### Assessment of Ecosystem Service Supply and Landowner Priorities and Their Implications for Program Delivery

Establishing a Model for Targeting Landowner Engagement





Sara Mason, Nicholas Institute for Environmental Policy Solutions

Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative (GCPO LCC)



#### 5 functional roles:

- Offer a **landscape perspective** for conservation activities
- Develop linkages across existing conservation partnerships
- Help incorporate future change into conservation
  planning
- Help conservation partners define and design sustainable landscapes
- Monitor effectiveness of conservation programs

### Three Interrelated pieces



1. A **survey of landowners** to identify what services are important to them and how willing they are to participate in conservation or restoration activities;



2. A **social network analysis** to understand how best to engage private landowners across the region; and



**3**. Coarse resolution **maps** of the provision and, where possible, demand for **ecosystem services** in the region

# Landowner Survey

#### Assessed:

- Amount of land owned
- Reasons for owning land
- Landowner concerns
- Landowner engagement with conservation groups
- Willingness to accept payments for conservation practices





The information collected in this survey will be used for the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative as they work with local organizations to develop conservation plans and programs for the region that will more effectively meet the needs of landowners.







Map projection USA Contiguous Albers Equal Area Conic USGS version

not at all concerned moderately concerned slightly concerned extremely concerned

Survey Outputs







# Social Network Analysis

- Which community agencies or groups are most (and least) central in the network?
- 2) Which groups of organizations within the network currently have strong working relationships?





# Ecosystem Service Mapping Motivations



- Give the GCPO LCC managers an idea of where services are provided and how they vary
- •Determine if this type of project could be done using **only publicly available data**



# Ecosystem service data assessment and mapping



### Services we were able to map...

Service	Description	Data Source	Scale
Food Provision	Crop sales per acre of cropland	USDA Cropland Data Layer (CDL)	County
Pollination	Areas that support pollinators within range of crops that need them	National Land Cover Dataset (NLCD); CDL	HUC 12
Forest C Sequestration	Carbon stored in existing forests	USDA FS Forest Inventory Analysis (FIA) database	County
	Potential additional carbon storage on private lands	FIA	County
Timber Production	Merchantable timber extractions	FIA	County
Biodiversity	Vertebrate species richness	EPA EnviroAtlas (GAP project data)	HUC 12
	Rare species richness	EnviroAtlas (nature serve data)	HUC 12
	T/E species' critical habitats	USFWS	n/a
Recreational Birding	Important Bird Areas Ebird user areas	Bird Life International/ National Audubon Society eBird (Cornell lab of ornithology)	n/a HUC 12
Recreational Hunting	Waterfowl harvests	USFWS Harvest Branch	County
Water Filtration (proxy for water quality improvement)	Length of natural habitat in the hydrological flow path between non-point sources of pollution and waterways	NLCD; DEM	HUC 12
Infiltration Capacity (proxy for flood	Length of natural habitat in the flow path between impervious surfaces and		

mitigation potential) waterways NLCD; DEM HUC 12





### Conservation vs. Restoration

For most services we highlighted the areas most important for conservation and restoration



Areas with:

-large area of pollinator benefitted crops -large probability of pollinator visitation

#### Pollinators: Restoration



#### Areas with: -large area of pollinator benefitted crops -small probability of pollinator visitation

#### Combining data layers to answer management questions



Where carbon storage is already valued by landowners, should managers target conservation or restoration? What are the associated co-benefits?

Survey question: How important to you is carbon storage? (1 = Not a priority, 5 = Essential)

#### Transferrable Costs



Personnel	Time	Cost
GIS Analyst	1.5 months (full time)	\$6000
Supervisor	15 hours (advising, editing)	\$800
	Total	\$6800

#### Transferrable Costs



Personnel	Time	Cost
GIS Analyst	1.5 months (full time)	\$6000
Supervisor	15 hours (advising, editing)	\$800
	Total	\$6800
Additional cost of landowner survey		
2,000 respondents		\$23,750
6,000 respondents		\$40,000



# **Three Complimentary Parts**



sara.mason@duke.edu