New Mexico 2020 Forest Action Plan

Project Update and Model Review

NM Forest and Watershed Health Coordinating Group — October 25, 2019

Presentation Outline

- Overview of 2020 Forest Action Plan (10 min.)
- Role for this Coordinating Group (5 min.)
- Draft Conceptual Models (12 min. each)
  - Wildland and Communities
  - Indigenous and Traditional Communities
  - Timber and Grazing
  - Carbon and Soils
  - Biodiversity
  - Recreation and Cultural Use
  - Water Quality and Supply
  - Urban Forests and Communities
- Threats and Response Functions (10 minutes)
- Next Steps (5 min.)

Forest Action Planning — Overview

- State Forest Action Plans
  - Required by 2008 Farm Bill

- Natural Resources Assessment
  - Documents the conditions and trends of forest resources

- Forest Strategy and Action Plan
  - Outline a plan of action to:
    1. Conserve Working Landscapes
    2. Protect Watersheds from Harm
    3. Enhance Public Benefit from Natural Resources

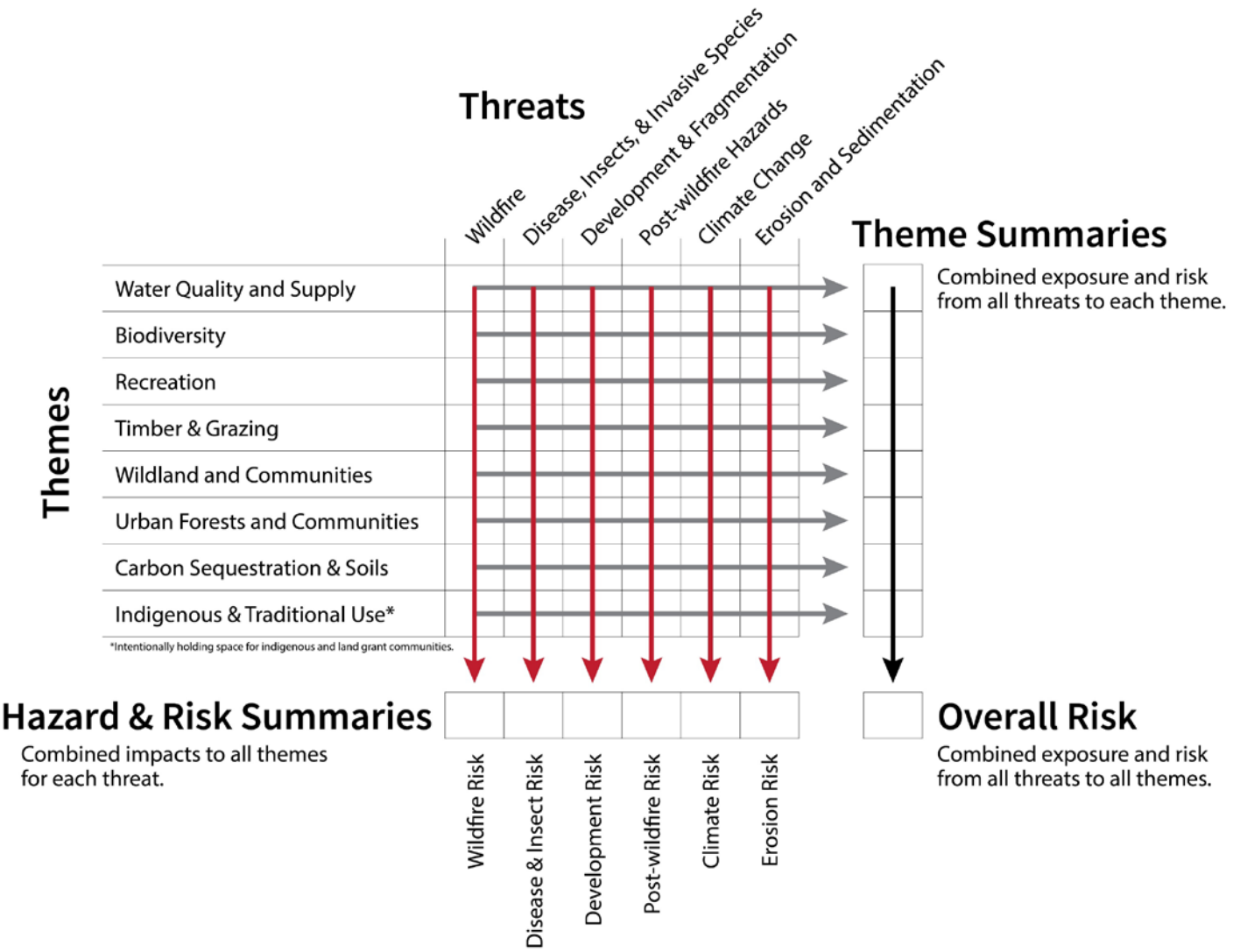
2020 Assessment — Approach

- Values — “Things We Care About”
- Threats — “Things We Worry About”

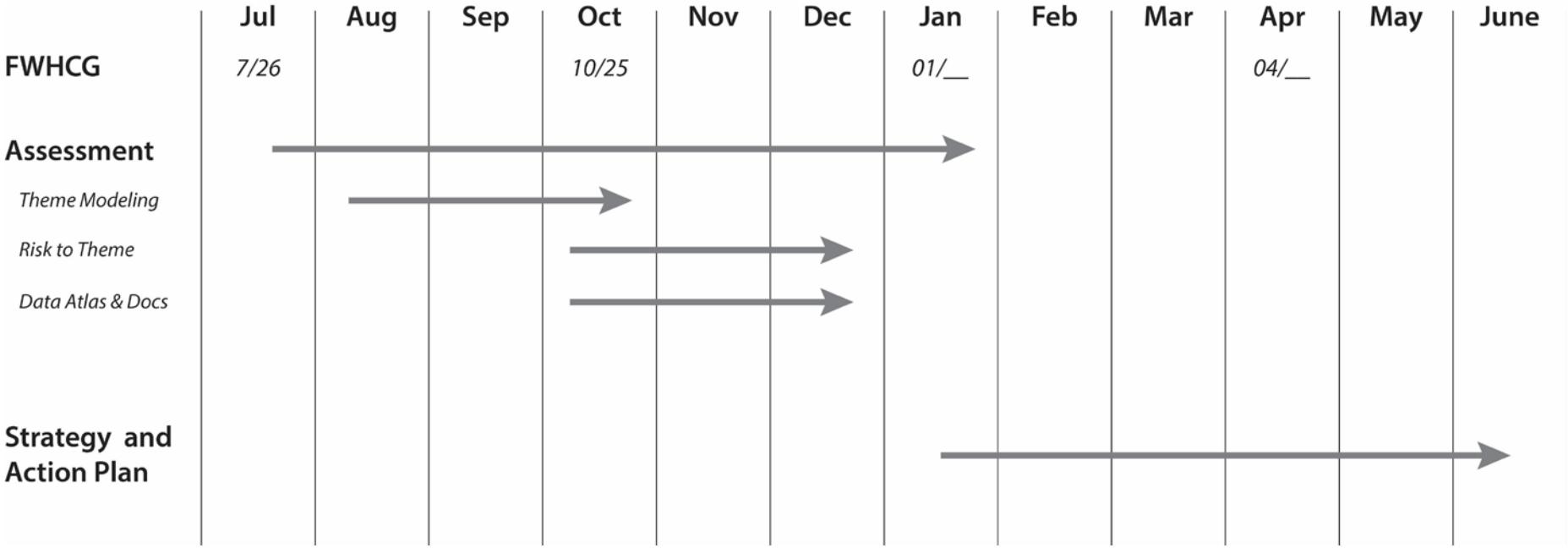
- Risk — function of Value and Threat

- Opportunity & Cost to Mitigate

2020 Forest Action Plan — Structure



2020 Forest Action Plan — Timeline



Coordinating Group Role

- ✓ Provide high-level feedback on Assessment approach.
- ✓ Evaluate Theme scope and separation.
- ✓ Identify technical experts for each Theme.
- ❑ Evaluate practicality and utility of Theme models.
- ❑ Review hazard and threat characterization.
- ❑ Review Strategies to be included in Action Plan.
- ❑ Review Priorities in draft Action Plan.

Today's Objectives

- Review data models for mapping Theme value

- Approve draft Theme models
  – or –
- Suggest modifications to Theme models

Evaluate practicality and utility of Theme models.

Theme Model Structure

- What is the *spatial distribution* of the value of this resource or asset?
    - Where is this resource or asset?
    - Where are the beneficiaries of this resource or asset?
- Where is this resource or asset at risk from hazards?
- Where can actions be taken to mitigate risk?
    - Cost, Operability, Site Sensitivity

Theme Model Review

- Wildland Communities
- Water Quality and Supply
- Carbon and Soils
- Timber and Grazing
- Biodiversity
- Indigenous and Traditional Communities
- Recreation
- Urban Forests and Communities

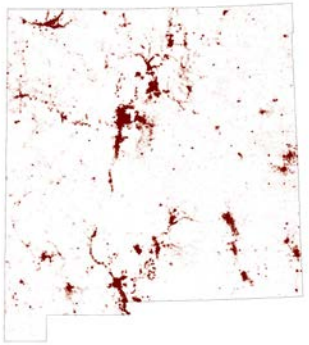
Questions to Answer:

Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

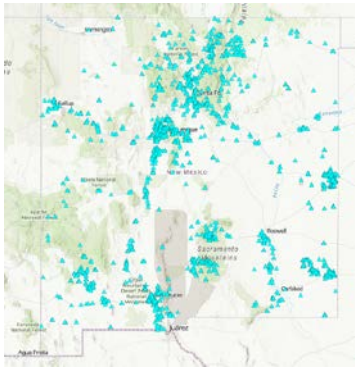
Wildland Communities

Wildland Communities — Value



Building Density

Communications Sites



Public Water Infrastructure

Wildland Communities — Value

Building Density

(Microsoft, 2018)

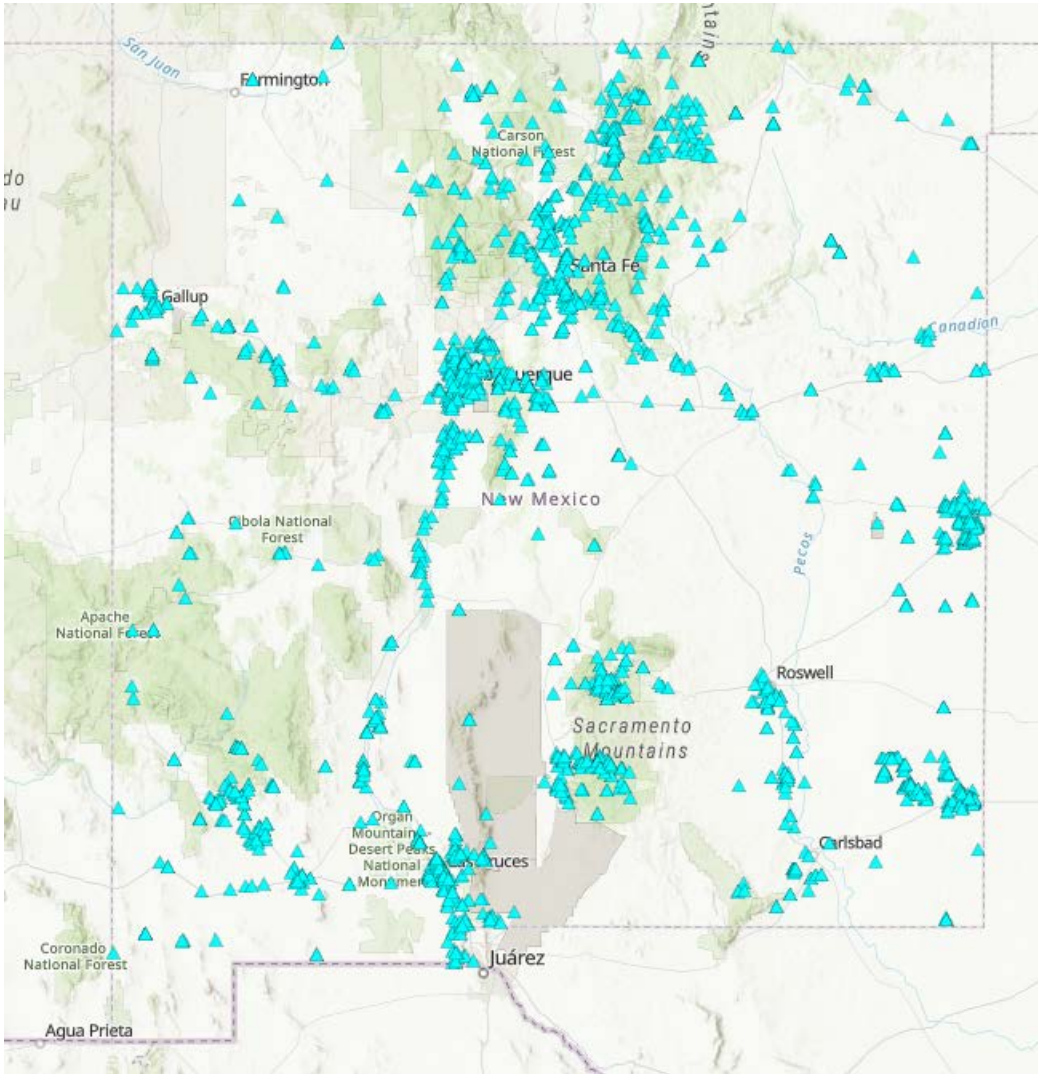
Wildland Communities — Value

Communications Towers and Sites

(FCC 2019)

Wildland Communities — Value

Public Water Infrastructure



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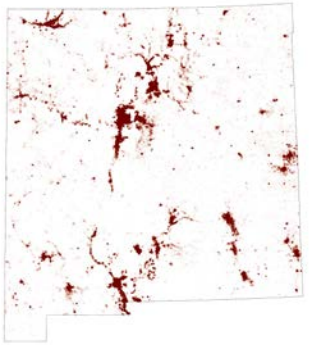

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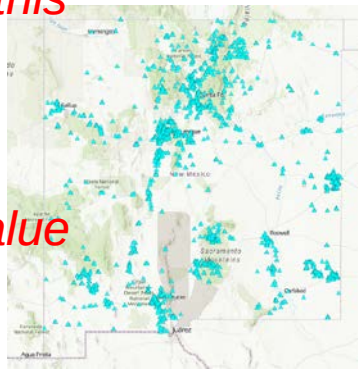

Public Water Infrastructure

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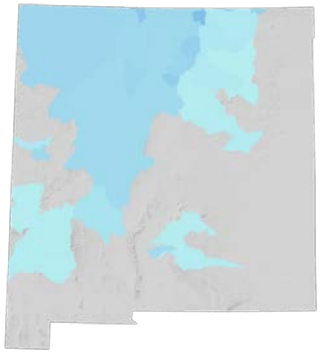
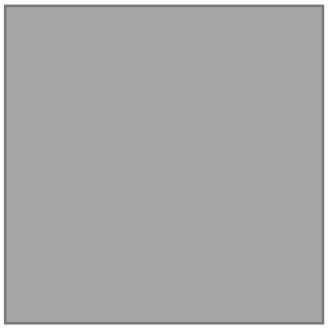
Water Quality and Supply

Water Quality and Supply — Value

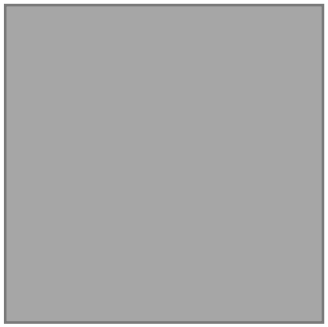


Surface Water Supply for Irrigation



Groundwater Supply for Irrigation

Surface Water Supply for Domestic Use



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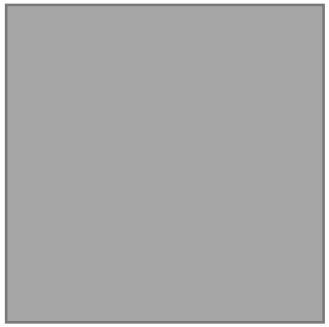
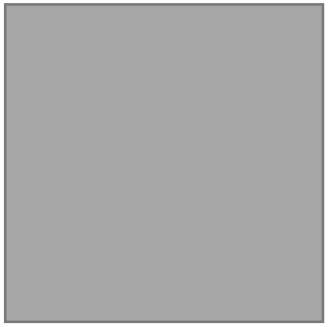


Surface Water Quality at Diversions and Reservoirs

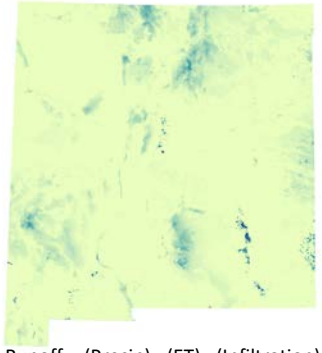


Water Conveyance through River Flow

Water Quality and Supply — Value

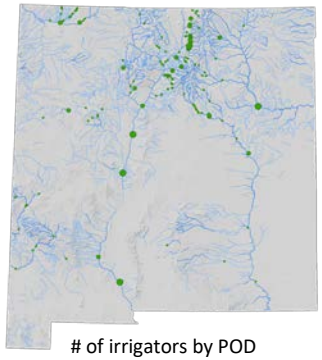
Surface Water for Irrigation

Source = Runoff



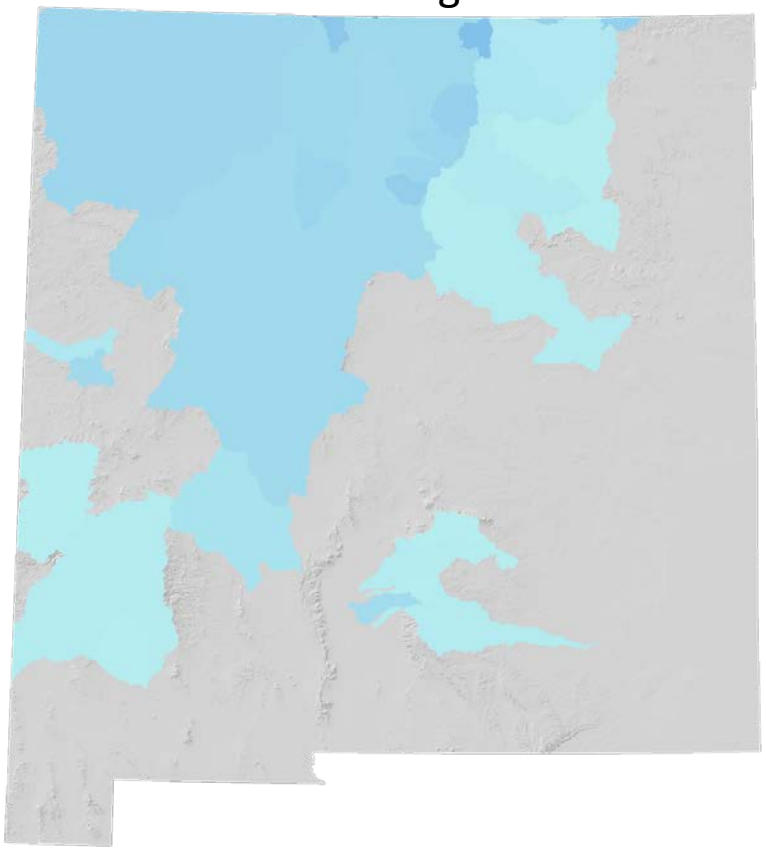
Runoff = (Precip) - (ET) - (Infiltration)

Benefit = Irrigators



# of irrigators by POD

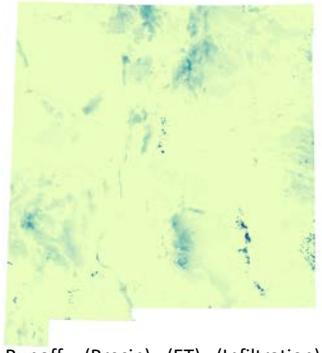
Value = Benefit-Weighted Runoff



Water Quality and Supply — Value

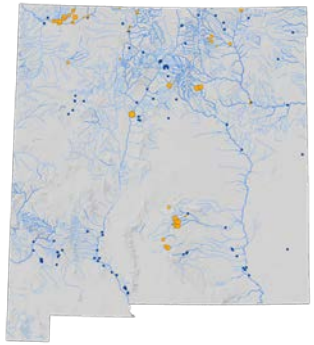
Surface Water for Domestic Use

Source = Runoff



Runoff = (Precip) - (ET) - (Infiltration)

Benefit = People



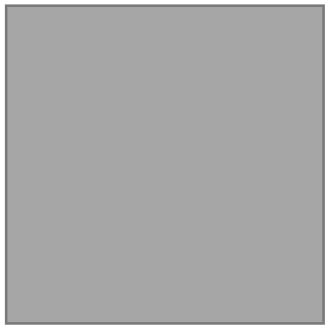
Population served by POD

Value = Benefit-Weighted Runoff

Water Quality and Supply — Value

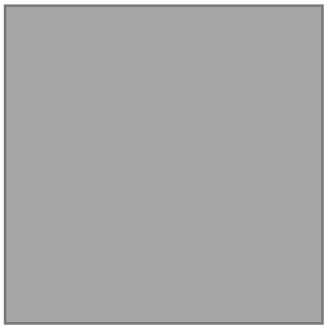
Surface Water Quality for Diversions and Reservoirs

Source = Sediment Transport Decay



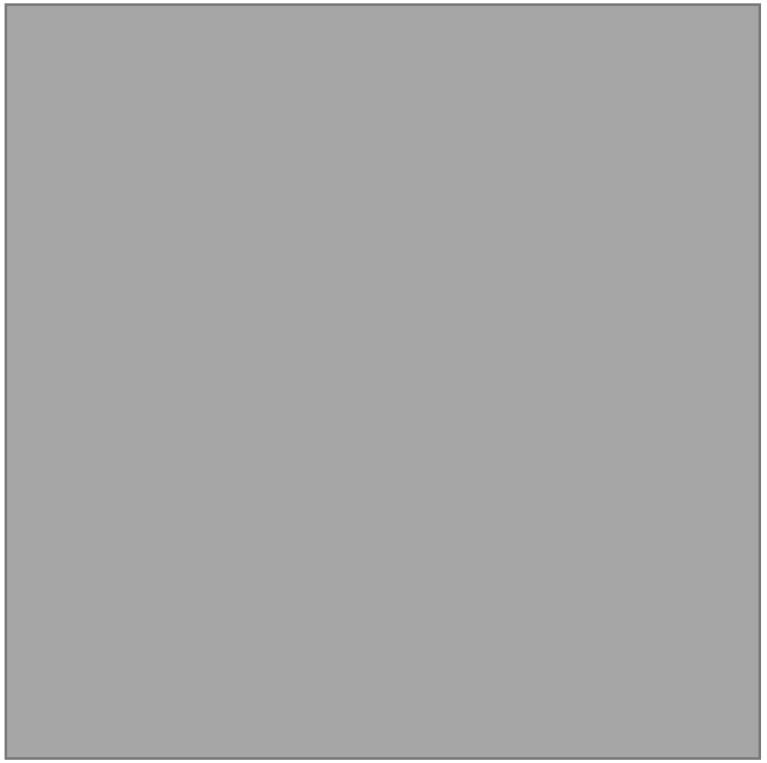
(distance) or (distance + flow + slope)

Benefit = POD



POD

Value = POD Impact Intensity



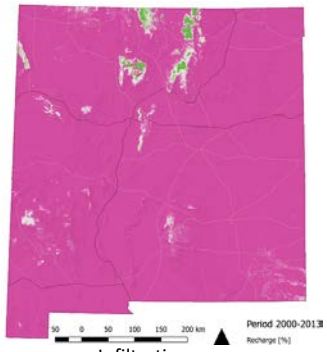
W = (1 – 0.01) ^ (d), where W is the proportional weight and d is the distance from the POD.

Mockrin, M. H., Lilja, R. L., Weidner, E., Stein, S. M., Carr, M. A., & Service, F. (2014). *Private Forests, Housing Growth, and America's Water Supply A Report From the Forests on the Edge and Forests to Faucets Projects*.

Water Quality and Supply — Value

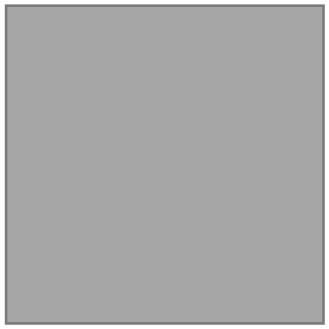
Groundwater Supply for Irrigation

Source = Infiltration



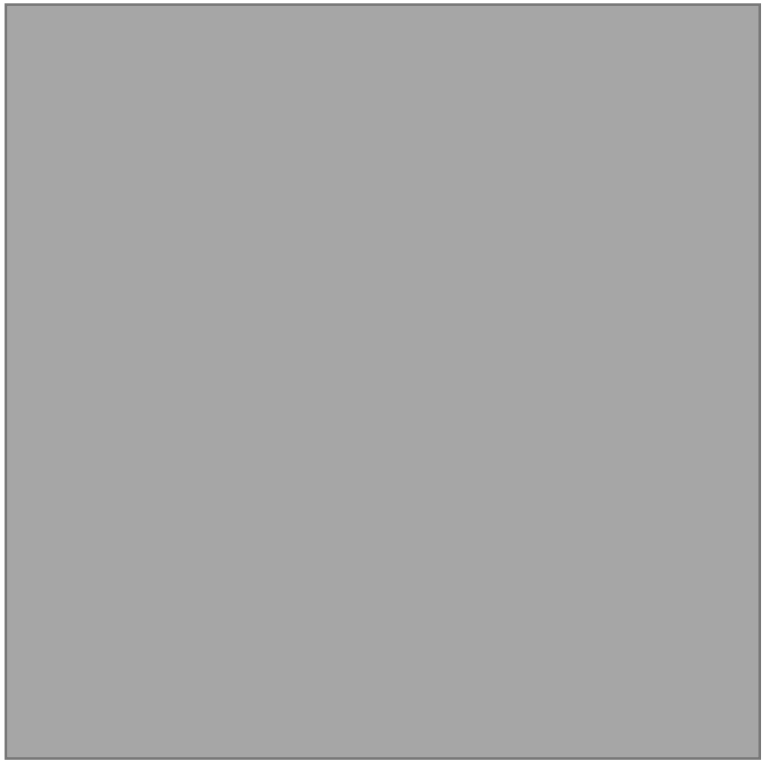
Infiltration

Benefit = Well Source



Aquifer for Well Source
Weighted by Irrigators

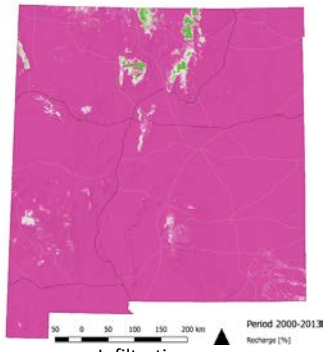
Value = Benefit Weighted Infiltration



Water Quality and Supply — Value

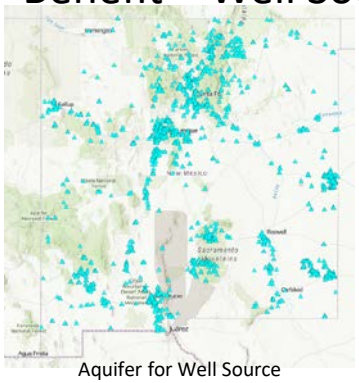
Groundwater Supply for Domestic Use

Source = Infiltration



Infiltration

Benefit = Well Source



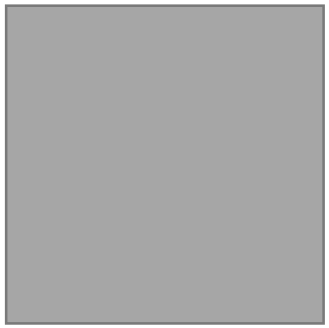
Aquifer for Well Source
Weighted by Population Served

Value = Benefit Weighted Infiltration

Water Quality and Supply — Value

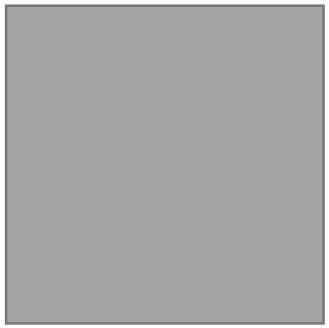
Water Conveyance through River Flow

Source = Sediment Transport Decay



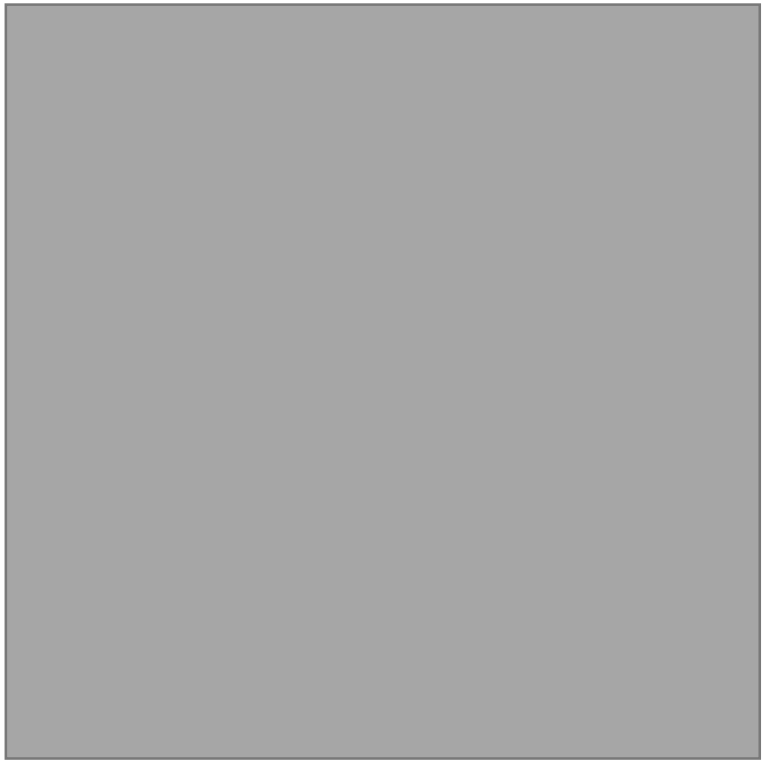
(distance) or (distance + flow + slope)

Benefit = Critical Rivers



Rivers used to transmit Compact or Imported Water

Value = River Impact Intensity



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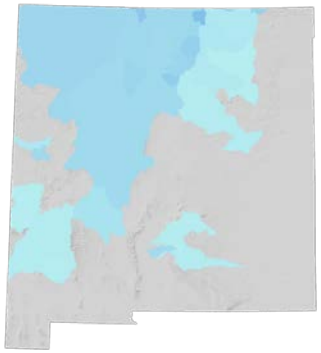

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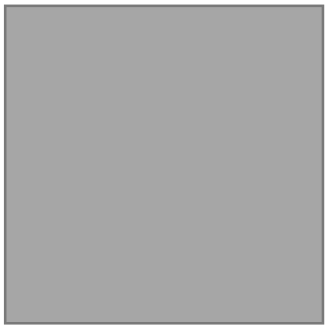
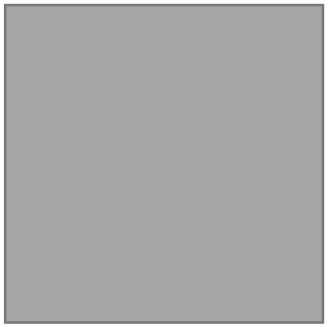


Groundwater Supply for Irrigation

Surface Water Supply for Domestic Use



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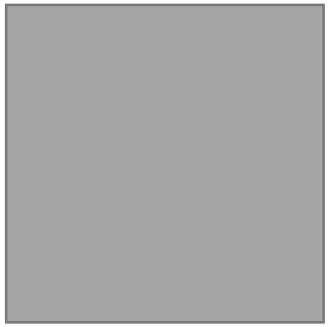

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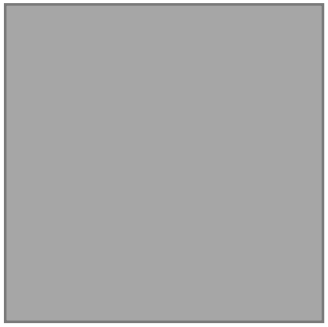
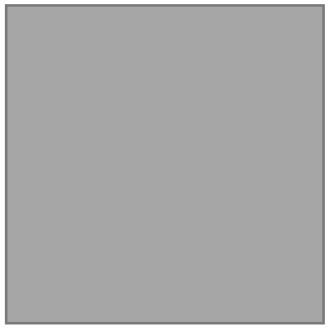


Water Conveyance through River Flow

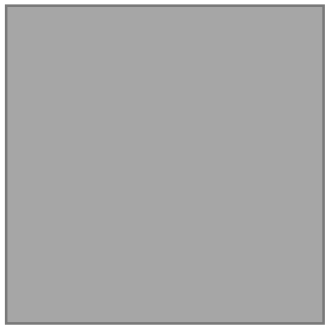
**RG Compact weight based on NM share of upstream water.*

Carbon and Soils

Carbon and Soils — Value



Aboveground Biomass



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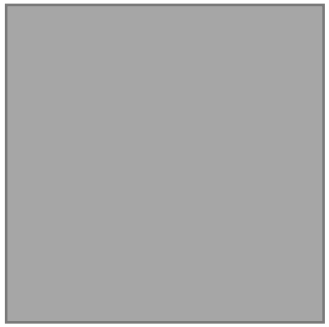
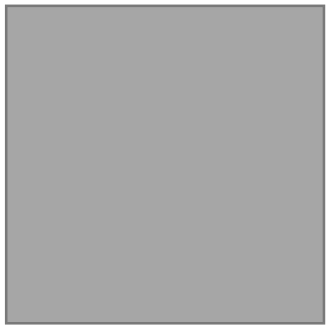


Woody Debris

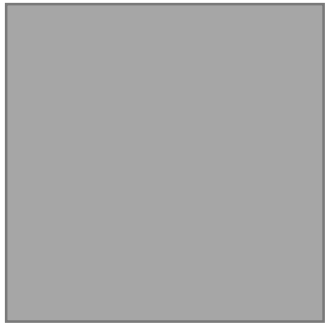


Soil Organic Matter

Carbon and Soils — Value

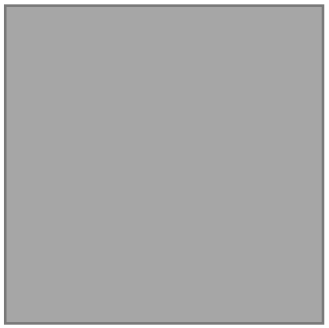
Aboveground & Belowground Biomass

Source = Stored
Aboveground Carbon



tons of C
Imputed from FIA

Source = Stored
Belowground Carbon



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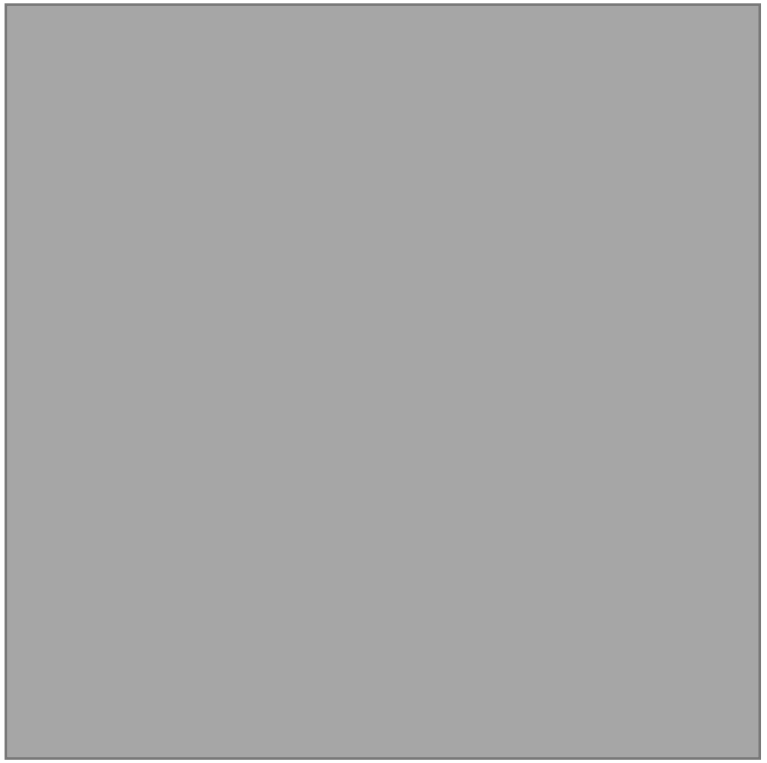
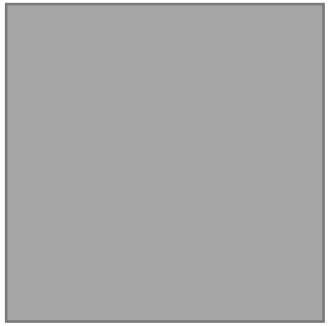


Carbon and Soils — Value

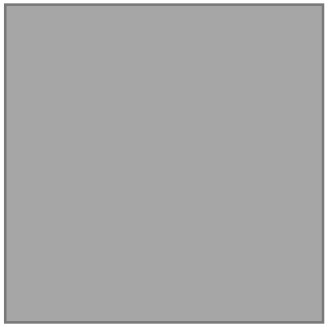
Aboveground & Belowground Biomass

Source =
Woody Debris



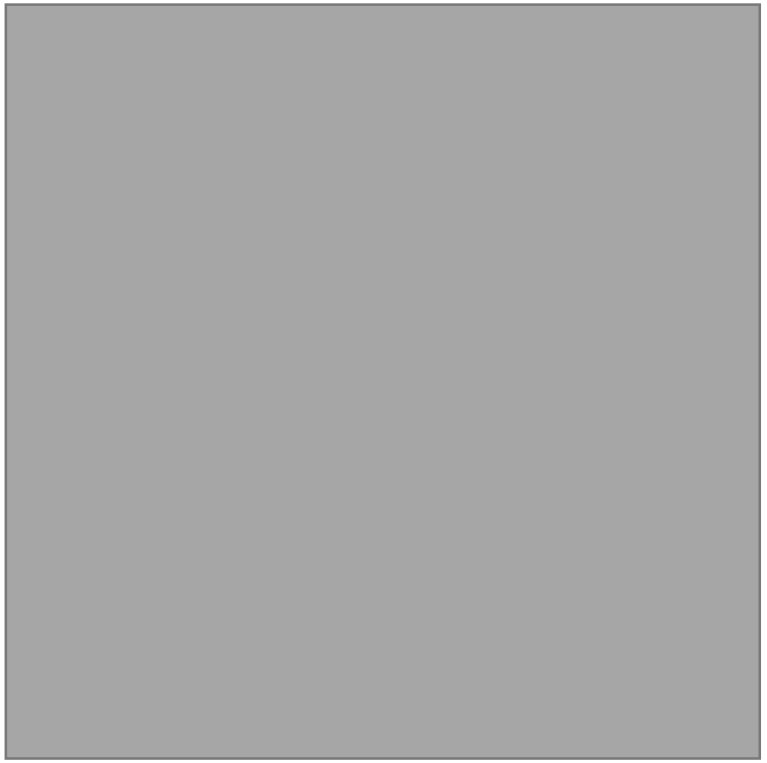
LANDFIRE Fuel Loading

Source = Soil
Organic Matter



POLARIS

Value = Tons of Carbon



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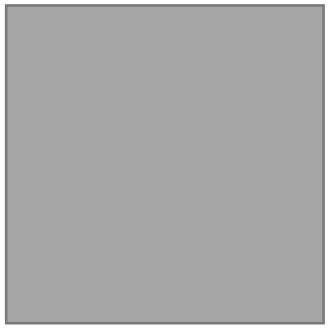
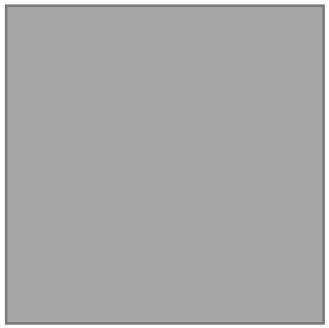
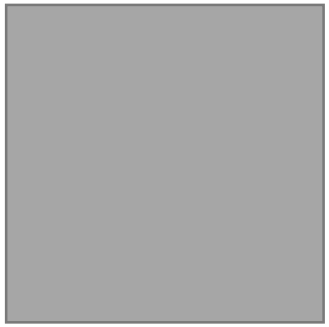


Aboveground Biomass



Belowground Biomass



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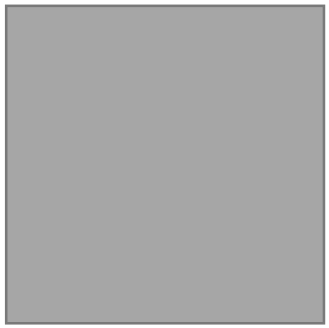
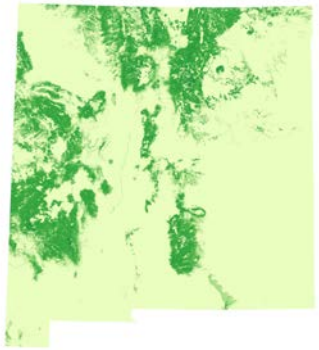


Soil Organic Matter

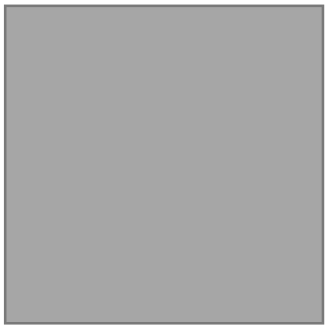
Carbon pools respond to disturbance differently.

Timber and Grazing

Timber and Grazing — Value



Standing Inventory



Forage Production

Mills and Processing Facilities

Timber and Grazing — Value

Standing Timber Inventory

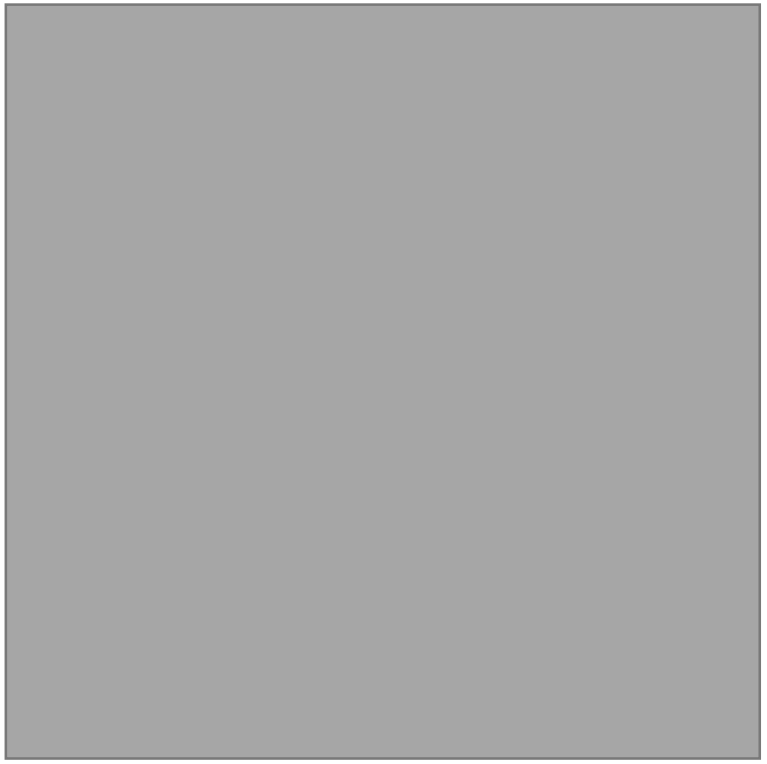
Source = Operable Standing Inventory

Sawlogs
Small Diameter
Other Biomass

Benefit = Accessibility from Mills, etc.

Distance to Existing and Proposed Mills etc.

Value = Accessibility-Weighted Inventory

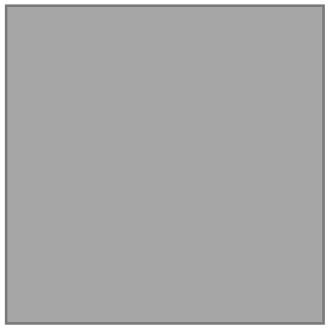


Mills and other sources of demand for products as asset?

Timber and Grazing — Value

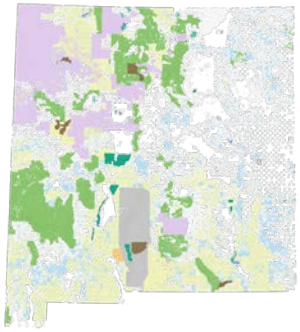
Forage Production

Source = Forage Production Potential



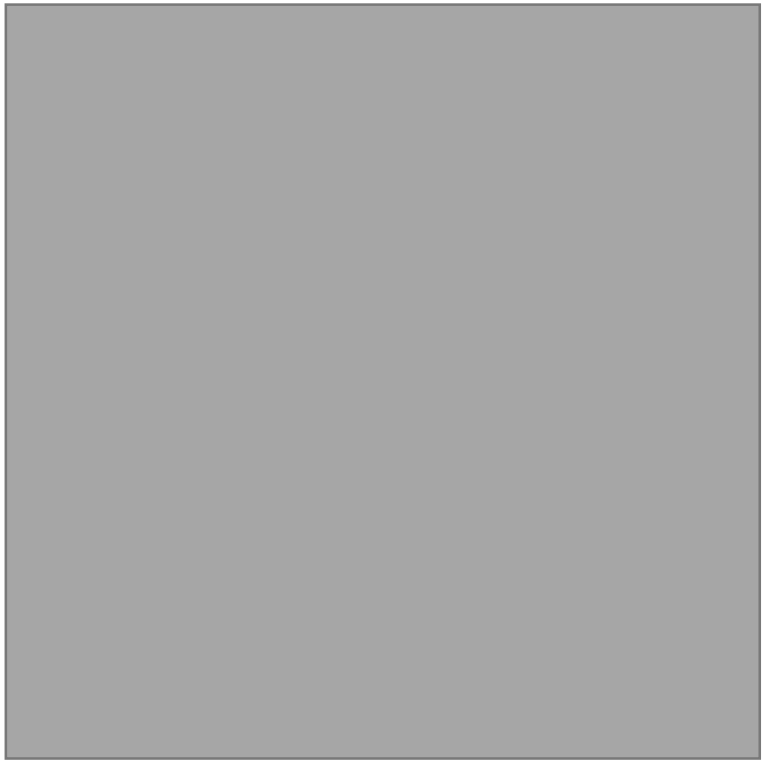
Canopy cover, Precipitation, and Soils

Benefit = Grazing Lands



Slight value increase for private lands and allotments

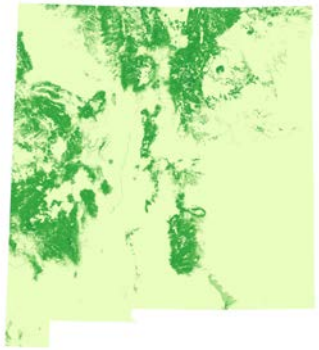
Value = Benefit Weighted Forage Production Potential



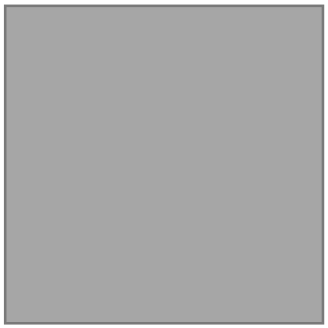
Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

Timber and Grazing — Value



Standing Inventory



Forage Production

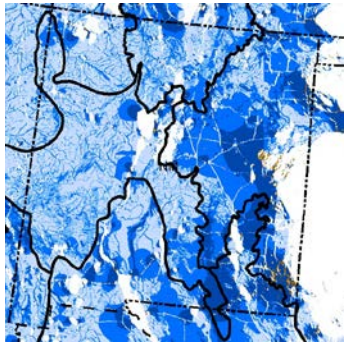
Mills and Processing Facilities

Biodiversity

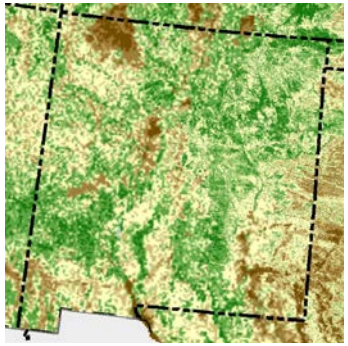
Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

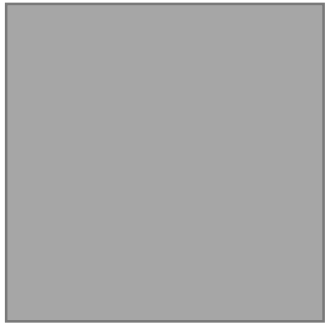
Biodiversity — Value



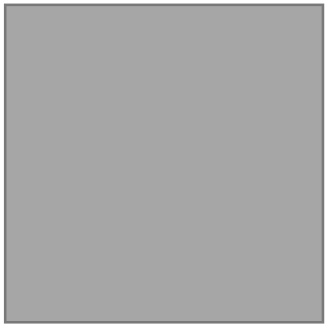
Site Connectivity



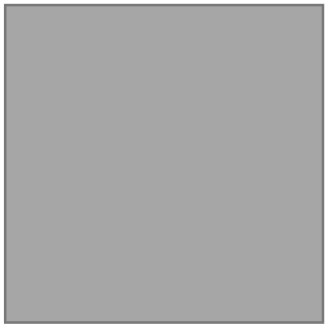
Site Resilience



Confirmed Biodiversity



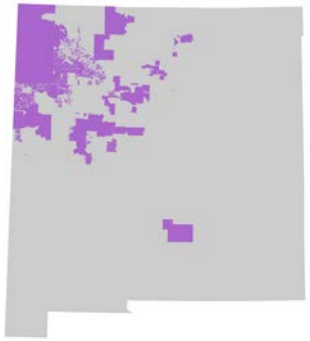
Critical Habitat for T&E Species



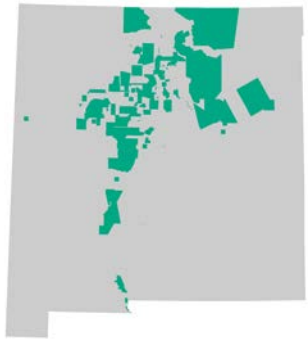
Ecosystem Resilience

Indigenous and Traditional Communities

Indigenous and Traditional Communities



Indigenous Communities



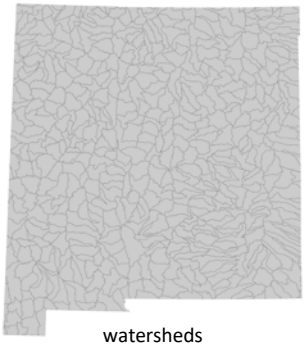
Land Grant Communities

How can we map cultural heritage?

Communities that maintain traditional place-based practices?

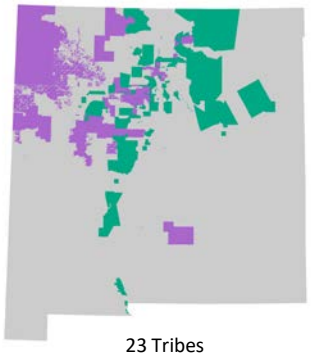
Indigenous and Traditional Communities

Source = Watersheds



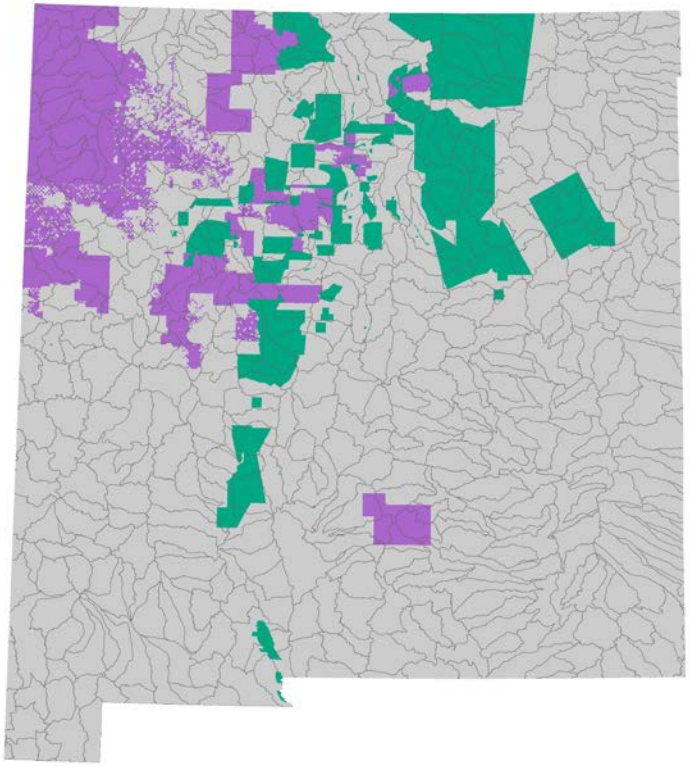
watersheds

Benefit = Communities



23 Tribes
295 Spanish and Mexican Land Grants
(154 Community Land Grants)

Value = Watersheds that sustain traditional lifeways.

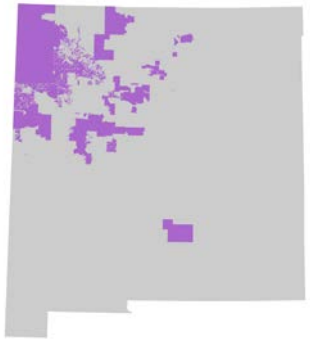


- *Water essential for community in NM.*
- *Watersheds cross elevational gradients.*
- *Watersheds provide other benefits.*

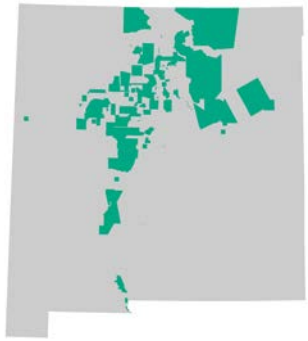
Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

Indigenous and Traditional Communities



Indigenous Communities



Land Grant Communities

How can we map cultural heritage?

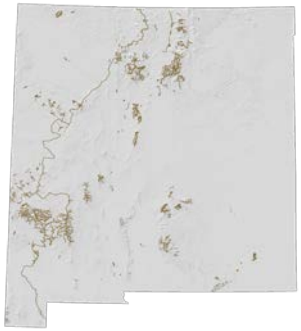
Communities that maintain traditional place-based practices?

Recreation and Cultural Use

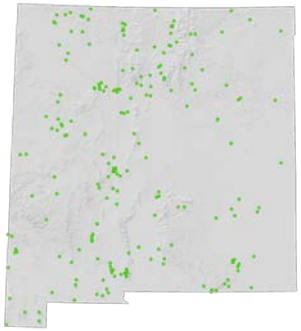
Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

Recreation and Cultural Use — Value

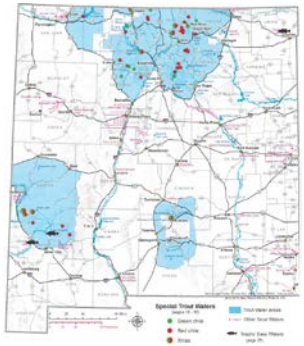


Trails

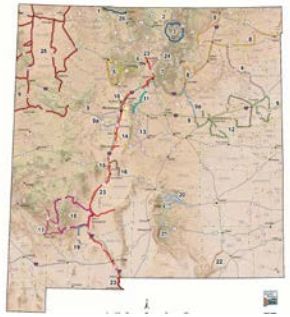


Campgrounds, Picnic Areas, & Other Developed Rec. Sites

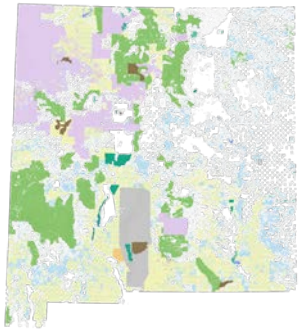
Ski Areas



Fishing Waters



Scenic Byways



Public Lands

**Wild &Scenic, and Recreation Rivers*
**Legal Access to Recreation*
**Hunting*

Urban Forests and Communities

Urban Forests and Communities — Value

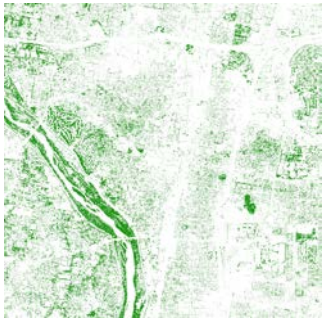
Tree Canopy for People

Are there any other data that should be considered for this value theme?

Does the theme model adequately capture the value at the state-wide scale?

Urban Forests and Communities — Value

Source = Canopy



Canopy Cover

Benefit = People

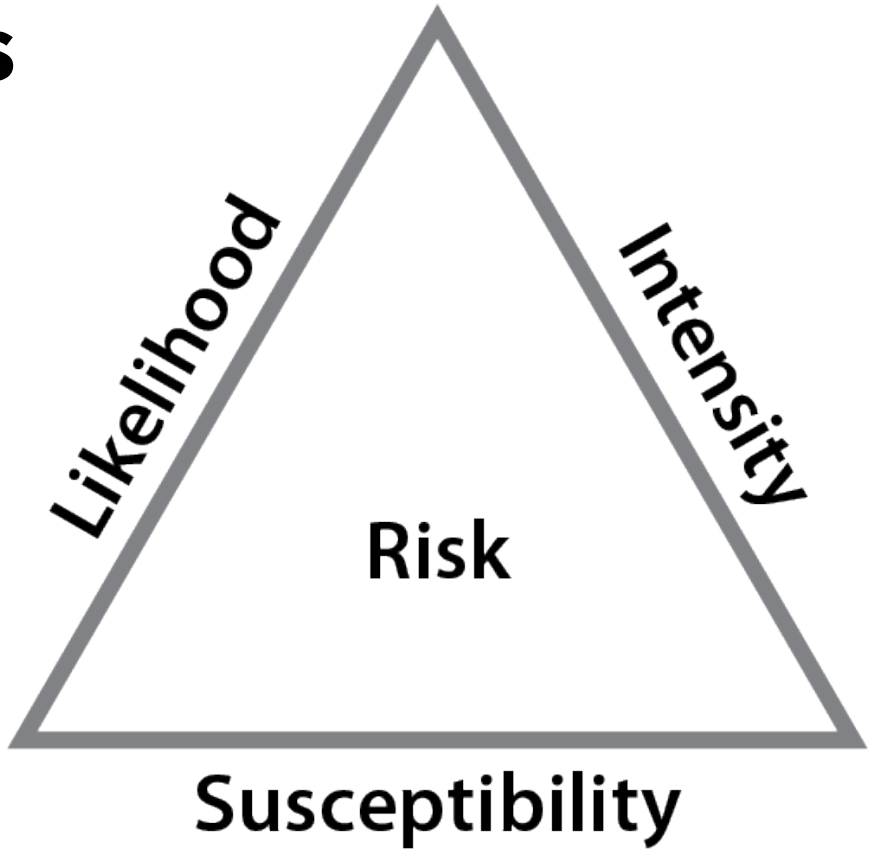
Buildings Approximate People

Value = Beneficiary Weighted Canopy

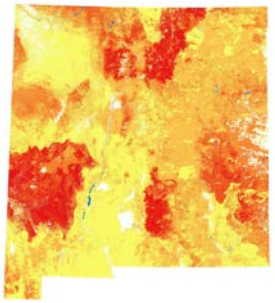
- *"Canopy Gap"*
- *Equity and Uneven Benefit*

Threats

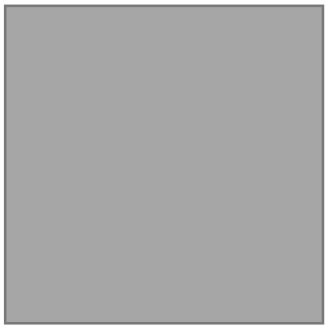
Risk from Threats



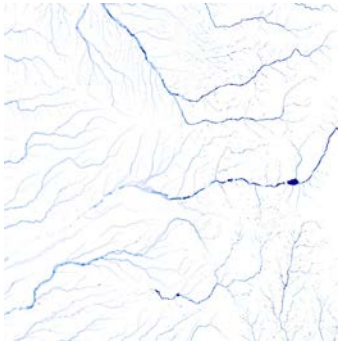
Threats



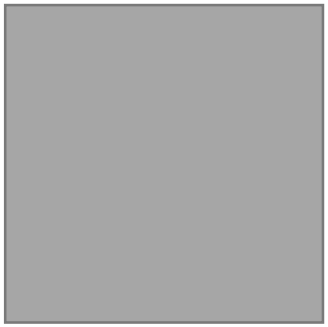
Wildfire



Climate Change

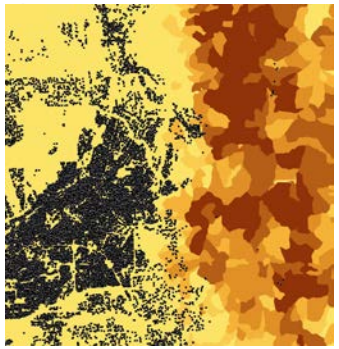


Post-fire Hazards
(Debris Flow, Flooding)



Development

Disease and Insects



Erosion and Sediment

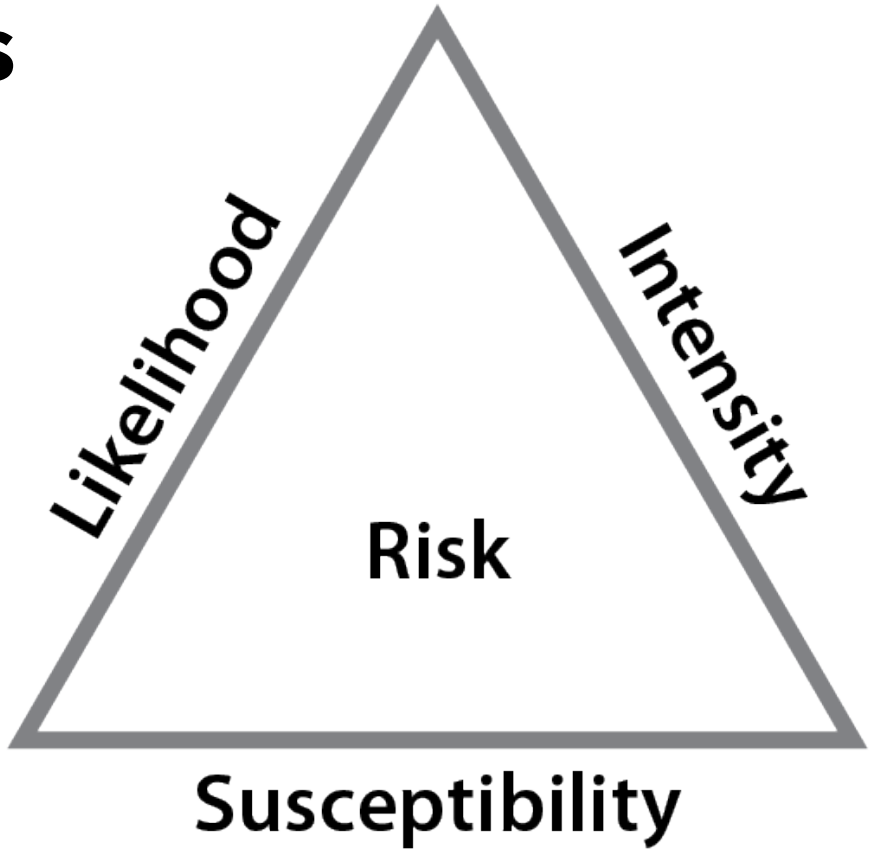
Response Functions (Suceptibility)

HVRA Name	Sub-HVRA Name	FIL 1	FIL 2	FIL 3	FIL 4	FIL 5	FIL 6
Investments	Game and Fish feedgrounds	-50	-70	-90	-100	-100	-100
	Special use permit areas	-50	-70	-90	-100	-100	-100
	Trailheads/boating sites	0	-10	-20	-30	-40	-50
	Campgrounds/picnic areas	0	-10	-20	-55	-75	-75
	Cabins/guard stations	-50	-70	-90	-100	-100	-100
	Oil and gas development	-10	-20	-40	-80	-100	-100
	Communication sites	0	-30	-60	-80	-100	-100
	Power lines	-10	-20	-40	-80	-100	-100
	Whitebark pine plus trees	-10	-70	-100	-100	-100	-100
Wildland urban Interface	WUI defense zone	0	-50	-75	-100	-100	-100
	Protection FMU	10	0	-25	-50	-50	-50
Watershed	Municipal Watershed (DFC 4)	20	0	-20	-50	-75	-100
Timber base	Desired future condition 1B	20	-20	-50	-80	-100	-100
	Desired future condition 10	50	25	10	0	-25	-50

How do valued resources respond to the expected hazard intensity?

Risk from Threats

Mitigation Strategies



Coordinating Group Role

- ✓ Provide high-level feedback on Assessment approach.
- ✓ Evaluate Theme scope and separation.
- ✓ Identify technical experts for each Theme.
- ✓ Evaluate practicality and utility of Theme models.
- ❑ Review hazard and threat characterization.
- ❑ Review Strategies to be included in Action Plan.
- ❑ Review Priorities in draft Action Plan.