

Appendix 2. Interview protocol.

Semi-structured interviews were conducted by part or all of the research team by telephone, lasting 45 to 90 minutes. The following interview guides were used by the research team under IRB Protocol #50991 (Exempt status).

A: ESMC Member & Expert Interviews

1. Could you share a bit with us about your company and position, as a member of ESMC? How would you describe your company and what you do? Would you call your company a social or environmental-impact enterprise?
2. For how long has your company / team been interested in ag lands ecosystem services, and why? Where does that interest stem from? Are you involved in other initiatives on this topic besides ESMC?
3. Have you invested in ag lands ecosystem services in the past? How about rangelands specifically? Is your company or organization most interested in ranching or farming-based outcomes, or are they equally important to you?
4. Why is the specific focus on rangelands and on soil/water of interest to your company or organization? Is your company or organization interested in the longer-term potential to expand the program to biodiversity outcomes?

Motivations & Goals

5. What motivates you and your company to participate in ESMC? What are the principal reasons for your participation?
 1. To manage greenhouse gas and water risk outcomes (e.g. utilities)
 2. To meet environmental commitments stated in public or shareholder-facing documents
 3. To meet conservation program goals (e.g. NGOs)
 4. To meet present or expected regulatory obligations:
 1. Sustainable Development Goals (SDGs)
 2. SBTi (Science Based Target initiative) reporting
 3. GHG Corporate Standard reporting (Scopes 1, 2 or 3)
 4. Paris Climate Accord
 5. Other
 - e. To create a robust marketplace for future ecosystem services
 - f. To produce credits for other companies to purchase?
 - g. To strengthen corporate brand associations with environmental sustainability
 - h. Other
6. Do you have concerns about your producers being able to access the ESMC market if you were not a member / is that a motivating reason for your participation? (e.g. right to

operate, etc.)

7. Are you required to report on 1) carbon 2) GHGs 3) water quality and/or 4) water quantity metrics? What policy requires you to report on these things? For how long have you been reporting them?
8. On greenhouse gas emissions, when the market is open and credits/assets are being produced, is your company most interested in using these credits for scope 1, scope 2 or scope 3 reporting?
 - a. On water, are you interested in Water Efficiency Credits or Water Quality Credits? Ag Water Quality Protection Certificates?
 - b. On carbon, are you interested in Carbon Inset Credits or Carbon Offset Credits?
 - c. Is there an opportunity to sell your insets as offsets?
9. How do you expect your reporting on carbon and water to change in the future? How might this impact your participation in ESMC's market?
10. Would your company purchase credits created by other producers or markets, such as Indigo Ag or Nori?
11. What about ESMC made you chose to participate in this initiative in particular?
 1. Are ag companies inherently in a position to be producing these credits to increase sustainability/yield/PR opportunity or are they trying to offset Scope 3 emissions?
12. What aspects of the ESMC protocol are most important to you, and why?
 - a. Quantification, monitoring & verification
 - b. Outcome-based compensation
 - c. Consortium approach with broad membership
 - d. Public relations and marketing impact of participation on corporate brand
 - e. Other
13. Will your company or organization publicize its participation in ESMC? Is communicating this work to the public an important part of your participation?
14. Would your company or organization brand or certify its products as being conservation/water/soil-friendly based on participation in the ESMC initiative?
15. What aspects of the program do you find most concerning or challenging, looking ahead? What is your greatest reservation about participating in a sector-wide carbon market?
16. In your mind, what are the greatest barriers to achieving a successful carbon offset market, and how would you suggest they be overcome?

17. Are you primarily interested in outcomes in a certain geographic region? Is your company or organization's interest at the local, regional, national or global impact level when it comes to ESMC participation?
18. Would you be interested in applying your participation in this program internationally? What is the potential of ESMC to integrate across sectors, not just in terms of buyers but also sellers (e.g., energy, textiles, industry, non-ag etc.)

Other Questions

19. How important is it to you that the protocol for such a market be localized -- i.e. flexible to be locally-adjusted and fine-tuned to the specific context of a ranch?
20. Is ESMC interested in doing any joint lobbying? If so, what kind?
21. What is the future of ESMC in terms of connecting with international markets? Do you see it merging with the EU credit market or other international programs?

B: California Cattle Rancher Interviews

1. Operation overview
 - Can you tell us/me about the type of operation that you run? (E.g. cow-calf, stocker, grass-finished, diversified, other)?
 - Is ranching a family business for you? Have there been multiple generations involved in this ranch, or are you 1st generation? To what extent are you involved in ranch management decision-making, and who else participates in that process?
2. Defining Conservation & Past Experience
 - What does conservation on ranches mean to you?
 - Have you done any conservation work on your ranch in the past? (For example: grazing management plan, water developments, cross fencing / riparian fencing, rangeland improvements, fire fuel load reduction, invasive species control, native plant restoration, oak planting)
 - How has this work impacted your rangeland?
 - What is your main goal for doing the conservation work you do?
3. Government Funded Programs

Have you participated in conservation-focused programs through the USDA or another government agency? For example, cost-share programs or Farm Bill conservation incentive programs via NRCS?

 - (If they say "yes"): Which program? EQIP (e.g. for riparian fencing or off-stream water systems like solar pumps)? CRP/GRP (conservation/grassland reserve program)? Are you part of the Williamson Act? Other?
 - For how long have you been a part of this program?
 - Why do you participate?
 - How did you learn about it?

- What are some of the main challenges that you have faced while participating in the program? Could you provide some examples of these challenges?
 - What are some of the benefits you've seen through being a part of this program?
 - How time consuming is it to participate?
 - Do you find participation in this program to be a burden on your workload?
 - Do you participate in this program alone or in collaboration with other ranchers?
 - Has being a part of this program increased your revenue?
 - (If "yes") If you could put a percentage in that increase, what would it roughly be?
 - If you could make changes to this program, what would you like to change?
 - Do you think that the program achieves its intended goal?
- (If they say "no"):
 - Why not? Were you aware of it?
 - Would you consider participating in the future?
 - What would you look for in a program like this for you to be able to participate? [For research team: try to identify any economic, social, or environmental factors that would most strongly incentivize participation.]

4. Price Premiums & Certification Schemes

A second category of payments to ranchers for conservation is certain price premiums for niche market products, as in through farmers markets or branded corporate programs. Have you thought about doing any sustainability certifications or other branded programs that recognize certain sustainable or "conservation" focused approaches? Are you marketing any conservation values in your beef? E.g. Grassfed, organic, wildlife-friendly (e.g. Audubon's new bird-friendly certification, predator-friendly)?

If "yes":

- For how long have you been a part of this program?
- How did you learn about it?
- Why do you participate?
- What are some of the main challenges that you have faced?
- What are some of the benefits you've seen through being a part of this program?
- How time consuming is it?
- Do you find this to be a burden on your workload?
- Has being a part of this program increased your revenue?
 - (If "yes") If you could put a percentage in that increase, what would it roughly be?
- If you could make changes to this program, what would you like to change?
- Have you heard about regenerative beef, and what does that mean to you? Do you think you could earn more selling "regenerative" beef?

- Have you sold your products through farmers markets or director-to-consumer? (Why / Why not?)

If “no”:

- Why not?
- Would you consider participating in the future?
- What would you look for in a program like this for you to be able to participate? (i.e. economic, social, or environmental factors that would most strongly incentivize participation)

5. Payments for Ecosystem Services (Voluntary & Regulatory markets)

Are you familiar with formal Payment for Ecosystem Services, programs like the Chicago Climate Exchange that paid ranchers for soil carbon? Have you ever thought about participating in this kind of market?

If “yes”:

- For how long have you been a part of this program?
- How did you learn about it?
- Why did / do you participate?
- What are some of the main challenges that you have faced?
- What are some of the benefits you’ve seen through being a part of this program?
- How time consuming is it?
- Do you find this to be a burden on your workload?
- Has being a part of this program increased your revenue?
 - (If “yes”) If you could put a percentage in that increase, what would it roughly be?
- If you could make changes to this program, what would you like to change?

If “no”:

- Why not?
- Would you consider participating in the future?
- What would you look for in a program like this for you to be able to participate? (i.e. economic, social, or environmental factors that would most strongly incentivize participation)

6. New Carbon & Water Market: ESMC

There is a new pilot carbon and water credits market in development by a group of corporations and nonprofits that have come together to launch a soil carbon and water market geared at ranchers and farmers. It will be launched in 2022, and they’re testing it now on ranchers covering about 70,000 acres in Texas and Oklahoma.

- Would you be interested in this sort of program that would pay per amount of carbon sequestered or water saved?
- What concerns would you have about such a program?

- Would monitoring be an issue for you? Does it matter to you who does the monitoring? (NGO vs. corporation vs. government vs. rancher) What type of monitoring would be ok with you, and what types of monitoring might you have issue with?
 - Outcome-based compensation?
 - How important to you is who runs the market (non-profit or corporation)?
 - Other challenges as factors influencing participation?

- Would you be interested in reviewing further details about this program when they are available?
- What is most important to you regarding your participation in such a program? What would it take for you to participate?
- Would you have a preference for whether you were paid for your carbon or water asset by a non-profit organization vs. a corporation/LLC?
- How much would you need to be paid (per acre) for your participation in a PES program to be worthwhile even considering? Within what time period would you need to be compensated to make it worth your time?
- Some of these programs may require that you provide current and historic management plans and stocking rates, potentially back three years. Would you be able and willing to do that?
- Would you be willing and able to supply irrigation records, including type of irrigation system and diversion records, times of irrigation and amounts?
- Would you be comfortable with baseline and ongoing soil sampling on your property, on an annual basis? (Using a new technology called Quick Carbon, which measures down to 30 cm.)
- Some producers in the Great Plains are starting to participate in a pilot program with ESMC where these methods are being tested on their properties (without compensation yet), in the hopes that when the market opens in 2022, that these producers will be the first to be able to sell carbon assets on the carbon market. Would you be interesting in participating in such a pilot, if it were to come to California?
- There is a possibility in some of these markets that the payback time would be 5 years, for there to be proven change in soil carbon. Would you be willing to participate in a program with that 5-year timeline to payment?

- If you'd be interested in participating in a payment for ecosystem services program, is your motivation for doing it the income from your participation, the potential opportunity to improve yields or your overall operation, or to steward the land?
 - How important is it to you that the protocol or rules for participation in such a market be localized -- i.e. flexible to be locally-adjusted and fine tuned to the specific context of a ranch?

7. Land conservation: A final category of payments to ranchers for conservation is land conservation opportunities often coordinated by NGOs, like conservation easements. Is this something you have considered participating in before? Why or why not?

If “yes”:

- For how long have you been a part of this program?
- How did you learn about it?
- Why did / do you participate?
- Why did you choose that one organization/program?
- What are some of the main challenges that you have faced?
- What are some of the benefits you’ve seen through being a part of this program?
- How time consuming is it?
- Do you find this to be a burden on your workload?
- Has being a part of this program increased your revenue?
 - (If “yes”) If you could put a percentage in that increase, what would it roughly be?
- If you could make changes to this program, what would you like to change?

If “no”:

- Why not?
- Would you consider participating in the future?
- What would you look for in a program like this for you to be able to participate? (i.e. economic, social, or environmental factors that would most strongly incentivize participation)

Final survey questions

8. How long have you been ranching for?
9. What age range would you describe yourself in?
- 20-40
 - 40-65
 - over 65 years
10. Similarly, what range of livestock numbers would you put yourself in:
- Fewer than 50 cows
 - 50-100
 - 100-500
 - 500+?
11. Is ranching your principal occupation or part-time, etc.?