

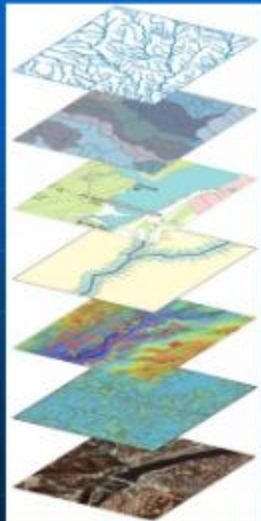
# GIS & GPS: Tools For Success on the Payson Verde River Ranch

# Main Points:

- GIS is a common language that bridges disciplines and political spheres.
- GIS provides powerful tools for documenting and evaluating landscape treatment and change over time.
- Facilitates planning and permitting efforts
- GIS analysis makes it easier to see the "Big Picture"
- GIS leverages specialized local knowledge and scientific research



# Geographic Information Systems

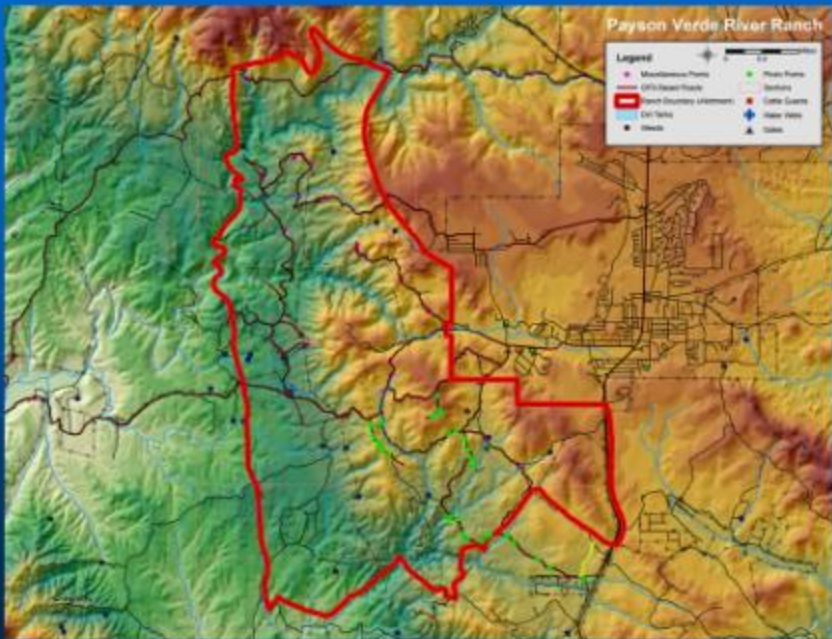


- A GIS is a system of hardware and software used for storage, retrieval, mapping, and analysis of geographic data.
- Spatial features are stored in a coordinate system that references specific geographic locations on the earth.
- Descriptive attributes in tabular form are associated with spatial features.
- Spatial data and associated attributes in the same coordinate system can then be layered together for mapping, query and analysis.
- Spatial relationships among features are defined via topology.

# Payson Verde River Ranch

## Legend

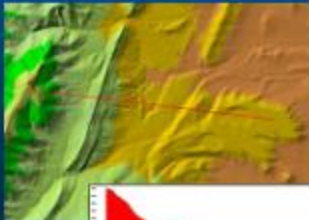
- Municipalities
- City/County Roads
- Ranch Boundary (Lithium)
- City Limits
- City/Town
- Water Points
- Water Pans
- Streams
- Contour Lines
- Water Wells
- Streams
- Streams





# Advantages of GIS

- GIS Places powerful tools for mapping, analysis and evaluation directly in the hands of decision-makers and managers.
- GIS provides an efficient interface for harvesting a broad spectrum of spatial and attribute data from both public and private sources to address real-world environmental issues.
- GIS allows us to ask *spatial* questions



# Spatial Questions

- >What is the percent groundcover?
- >Where do we see signs of range improvement?
- >Where have the goats grazed recently?
- >Where are the greatest erosion problems?

## About Clip

This operation uses a clip layer like a cookie cutter on your input layer. The input layer's attributes are not altered.



## About Dissolve

This operation aggregates features that have the same value for an attribute that you specify.



## About Intersect

This operation cuts an input layer with the features from an overlay layer to produce an output layer with features that have attribute data from both layers.



## About Buffers

Buffers are rings drawn around features at a specified distance from the features.



## About Union

This operation combines features of an input layer with the polygons from an overlay layer to produce an output layer that contains the attributes and full extent of both layers.



# Creating Tools With ModelBuilder

Waterbody & Riparian Zones

ColoursW  
waterbody

Feature to  
Raster (E)

Water1

Feature to  
Raster (E)

Water2

Single Output  
Map Algebra

Waterbody Zones

WaterZone1

Roadway Zones

Streets  
v

Feature to  
Raster (E)

Road1

Feature to  
Raster (E)

Road2

single  
output  
map  
algebra

Urban Zones

Urban  
v

Feature to  
Raster

Urban1

Feature to  
Raster

Urban2

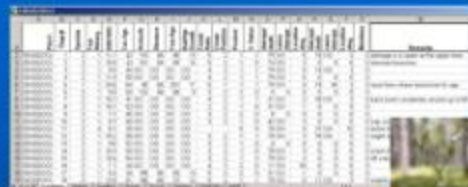
Final Waterbody Forested Zones

waterZone

- A model in ArcGIS is a tool defining a spatial model or geoprocessing work flow.
- Models are created with a visual graphing tool called ModelBuilder.
- Models are easy to make and share.



➤ Tracking ranch management practices over time.



The screenshot shows a software interface with a grid of data fields. The fields are organized into columns and rows, with some cells containing text and others containing numerical values. A small photo of a forest is visible in the bottom right corner of the interface.



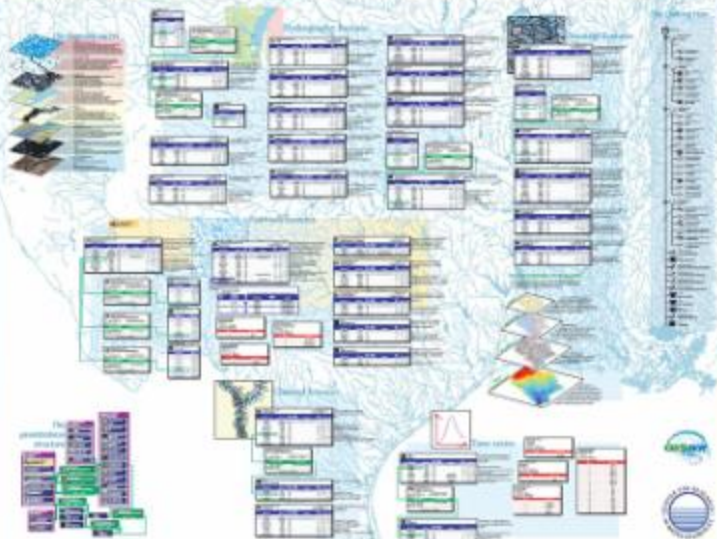
➤ Integrating a variety of attribute and spatial information such as log sheets, photos, animal information, weather.

➤ Providing practical tools for calculating acreage (paddocks) and length (# rolls electric fence)

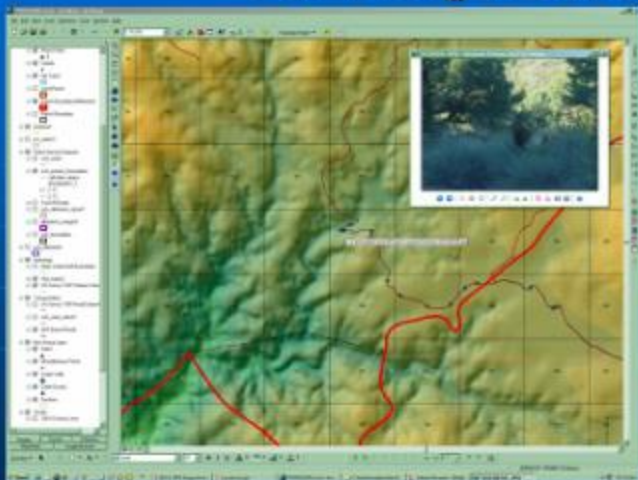
➤ Sampling and delineating areas



# THE ARC GIS HYDRO DATA MODEL

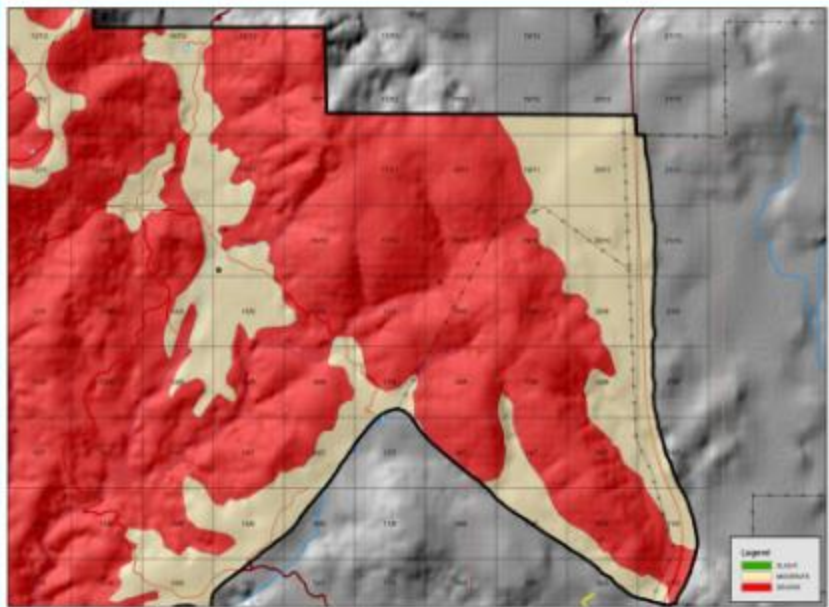


# Building a GIS



- GPS
- Onscreen Digitizing
- Manipulation of Existing Datasets
- Satellite and Aerial Photography
- Local Parcel Data
- Free Base Data
- Online Interactive Maps
- USGS, USFS, BLM





Payson Verde River Ranch TES Erosion Analysis

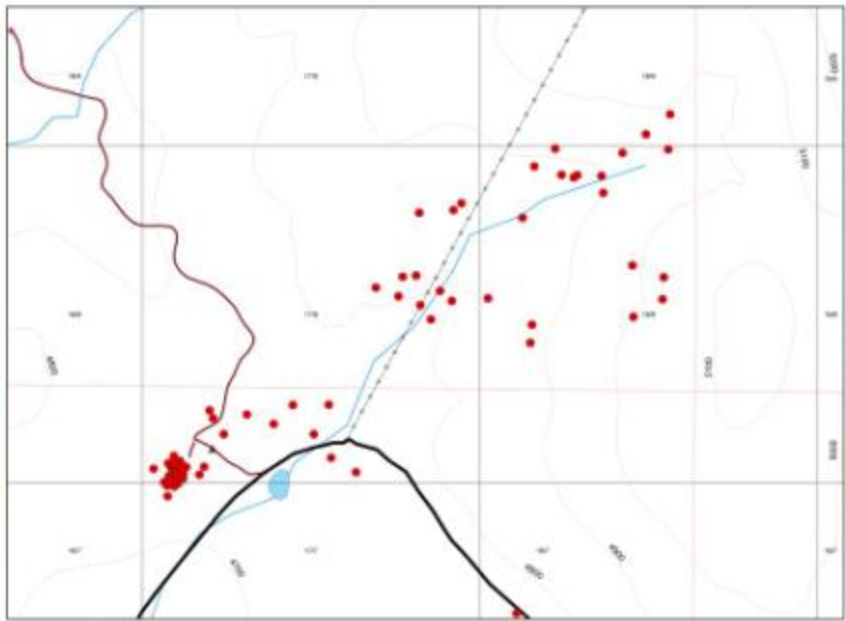












Payson Verde River Ranch: A Goat's Day

0 50 100 Feet





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