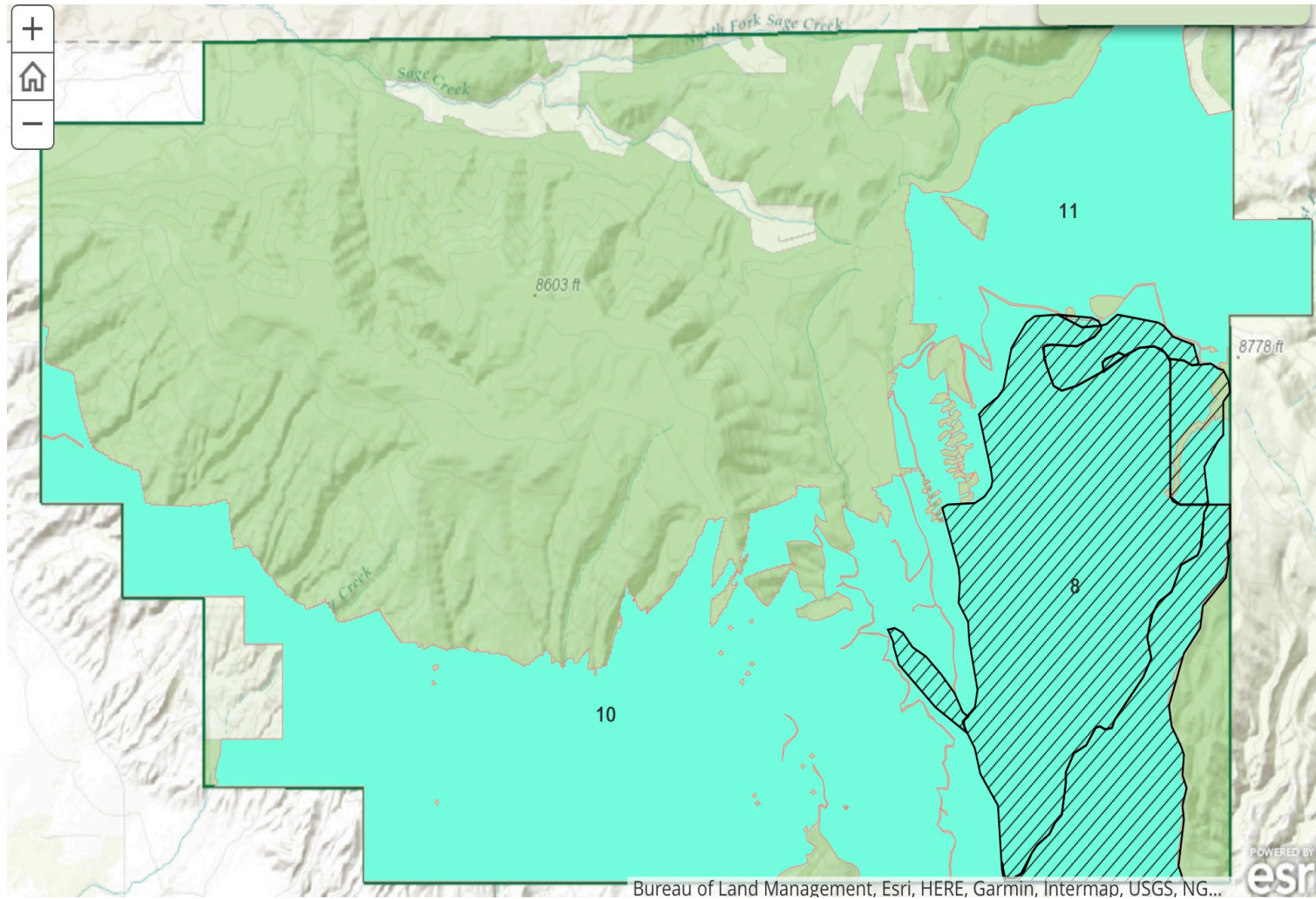
<sup>5</sup> Sagebrush and other vegetation can easily obscure fence posts. But even when in “plain sight,” they often blend into the natural landscape at quite short distances. Big Pryor Plateau has abundant dried green gentian (*Frasera speciosa*) stocks which visually mimic fence posts and vice versa.

<sup>6</sup> Called “Three Bears” because we once saw three black bears there.

## Appendix A Maps

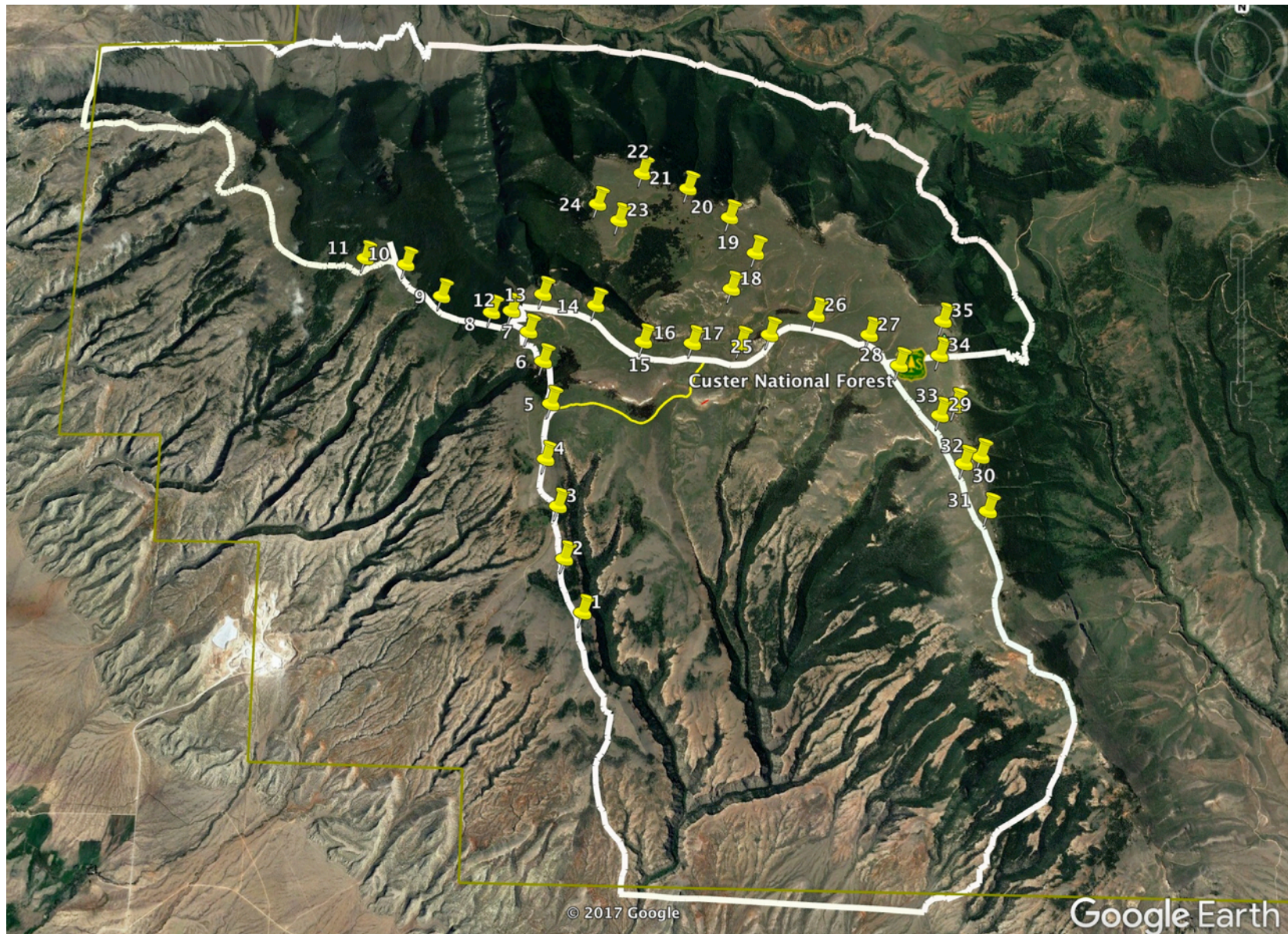
*These maps are also included on the flash drive with the noticeability survey photos. Those maps may show better resolution.*

**Map 1:** An excerpt from the CGNF draft Wilderness Inventory map showing the Pryor Mountains. The turquoise areas were included by CGNF in the draft Wilderness Inventory. More than half of Big Pryor Mountain was excluded from the Wilderness Inventory.



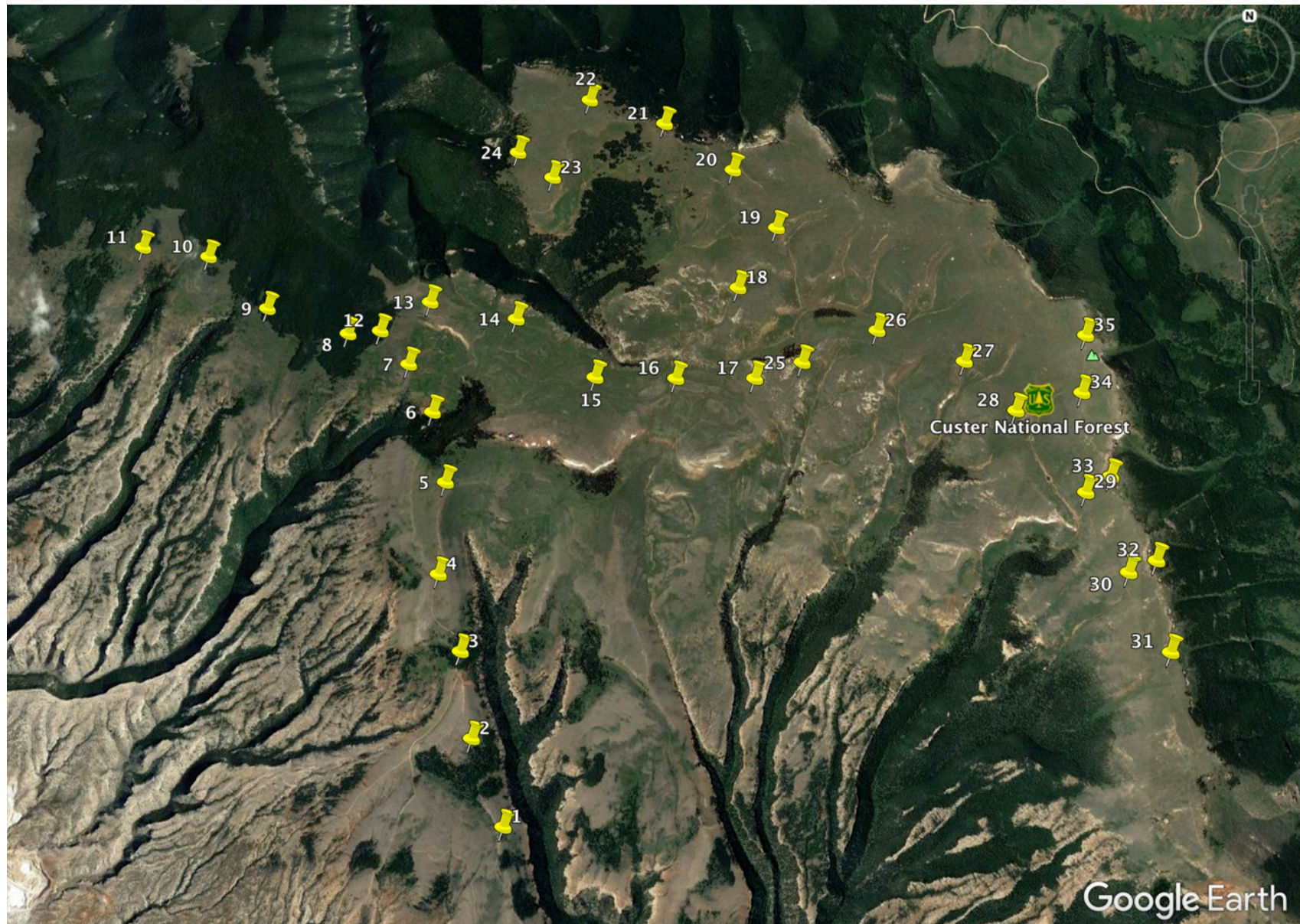


**Map 2:** Google Earth view of Big Pryor Mountain showing 35 GPSed survey points where photos were taken. White lines indicate boundaries of the Big Pryor and Bear Canyon RWAs proposed by the Pryors Coalition and supporting organizations.





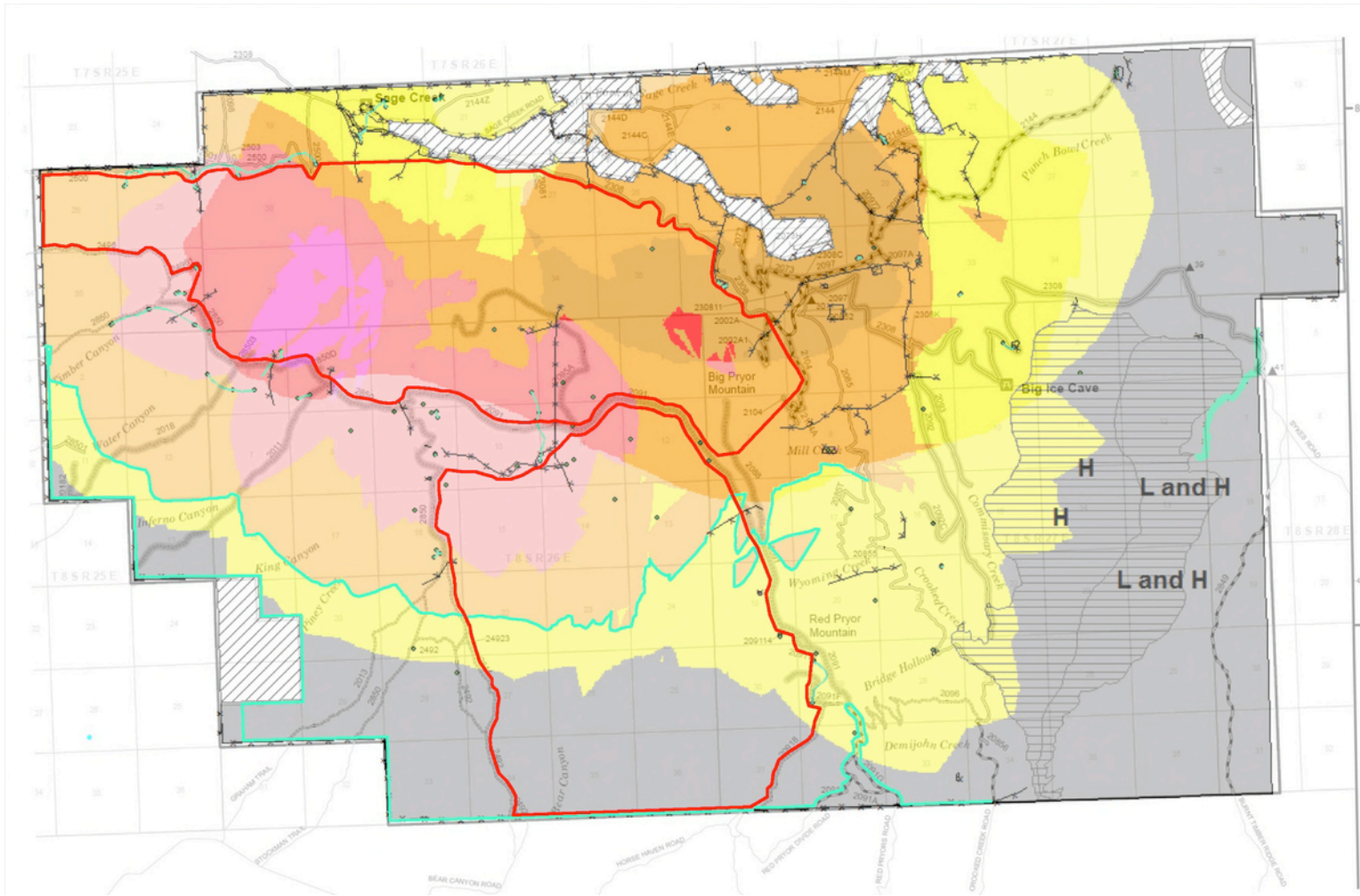
**Map 3:** Google Earth view of the upper part of Big Pryor Mountain showing 35 survey points where photos were taken.





**Map 4:** Pryors map modified from map on page 10 of “CGNF Allotment Infrastructure & Wilderness Inventory, Kim Reid, July, 2017.” Tiny black circles represent water developments (stock ponds and tanks). Black lines with tiny “X”es represent fences. Red lines are proposed RWA boundaries. Turquoise line shows boundaries of CGNF draft Wilderness Inventory on Big Pryor. Routes from MVUM are superimposed in gray for reference. *The colors from the original CGNF map should be ignored.* They are based on the flawed GIS model of range improvements. We were unable to construct the map without those colors since we did not have the original data files for fences and water developments. This map was created using Photoshop to overlay and draw features on the CGNF map.

**Note that stock ponds, tanks and fences are concentrated along the roads which also form the boundaries of the proposed RWAs. The interiors of the RWAs are largely “improvement” free.**





## Appendix B Photo Data and Statistics

### Photo Data in Numerical Order (condensed)

*We neglected to take photos at point #11 where we turned around on #2850 west of Bainbridge.*

Photo	Description of Developments Visible
1, 2 (all 8 photos)	NDV ( <i>No Developments Visible in the photos.</i> )
3A*	Seasonal Barricade
3D, E*	D: Fence and gate on #2814 (0.14 miles). E: same fence almost invisible.
4 (all)	NDV
5F	fence enclosure ~ 100 ft. square (750 ft)
6 (all)	NDV
7H	Fence from Bainbridge Cabin – barely visible at 360 ft
8, 9, 10 (all)	NDV
12A, B	A: Bainbridge Cabin fence and gate. B: same fence nearly invisible
12X1	Bainbridge pond, cabin and gate
13E	Bainbridge pond
14, 15 (all)	NDV
16A	jack leg barricade across #2095 880 ft
16B	distant section of jack leg fence 0.4 mile
17H	distant stock tank – barely visible 0.46 mile
18, 19 (all)	NDV
20H	fence visible
21, 22, 23, 24 (all)	NDV
25, 26, 27, 28, 29 (all)	NDV
30A, B, H	A: Fence and gate. B & H: same fence – somewhat noticeable
31 (all)	NDV
32E, F	E: Fence and gate. F: same fence – somewhat noticeable
33, 34, 35 (all)	NDV
272 photos	<b>13 photos include a fence 4.8%</b> (either gates or barely visible) includes 4 gate photos with 5 adjacent fence photos
	<b>3 photos include visible stock pond/tank 1.1% (Bainbridge twice)</b>

\* All photos at point #3 except A, D, and E had NDV and are not explicitly listed. The same notation is used for other points below.

### Photo Data Grouped by Development Category.

Photo	Description of Developments Visible
1,2,4,6,8,9,10,14,15, 18,19,21,22,23,24, 25,26,27,28,29, 31,33,34,35 (all)	No Developments Visible (NDV) in 8 photos at these points. 24 survey points of 34. <b>70.6% of points had NDV.</b>
3A, 16A	Barricades across road only. These are not range improvements.
(3D,E), (12A,B), (30A,B,H), (32E,F)	4 gates and adjacent fence.
5F, 7H, 16B, 20H	Fences visible – not at gates.
	<b>13 total photos with fence visible. 4.8% of 272 photos.</b>
12E (12X1*), 13E, 17H	<b>3 photos with stock ponds or tanks visible. 1.1% of 272 photos.</b>
	<b>256 photos with No Developments Visible. 94.1% of 272 photos</b>

*\* The three photos 12X1, 12X2 and 12X3 are substitutes for 12G and 12H. These photos show the setting better. Photos 12A-F were taken from just south of the gate seen in 12X1. The cabin would have been in 12G.*

#### Observations between photo points:

There is a gate between points 5 and 6 in the trees crossing King Canyon. There is no fence extending into the trees. This is a barricade across the road only.

There are gates in fences crossing the road between points 9 & 10, 16 & 17, and 20 & 21. (Photo 20H shows the fence near this third gate.)

A double water tank is visible west of the road between points 4 and 5. (See photo 04X.) Due to topography it was not visible from either point 4 or 5.

A stock pond is visible south of #2091 between GPS points 28 and 29. (See foggy photo 28X.) This pond is not visible from either point 28 or 29.

A stock pond near GPS point 18 can be seen from a segment of 2095A (but not from point 18). (no photo)



### Survey Point Locations

SURVEY POINT #	MILE	Approx. Direction Photo A	LAT (N)	LONG (W)
1	0.0	N	45.121858	-108.535153
2	0.5	N	45.128778	-108.538761
3	1.0	N	45.135631	-108.540168
4	1.5	N	45.141740	-108.542651
5	2.0	N	45.149066	-108.541947
6	2.5	NE	45.154806	-108.543659
7	3.0	W	45.158740	-108.546519
8	3.5	W	45.161304	-108.553674
9	4.0	NW	45.163515	-108.563340
10	4.5	NW	45.167836	-108.570411
11	5.0	no photos	45.168803	-108.578474
12	7.0	NE	45.161501	-108.549898
13	7.5	E	45.163689	-108.543989
14	8.0	SE	45.162187	-108.533980
15	8.5	E	45.157360	-108.524910
16	9.0	E	45.157254	-108.515735
17	9.5	NW	45.157260	-108.506778
18	10.0	NE	45.164715	-108.508584
19	10.5	N	45.169630	-108.504127
20	11.0	NW	45.174553	-108.509067
21	11.5	NW	45.178544	-108.516988
22	12.0	SW	45.180623	-108.525740
23	12.5	SW	45.174028	-108.530000
24	12.8	NW	45.176303	-108.534109
25	16.5	NE	45.158520	-108.501406
26	17.0	E	45.161199	-108.492771
27	17.5	E	45.158656	-108.482942
28	18.0	SE	45.154562	-108.477517
29	18.5	SE	45.148047	-108.470113
30	19.0	SE	45.141767	-108.465906
31	19.5	N	45.135629	-108.461764
32	20.0	N	45.142664	-108.462937
33	20.5	NW	45.149296	-108.467284
34	21.0	N	45.155978	-108.470086
35	21.3	N	45.160642	-108.469334