

To: Kevin Miller[khmiller@blm.gov]; Kristen Wobbe[kwobbe@blm.gov]; Hernandez, Cynthia[chernandez@blm.gov]; Staszak, Cynthia[cstaszak@blm.gov]; Amy Krause[alkrause@blm.gov]; Matthew Betenson[mbetenso@blm.gov]; Crutchfield, Larry E[lcrutchf@blm.gov]
From: Froistad, Alisa
Sent: 2017-07-03T17:56:04-04:00
Importance: Normal
Subject: GSENM Story Map Third Review
Received: 2017-07-03T17:56:18-04:00
[GSENM StoryMap TextForPubReview 20170703 3rdReview.docx](#)

Hi All,

I have finished updating the GSENM Story Map with Cynthia Hernandez's, Kevin Miller's, and Cynthia Staszak's comments for the third review. I think I got them all though a few questions still linger.

Attached is a simplified version of the Word document we have been tracking changes in. To make it easier to review, I removed almost all the deleted text and comments. I left deleted text and comments when there were multiple suggestion or if questions still lingered. I left all newly added/revised text since the second review. I do have a copy of the document with all the track changes and comments from the beginning. Let me know if you would prefer that version.

In case you need it again, here is the link to the GSENM Story Map:

<https://blm-egis.maps.arcgis.com/home/item.html?id=cef9f6d254d1487ab71c82cefc766975>

Thanks!

--

Alisa Froistad

GIS Technician

Bureau of Land Management

National Operations Center

E-mail: afroistad@blm.gov

Phone: (303) 236-2268

[Link to: BLM's Public Landscape Approach Data Portal](#)

[Link to: BLM's Internal Geospatial Gateway](#)

GSENM Story Map:

<http://blm.egis.maps.arcgis.com/home/item.html?id=cef9f6d254d1487ab71c82cefc766975>

Page 1 (Home)

Taking a Broad Scale Approach to a Management Plan

Grand Staircase-Escalante Nat'l Monument

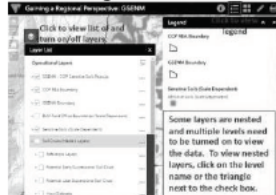
The **Grand Staircase-Escalante National Monument (GSENM)** is undergoing a **Grazing Plan Amendment** that will integrate livestock grazing and rangeland management with the management of GSENM objects and other resources. The Bureau of Land Management (BLM) is applying a broad scale approach to this planning process by analyzing regional trends observed for the **Colorado Plateau (COP) Rapid Ecoregional Assessment (REA)** in relation to their distribution and status in the GSENM. This Story Map looks at the following regional trend topics:

- Current Terrestrial Intactness
- Habitat Connectivity
- Road Density
- Sensitive Soils

The other sections of this Story Map have interactive maps that allow you to further explore the relation between the COP Ecoregion and the GSENM. Some things to note about using the interactive maps:

- The data in maps may load at various speeds, some taking 10–20 seconds to load.
- Some of the layers in the maps will not draw when zoomed out beyond a certain scale. When zoomed out too far, the layer name in the layer list will be grayed out.
- Some of the maps have nested layers. To view these layers, some levels may need to be expanded and turned on and layers above may need to be turned off.

See the image below for an example of nested layers and other map features.



Page 2

Defining the Landscape: GSENM in Relation to the COP Ecoregion

READ IT

Ecoregions define similar ecological and biophysical areas. Placing the GSENM into context within the COP Ecoregion helps inform BLM's management decisions.

SEE IT

Use the interactive map to the right to explore the GSENM and COP Ecoregion. Look at:

- The proportion of the size of the GSENM in relation to the COP Ecoregion.
- The size of cities, the distribution of roads, and the variety of surface management.

(b)(5) DPP

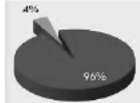
DO IT

- What percentage of the COP Ecoregion's total area is covered by the GSENM? Click on the ⓘ symbol on the map to find out.
- View the legend for the "Cities (by Population)" dataset to compare the general population sizes between the cities.
- View the legend for the "Surface Management Agency" dataset to see the variety of agencies with surface management in the area.

Pop up:

GSENM in Relation to the COP Ecoregion

GSENM is 4% of the COP Ecoregion. Because the COP Ecoregion is a much larger area, it has more variation in land use and condition.



Page 3

Defining the Landscape: GSENM Objects and Values**READ IT**

Integrating livestock and rangeland management with the management of GSENM objects and resources is a major component of the Livestock Grazing Plan Amendment Environmental Impact Statement (EIS). Some of the objects within the GSENM are:

- Geologic Resources: exposed stratigraphy, structures, sedimentary rock layers, vast geologic land formations
- Paleontologic Resources: significant fossils of mollusks, turtles, crocodilians, lizards, dinosaurs, fishes and mammals.
- Prehistoric & Historic Resources: Anasazi and Fremont cultures, rock art panels, occupation sites, campsite and granaries. Biologic resources: diverse soils, wildlife habitat, and terrestrial ecosystems

The management of these GSENM Objects and resources benefits from partnerships with many individuals and organizations, including permitted users (such as ranchers, outfitters and guides and recreationists), adjacent land owners and managers (including private land owners, the State of Utah, USFS and NPS), local government (Kane and Garfield Counties, the Cities of Kanab, UT and Page, AZ, and the Towns of Escalante, Boulder, Big Water, and Cannonville), local businesses, and non governmental organizations.

SEE IT

Use the interactive map to the right to explore the natural and developed areas and features in the vicinity of the GSENM and COP Ecoregion. Look at:

- Natural areas, features, and terrain.
- Cities and roads.

DO IT

Click on the ⓘ symbols on the map to see some examples of the natural and developed areas and features in the vicinity of the GSENM and COP Ecoregion.

(b)(5) DPP

Pop up 1:**Urban Areas**

Within the COP Ecoregion, dense urban areas reduce the ecological integrity in that location. Click on the image below to visit the City of Grand Junction's website.



(b)(5) DPP

Pop up 2:**Colorado River**

The steep canyon walls of the inner gorge along many parts of the Colorado River separate these regions from the higher plateaus and benches above. Click on the image below to visit BLM's webpage for recreation activities in Utah.

**Pop up 3:****Desert Bighorn Sheep**

The COP Ecoregion has several key species, including the Desert Bighorn Sheep. While not shown in this map, COP REA accounts for desert bighorn in the area. Click on the image below to visit Utah's Division of Wildlife Resources website.

**Pop up 4:****Grand Staircase-Escalante National Monument**

The GSENM is comprised of immense sedimentary rock layers, canyons, plateaus, arches, and natural bridges. These features create the vast and austere landscape that defines this area. Click on the image below to go to the BLM's GSENM webpage.

**Pop up 5:****Grand Canyon National Park**

The GSENM is close to a variety of natural and protected areas, such as the Grand Canyon. This provides the BLM with an opportunity to apply a broad scale approach to its management decisions relating to adjacent land uses. Click on the image below to visit National Park Service's Grand Canyon National Park webpage.



Page 4

Regional Trends: Current Terrestrial Intactness

READ IT

Terrestrial Intactness (an estimate of the degree of naturalness) is comprised of three key components:

- Vegetation (invasives, fire regime departure)
- Development (road, utility, urban area, agriculture, energy)
- Habitat Fragmentation

The COP REA Current Terrestrial Landscape Intactness Logic Model (as in the COP REA report and appendices) takes all these components into account. The results of this model were used to compare the degree of naturalness within the GSENM to that within the overall COP Ecoregion.

SEE IT

Use the interactive map to the right to explore current terrestrial intactness. Look at:

- Current terrestrial intactness within the GSENM.
- Current terrestrial intactness outside of the GSENM, within the COP Ecoregion.

DO IT

- View the legend for the Current Terrestrial Intactness dataset to see the symbology color that corresponds to each level of intactness.
- Is the terrestrial intactness of the GSENM relatively more, less, or similar to the COP Ecoregion? Click on the ⓘ symbols on the map to find out.

Pop up 1:

Areas of Lower Current Terrestrial Intactness

Lower current terrestrial intactness is found around large cities and urban areas (i.e. Grand Junction, Farmington, Durango, etc) because large cities and urban areas typically correspond to a greater amount of anthropogenic disturbance. Click on the image below to view a graphical representation of the comparison between the COP and GSENM.

Pop up 2:

Areas of Higher Current Terrestrial Intactness

GSENM has relatively higher levels of current terrestrial intactness than the COP Ecoregion as a whole. The GSENM does not contain any large cities or urban areas. We can conclude that its relatively higher level of intactness is due to lower anthropogenic disturbance, not necessarily due to greater habitat quality. Click on the image below to view a graphical representation of the comparison between the two areas.

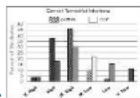


Image for both pop ups:

Page 5

(b)(5) DPP

Regional Trends: Current Terrestrial Intactness: Vegetation Intactness and Development

READ IT

Vegetation Intactness and Development datasets are inputs ([data used in the model](#)) to the COP REA **Current Terrestrial Landscape Intactness Logic Model** (as in the COP REA [report](#) and [appendices](#)).

The Vegetation Intactness input includes data for:

- Invasive [species](#) (i.e. alien annual grasses, noxious weeds)
- Fire Regime Departure (current vegetation conditions compared to reference vegetation conditions)

Low [density/presence](#) of invasives and low fire regime departure equals high vegetation [intactness](#) [which](#) means there is a high degree of naturalness.

The Development input includes data for:

- Permanent Development (roads, utility line, pipeline, urban areas)
- Semi Permanent Development (agriculture, mining, geothermal, oil and gas)

Low permanent and low semi permanent development equals low development.

SEE IT

The interactive map to the right depicts areas of high to low invasives, fire regime departure, and development. This dataset has a scale dependency set on it, if you zoom out too far the data will not display.

Compare areas of high invasives, fire regime departure, and development to areas of low invasives, fire regime departure, and development. Use the graphic below to help understand the legend and color gradient between the two extremes.



DO IT

How does the high/low vegetation/development compare between the GSENM and COP Ecoregion? Click on the ⓘ symbols on the map to find out. This dataset has a scale dependency set on it, if you zoom out too far the data will not display.

Pop up 1 Text:

High Fire Departure / Invasives / Development

In contrast to the GSENM, the COP Ecoregion has relatively more areas of high fire regime departure, invasives, and development due to the large cities and urban areas (i.e. Grand Junction, Farmington, Durango, etc). Click on the image below to view a graphical representation of the comparison between the two areas.

Pop up 2 Text:

Low Fire Departure / Invasives / Development

The GSENM has relatively more areas with low fire regime departure, invasives, and development than the COP Ecoregion as a whole. This [finding supports current management decisions within the area and can be used in future decisions](#). Click on the image below to view a graphical representation of the comparison between the two areas.

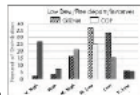


Image for both pop ups:

(b)(5) DPP

Page 6

Regional Trends: Terrestrial Intactness: Habitat Fragmentation**READ IT**

Habitat Fragmentation (habitat loss resulting in smaller, isolated patches of habitat) is an input to the COP REA Current Terrestrial Landscape Intactness Logic Model (as in the COP REA report and appendices). The Habitat Fragmentation input includes data for:

- Number of Patches (defined based on vegetation communities, wildlife habitats, or landscape intactness level)
- Core Integrity (natural core area, nearest neighbor)

Low number of patches and high core integrity equals low habitat fragmentation.

SEE IT

The interactive map to the right depicts areas of high/low habitat fragmentation as a function of distance to anthropogenic features (cities, roads, etc). View the legend for the Habitat Fragmentation dataset and compare areas of high fragmentation to areas of low fragmentation.

DO IT

How does the high/low habitat fragmentation compare between the GSENM and COP Ecoregion? Click on the ⓘ symbols on the map to find out.

Pop up 1 Text:

High Fragmentation

The COP Ecoregion has areas of high habitat fragmentation around the large cities and urban areas (i.e. Grand Junction, Farmington, Durango, etc), but it also has areas of low habitat fragmentation, particularly in the western half of the ecoregion where there is less anthropogenic disturbance. Click on the image below to view a graphical representation of the comparison between the two areas.

Pop up 2 Text:

Low Fragmentation

The GSENM has minimal anthropogenic disturbance, resulting in low habitat fragmentation. This supports the claim that the GSENM is a key component of a large natural habitat connectivity block. Click on the image below to view a graphical representation of the comparison between the two areas.

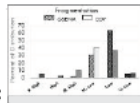


Image for both pop ups:

(b)(5) DPP

Page 7

Regional Trends: Habitat Connectivity**READ IT**

The COP REA (report and appendices) uses three datasets to analyze habitat connectivity:

- Natural Blocks (large natural landscape blocks used in corridor modeling)
- Sticks (lines between natural blocks used for corridor modeling)

- Least Cost Corridors (potential linkages between natural blocks, with the "cost" of moving between natural blocks increasing when there is increased risk but things such as developed areas, roads, or unsuitable habitat)

This network of data was used to identify potential areas to be connected between natural blocks.

SEE IT

Use the interactive map to the right to explore habitat connectivity blocks and networks, which are hypothetical connections between the center of the habitat blocks. Look at areas with more habitat connectivity blocks compared to those with less habitat connectivity blocks.

DO IT

- How is the habitat connectivity in the GSENM? How does its habitat connectivity affect the surrounding areas? Click on the ⓘ symbol within the GSENM boundary on the map to find out.
- How does the percentage of natural landscape blocks in the COP Ecoregion compare to the percentage within the GSENM? Click on the ⓘ symbol within the COP Ecoregion boundary on the map to find out.
- Turn on the layers for surface management, cities, and highways to see how that may affect habitat connectivity. To view the surface management layer better, you may need to turn off the Natural Blocks and Least Cost Corridors layers off (under Habitat Connectivity (Nested Layers) in the Layer List).

Pop up 1 Text:

Lower Habitat Connectivity

The COP Ecoregion has lower habitat connectivity than the GSENM due to greater disturbance caused by large cities and urban areas, more roadways, and more private land. Most of the potential for habitat corridors is concentrated in the eastern third of the ecoregion where much of the human disturbance is located. Click on the image below to view a graphical comparison of habitat connectivity between the two areas.



Pop up 2 Text:

Greater Natural Habitat Connectivity

The GSENM is mostly comprised of large, intact habitat blocks and provides natural connections between habitat on neighboring land. Due to the natural habitat connectivity of this area, the potential need for habitat corridors is minimal. This is aided by the natural and protected areas of BLM, USFS, National Park, State, and Reservation land surrounding the GSENM. Click on the image below to view a map of the GSENM and its' surrounding areas.



(b)(5) DPP

The COP REA analysis of the density of anthropogenic features, such as cities and roads, demonstrates the remoteness of GSENM which helps protect ecological values in that area.

The ability to observe and quantify the presence or absence of roads provides an increased level of analysis and use for these data in making land management decisions.

SEE IT

The interactive map to the right depicts areas of high and low road density (averaged within watersheds (5th level hydrologic unit code)). View the legend for the Habitat Fragmentation dataset and compare areas of high road density to areas of low road density.

DO IT

How does the high/low road density compare between the GSENM and COP Ecoregion? Click on the ⓘ symbols on the map to find out.

Pop up 1 Text:

Higher Road Density

Higher road density is found along major roadways and in the vicinity of large cities and urban areas. Click on the image below to view a graphical representation of the comparison between the two areas.

Pop up 2 Text:

Lower Road Density

GSENM has relatively lower road density than the COP Ecoregion as a whole. Though GSENM does contain roads, it does not contain major roads, large cities or urban areas. We can conclude the GSENM's relatively lower road density reflects its remoteness (distance from major roads, large cities, and urban areas). Click on the image below to view a graphical representation of the comparison between the two areas.

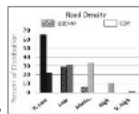


Image for both pop ups:

Page 9

Regional Trends: Sensitive Soils

READ IT

The COP REA report and appendices include analysis of soils related to:

- Sensitive Soils
- Potential Early Successional Soil Crust (% cover): Refers to biocrusts that first colonize an area (i.e. lichens, mosses and dark cyanobacteria)
- Potential Late Successional Soil Crust (% cover): Refers to biocrusts that are more diverse and complex communities (i.e. light cyanobacteria and some physical crust cover)

A benefit to these data is they can be field verified by going to locations and looking for the presence or absence of sensitive and/or successional soils. This ability provides an increased level of analysis and use for these data in making land management decisions.

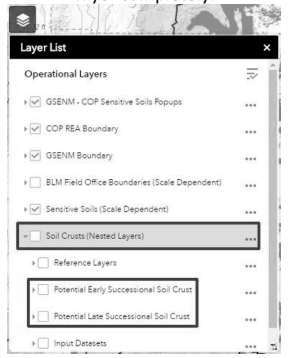
SEE IT

(b)(5) DPP

Use the interactive map to the right to explore areas of sensitive soils. This dataset it has a scale dependency set on it, if you zoom out too far the data will not display.

DO IT

- What actions is the BLM taking to help protect sensitive soils? Click on the ⓘ symbol within the GSENM boundary on the map to find out.
- How does the percentage of area covered by sensitive soils in the COP Ecoregion compare to that of the GSENM? Click on the ⓘ symbol within the COP Ecoregion boundary on the map to find out.
- To view areas of potential early and late successional soil crust open the Layer List > check the box for "Soil Crusts (Nested Layers)" and expand to see Soil Crust sub layers > check the boxes for "Potential Early Successional Soil Crust" or "Potential Late Successional Soil Crust", depending on which you want to view. You will need to turn off the sensitive soils layer in order to view a soil crust layer completely.



Pop up 1 Text:

Sensitive Soils in the COP Ecoregion Compared to GSENM

The percentage of sensitive soils in the COP Ecoregion is relatively similar to the percentage of sensitive soils in the GSENM. Click on the image below to view a graphical representation of the comparison between the two areas.



Pop up 2 Text:

GSENM Grazing Plan Amendment

The BLM is working on an amendment to the original GSENM Grazing Plan that will provide updated direction for livestock grazing. Click on the image below for more information about this amendment [on the BLM's website](#).



Page 10

Regional Trends: Sensitive Soils: Allotments with High Potential Successional Soils**READ IT**

Aside from using this data for a more regional analysis, we can also use the sensitive and successional soils data for more detailed analysis of smaller areas such as allotments.

(b)(5) DPP

SEE IT

Use the interactive map to the right to explore the three allotments in GSENM with the greatest percentage of area covered by high potential early (>51% cover) and late (>25% cover) successional soil crust. Look at the percentage of area of these allotments covered by high potential early and late successional soil crust.

DO IT

Click on the ⓘ symbols on the map to see what percentage of each allotment has high potential for early and late successional soil crust.

To view sensitive soils or areas of potential early and late successional soil crust open the Layer List and:

- For Sensitive Soils, check the box next to "Sensitive Soils (Scale Dependent)". This dataset has a scale dependency set on it, if you zoom out too far the data will not display.
- For areas of potential early and late successional soil crust, click on "Soil Crusts (Nested Layers)" > check the boxes next to "Soil Crusts (Nested Layers)" and "Early Successional Soil Crust" or "Late Successional Soil Crust", depending on which you want to view. You may need to turn off the sensitive soils layer in order to view a soil crust layer completely.



Pop up 1:

Dry Valley Grazing Allotment

55% of the Dry Valley grazing allotment has high potential for early and late successional soils.

Pop up 2:

Cockscomb Grazing Allotment

51% of the Cockscomb grazing allotment has high potential for early and late successional soils.

Pop up 3:

Coyote Grazing Allotment

56% of the Coyote grazing allotment has high potential for early and late successional soils.

Page 11

Conclusion

This Story Map has illustrated some potential ways in which we can apply regional data such as that for the **COP REA**, to a smaller area, such as the **GSENM**.

The difference between GSENM and regional trends demonstrate its uniqueness within the ecoregion, reflect the
it was designed to protect, and help inform land management decisions.

The current terrestrial intactness and its related components show the GSENM has both a vast and austere landscape and is also rugged and remote.

The habitat connectivity and road density show how the GSENM is largely comprised of unspoiled natural areas which provides a suitable environment for diverse soils, wildlife habitat, and terrestrial ecosystems.

Data for susceptible biological resources, such as sensitive soils, is important to have when developing management plans, such as the GSENM **Grazing Plan Amendment**. Having this data available helps integrate multiple uses such as grazing, with protection of the objects and resources. For more insight to how the BLM uses large scale data to inform land management decisions, visit our webpage for Planning and NEPA in the BLM.

(b)(5) DPP