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[GSENM StoryMap\\_TextForPubReview\\_20170714\\_FinalReview.docx](#)

Hi Cynthia and Cindy,

Kevin, Kris, and I have finished reviewing all suggested revisions to the GSENM. We were able to incorporate almost all of the suggestions and have updated the GSENM story map accordingly.

Please review the GSENM story map via the application, as this will help in reviewing the flow and interaction of the story map:

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

Once your review is complete, please reply and let us know if you approve it for publication. Let us know if you have any questions.

For reference of where updates were made, attached is the Word document I have been using to track the revisions.

Appreciative of your time.

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[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

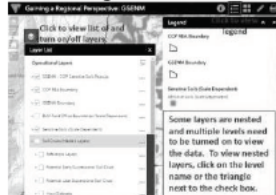
The **Grand Staircase-Escalante National Monument (GSENM)** is undergoing a **Management Plan amendment** that will integrate livestock grazing and rangeland management with the management of **GSENM objects and resources** (national monuments are managed to protect the objects upon which their designation was based). 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 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 can be used to explore the relation between the COP ecoregion and GSENM. Some things to note about using the interactive maps:

- Maps may load at various speeds
- Some map layers will not display when zoomed out in which case the layer name 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 **GSENM** into context within the **COP ecoregion** helps inform BLM's management decisions.


**SEE IT**

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

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

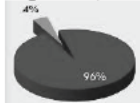
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**DO IT**

- What percentage of the COP ecoregion's total area is covered by GSENM? Click on the  symbol on the map to find out.
- View the legend for the "Cities (by Population)" [layer](#) to compare the general population sizes between the cities.
- View the legend for the "Surface Management Agency" [layer](#) to see the [different land management agencies](#).

**Pop up:****GSENM in Relation to the COP Ecoregion**

GSENM is 4% (3,000 sq mi) of the COP ecoregion (75,000 sq mi). 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 [Resources](#)****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 GSENM are](#):

- [Geologic Resources](#) [exposed stratigraphy, structures, sedimentary rock layers, and 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](#) [cryptobiotic soil crusts, hanging gardens, diverse soils, wildlife habitat, and terrestrial ecosystems](#).

[The management of these and other 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 \(Kane and Garfield Counties, the Cities of Kanab and Escalante City, UT and Page, AZ, and the Towns of Boulder, Big Water, Tropic, and Cannonville\), local businesses, and non governmental organizations.](#)

**SEE IT**

- [Look at the interactive map to the right to explore the natural areas \(i.e. national forests and recreation area\) and developed areas \(i.e. cities and roads\) in the vicinity of GSENM and the COP ecoregion.](#)

**DO IT**

- [Click on the !\[\]\(a16a19bbc0e991a431a3f945e52ea4ee\_img.jpg\) and !\[\]\(84adebc4a9e78c4c1c7cf356a810b3d7\_img.jpg\) symbols on the map to see some examples of the natural and developed areas. In order to see features and terrain, zoom in on the map. To view these area more clearly, open the Layer List and uncheck the box next to the Surface Management Agency layer.](#)

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## Pop up 1:

**Urban Areas**

Within the COP ecoregion, dense urban areas reduce the ecological integrity such as fragmentation of wildlife corridors in that location. Click on the image below to visit the City of Grand Junction's website.



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## 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**

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**

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 and fire regime departure)
- Development (roads, utility corridors, urban areas, agriculture, and energy)
- Habitat Fragmentation

The COP REA **Current Terrestrial Landscape Intactness Logic Model** (as in the COP REA **report** and **appendices**) accounts for these components. Model results compared the degree of naturalness within GSENM to that of the COP ecoregion.

**SEE IT**

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

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

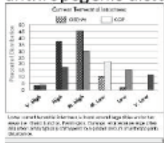
**DO IT**

- View the legend for the Current Terrestrial Intactness [layer](#) to see the symbology color that corresponds to each level of intactness.
- Is the terrestrial intactness of GSENM relatively more, less, or similar to the COP ecoregion? Click on the and 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 image below to enlarge graphic.](#)



Pop up 2:

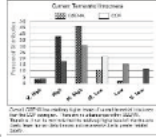
**Areas of Higher Current Terrestrial Intactness**

Overall, GSENM has relatively higher levels of current terrestrial intactness than the COP ecoregion. There are no urban areas within GSENM. Therefore, it can be concluded that the relatively higher level of

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intactness is due to fewer human disturbances, not necessarily due to greater habitat quality. Click on image



below to enlarge graphic.

Page 5

#### Regional Trends: Current Terrestrial Intactness: Vegetation Intactness and Development

##### READ IT

Vegetation Intactness and Development data sets 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 data includes:

- Invasive species (i.e. alien annual grasses and 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 data includes:

- Permanent Development (roads, utility lines, pipelines, and 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 layer is scale dependent, if zoomed 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. The graphic below shows the color spectrum of the two extremes.



##### DO IT

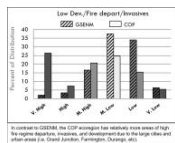
How does the high/low vegetation/development compare between GSENM and the COP ecoregion? Click on the and symbols on the map to find out. This layer is scale dependent, if zoomed out too far the data will not display.

Pop up 1 Text:

##### High Fire Departure / Invasives / Development

In contrast to 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 enlarge the graphic.

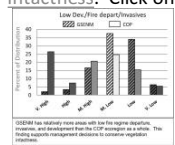
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Pop up 2 Text:

#### Low Fire Departure / Invasives / Development

GSENM has relatively more areas with low fire regime departure, invasives, and development than the COP ecoregion as a whole. This finding supports management decisions to conserve vegetation intactness. Click on the image below to enlarge the graphic.



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**) and includes:

- Number of Patches (defined based on vegetation communities, wildlife habitats, or landscape intactness level)
- Core Integrity (the naturalness of core areas, those portions of patches not subject to edge effects).

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). [Look at the pattern of the habitat fragmentation layer.](#)

##### DO IT

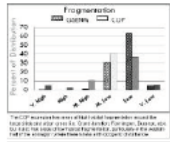
- View the legend for the habitat fragmentation and compare areas of higher and lower habitat fragmentation.
- How does habitat fragmentation compare between GSENM and the COP ecoregion? Click on the ⓘ and 🔍 symbols on the map to find out.

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 enlarge the graphic.

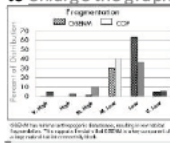
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Pop up 2 Text:

#### Low Fragmentation

GSENM has minimal anthropogenic disturbance, resulting in low habitat fragmentation. This supports the claim that GSENM is a key component of a large natural habitat connectivity block. Click on the image below to [enlarge the graphic](#).



Page 7

#### Regional Trends: Habitat Connectivity

##### READ IT

The COP REA ([report](#) and [appendices](#)) uses three data sets to analyze habitat connectivity:

- [Natural Blocks \(large > 5,000 ac natural landscape blocks used in corridor modeling\)](#)
- [Sticks \(lines between natural blocks used for corridor modeling\)](#)
- [Least Cost Corridors \(potential linkages between natural blocks, with the "cost" of moving between natural blocks increasing when there is increased risk from features such as developed areas, roads, or unsuitable habitat\)](#)

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 well connect is habitat within GSENM?](#) [Between GSENM](#) 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 GSENM? Click on the [📍](#) symbol within the COP [ecoregion](#) boundary on the map to find out.
- [Open the Layer List, uncheck the box next to Habitat Connectivity \(Nested Layers\), and check the box next to "Surface Management Agency".](#) Notice the centers of habitat blocks (green dots) are mostly on protected lands (NPS, USFS, BIA, and GSENM).

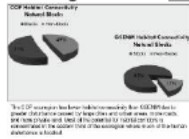
Pop up 1 Text:

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#### Lower Natural Habitat Connectivity

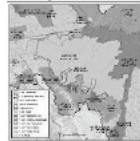
The COP ecoregion has lower habitat connectivity than GSENM due to greater disturbance caused by large cities and urban areas, more roads, and more private land. Most of the potential for habitat corridors is concentrated in the eastern third of the ecoregion where much of the human disturbance is located. Click on the image below to [enlarge the graphic](#).



#### Pop up 2 Text:

##### Greater Natural Habitat Connectivity

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 to restore habitat corridors is minimal. This is aided by the natural and protected areas of BLM, USFS, National Park, State, and Reservation land surrounding GSENM. Click on the image below to [enlarge the graphic](#).



Page 8

#### Regional Trends: Road Density

##### READ IT

Analyses of the density of anthropogenic features such as cities and roads demonstrate the remoteness of GSENM, a characteristic that has helped protect ecological values.

**Q** antifying the presence or absence of roads (road density) can help in making land management decisions.

##### SEE IT

The interactive map to the right depicts average road density within watersheds. Look at the pattern of the road density layer.

##### DO IT

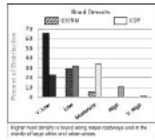
- View the legend for the road density layer and compare areas of higher and lower road density.
- How does road density compare between GSENM and the COP ecoregion? Click on the and symbols on the map to find out.

#### 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 [enlarge the graphic](#).

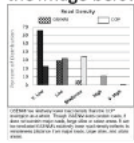
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Pop up 2 Text:

#### 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. It can be concluded GSENM's relatively lower road density reflects its remoteness (distance from major roads, large cities, and urban areas). Click on the image below to enlarge the graphic.



Page 9

#### Regional Trends: Sensitive Soils

##### READ IT

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

- Sensitive Soils: Refers to soils that are extremely susceptible to impacts and difficult to restore or reclaim.
- 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)

Sensitive soils data come from, and soil crust data are derived from, Natural Resources Conservation Service (NRCS) soil surveys. These surveys are generalized but can be made more specific by sampling at individual sites. This increases the utility of these data in making land management decisions.

##### SEE IT

Use the interactive map to the right to explore areas of sensitive soils. This layer is scale dependent, if zoomed 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 GSENM? Click on the ⓘ symbol within the COP ecoregion boundary on the map to find out.
- To view areas of potential early or 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

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want to view. The sensitive soils layer will need to be turned off 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 GSENM. Click on the image below to [enlarge the graphic](#).



#### Pop up 2 Text:

##### **GSENM Management Plan**

GSENM is preparing an amendment to its 2000 Monument Management Plan (MMP) to integrate livestock grazing and rangeland management with the management of other resources. 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**

In addition to using the sensitive and successional soils data for regional analysis, these data can also be used in detailed analyses to help inform land management decisions for smaller areas such as grazing allotments.

#### **SEE IT**

Looking at the three allotments on the map, notice the difference in area covered by high potential early (>51% cover) and late ( $\geq 25\%$  cover) 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.

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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 layer is scale dependent, if zoomed 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 box next to "Soil Crusts (Nested Layers)" and "Early Successional Soil Crust" or "Late Successional Soil Crust", depending on which you want to view. The sensitive soils layer will need to be turned off in order to view a soil crust layer completely.



Pop up 1:

**Dry Valley Grazing Allotment**

55% of the GSENM portion of the Dry Valley grazing allotment has high potential for early and late successional soils. There are no data for the portion of the allotment outside GSENM.

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 illustrates some potential ways to apply the COP REA regional data to a smaller area such as GSENM.

The comparison of GSENM to regional data demonstrates its uniqueness within the ecoregion and supports the reasons for the Monument designation and the need for protection.

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

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

Data and analyses of susceptible biological resources such as that contained in the Story Map, necessary to inform the National Environmental and Policy Act (NEPA) planning including the GSENM Grazing Plan Amendment. These data help integrate livestock grazing and protection of objects and resources. For more information on BLM Planning and NEPA visit the website.

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