



Characteristics and motivations of participants and nonparticipants in an at-risk species conservation program

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The majority of species at risk of being listed under the United States (U.S.) Endangered Species Act (ESA) relies on habitat located on privately owned land (Turner & Rylander, 1998). There are numerous programs in the U.S. that seek to incentivize private landowners to manage their land to benefit at-risk species prior to any regulatory triggers (i.e., prelisting conservation programs; Donlan, 2015). Although a critical mass of participation is necessary to produce the landscape-level benefits needed for species recovery, an understanding of what motivates private landowner willingness or unwillingness to participate in prelisting conservation programs is often overlooked as a key factor in their success (Sorice et al., 2013).

We used the Lesser Prairie-Chicken Initiative (LPCI) as a case study to explore the characteristics and motivations of private landowners who were willing or unwilling to enroll in a nearly decade-long program to protect the lesser prairie-chicken (*Tympanuchus pallidicinctus*). The distribution of this species has been reduced by more than 90% over the past century, and threats to its habitat persist (Hagen et al., 2004). The LPCI was launched in 2010 by the Natural Resources Conservation Service (NRCS) to help ranchers and farmers voluntarily enhance habitat and prevent an ESA listing while also aligning with ranching and agricultural operations (LPCI, 2019). Despite this prelisting effort, the lesser prairie-chicken was listed as threatened under the ESA in 2014, only to be de-listed in 2016 after the decision was voided by a federal court (USFWS, 2016). Following multiple petitions to re-list this species as endangered in 2016, it remains a candidate for listing with its status under review (USFWS, 2019). Declining participation was a motivating factor for our case study because applications to the LPCI sharply declined coinciding with the 2014 listing.

Methods

Our study area was all privately owned lands within the lesser prairie-chicken's current range, which spans portions of Colorado, New Mexico, Kansas, Oklahoma, and Texas (McDonald et al., 2014). Our population was primary decision-makers (typically landowners) for farms and ranches who were eligible to enroll in and aware of the LPCI (e.g., those who had made an explicit choice about enrollment). We used a stratified, purposeful

sampling strategy to invite: (a) LPCI participants with active or completed contracts, and (b) nonparticipants from across the region to complete a structured interview. We worked with state- and county-level NRCS staff to create a sampling frame. We used snowball sampling to identify nonparticipants because it was difficult to identify landowner familiarity with the LPCI *a priori*.

We collected quantitative information across four dimensions: characteristics of people and their land, motivations and values, knowledge and attitudes toward the ESA, and perceptions about participation in the LPCI (Table 1). We pre-tested and refined the questionnaire with NRCS staff, landowners, and others familiar with the LPCI. We administered the questionnaires during in-person interviews between October 2017 and January 2018. We did not conduct statistical tests since our sample was not randomly selected. Rather, we used central tendencies (95% confidence intervals, $\alpha = .05$) and Likert plots to characterize factors related to participation and explore the similarity of responses between participants and nonparticipants (Amrhein et al., 2019).

Results

We obtained 86 useable questionnaires ($n = 64$ participants, $n = 22$ nonparticipants), covering all states (Kansas = 45; Colorado = 13; Texas = 13; New Mexico = 9; Oklahoma = 6). Our sample of participants was large relative to our population, as it was greater than the average number of annual LPCI contracts and similar to the total number of 2018 participants ($n = 69$).

People and Their Land

There were only minor differences between participants and nonparticipants with respect to personal and land characteristics (Table 1). Most respondents were male, had four years of college or more, and were middle-aged. More than 75% of both groups spent almost all of their lives on a farm or ranch. Most had spent greater than 75% of their lives in the area, had been landowners for about half of their lives, spent greater than 40 hours per week managing their land, generated greater than 50% of their income from their land, and were highly experienced with respect to farming and ranching. The social networks and rootedness of both groups were similar, as most respondents came from families who had lived on the land for more than 80 years, and a high percentage of their friends and family engaged in farming and ranching. Acres under management varied widely for both groups, with participants managing an average of 1,817 acres more than nonparticipants.

Motivations and Values

Both groups rated livestock, rural lifestyle, real estate investment, and wildlife management as their most important management objectives (Figure 1). Both groups also expressed high economic dependence on their land, that their land represented their way of life, and nearly identical beliefs with respect to environmental values (Table 1).

Table 1. Concepts and indicators used in the questionnaires. Summary statistics are provided for participant and nonparticipant responses to each item. Respondents were also asked about: management objectives (Figure 1), beliefs about participation (Figure 2), how they first heard about the LPCI, factors that piqued their interest in the LPCI, and the relative importance of program factors (results from last three described in text).

Concept	Indicator	Nonparticipant		Participant	
		M	95% CI	M	95% CI
Personal and land characteristics					
Gender	% male	95.3	.	91.0	.
Education	# years education completed	14.7	0.4	14.2	0.8
Age	Age calculated as 2018 – year born	59.8	3.1	53.0	5.8
Socialization	Proportion of childhood on a farm/ranch (1 = none, 5 = all)	4.7	0.5	4.2	0.4
Experience	Proportion of adult life ranching or farming (1 = none, 5 = all)	1.0	0.0	0.9	0.1
Rootedness/social network	# years living in area	50.3	6.9	49.3	5.1
	# years owning land	23.7	6.5	26.7	3.9
Acres managed	# generations their land was in their (or spouse's) family	3.8	0.4	3.5	0.2
	% of extended family that farm/ranch in the area	40.7	13.4	23.6	6.8
	% of current friends that farm or ranch in the area	52.6	12.2	56.5	6.2
	Acres owned + acres leased in – acres leased out	105588	6280.6	12375.8	7123.6
Motivations and values					
Environmental values	Nine beliefs pooled into concepts (1 = not at all, 5 = extremely)				
	(1) Concern for other people	3.9	0.3	4.0	0.2
	(2) Concern for natural world	4.0	0.3	4.2	0.2
	(3) Concern for self	4.1	0.3	4.2	0.2
Economic dependence and way of life	(4) Wildlife values	4.0	0.3	3.9	0.2
	Nine beliefs pooled into concepts (1 = not at all, 5 = completely)				
	(1) Economic dependence on land	4.5	0.2	4.3	0.2
	(2) Profit motivation	3.9	0.4	3.7	0.3
Knowledge and attitudes about the Endangered Species Act	(3) Use my place to escape my day-to-day life	2.0	0.6	2.7	0.4
	(4) Use my place as a way of life	4.7	0.2	4.5	0.2
	Awareness of LPC listing in 2014 (1 = not, 3 = very)	2.6	0.3	2.7	0.2
	How closely they followed the LPC listing (1 = not, 5 = very)	3.5	0.6	3.8	0.3
Knowledge and awareness of the lesser prairie-chicken's Endangered Species Act listing and potential relisting	Influence of 2014 listing on willingness to participate in LPCI (1 = much less, 7 = much more)	3.8	0.7	4.6	0.3
	Awareness of LPC potential re-listing (1 = not, 3 = very)	1.6	0.4	1.6	0.2
	Influence of potential relisting on willingness to participate in LPCI (1 = much less, 7 = much more)	3.6	0.6	4.6	0.4
	Confidence that the assurances of the LPCI would protect them if enrolled (1 = not at all, 5 = complete)	2.2	0.4	2.6	0.3
Perceptions about participation in LPCI					
Perceptions of program	Four beliefs pooled into attitude about participation concept (e.g., 1 = negative, 5 = positive)	2.8	0.3	4.4	0.2
	Perceived riskiness (1 = not at all, 5 = extremely)	3.0	0.4	1.8	0.2
Riskiness	Likelihood of re-enrolling given the opportunity (1 = extremely unlikely, 7 = extremely likely)	3.0	0.8	6.1	0.3

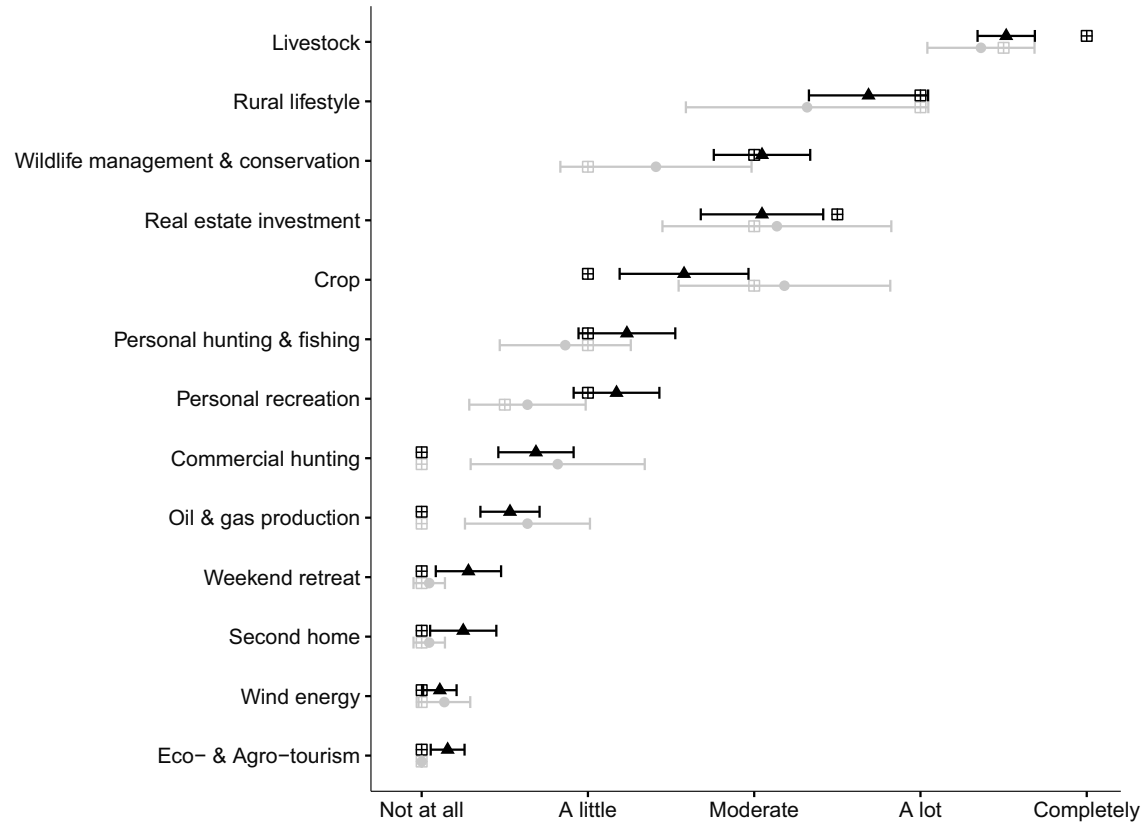


Figure 1. Surveyed participants (▲) and nonparticipants (●) of the Lesser Prairie-Chicken Initiative appear to have similar management objectives. Respondents rated their management objectives for their land, on a Likert-type scale, based on how well each factor described what they do with their place. Means (95% CI) and medians (▣) are shown.

Knowledge and Attitudes toward the ESA

Most respondents from both groups (>60%) were aware of the 2014 lesser prairie-chicken's ESA listing and closely followed events connected to the species' ESA status (Table 1). In contrast, both groups were largely unaware of the species' pending reevaluation and re-listing under the ESA. Most respondents had a moderate or less level of confidence that the assurances under the LPCI would protect them from the ESA. About half of both groups stated that the ESA listing had no influence in their decision to participate or not in the LPCI and almost all participants similarly stated that the re-listing evaluation would not influence future decisions about participation.

Perceptions on LPCI Participation

Compared to nonparticipants, participants had a more positive attitude of the LPCI, viewed it as less risky, and expected more positive outcomes from the LPCI (Table 1). Participants' strongest beliefs about what would happen with participation were related to economic benefits (e.g., cost-share, payments), followed by helping future generations and helping the lesser prairie-chicken (Figure 2). Nonparticipants had more negative beliefs about potential outcomes, including lower expectations of cost-share, the potential to help future generations, and effects on productivity. They also believed the program would result in increased negative impacts from wildfires. Nonparticipants ranked giving up control, over-regulation, and the difficulty of working with the government as the strongest barriers to participation in the LPCI (Figure 3).

Both groups had similar views on the importance of program factors and ranked having practices that are compatible with their operation as the most important attribute, and having a fast and efficient application process and a low level of monitoring for program compliance as the least important factors. High cost-shares, high grazing payments, and sensible timing of required practice were of high importance to both participants and nonparticipants. Receiving protection from ESA regulation was more important to nonparticipants than participants.

Most participants and nonparticipants first heard about the program directly from an NRCS officer (62%). When asked an open-ended question of what sparked initial interest in the LPCI, most responses revolved around benefits for landowners as opposed to wildlife or other reasons. Common responses were cost-share (52%), grazing payments (31%), and improving grazing practices (31%). Other reasons included aiding in natural disaster recovery (20%), wildlife or conservation (19%), helping the lesser prairie-chicken (13%), technical assistance (9%), compatibility with their existing land management practices (6%), and a desire to prevent or protect themselves from an ESA listing (5%). Two-thirds (67%) would be moderately or extremely likely to re-enroll if given the opportunity in the next six months.

Discussion

We identified only minor differences between participants and nonparticipants across personal and land characteristics, motivations and values, and knowledge and attitudes toward the ESA. These factors may not predispose individuals to participate or not in

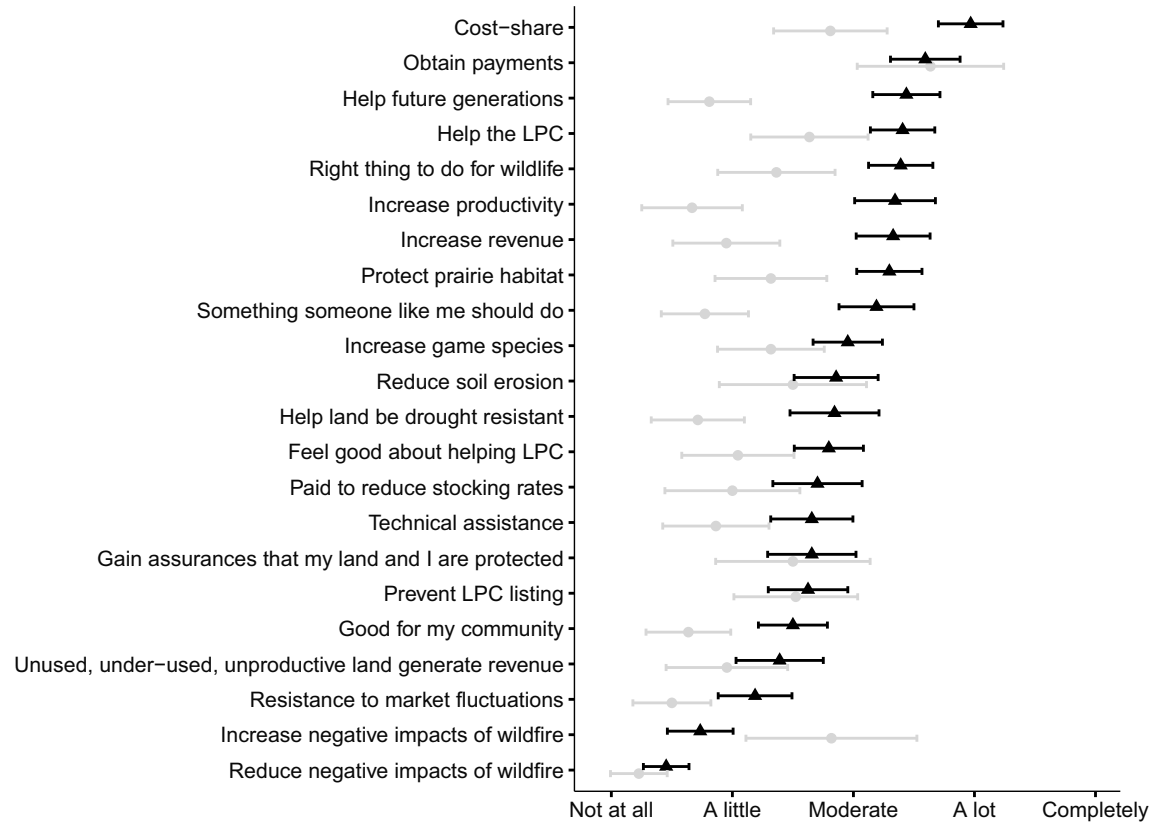


Figure 2. Participant (▲) and nonparticipant (●) beliefs on outcomes that would result from participation in the Lesser Prairie-Chicken (LPC) Initiative. Participants were asked *I initially participated because I thought it would result in outcome x*. Nonparticipants were asked *If I did decide to participate in the LPCI Program, I think it would result in outcome x*. Means (95% CI) are shown.

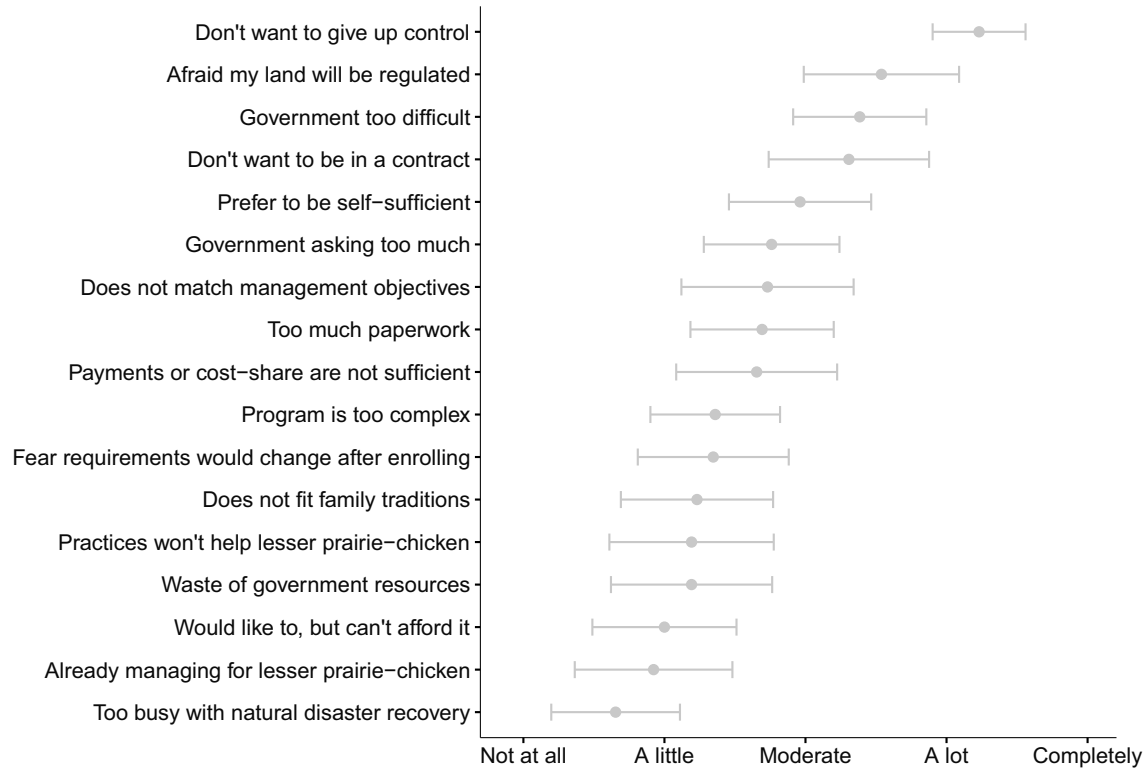


Figure 3. Rating of barriers to participation in the Lesser Prairie-Chicken Initiative given by nonparticipant respondents. Means (95% CI) are shown.

prelisting conservation programs. However, we did observe differences in perceptions about the LPCI and decisions about participation. This raises the question, how do similar landowners come to different conclusions about the LPCI? We consider two possibilities that would benefit from more research, and we discuss their management implications.

First, program outreach may differ across contexts. Most landowners first heard about the LPCI from an NRCS officer, but these agents differed in their familiarity, experience, and opinions of the program (A. Santo, personal communication). NRCS agents may increase or suppress participation in the LPCI by introducing landowners to the program. Program managers may be able to increase participation through increased outreach to landowners and NRCS staff training that focuses on communicating the benefits of the LPCI to landowners.

Second, barriers for nonparticipants to enroll in the LPCI and the observation that most landowners distrusted the regulatory assurances provided by the program are consistent with other studies (e.g., Lien et al., 2019). Combined, these results suggest that independence and dissociation with the federal government may be additional factors motivating nonparticipant decisions. In such a case, efforts to decouple the LPCI from the federal government may enhance participation (e.g., non-federal government administration or funding; Lien et al., 2019).

A further consideration for managers is that declining enrollment may be related to structural factors of the LPCI. Landowners with favorable attitudes and greatest potential gains from the program may have been the first to enroll, but then phased out of the program. Participants must implement new conservation practices on their land with each subsequent contract. Thus, re-enrollment is limited and the program relies heavily on recruitment. Our results are consistent with this hypothesis, given that many participants expressed interest in continued participation despite becoming ineligible. Program managers may thus be able to safeguard more lesser prairie-chicken habitat by implementing structural changes that allow past participants to stay engaged with the program.

Our purposive sampling strategy limits the generalizability of these results, but random sampling would not have been feasible due to the impossibility of identifying *a priori* the entire population of participants and nonparticipants. Our goal was not to generalize, but to provide useful insights into this case study. The results suggest that participants and nonparticipants of the LPCI share many characteristics, values, and motivations. Yet, they have different attitudes toward the program and are making different decisions with regards to participation. This highlights the need to identify other factors that motivate or inhibit participation, such as outreach, program structure, or other landowner values.

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