Assessing Farmer Understanding of Agricultural Ecosystem Services

ACES 2012

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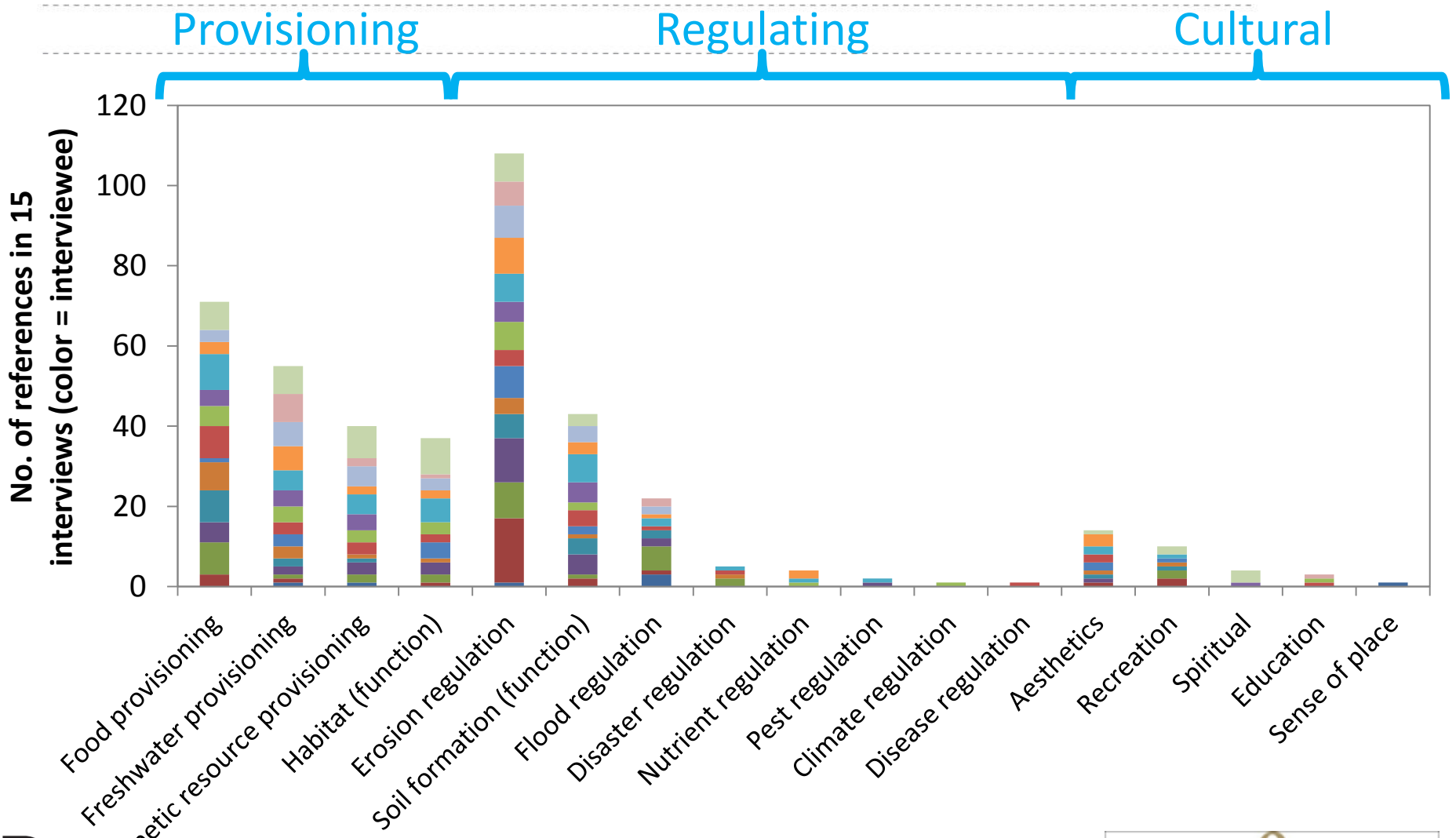
Background & Motivations

- Farmers and landowners are land management decision-makers
- The ecosystem services concept provides a comprehensive structure for identifying tradeoffs and making land management decisions
- Is there an opportunity for farmers and landowners to make land management decisions based upon ecosystem services?

Existing Literature

- Emphasis on agroecosystems restoration compared to natural system preservation *(Dale & Polasky, 2007; Benayas & Bullock, 2012)*
- Information on farmer decision-making for conservation practice adoption, but limited work on ecosystem services awareness, understanding or adoption in the U.S.
- Increasing number of publications integrating social science metrics into biophysical models to quantify impacts on ES *(Broch et al., 2012; Liu et al., 2012; Pfeifer et al., 2012; Poppenborg & Koeliner, 2013; Rutgers et al., 2012)*

Interviews: farmer knowledge of ES



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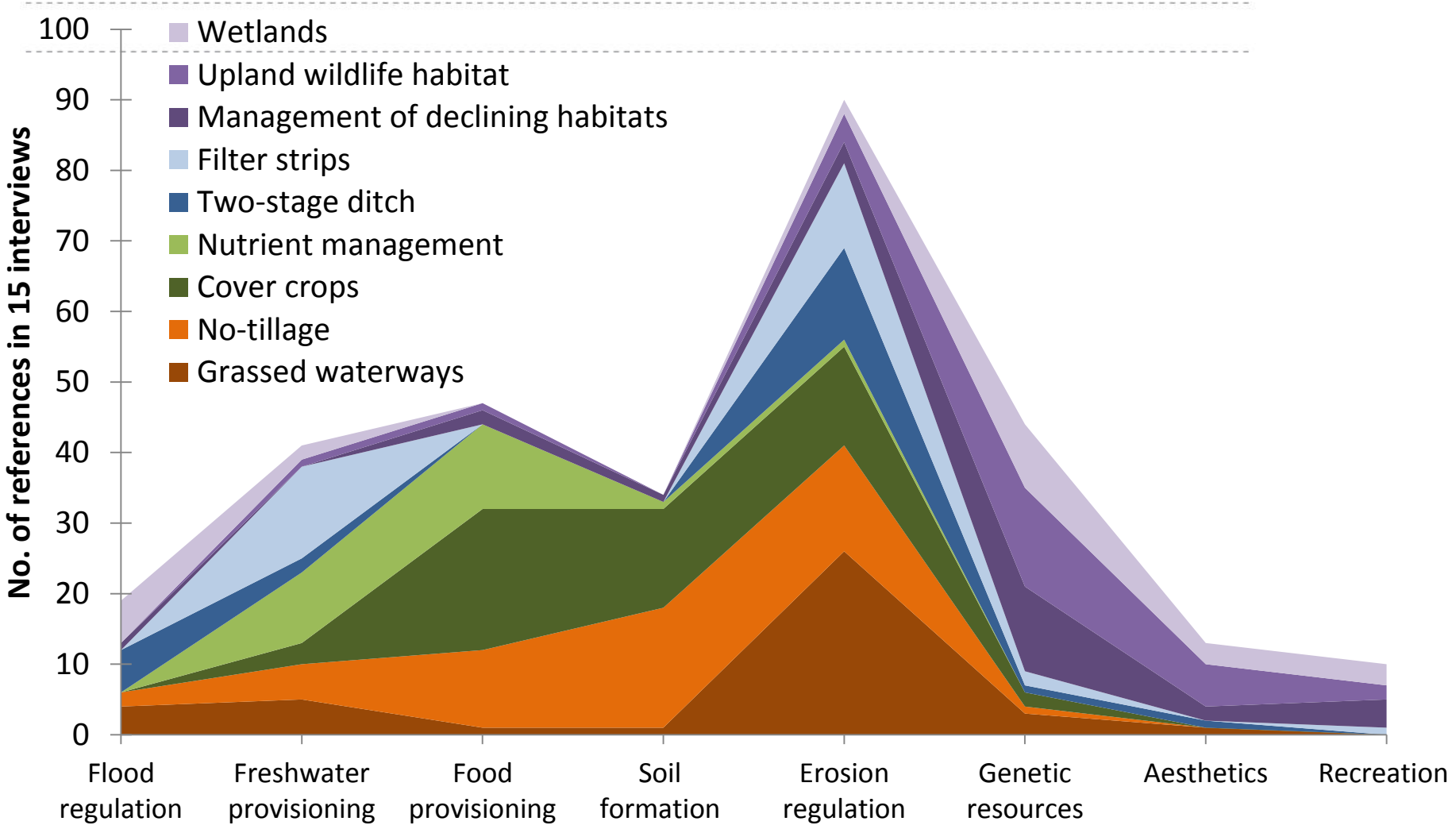
Interviews: ES by conservation practice



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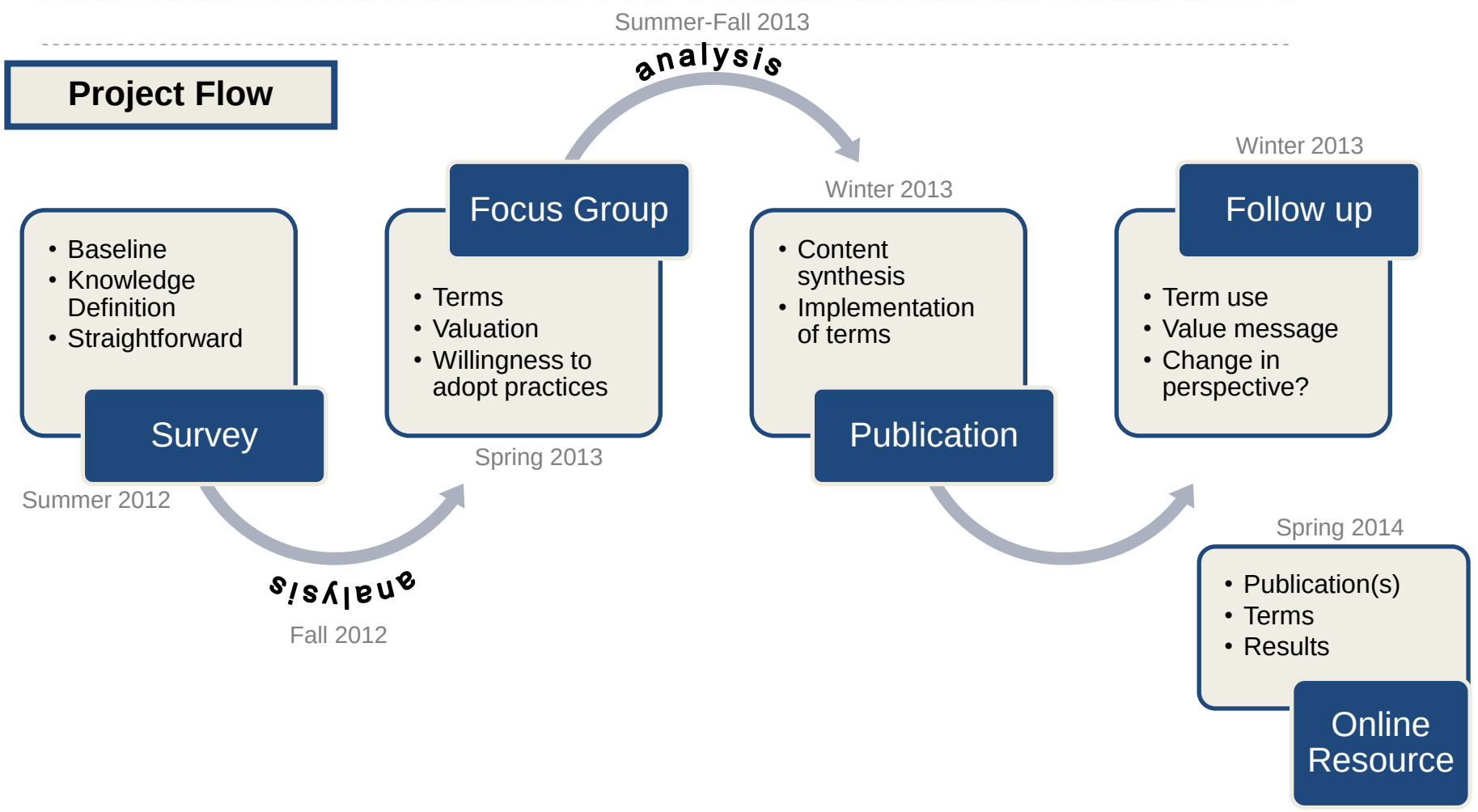
Purpose of Study

1. Evaluate Indiana agricultural producers' understanding of ecosystem services (i.e., assess their baseline knowledge).
2. Assess willingness to adopt practices that improve ES, if they had more information.
3. Identify appropriate language and methods to convey ES concept to farmers.

Questions

1. Are farmers familiar with the term "ecosystem services”?
2. Do farmers recognize the “benefits provided by ecosystems” regardless of whether or not they know the term?
3. Will farmers who have heard of ES be likely to adequately describe ES?
4. Will farmers will more often value provisioning services than regulating or cultural services?
5. Will the term “regulate” influence whether soil erosion (i.e., soil regulation) is perceived as a benefit?
6. Does land type influence who is most responsible for maintaining benefits?
7. Does a person’s work influence who they believe is most responsible for maintaining ecosystem benefits?
8. Will farmers who have participated in conservation programming be more likely have heard of ES?
9. Will farmers be open to implementing conservation practices if they knew or had more information on the benefits?
10. Best way to get information to Indiana farmers?

Methods



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Survey Design

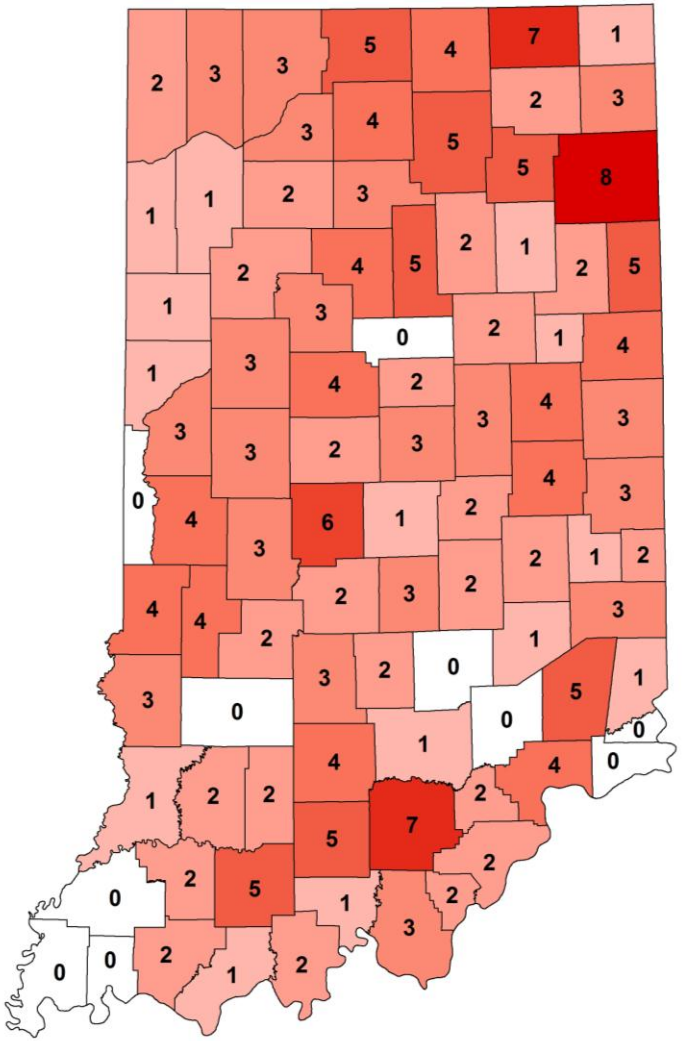
- Conducted exploratory work through 15 in-depth interviews with local farmers/landowners.
- Designed survey to assess farmer familiarity with “ecosystem services,” and perception and value of environmental benefits in the landscape and views on who is responsible to maintain benefits.
- Several rounds of survey revision based on feedback from experts in the academy, NASS, and local farmers.
- Pretested survey with small group of undergraduates with farm backgrounds.

Survey Methods

- Obtained names and addresses of Indiana farmers/landowners from farm USDA payment records via a Freedom of Information Act request (FOIA).
- Randomly sampled 1,000 among 85,216, selecting from each county in proportion to its number of farms.
- Sent hard copy surveys, 3 rounds with reminders (Dillman, 2000).

Survey Response

- 20.4% response rate (n=201, N=982)
- 82/92 Indiana counties represented in responses
- Survey type responses:
  - Indiana forests (61)
  - Indiana croplands (70)
  - Indiana reservoirs (69)



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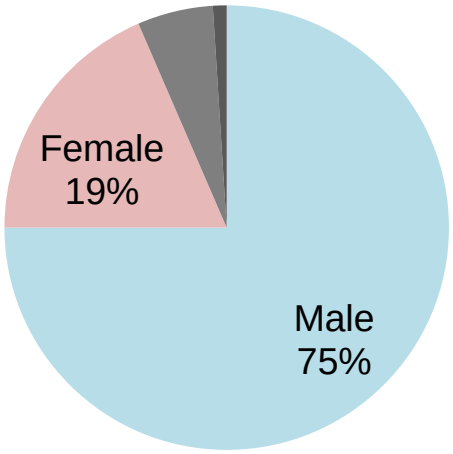
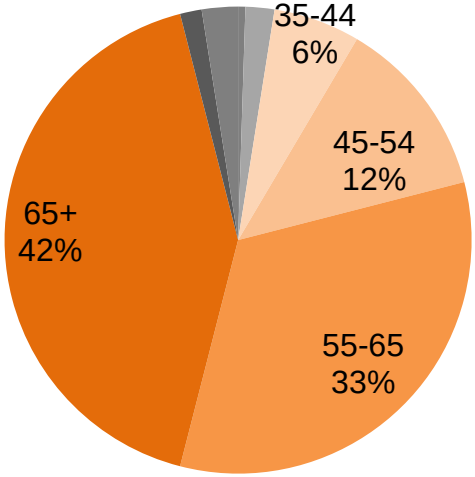
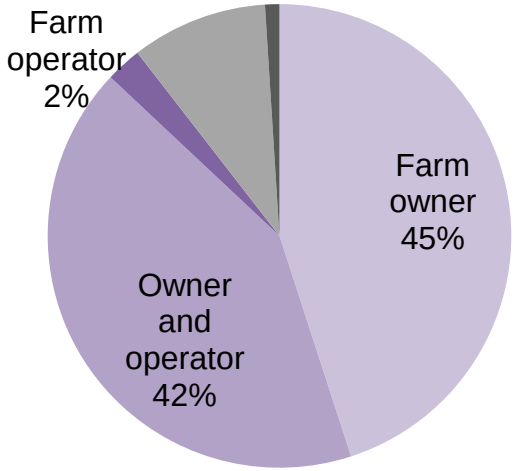
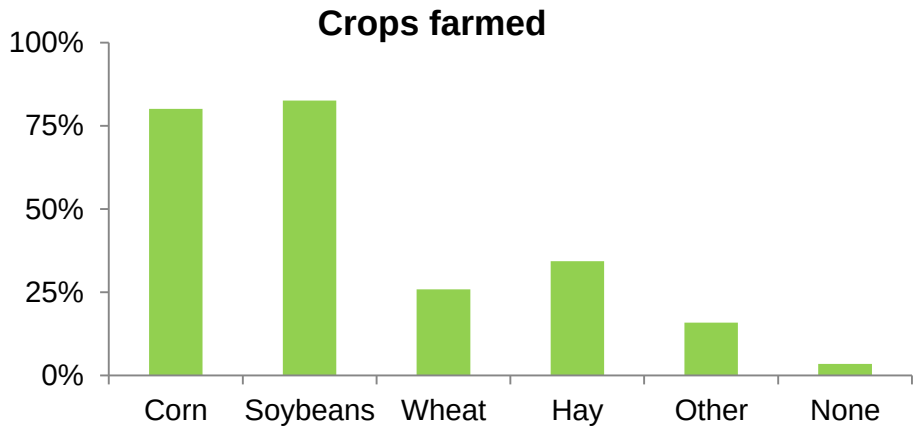
Sample Characteristics









	Min	Mean	Max
Conservation practices (no.)	0	2.8	7
Conservation programs (no.)	0	1.2	4
Acres farmed (acres)	0	405	3,000

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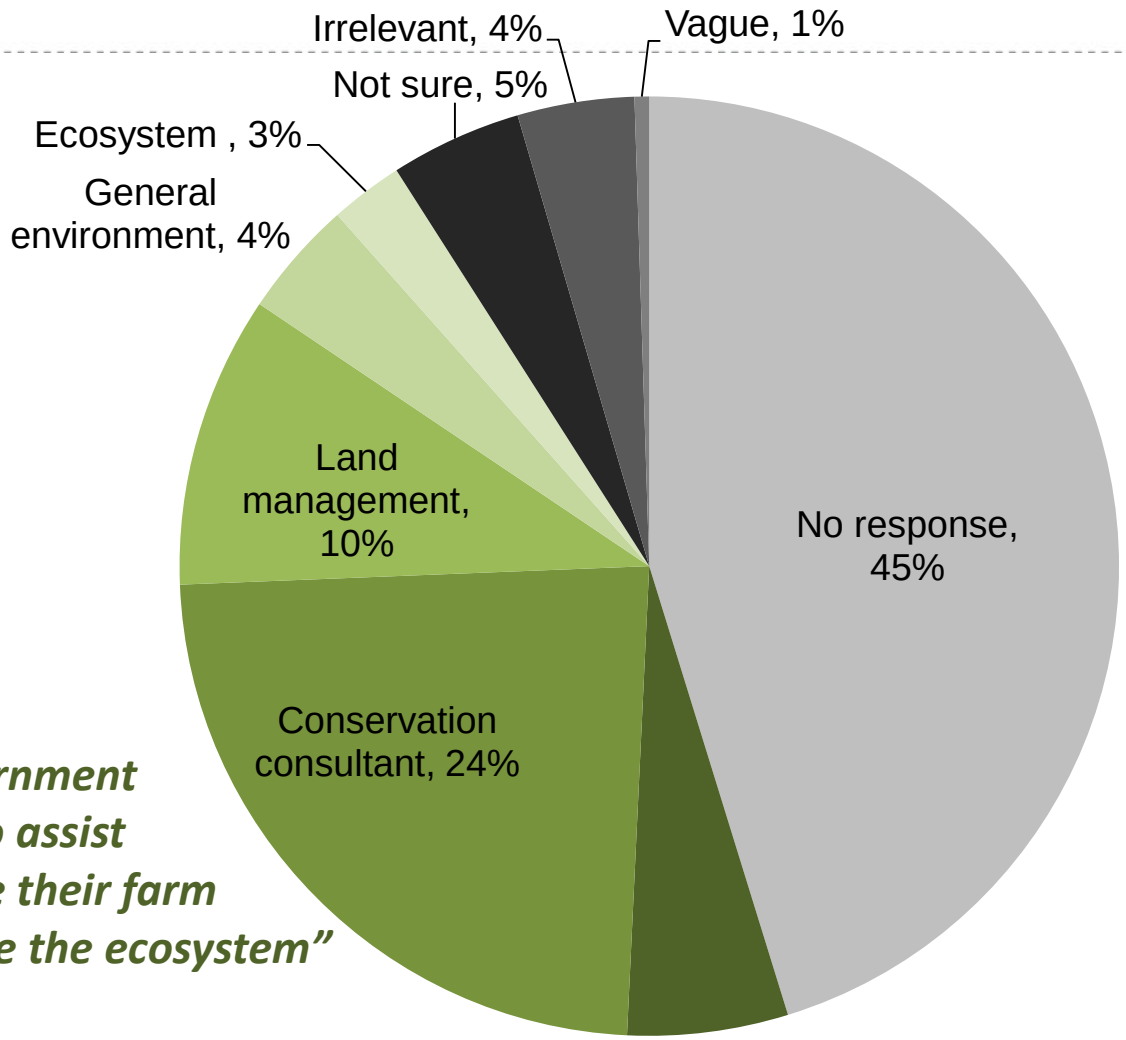
Survey Results

- Knowledge of the term ecosystem services:
  - 28% have heard of term
  - 72% were unfamiliar with the term

	Familiar with Term	Not Familiar with Term
Definition Right	6	5
Definition Wrong	24	65

Categories of ES definitions



"Help from a Government agency or Group to assist farmers to improve their farm and in turn improve the ecosystem"

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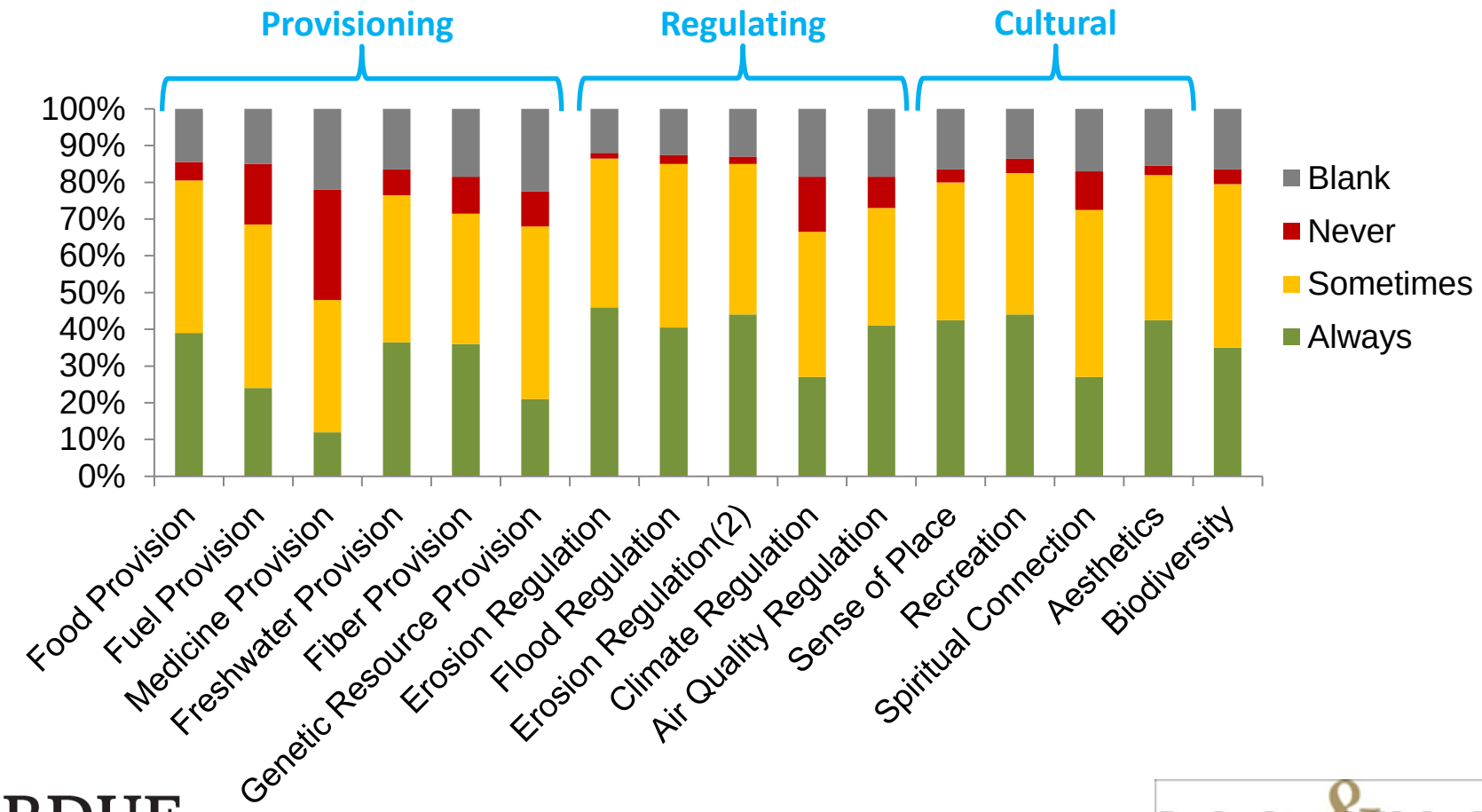
Recognized Ecosystem Services

Indiana



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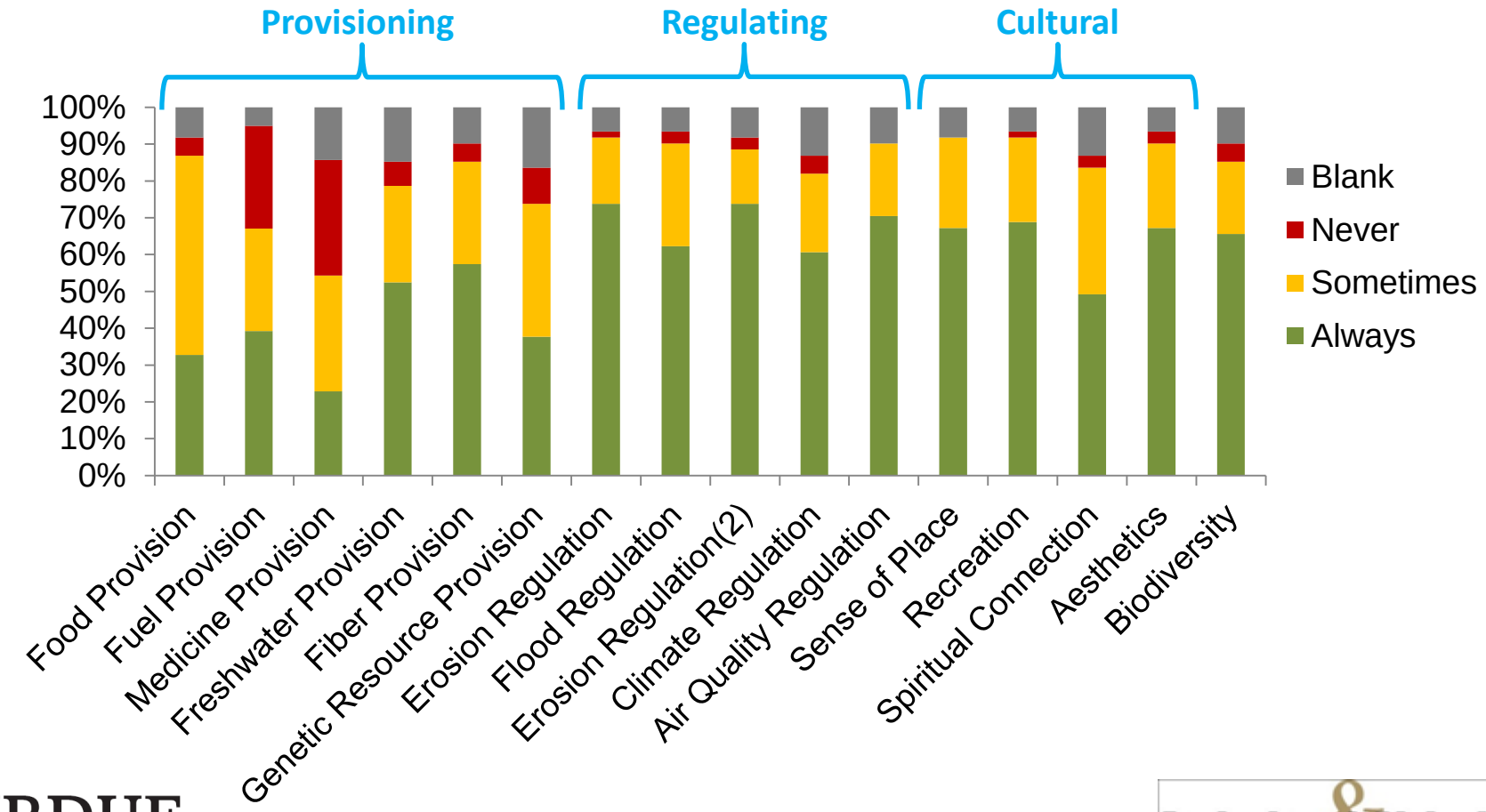
Recognized Ecosystem Services

Indiana forests



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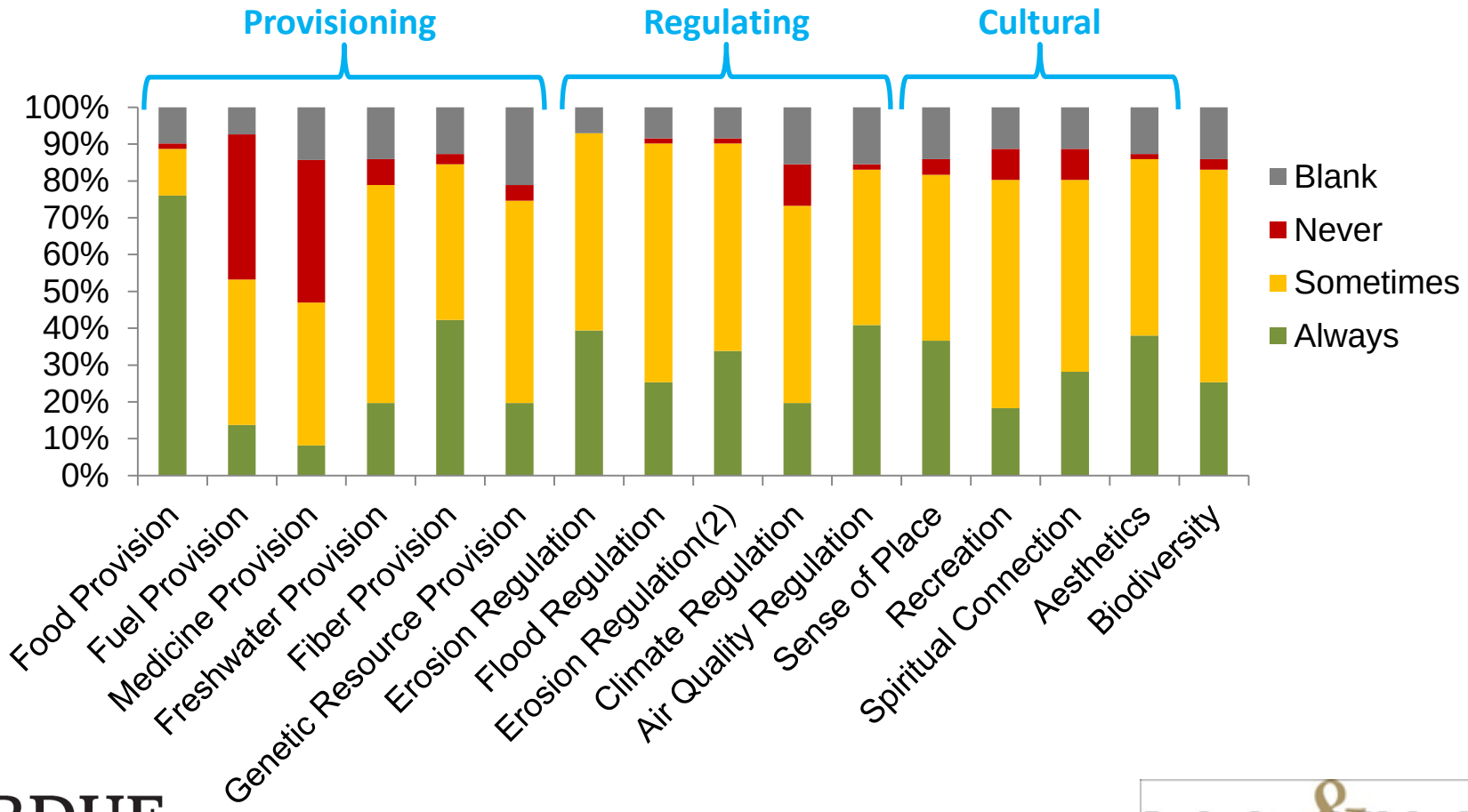
Recognized Ecosystem Services

Indiana croplands



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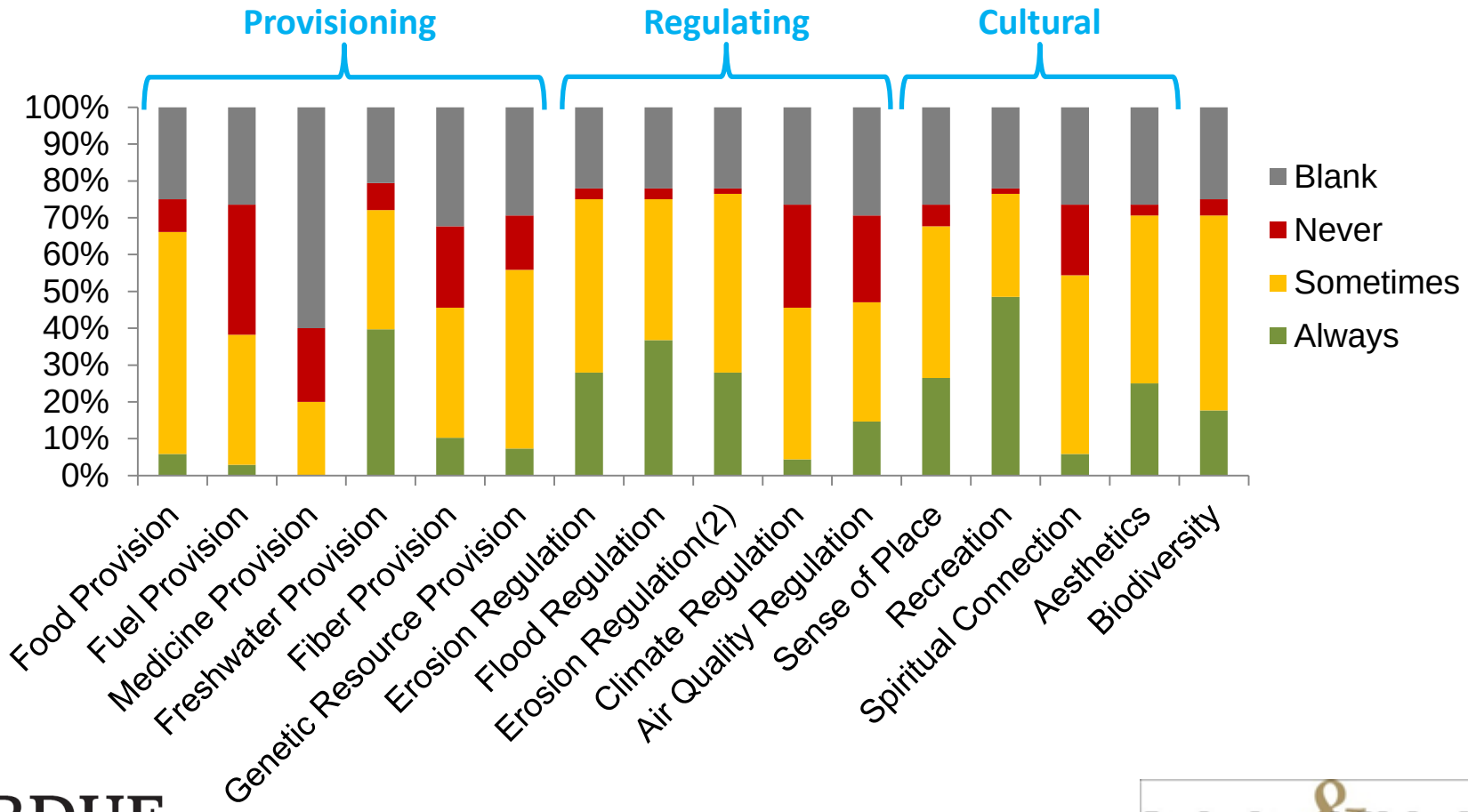
Recognized Ecosystem Services

Indiana reservoirs



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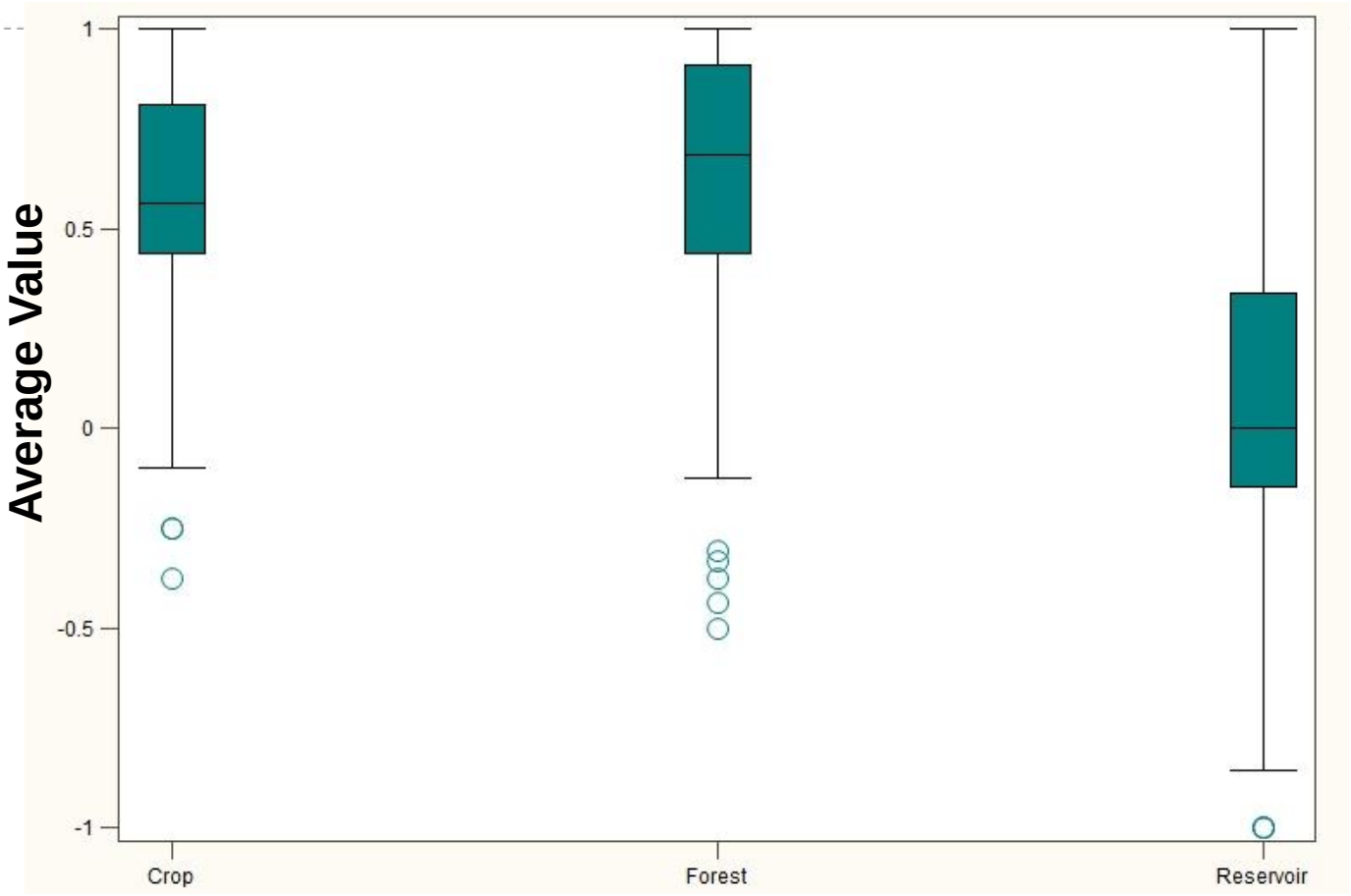
Valuation difference by land type



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Conservation-ness Influence on Valuation

	Significant Overall	By Survey Type		
		Crop	Forest	Reservoir
Total # conservation practices	No	No	No	No
Total # conservation programs	No	No	No	No
Self assessment of conservation-minded	No	No	Yes	No

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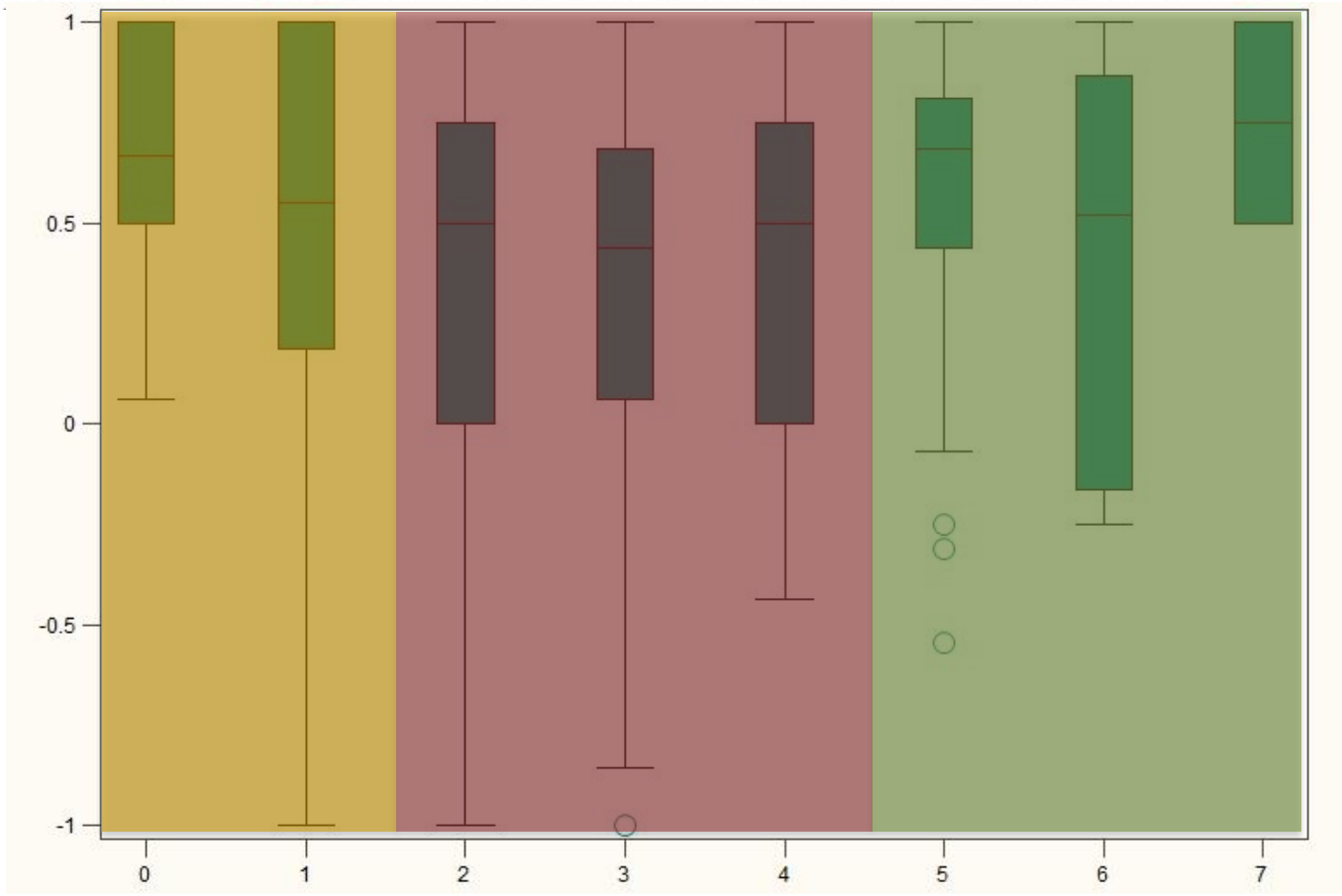
Conservation Practice Influence



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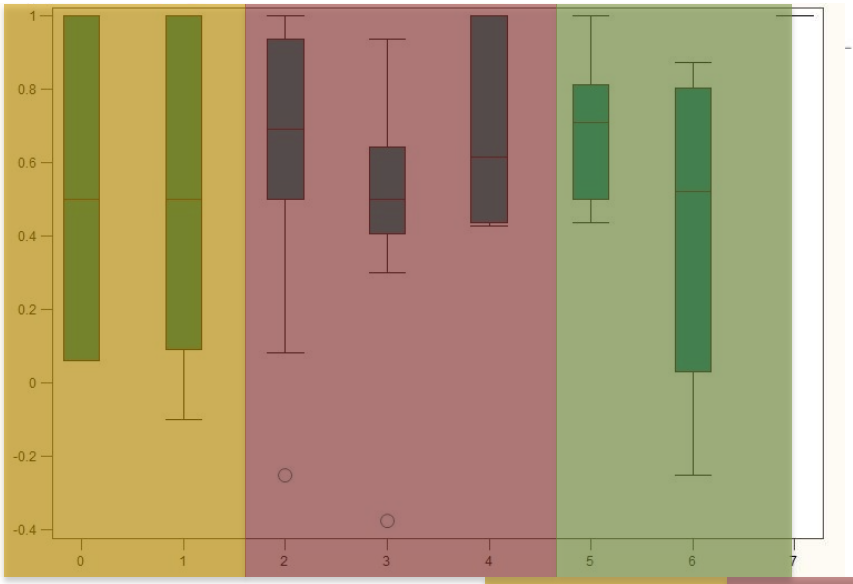
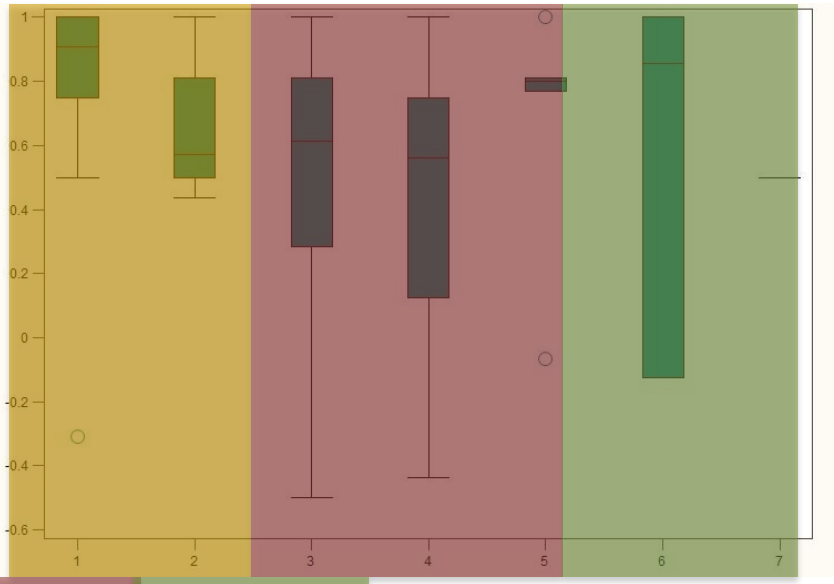
Conservation practice influence

Cropland



Forest



Reservoir

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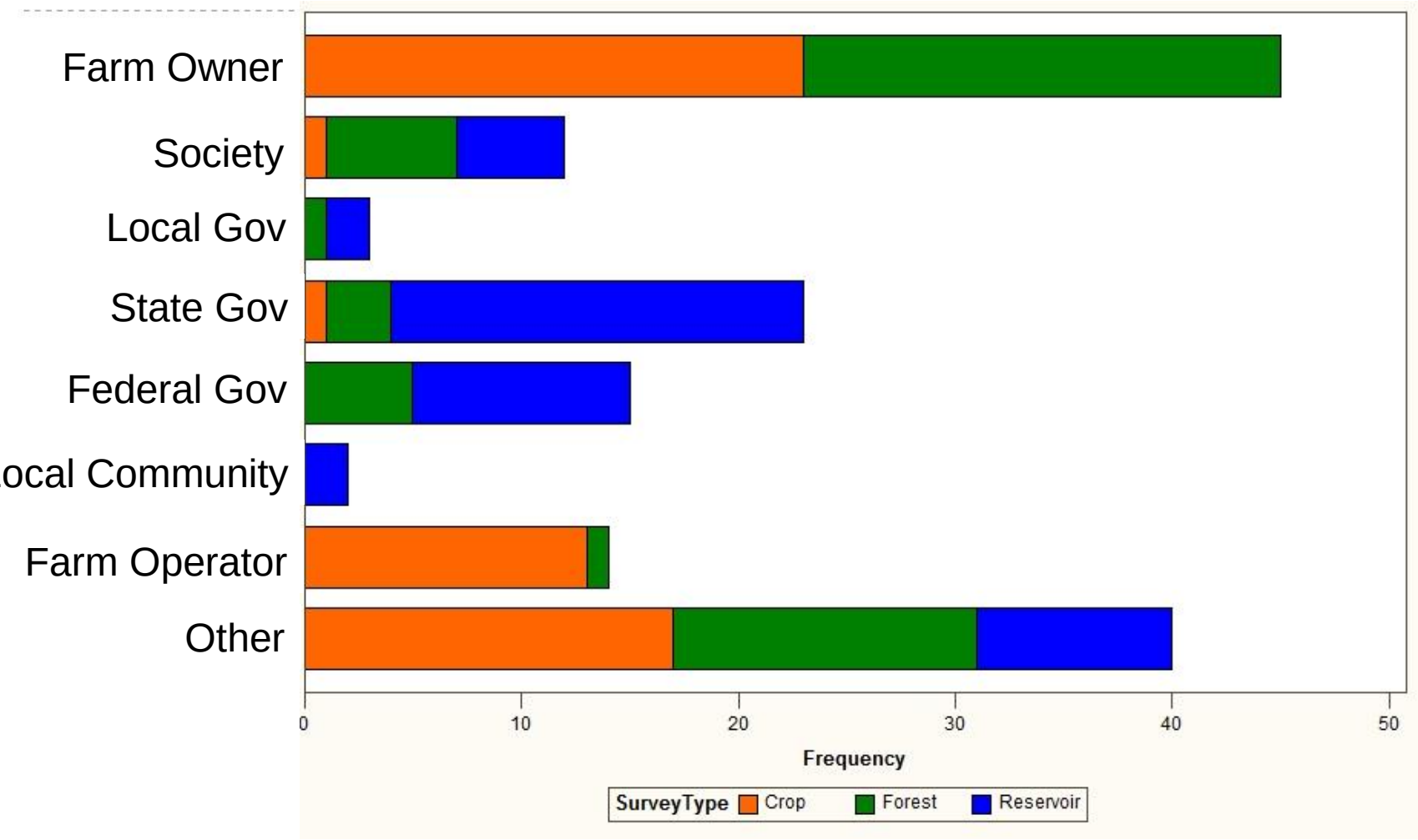
Most Responsible for Maintaining ES



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Regulate v. Reduce Erosion

Reduce Erosion	Regulate Erosion: Always Valuable	Regulate Erosion: Sometimes Valuable	Regulate Erosion: Never Valuable
Always Valuable	69	18	0
Sometimes Valuable	21	60	1
Never Valuable	0	2	2

- 65% chose same ‘level’ of value
- 20% chose to value, but at different level
- 1% chose one as valuable, one as not valuable
- 12% left both blank (i.e., didn’t answer, or didn’t choose it as a benefit)
- 2% left one blank and answered the other

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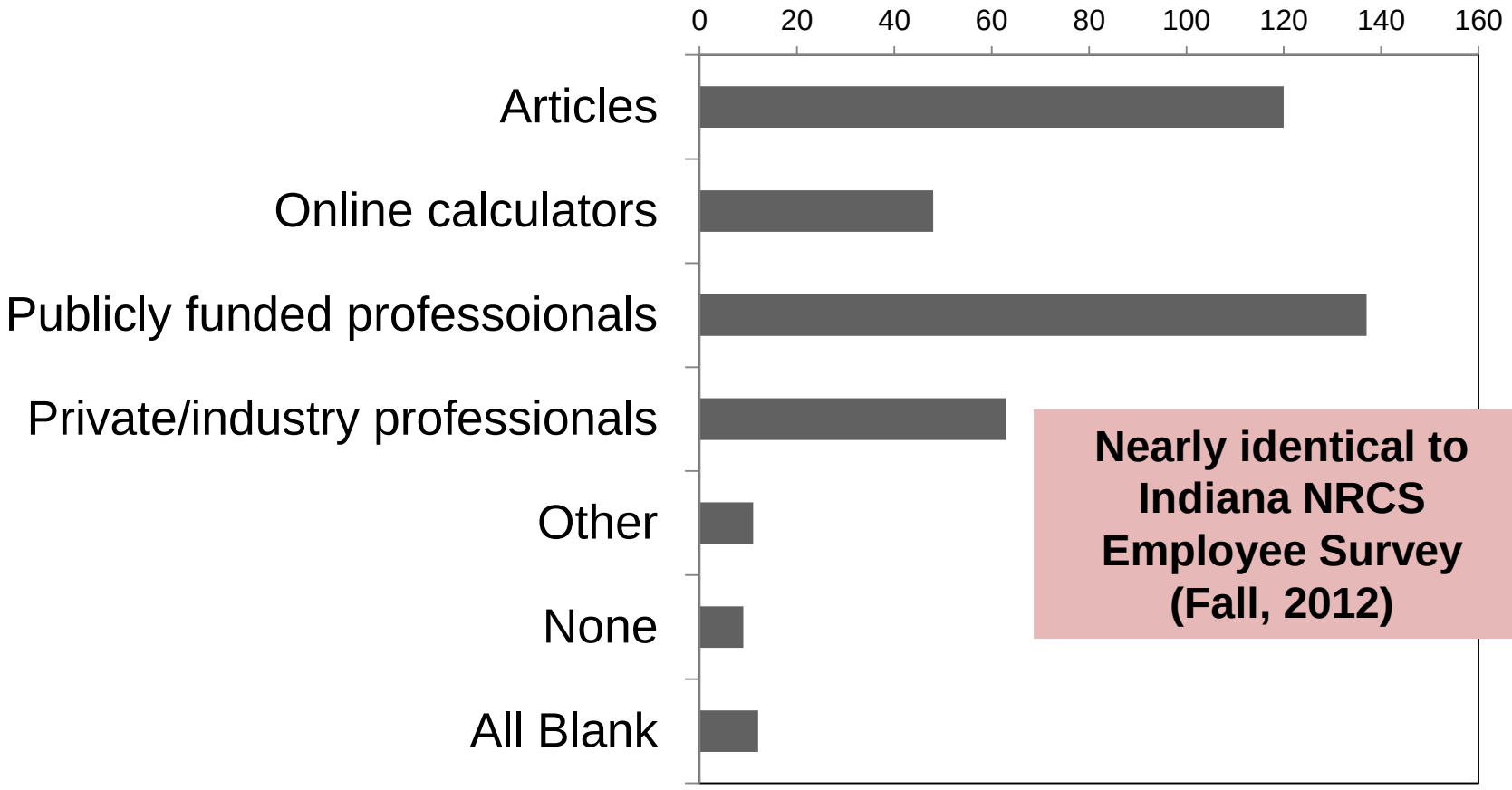
Best way to get information



Nearly identical to Indiana NRCS Employee Survey (Fall, 2012)

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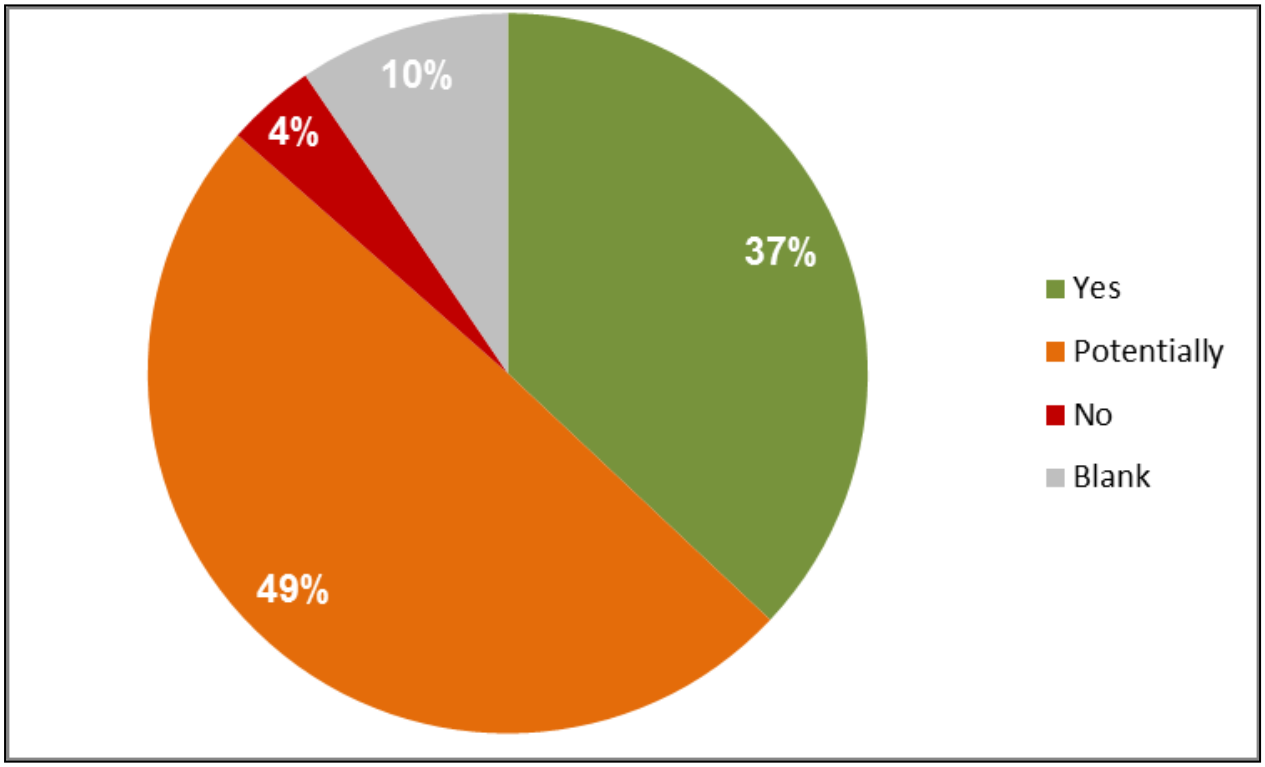
Willingness to Implement



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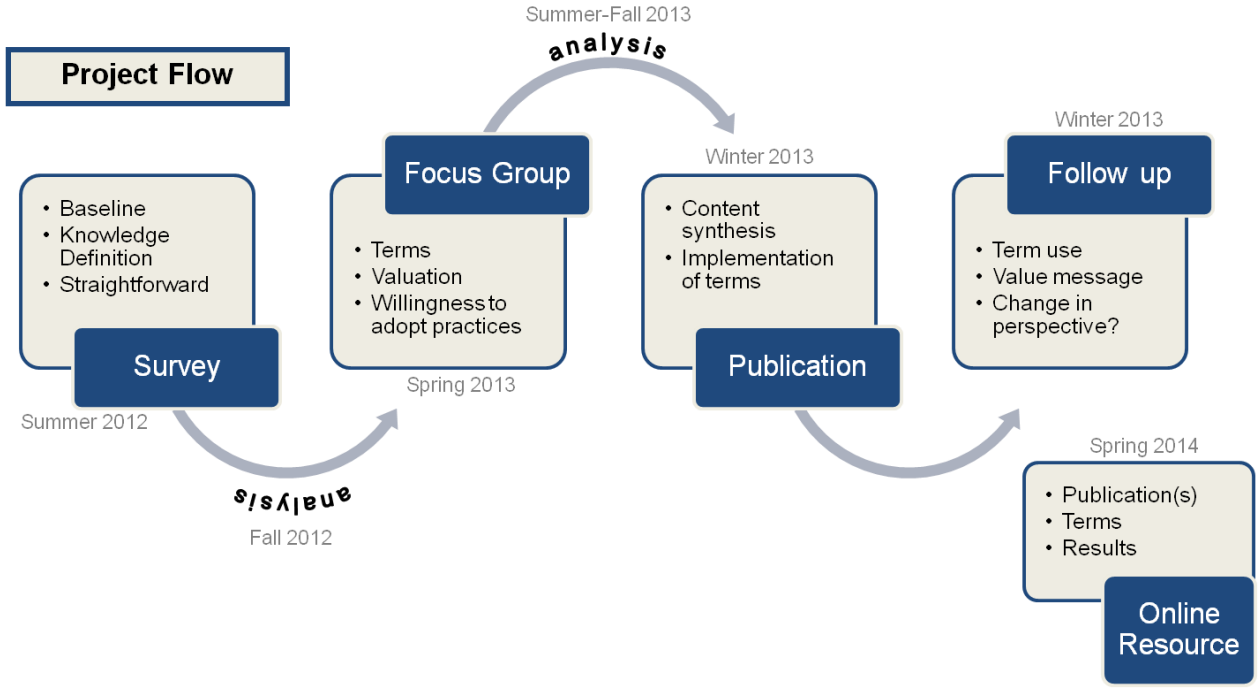
Future Work

- Focus Groups
- Publication
- Website



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Summary

- Farmers/landowners
  - generally not familiar with the term “ecosystem services.”
  - can identify ecosystem benefits in the landscape.
  - aware that different services come from different ecosystems (crops, forests, reservoirs).
- It appears that:
  - Involvement in conservation programming did not clearly influence their views of benefits and values to ES.
  - **Findings suggest an opportunity to engage farmers to influence land management for ES.**

References

- Dillman, D. A. (2000). Mail and Internet Surveys: The Tailored Design Method. New York: Wiley.

1. Do you know what an **"ecosystem"** is? ☐ Yes ☐ No
2. Have you heard of the term **"ecosystem services"**? ☐ Yes ☐ No
3. What would you guess that **"ecosystem services"** means?

   _____

   _____

   _____

4. Please check the conservation practices on your farm: (check all that apply)
   ☐ Riparian buffer ☐ Filter strips ☐ Wetland
   ☐ Grassed waterways ☐ Two-stage ditch ☐ No-till
   ☐ Nutrient management ☐ Cover Crops ☐ None
   ☐ Others _____

5. Please check all federal or state conservation programs you have participated in: (check all that apply)
   ☐ Environmental Quality Incentives Program (EQIP)
   ☐ Conservation Reserve Program (CRP)
   ☐ Conservation Reserve Enhancement Program (CREP)
   ☐ Wetlands Reserve Program (WRP)
   ☐ Wildlife Habitat Incentives Program (WHIP)
   ☐ None of the above ☐ Others

6. Where do you get information when making farm management decisions? (check all that apply)
   ☐ Extension ☐ Other farmers ☐ Farm Service Agency
   ☐ Internet ☐ Newspapers ☐ Private crop advisor
   ☐ Radio ☐ Soil and Water Conservation District
   ☐ NRCS (Soil or District Conservationist)
   ☐ Other: _____ ☐ None of the above

7. Do you consider yourself to be conservation-minded in your views of agricultural production?
   ☐ Yes ☐ No ☐ Mostly ☐ Somewhat ☐ Unsure

8. What county/counties do you farm in Indiana?

   _____

9. Approximately how many acres do you farm? _____
10. Please check the crops you produce: (check all that apply)
    ☐ Corn ☐ Soybeans ☐ Wheat ☐ Hay ☐ No crops
    ☐ Specialty crop: _____ ☐ Other: _____
11. Do you have any livestock on your farm? (check all that apply)
    ☐ Dairy cattle ☐ Beef cattle ☐ Hogs ☐ Poultry
    ☐ Sheep ☐ Goats ☐ None
    ☐ Other_____
12. How many years have you farmed officially in the area?:_____
13. Did you grow up on a farm? ☐ Yes ☐ No ☐ Prefer not to answer
14. Would you be more willing to implement conservation practices if you knew how they benefited your farm's ecosystems?
    ☐ Yes ☐ No ☐ Potentially
15. What resources would you consult for information about the environmental benefits on your farm? (check all that apply)
    ☐ Articles in farm or other magazines that I read
    ☐ Online or farm-specific calculators
    ☐ Conversations with publicly funded professionals (e.g., Extension services, NRCS conservationists, SWCD technical staff)
    ☐ Conversations with private/industry professionals (e.g., crop advisors)
    ☐ Other: _____ ☐ None
16. Gender: ☐ M ☐ F ☐ Prefer not to answer
17. Age: ☐ < 25 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-65
    ☐ 65+ ☐ Prefer not to answer
18. Which best describes your work? ☐ Farm owner
    ☐ Farm operator ☐ Owner & operator ☐ Other: _____
19. Do you identify as a racial minority?
    ☐ Yes ☐ No ☐ Prefer not to answer

FOREST LANDS – think of the forest lands in your town and in the state of Indiana, and answer the following questions.

	20. How often do forest lands provide the following **benefits to society**?			21. If you just checked always or sometimes, how **valuable** is this benefit (from forest lands) to **you**?		
FOREST LANDS…	**Always**	**Sometimes**	**Never**	**Very Valuable**	**Somewhat Valuable**	**Not Valuable**
…provide food	☐	☐	☐	☐	☐	☐
…provide a "sense of place"	☐	☐	☐	☐	☐	☐
…regulate erosion	☐	☐	☐	☐	☐	☐
…provide fuel	☐	☐	☐	☐	☐	☐
…provide medicines	☐	☐	☐	☐	☐	☐
…give opportunities for recreation	☐	☐	☐	☐	☐	☐
…inspire spiritual connection	☐	☐	☐	☐	☐	☐
…provide fresh water	☐	☐	☐	☐	☐	☐
…reduce flooding	☐	☐	☐	☐	☐	☐
…are aesthetically pleasing	☐	☐	☐	☐	☐	☐
…maintain species diversity	☐	☐	☐	☐	☐	☐
…provide plant fibers	☐	☐	☐	☐	☐	☐
…reduce soil loss	☐	☐	☐	☐	☐	☐
…provide genetic resources	☐	☐	☐	☐	☐	☐
…regulate local climate	☐	☐	☐	☐	☐	☐
…provide clean air	☐	☐	☐	☐	☐	☐

	22. Check each box for those who **benefit from** forest lands	23. Check each box for those who should be **responsible for** maintaining forest benefits
Farm owner	☐	☐
Society	☐	☐
Local gov't	☐	☐
State gov't	☐	☐
Fed. gov't	☐	☐
Local community	☐	☐
Farm operator	☐	☐
No one	☐	☐
Other (fill in blank)	_____	_____

24. Of the list above, who is most responsible for maintaining benefits from forest lands?

_____

Please provide us with any comments, questions, or suggestions you have in the blank space below!

THANK YOU!!