

USFS Region 4 - Forest Planning

Forest Planning



Ashley National Forest - Geospatial Data for Forest Plan Revision

1 2 3 4 5 6 7 8 9

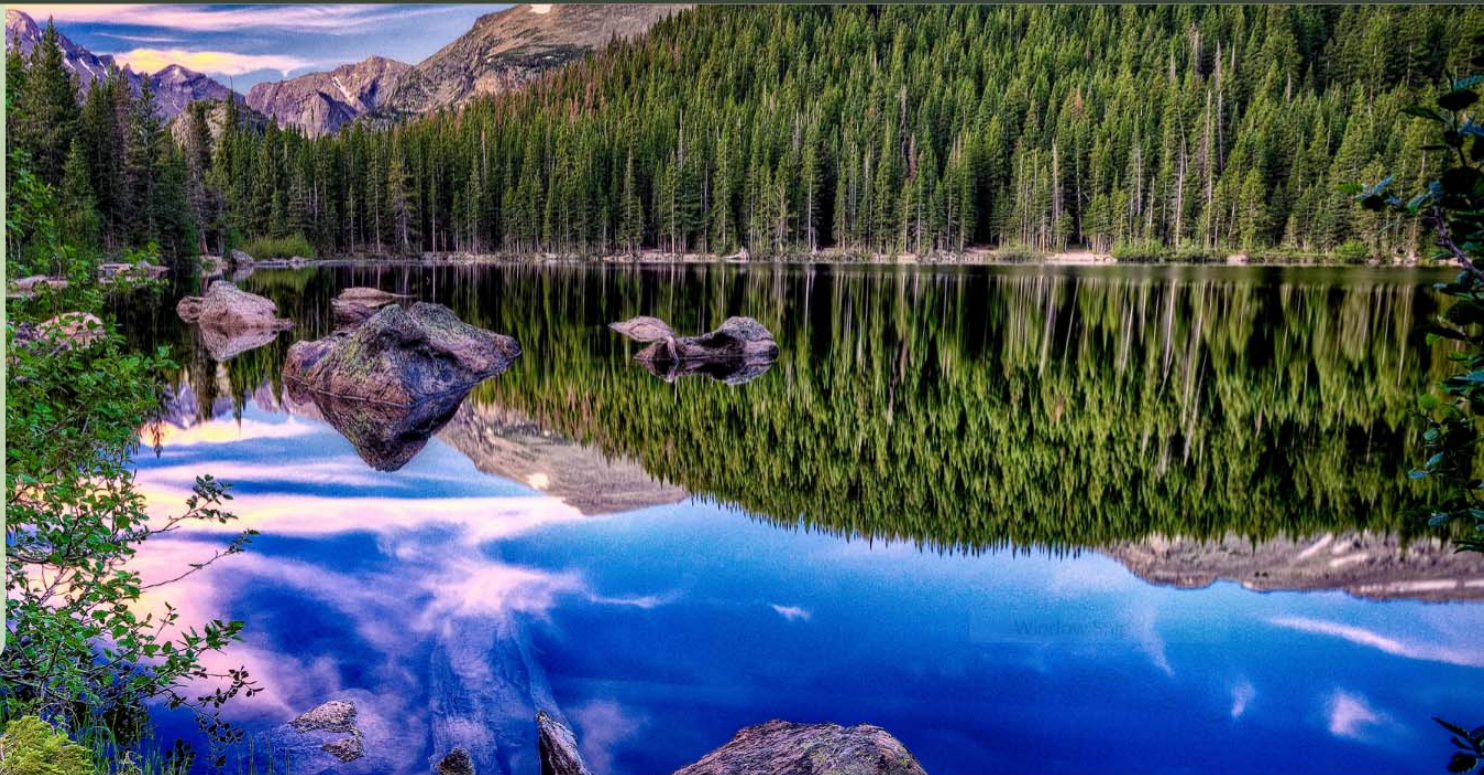
Forest Planning

In 2012, the Forest Service Planning Rule set in motion a new way of doing business for designing and implementing Forest management plans across the country.

The rule calls for a **Forest Assessment** as a first step in a collaborative process with public stakeholders.

However, Forest Service managers and public stakeholders face a common challenge as they must also demonstrate and document how decisions are informed and made together.

Geospatial information plays a vital role in each Forest Assessment.





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The Land Management Planning

Handbook outlines the components of what a Forest Assessment must include.

Scroll down to Chapters 12 and 13 to identify sections in the Handbook where GIS data can play an integral role in making the case for management action.

- Identifying key ecosystem characteristics?
- Assessing air, soil, water conditions?
- Identifying and assessing At-Risk Species?
- Resolving multiple uses?
- Assessing recreation opportunities?
- Identifying watershed restoration priorities?

For agency suggestions about the types of information and data that Forest Planners should consider in the Forest Assessment, see the following Technical Information for Planning (TIPs):

<http://www.fs.fed.us/emc/nfma/TIPS/directives.shtml>

Proposed FS1909.12, Chapter 10, Version—02/14/2013
Information on how to comment is available online at <http://www.fs.usda.gov/goto/planningrule/directives>

1909.12
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**FOREST SERVICE HANDBOOK
NATIONAL HEADQUARTERS (WO)
WASHINGTON, DC**

FSH 1909.12 – LAND MANAGEMENT PLANNING HANDBOOK

CHAPTER 10 – THE ASSESSMENT



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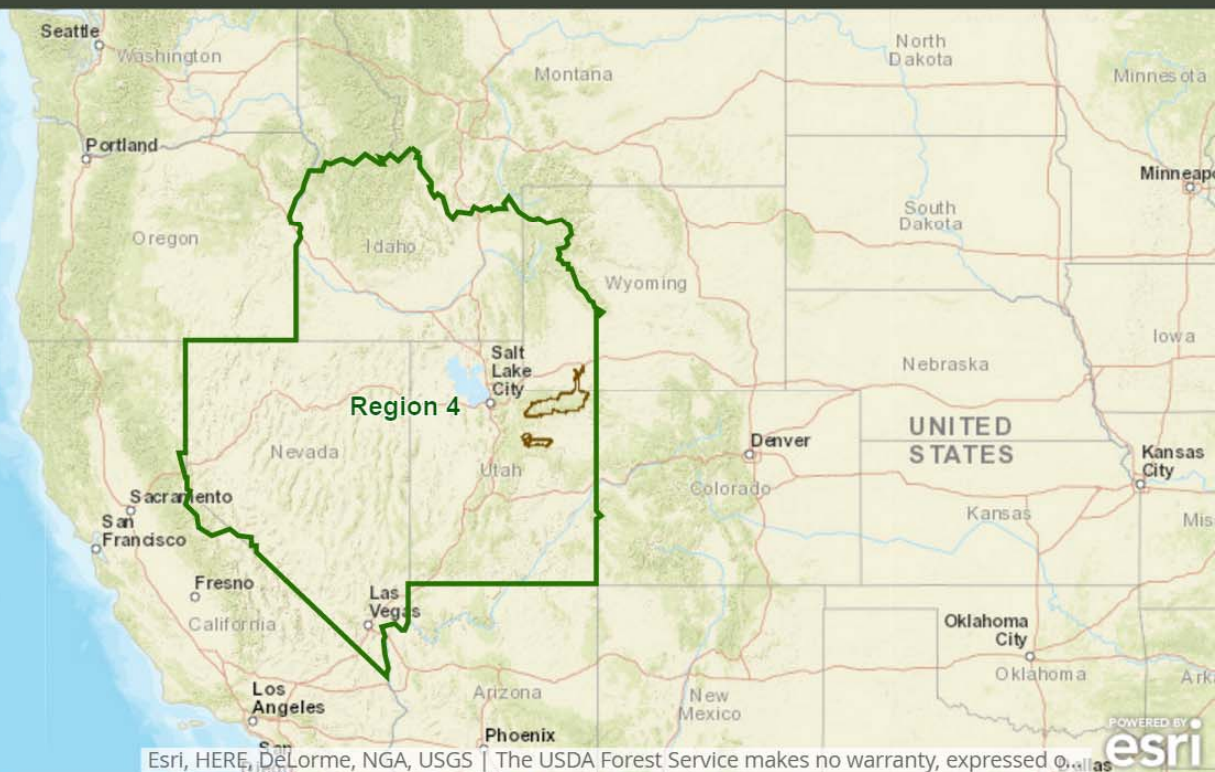
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Nine Forest Plan revisions are scheduled across seven National Forests in Region 4 from 2016-2024.

To prepare a standard approach to harness geospatial data for these Forest Assessments, USFS Region 4 and the Ashley National Forest have coordinated an effort to assemble relevant data to inform Forest Assessments in 2016-17.

This narrative illustrates some of the numerous datasets assembled for the Ashley National Forest and provides a point of entry to utilize these data to inform and document the Forest Assessment.

(There are far more data assembled and rendered to the Ashley and Region 4 than are presented here.)



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So much data. How to organize?

1 Data...

Dozens of Interviews with Natural Resource Program staff and Forest Planning Staff at the Region and on the Ashley National Forest resulted in hundreds of geospatial datasets.

To the right are listed samples of various data

2 Data...

3 and more DATA.

Contents Preview Description		
Name	Type	
FS_data_test.mxd	Map Document	
USFS_R4_FP_Abiotic.mxd	Map Document	
USFS_R4_FP_CH_13_5_Energy...	Map Document	
USFS_R4_FP_CH_13_6_Infrastruc...	Map Document	
USFS_R4_FP_Data.mxd	Map Document	
USFS_R4_FP_ForSnapshot.mxd	Map Document	
USFS_R4_FP_ForSnapshot_test...	Map Document	
USFS_R4_FP_Geology.mxd	Map Document	
USFS_R4_FP_Infrastructure.mxd	Map Document	
USFS_R4_FP_Landscape_1.mxd	Map Document	
USFS_R4_FP_Landscape_2.mxd	Map Document	
USFS_R4_FP_Range.mxd	Map Document	
USFS_R4_FP_Recreation.mxd	Map Document	
USFS_R4_FP_Vegetation_1.mxd	Map Document	
USFS_R4_FP_Vegetation_2.mxd	Map Document	
USFS_R4_FP_Water.mxd	Map Document	
USFS_R4_FP_Water_1.mxd	Map Document	
USFS_R4_FP_Wildlife_1.mxd	Map Document	
USFS_R4_FP_Wildlife_2_Utah.mxd	Map Document	

DATA for Planning...

Wildlife

- ☒ Reference
- ☒ Proclaimed Forest
- ☒ Fish/Wildlife Observation
- ☒ S_USA_TESP_OccurrenceAll
- ☒ S_USA_TESP_OccurrenceCur
- ☒ S_USA_NRES_Survey
- ☒ S_USA_FHP_IDSurvey_Area
- ☒ NEDRA_Map/CompositeData
- ☒ S_USA_InvasivePlantAll
- ☒ S_USA_InvasivePlantCurrent
- ☒ S_USA_FHP_IDSurvey_Damage
- ☒ WildlifeSites
- ☒ Aquatic Invasives
- ☒ MSO_1997
- ☒ MSO_2000
- ☒ 2012 National Insect and Disease Risk Map
- ☒ Lyme
- ☒ Lyme analysis units
- ☒ SageGrouse
- ☒ Admin_Forest
- ☒ State_July
- ☒ Reviewed but not included

Geology

- ☒ Geology
- ☒ R04 Digitized geology
- ☒ ElevationNED_10
- ☒ Active_Mines_Mineral_Plants_USGS
- ☒ Mining_claim_activity
- ☒ Major_Mineral_Deposits_USGS
- ☒ S_R04_ASF_GeoSci_Geology
- ☒ S_USA_GeologyMapUnitsOrder3
- ☒ FSSDE_STRATA
- ☒ FSSDE_LANDSLIDE
- ☒ Mineral_Resources_USGS
- ☒ FSSDE_COAL
- ☒ FSSDE_OIL_SHALE
- ☒ FSSDE_TAR_SAND
- ☒ S_USA_MineralRight
- ☒ S_USA_OtherSurfaceRight
- ☒ S_USA_OtherSubSurfaceRight
- ☒ MineralUse
- ☒ Oil and Gas
- ☒ FIA_TotalForestCarbon
- ☒ FIA_ForestSoilCarbon
- ☒ Reviewed but not included
- ☒ S_USA_GeologyMapUnitsOrder1
- ☒ S_USA_GeologyMapUnitsOrder2
- ☒ S_R04_ASF_GeoSci_SoilPedin
- ☒ S_R04_ASF_GeoSci_LandSysInv

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So much data. How to organize?

1 Data...

2 Data...

Interviews were conducted to identify and retrieve key geospatial data that Forest Planners will use to conduct the Forest Assessment for the Ashley National Forest.

The data inventory resulting from these specialists'

3 and more DATA.

Range

- ☒ Proclaimed Forest
- ☐ Allotments
- ☐ TWB Range Allotment PLY
- ☐ ash_allots
- ☐ S_R04_ASF_cf_pt
- ☐ S_R04_ASF_cf_in
- ☐ S_R04_ASF_cf_pl
- ☐ GI Data
- ☐ Pastures
- ☐ Pastures_FromGL091011
- ☐ capability_cattle
- ☐ capability_sheep
- ☐ suitability_cattle
- ☐ suitability_sheep
- ☐ S_R04_ASF_rmu_subunit
- ☐ S_R04_ASF_rmu_unit
- ☐ 2000Studies_1_12_2015
- ☐ Administrative Forest Boundaries

Vegetation

- ☒ Proclaimed Forest
- ☒ S_R04_ASF_original_veg
- ☒ S_R04_ASF_general_vegetation
- ☐ S_R04_ASF_compartments
- ☐ S_R04_ASF_stands
- ☐ S_R04_ASF_veg_segments
- ☐ Ashley_VegPoly_20130306
- ☐ FACTS/inactive/ActiveACTV100RSW
- ☐ S_USA_FHP_IDSurvey_Damage
- ☐ S_USA_FHP_IDSurvey_Area
- ☐ AshleyFAPlots
- ☐ d04_FMAPLiveAnnualTreeStats_01
- ☐ EDW_FS_Veg_01
- ☐ NRDS_VegPoly
- ☐ NRDS_VegPoint
- ☐ Grassland Impacted by Grazing
- ☒ S_R04_ASF_general_vegetation SERIES
- ☐ Grassland
- ☒ TWB Range Allotment PLY
- ☐ eTOPO Topographic Map
- ☐ Reviewed but not included
- ☐ r4_ads2006to2010dmg
- ☐ S_USA_InvasivePlantAll
- ☐ S_USA_InvasivePlantCurrent
- ☐ Current Invasive Plants Inventory
- ☐ S_R04_ASF_GeoSci_LandSysInv
- ☐ S_R04_ASF_tew
- ☐ oldgrowth_update2012
- ☐ 2012 National Insect and Disease Risk Map
- ☐ U.S. Forest Service - Insect and Disease Risk
- ☐ S_USA.Riparian
- ☐ S_USA.Wetlands
- ☐ Timber Harvests
- ☐ EcomagSubsections
- ☐ Ecological Sections
- ☐ eTOPO Topographic Map
- ☐ Reviewed but not included

Water

- ☒ S_USA.AdministrativeForest
- ☐ (Dam Removal) ActivitySiteCostsAccom
- ☐ AquChannelMorphologySurveyRSW
- ☐ Forest_Water_Rights
- ☐ Crystal_Ranch_Area_WR
- ☐ Skoret_2011
- ☐ WIT_ActivitySites
- ☒ WatershedConditionClass
- ☐ S_USA.NRDS_Survey
- ☐ S_R04.NHDWaterbody
- ☐ Lumped features...
- ☐ Drainage_X
- ☒ Drainage_L
- ☐ Drainage_P
- ☐ ashb_region_Types
- ☐ TeamsSurvey
- ☐ S_USA.WaterBodyTypes_ESRI
- ☒ AGOL
- ☐ USA Flood Risk
- ☐ 100 Year Flood Areas
- ☐ USDOC NOAA Watches, Warnings, and Advisories
- ☒ Proclaimed Forest
- ☐ Administrative Forest Boundaries
- ☐ Water
- ☐ Watershed Boundaries
- ☐ Regions (HUC2)
- ☐ Subregions (HUC4)
- ☐ Basins (HUC6)
- ☐ Subbasins (HUC8)
- ☐ Watersheds (HUC10)
- ☐ Subwatersheds (HUC12)
- ☐ Surface Drinking Water Importance
- ☐ Subwatersheds (HUC-12)
- ☒ Surface Drinking Water Importance Index
- ☒ Index of Forest Importance to Surface Drinking Water
- ☐ Index of insect and disease threat to forests important
- ☐ Index of development threat to forests important to
- ☐ Index of wildland fire threat to forests important to

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So much data. How to organize?

1

Data...

2

Data...

3

and more DATA.

Clearly, now that dozens of datasets have been identified and retrieved, the biggest hurdle lies in organizing data intuitively. By reviewing these datasets, Forest Planners will become well-equipped to sort data according to the purpose they will serve in a Forest Assessment.

And more DATA...

☒ Fire

- ☐ Aerial Fire Retardant Hydrographic Av
- ☐ S_R04_ASF.FireHis_PL
- ☐ S_R04_ASF.FireHis_PT
- ☐ Wildfire Hazard Potential, Version 201
- ☐ ForestFRCC
- ☐ S_USA.Activity_HazFuelTrt_LN
- ☐ S_USA.Activity_HazFuelTrt_PL
- ☐ GeoMAC Fire Locations and Perimete
- ☐ Activity Timber Harvest
- ☐ wfp2012_cls
- ☐ Haz
- ☐ Air
 - ☐ S_USA.AIR_NAA_Ozone_8hr
 - ☐ EPA Non Attainment Areas - Ozone
 - ☐ S_USA.AIR_NAA_PM25
 - ☐ EPA Non Attainment Areas - Particulate
 - ☐ n_td-20130
 - ☐ Air - Wilderness Park Polygons Query
 - ☐ Air - NonAttainment Polygons Query
 - ☐ Air - Monitoring Site Points QueryDef
 - ☐ NRIS_AirPollutionSources_01

☐ Carbon

- ☐ FIA_TotalForestCarbon
- ☐ Boundary
- ☒ Footprint
- ☒ Image

☐ Energy_Renewable

- ☒ biomassArgonnet3
- ☐ csp7Argonnet3
- ☐ egsArgonnet3
- ☐ pv58Argonnet3
- ☐ wind1004Argonnet3

☐ Water

- ☐ WBD_HU2
- ☐ WBD_HU4
- ☐ WBD_HU6
- ☐ WBD_HU8
- ☐ WBD_HU10
- ☐ WBD_HU12
- ☐ R04_NHDFlowline
- ☐ R04_NHDLIne
- ☐ R04_NHDArea
- ☐ R04_NHDWaterbody
- ☐ Watershed Boundaries
- ☐ Surface Drinking Water Importance

Value

High: 1450.61

Low

ForestS

Bounda

Footpri

Image

Valu

High

Low

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Forest Assessment

1 One Chapter, LOTS of data

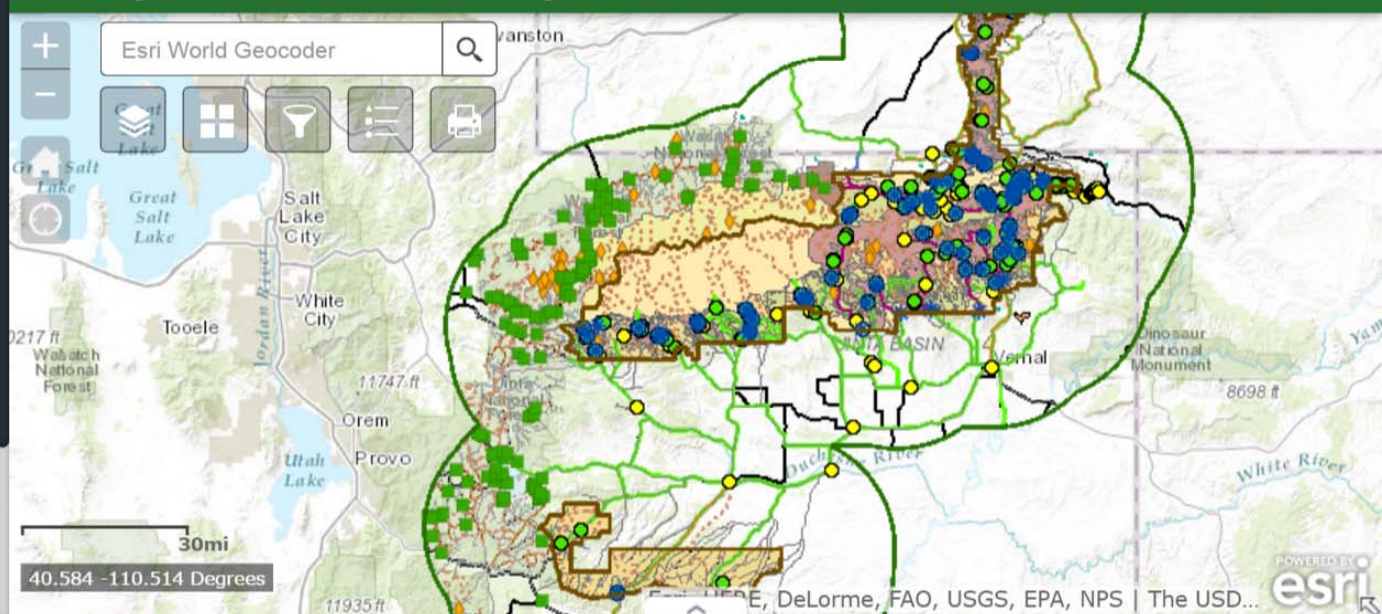
Chapter 13.4: Recreation Opportunities and Scenic Character

As an example of how to organize data for the Forest Assessment, this map displays data collected through interviews and data calls with Natural Resources Management staff from the Ashley National Forest and Region 4 that could inform Chapter 13.4: Recreation Opportunities and Scenic Character.

2 Data by Chapter...

3 Data by Theme...

Ashley National Forest: Chapter 13.4



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Forest Assessment

1 One Chapter, LOTS of data

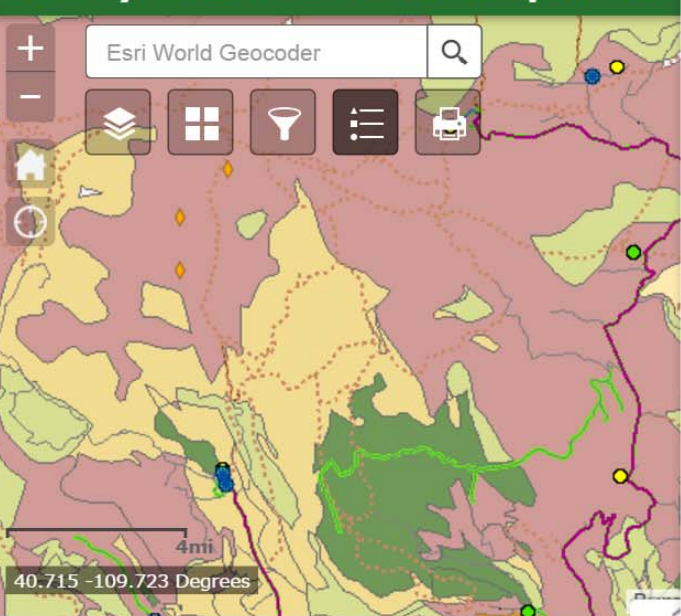
2 Data by Chapter...

However, this map has many data layers, resulting in a confusing, noisy map that is not easily interpreted. Some layers may be useful for reference, while a different subset of layers can be used to inform where management action is most necessary.

Turn layers on and off, zoom in, and become familiar with these data and consider what purpose they will play in a Forest

3 Data by Theme...

Ashley National Forest: Chapter 13.4



Legend

- vast Backyard
- S_R04_ASF_SceneryVisibility
- Bg1
- Bg2
- Fg1
- Fg2
- Mg1
- Mg2
- S_R04_ASF_SceneryVisibility_ss
- Flaming Gorge
- High Uintas Wilderness
- Rugged Backcountry
- Vast Backyard



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Forest Assessment

2 Data by Chapter...

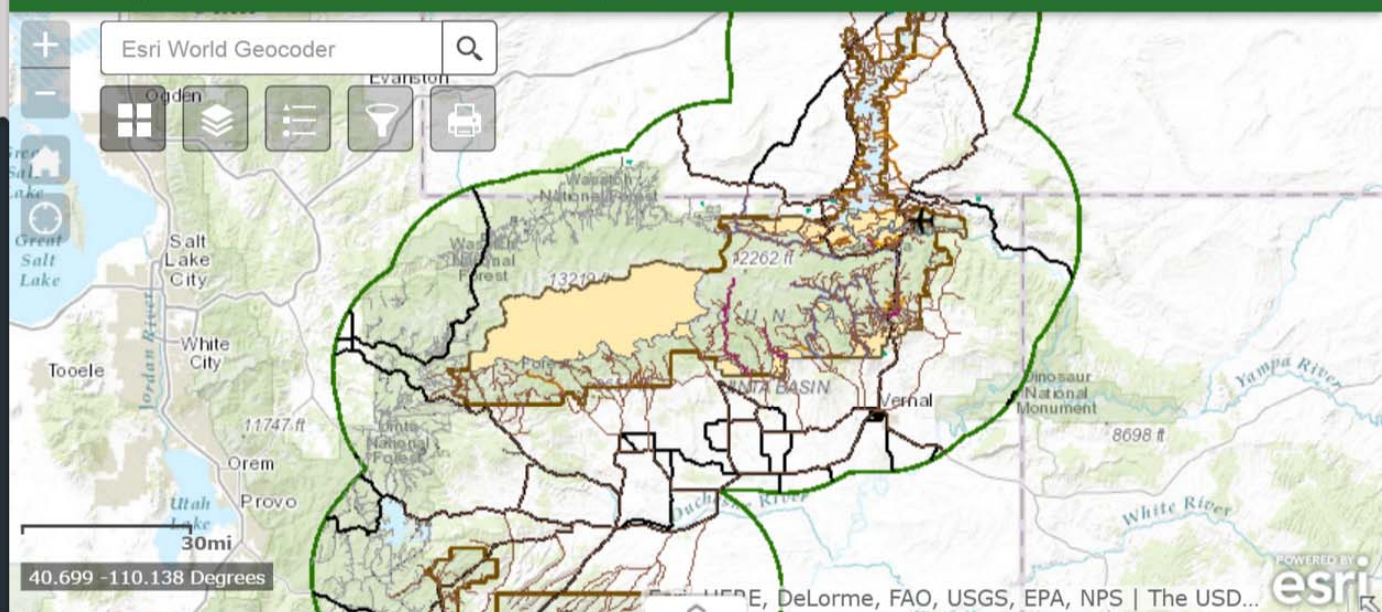
3 Data by Theme...

While these data are bundled together to inform a specific Chapter in the Assessment (13.4), Planners will also need to consider other data that will help inform multiple uses.

Rather than bundling data only according to Planning Handbook Chapter, an alternative grouping of the data, by descriptive theme for example, may grant a more flexible and intuitive opportunity.

4 What purpose do the data serve in a Forest Assessment?

Ashley National Forest - Transportation



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Forest Assessment

2 Data by Chapter...

3 Data by Theme...

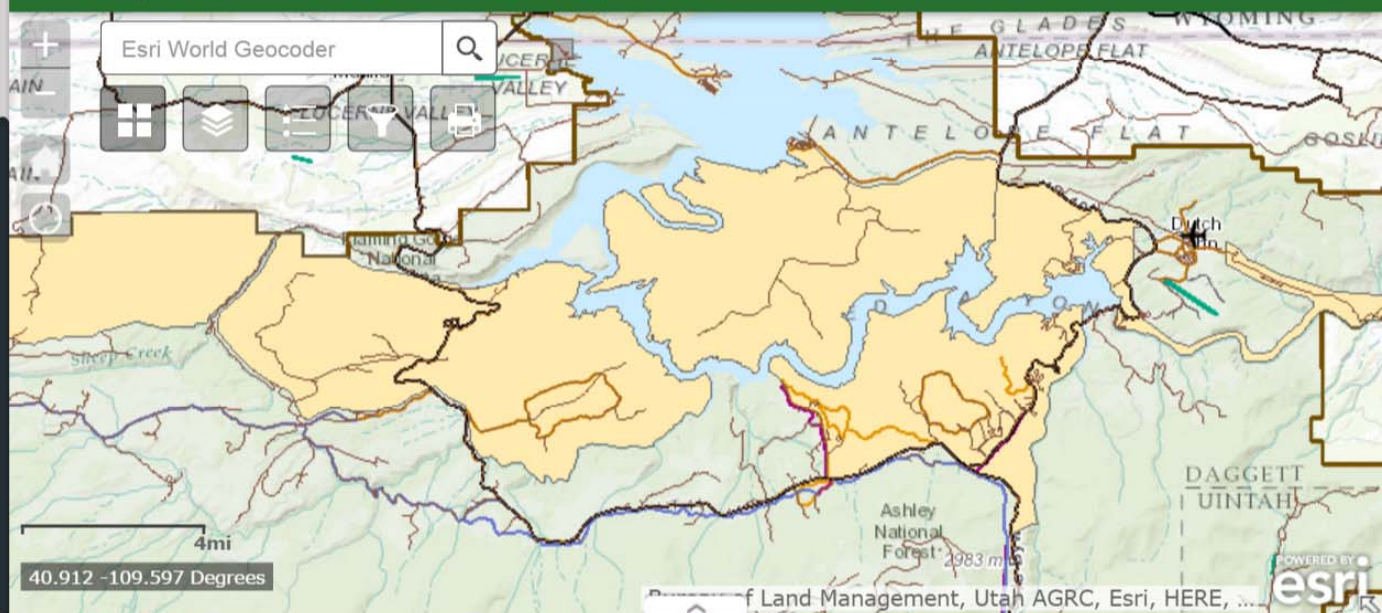
4 What purpose do the data serve in a Forest Assessment?

By organizing data into intuitive themes, Planning staff can better navigate to pick and choose the data that will best serve a purpose within the Forest Assessment.

Consider the purpose of GIS datasets in a Forest Assessment:

- For Reference (Forest Boundary, Districts, Wilderness/Roadless, Basemap Topography, etc..)
- For querying and data discovery (how many

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It's an assessment of

PRIORITIES

A Forest Assessment's primary purpose is to identify a need for change. The Assessment should evaluate landscape conditions, compare them with desired conditions, and prioritize where action is required to accomplish landscape objectives:

- Where should culverts be replaced or roads decommissioned to restore fisheries populations?
- Where do wildland fuels pose a risk to communities? Where do they pose an ecological risk?
- Where can conflict between motorized and non-motorized recreation be reduced?

These are spatial questions that the Forest Service can prioritize *only* by utilizing geospatial data.

For this reason, it is often helpful to perform a spatial analysis to *eliminate* places where a given land management action is clearly inappropriate, resulting a narrower map of targets for dedicated collaboration with public stakeholders.





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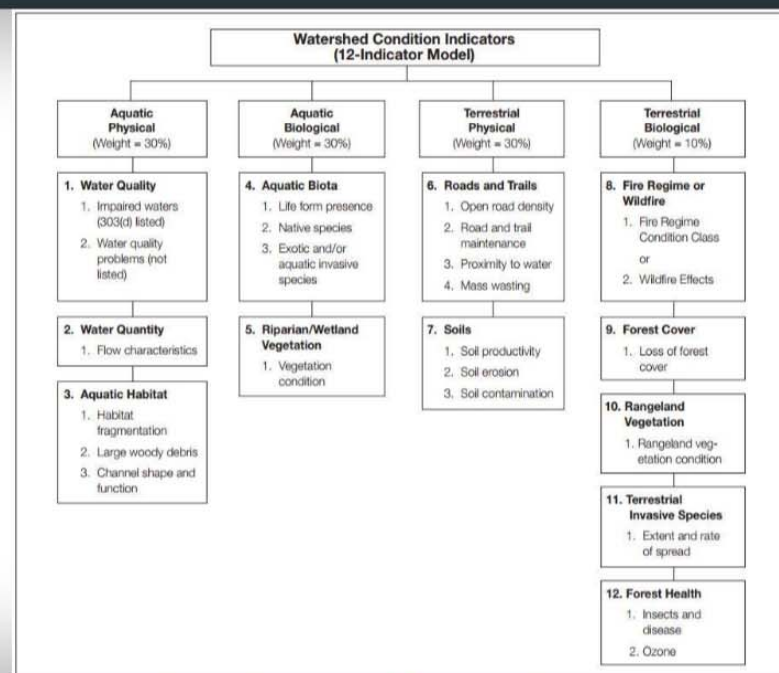
Watershed Condition Framework

1 What is the Watershed Condition Framework?

This Watershed Condition Framework (WCF) provides a good example of how geospatial analysis can inform priorities for restoration. Conveniently, it was identified as a relevant dataset for a number of Assessment chapters. The WCF is composed of 12 geospatial variables that represent:

2 Using Watershed Condition to Target Restoration Activities

3 Why is Swift Creek Watershed a High-Priority Watershed?



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Watershed Condition Framework

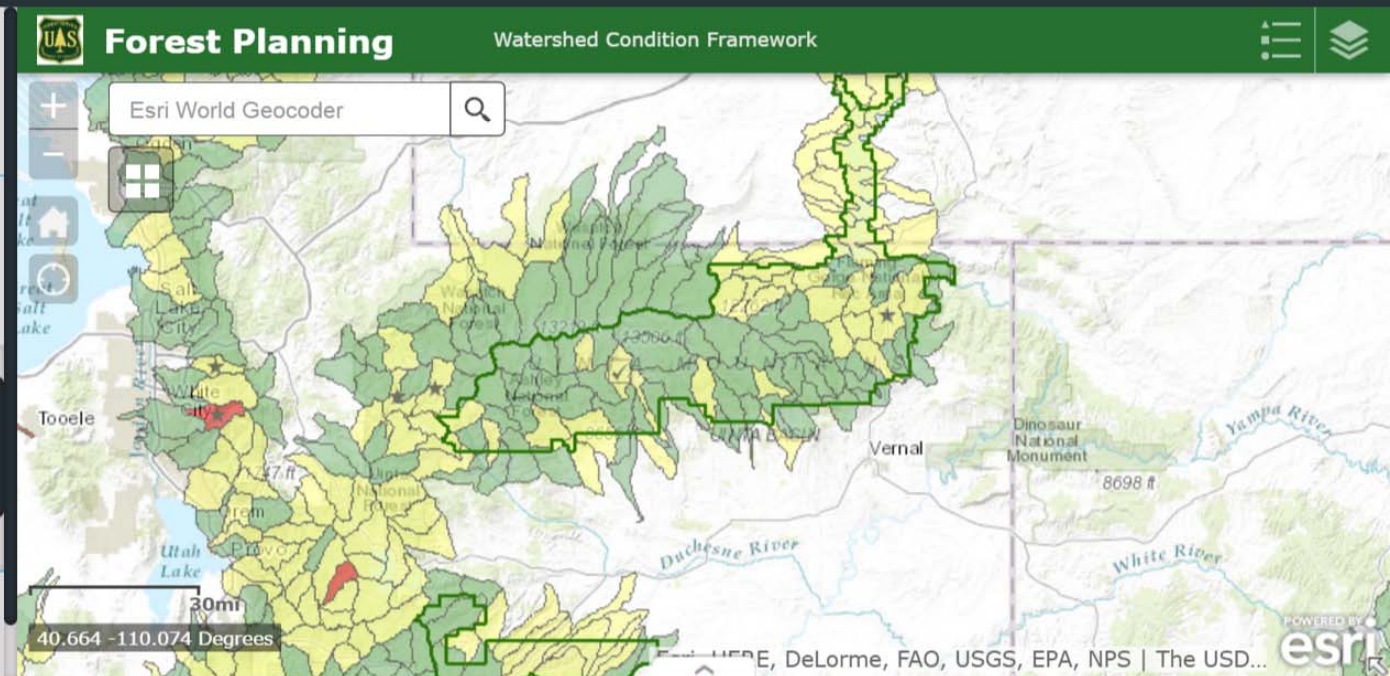
1 What is the Watershed Condition Framework?

2 Using Watershed Condition to Target Restoration Activities

While the summary watershed condition index is a helpful guide for prioritizing where restoration is needed. A look at the individual components helps identify the type of restoration that's required.

Explore this Forest Planning Application to turn layers on and off, toggle basemaps, and click on watersheds to

3 Why is Swift Creek Watershed a High Priority Watershed?





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Watershed Condition Framework

1 What is the Watershed Condition Framework?

2 Using Watershed Condition to Target Restoration Activities

3 Why is Swift Creek Watershed a High Priority Watershed?

By zooming in and investigating why a certain watershed was prioritized for restoration, management strategies can be designed through Forest Plan Revision.

Click on the Swift Creek Watershed to identify why it was identified as "Functioning At Risk" and qualifies for restoration efforts. Investigation reveals that a 7-mile historic mining road has resulted in increased soil erosion and sediment contributed



Swift Creek Priority Watershed





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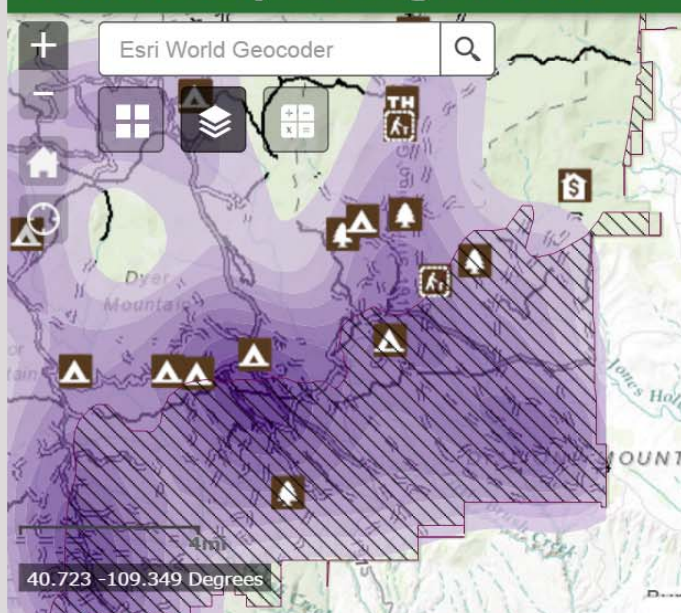
Reconciling Multiple Uses

Consider this combination of maps to highlight an issue of management concern and potentially target where multiple uses are in conflict.

This map represents recreational opportunities (trailheads, campsites, fishing etc) with motor vehicle use maps (MVUM), motorized road density, and priority sage grouse habitat. By mapping these targets for management action (ie Sage Grouse habitat protection), Forest Planners can harness the collaborative process with public stakeholders to design the most appropriate management action.

It starts, however, with mapping priority areas for management attention.

Road Density and Sage Grouse



Layer List

Operational Layers

- ☐ Greater Sage Grouse Habitat - Wyoming 9-Plan
- ☒ Greater Sage Grouse Habitat - Utah
 - ☐ GHMA - General Habitat Mgmt Area
 - ☐ Occupied - Anthro Mountain
 - ☐ PHMA - Priority Habitat Mgmt Area
- ☒ Recreation Opportunities
- ☒ MVUM_Roads_Roads_Density
- ☒ Motor Vehicle Use Map: Roads and Trails

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1. Data assembly is necessary, but not sufficient for Forest Planning.
2. The Forest Assessment must demonstrate the need for landscape change, and map where this change is needed most.
3. Once Forest Planning staff are familiar with these data, consider how to integrate data to inform priorities for various management actions.
4. Discriminate between reference purposes and analytical purposes.
5. Forest assessment results and maps of priorities will be shared with the public.

By sharing maps of assessment ingredients and results, collaboration with public stakeholders can be facilitated, and accomplishments can be more transparently reported.

