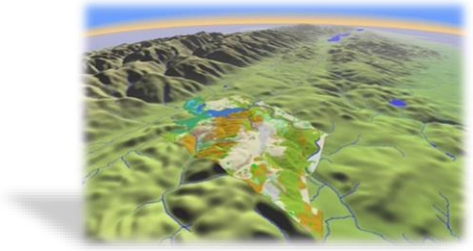
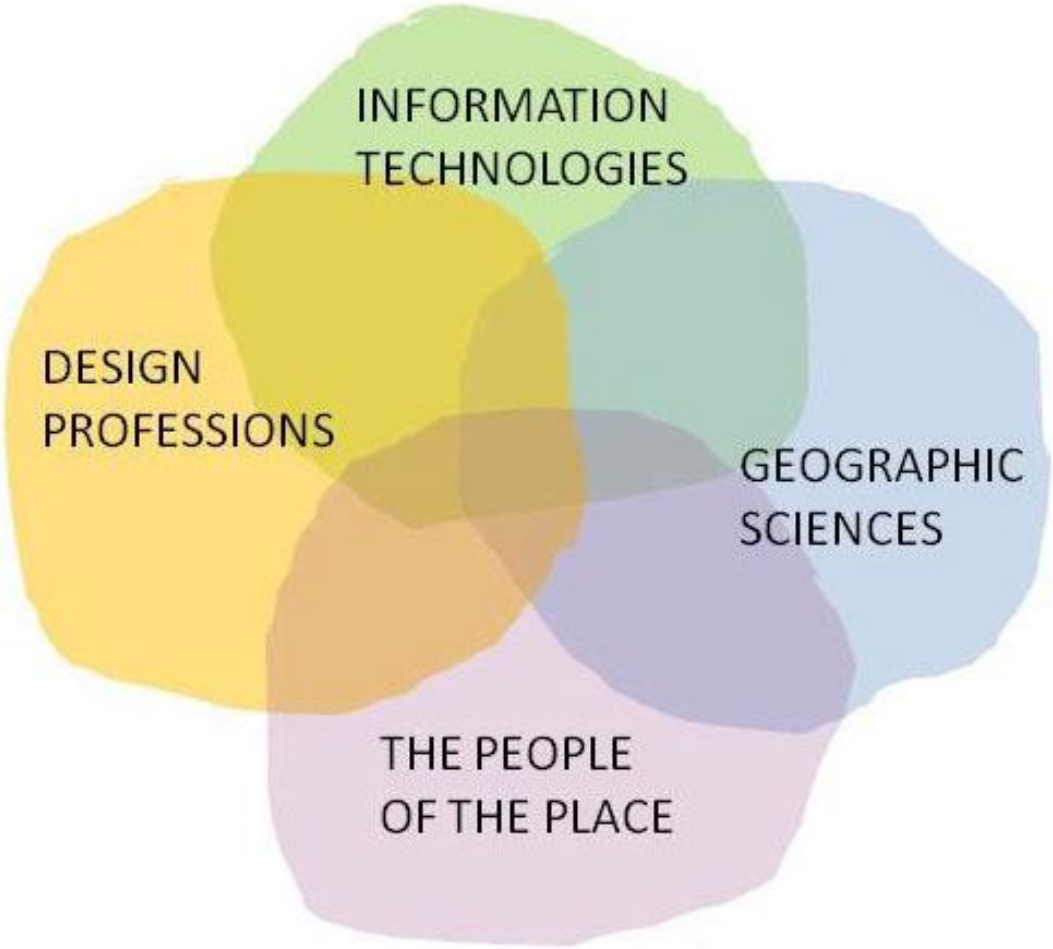
NICHOLAS SCHOOL OF THE ENVIRONMENT AND EARTH SCIENCES
DUKE UNIVERSITY



ENVIRON 761: Section 4

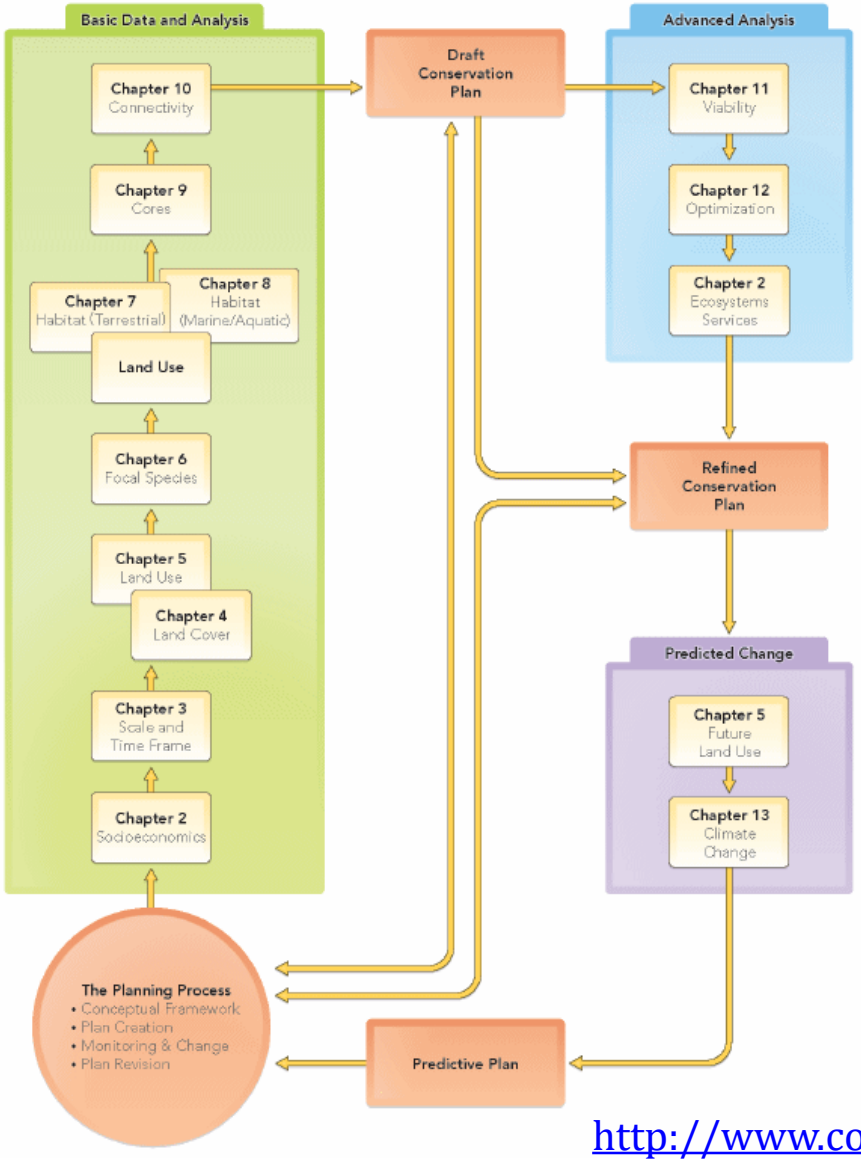
Landscape Assessment

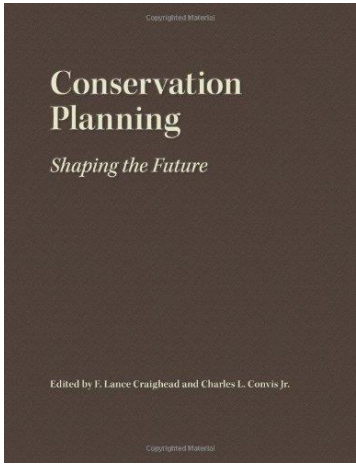
“Geodesign”



http://www.esri.com/products/arcgis-capabilities/geodesign/overview

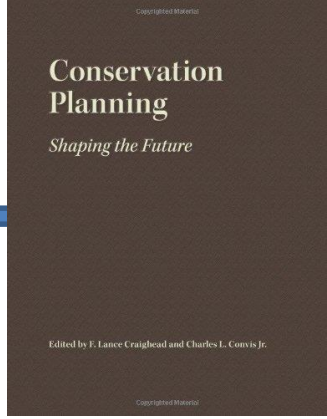
Conservation planning





http://www.conservationgis.org/publications/consplanningbook.html

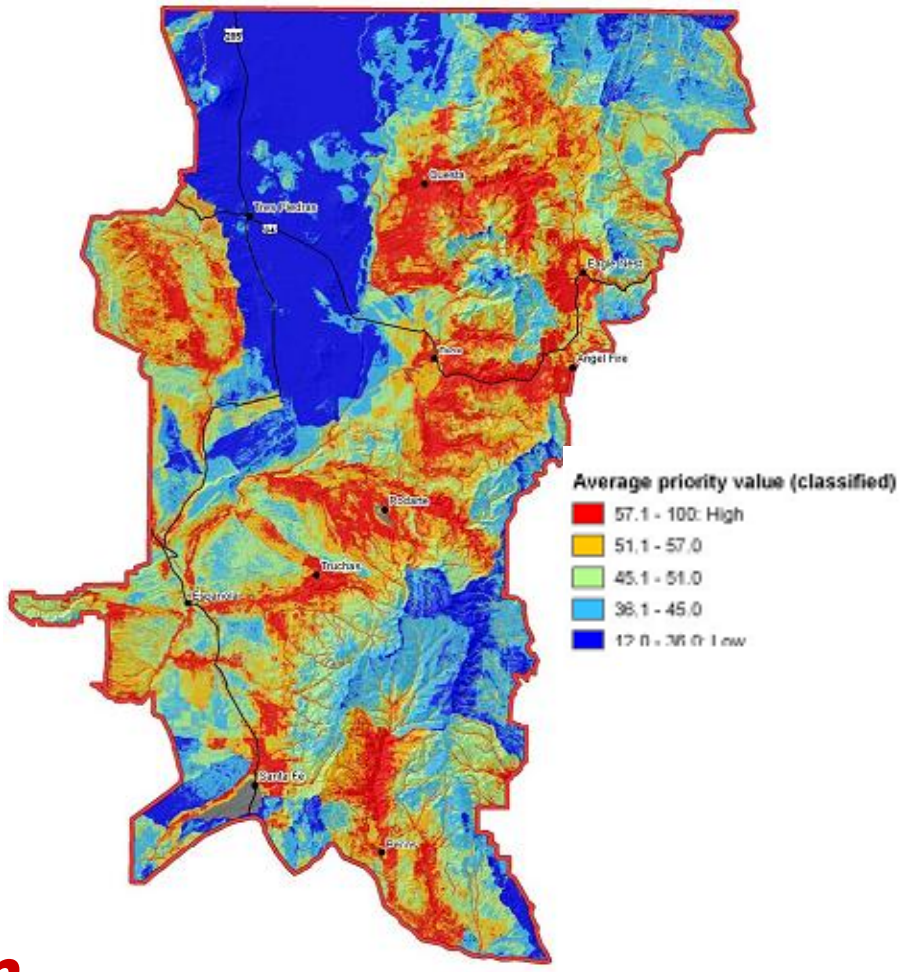
Conservation Planning *(Craighead)*



- Think like a grizzly bear. (modeling ecology and behavior)
- How big is your world? (scale and conservation planning)
- Get the lay of the land. (land cover: the foundation for planning)
- Which animals represent the landscape? (focal species)
- Where is the best habitat on land (& in water)? (habitat analysis)
- Where are the best blocks of good habitat? (mapping habitat cores)
- Getting there from here. (corridor mapping/connectivity)
- How much is enough? (population viability/metapopulation analysis)
- What is the best of the best? (optimization, prioritization)
- Valuation of natural landscapes (biodiversity & ecosystem services)
- Changing landscapes (land use projections – development/climate)

ENV 761 -- Landscape Assessment

Q: How do we select portions of a species habitat to protect when we simply can't protect it all?

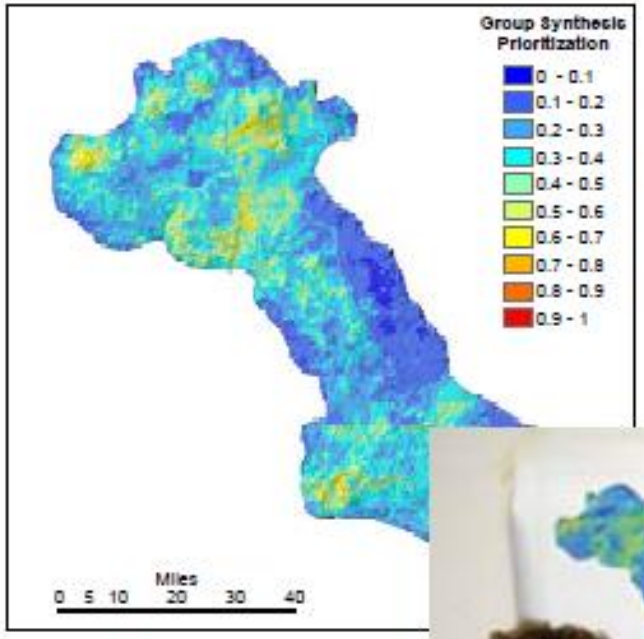


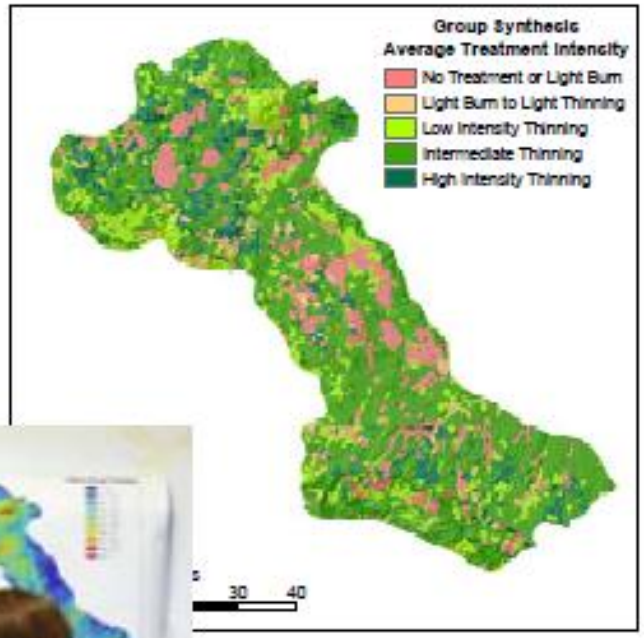
A: Landscape prioritization…

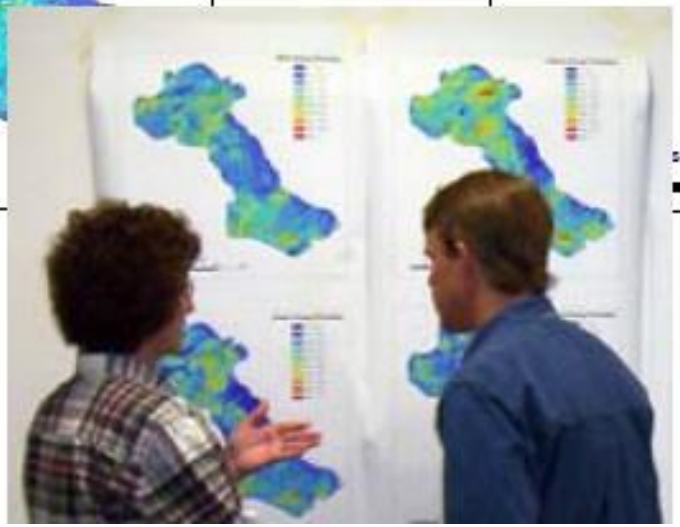
Map created by ForestERA 1 April 2007, based on data developed October 2006, for the North-Central New Mexico Landscape Assessment.

Landscape Assessment

Western Mogollon Plateau Adaptive Landscape Assessment (WMPALA) Report







WMPALA_FinalReport_Vol2.pdf

Pronghorn Antelope Distribution Model

ForestERA

Forest Ecosystem Restoration Analysis

Landscape-scale solutions for forest ecosystem restoration in the American Southwest

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home > data and maps > derived data > pronghorn habitat suitability

Data and Maps
Overview
Foundational
Derived
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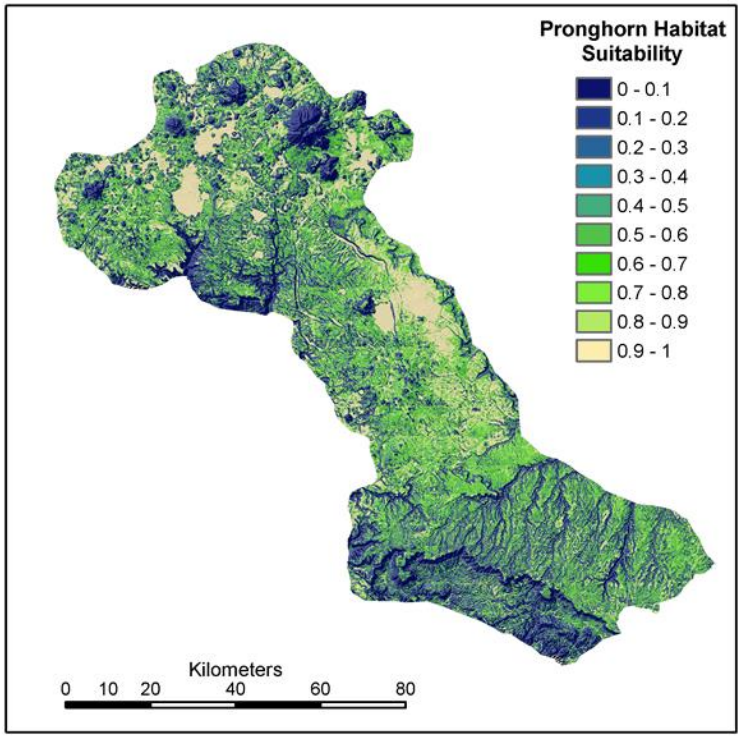
Unavailable
Downloads
Glossary

ForestERA Data Layer Overview - Pronghorn Habitat Suitability



http://www.forestera.nau.edu/WestMogPlateauLandscapeAssmt_AZ.html

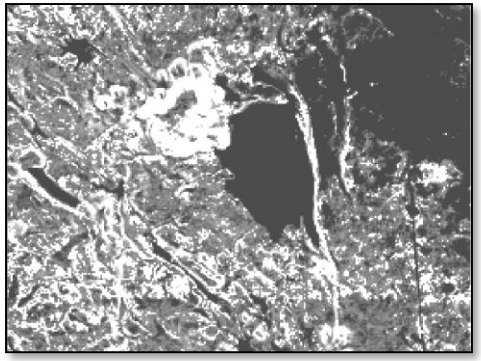
Habitat and *Habitat Patch* maps

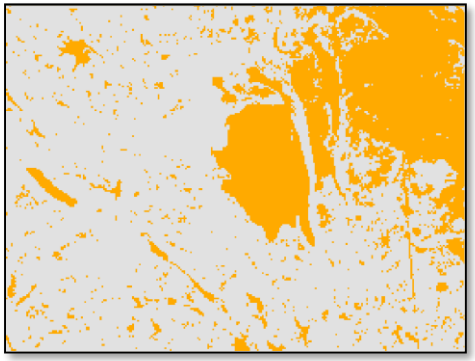
Pronghorn distribution model → Pronghorn habitat map → Pronghorn habitat-patch map

Continuous:
Pronghorn habitat suitability (0.0-1.0)

Binary:
Separates pixels into suitable and non-suitable classes

Nominal:
Clusters of connected habitat cells are grouped and given a unique ID





Patch attributes

- Patch size, shape, and distribution
  - Area, compactness, core:area ratio
- Patch corridors and connectivity
  - Least cost paths; corridors; and effective proximity
- Patch sensitivity and proximity to threats/stresses
  - Mapping threat density and magnitude

COURSE PROJECTS

Hog Farm Analysis: *Objective*

Create a table of attributes for each hog farm complex that helps decide which would be the best for installing digesters.

- Environmental impacts (streams & estuaries)
- Health/social justice impacts (odor, air)
- Power source potential

Hog Farm Analysis: Task 1

- Read documents on W:/761_docs/HogFarms
  - Supplement with web search…

- Prepare for discussion on:
  - Indicators of health | environmental | power
  - Geospatial datasets relevant for above
  - Geospatial analyses for above

Solar Farm Analysis: *Objective*

- What are the potential ecological impacts of solar farm installations in southeastern NC
  - Fragmentation of natural landscape
  - Connectivity between habitat refuges
  - Other impacts?

- Compare landscape before current blitz to now
- Impacts of permitted solar farms
- Likely locations (and impacts) of future farms?

Solar Farm Analysis: *Task 1*

- Read materials on W:/761_docs/SolarFarms
  - Supplement with web search…

- Prepare for discussion on:
  - What specific ecological impacts might solar have
  - What data sets would be useful
  - What geospatial analyses would be useful

Date	Topic	Lecture	Lab Topic
9-Jan	**Course Introduction**	Course Introduction	Lab introduction/Best practices
14-Jan	**Project Based GIS**	Intro/Geospatial Data I	SL 1: Using ArcGIS Online
		Geospatial Data II	P1: Pipeline Assessment
21-Jan		*MLK Day*	*no class*
		Guest: Liz Kailes	
28-Jan		Communicating results	
	Ecohydrology/Terrain Analysis	Ecohydrology	P2: Sierra Costera Site Assessment
4-Feb		Terrain analysis	
		Riparian analysis	
11-Feb		NC Hog Farms (Vujic)	
	Habitat Modeling	Habitat modeling approaches	P3: Salamander habitat model
18-Feb		GeoWET habitat tool	
		GJAM (A. Schwantes)	
25-Feb		Model evaluation	
		Machine learning (K. Bradbury)	
4-Mar	**Landscape analysis**	Habitat patches & patch geometry	SL: Patch geometry (March 19)
		Wildife Road Xings (R. Sutherland)	
11-Mar		*Spring break*	*no class*
		Spring break	*no class*
18-Mar		Patch corridors & connectivity	SL: Patch connectivity(March 25)
		Course project discussion	
25-Mar		Patch sensitivities/stresses	SL: Patch threats (April 1)
		Fuzzy Analysis	*Project Check-ins*
1-Apr	**Conservation planning**	Computing biodiversity	SL: Biodiversity (April 8)
		Prioritization & MARXAN	SL: Prioritization
8-Apr		Monitoring & Change detection	SL: Monitoring & change (April 15)
		Google Earth Engine	
15-Apr	**Misc Topics**	Network models	SL: Duke forest network analysis
		Course Recap	