

A “hammer held over their heads”: voluntary conservation spurred by the prospect of regulatory enforcement in Oregon

KATHERINE L. WOLLSTEIN, Department of Natural Resources and Society, University of Idaho,
875 Perimeter Drive MS 1139, Moscow, ID 83843, USA kwollstein@uidaho.edu

EMILY JANE DAVIS, Department of Forest Ecosystems and Society, Oregon State University,
321 Richardson Hall, Corvallis, OR 97331, USA

Abstract: When the U.S. Fish and Wildlife Service (USFWS) determined that greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) did not warrant listing under the Endangered Species Act (ESA) in 2015, the agency recognized a coordinated effort of private landowners, non-governmental organizations (NGOs), and state and federal agencies that effectively reduced threats to the species. This effort exemplified an alternative model to species conservation that relies on voluntary conservation of private landowners to preclude government regulation. Through an in-depth case study of private landowners' voluntary sage-grouse conservation efforts in Lake County, Oregon, we explored features of these voluntary arrangements that motivate participating private landowners whose livelihoods depend on livestock production. Using in-depth, semi-structured interviews, we explored how private and public actors implemented sage-grouse conservation, landowners' production and conservation goals, and perceived foundations for participation. Qualitative analysis of interviews and documentation found that private landowner participation in voluntary arrangements was motivated by well-funded program offerings that were largely aligned with production goals and gave them a sense of control over their economic futures in the context of a potential ESA listing of sage-grouse. Subscription to these programs was largely facilitated by landowner and agency leadership operating as intermediaries. By aligning voluntary conservation offerings with economic and cultural contexts (e.g., using trusted intermediaries to deliver resources to landowners), voluntary arrangements may alleviate reliance on regulatory protections for species conservation where conservation and rural livelihoods intersect.

Key words: *Centrocercus urophasianus*, Endangered Species Act, greater sage-grouse, Oregon, private land, ranching, voluntary conservation

IN THE UNITED STATES, wildlife are a public good held in trust for citizens by the state (Prukop and Regan 2005). However, because 95% of all federally threatened and endangered species in the United States have some habitat on private land and 19% of these species are exclusively found on private property, private landowners are particularly important in conserving species-at-risk (Wilcove et al. 1996). Thus, conservation of wildlife species may not be achieved by understanding a species' ecology alone (e.g., Messmer 2013); it will require a better understanding of the people and organizations that are needed to engage in conservation activities (Knapp et al. 2013).

Species conservation in the United States has been pursued through government-enforced (i.e., regulatory) approaches, such as use of the Endangered Species Act of 1973 (ESA) by designating threatened or endangered species

(Raymond and Olive 2008, Pierre 2012). Some private landowners view this regulatory approach as undermining private property rights and livelihoods (Jackson-Smith et al. 2005, Cooke et al. 2012). Therefore, landowners are charged with balancing their private interests (e.g., livestock production, timber harvest) with the public good, including maintaining ecosystem services, preserving open spaces, harboring wildlife, and protecting biodiversity (Maestas et al. 2003, Brunson and Huntsinger 2008). Thus, the benefits from conservation activities undertaken by a landowner on their private land are not necessarily exclusively accrued by that landowner, even if they shoulder the cost of such activities.

Private landowner goals and wildlife conservation have been, at times, discordant in the United States, and government-enforced restrictions on activity on these lands have

exacerbated private landowner resistance to regulatory approaches to resource management (Jackson-Smith et al. 2005, Langpap 2006). In particular, this occurs through Section 9 of the ESA, which prohibits any action, even on private land, that may directly result in the taking of endangered species or indirectly harming a species through habitat modification in ways that impair essential behavioral patterns (50 CFR § 17.3(c)(3)). This statute has raised questions about private property rights, in the cases that a public resource, wildlife, occupies private land (Langpap 2006, Raymond and Olive 2008). Listing species as threatened or endangered under the ESA may also undermine species recovery if perverse incentives have been generated through the statute to discourage, for example, landowner protection of threatened or endangered species' habitat to avoid restrictions (e.g., Lueck and Michael 2003, Raymond and Olive 2008, Huntsinger et al. 2012). Thus, the ESA presents a paradox: although its purpose is to protect and recover imperiled species and the ecosystems upon which they depend, a documented outcome has been undesirable behavior by private landowners to avoid costs of habitat protection (i.e., costs incurred through restoration, if necessary, and those in forgone potential revenue from the use of the property; Langpap 2006).

An alternative model to government-enforced conservation has emerged through voluntary arrangements that may allow private landowners to protect public goods while possibly offering them flexibility to meet their own interests (Lemos and Agrawal 2006). These may include both monetary (e.g., payment for conservation actions or ecosystem services) and non-monetary approaches. In general, voluntary arrangements include collaborative public and private stakeholder involvement in rule-making and implementation of conservation, as well as use of instruments that are less rigid, prescriptive, committed to uniform outcomes, and hierarchical (Van der Heijden 2012). There is evidence that landowners respond more positively to voluntary measures rather than to regulation (Cooke et al. 2012), and that they also perceive voluntary measures to be more effective (Knapp et al. 2015). Some authors have reported that offering incentives via compensation

and regulatory assurances could increase the likelihood of landowners participating in voluntary arrangements and assuage concerns about lost property rights and government intervention (e.g., Langpap and Wu 2004). In other words, a combination of voluntary "carrots" may be necessary as well as regulatory "sticks" to actually promote landowner participation in conservation (Langpap 2006).

Some organizations acting as intermediaries, bridging between different levels of governance, have been found to facilitate landowner access or trust in programs and reduce reluctance to participate (Cash 2001, Breetz et al. 2005). Additionally, a mixture of institutional and personal factors such as incentives, program design, and landowner attitudes and disposition may affect engagement in voluntary arrangements (e.g., Breetz et al. 2005, Langpap 2006, Cocklin et al. 2007, Sorice et al. 2011, Selinske et al. 2015). Some authors have also proposed that private landowner conservation arrangements should rely on both monetary and non-monetary incentives. Monetary incentives could be achieved via subsidies, cost-sharing, mitigation banking, or tradable credits (Sorice et al. 2012, Sorice et al. 2013). Non-monetary incentives include policy mechanisms reducing uncertainty, and suasion measures such as access to information, training, and technical services (Cooke et al. 2012). However, understanding of factors in landowner participation in voluntary conservation is largely based on studies of farmers and non-industrial family forest landowners (e.g., Sorice et al. 2013). Less research has examined factors in landowner subscription to voluntary conservation in rangeland contexts, where private landownerships may be spatially extensive and open range is primarily used for year-round livestock production. In addition to this, qualitative research to understand the decision-making of ranchers is generally lacking (Sayre 2004).

The conservation of greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) offered an opportunity to study the role of voluntary incentives in species protection. In 2010, the U.S. Fish and Wildlife Service (USFWS) determined that listing sage-grouse under the ESA was "warranted but precluded" due to higher priorities, designating the species a

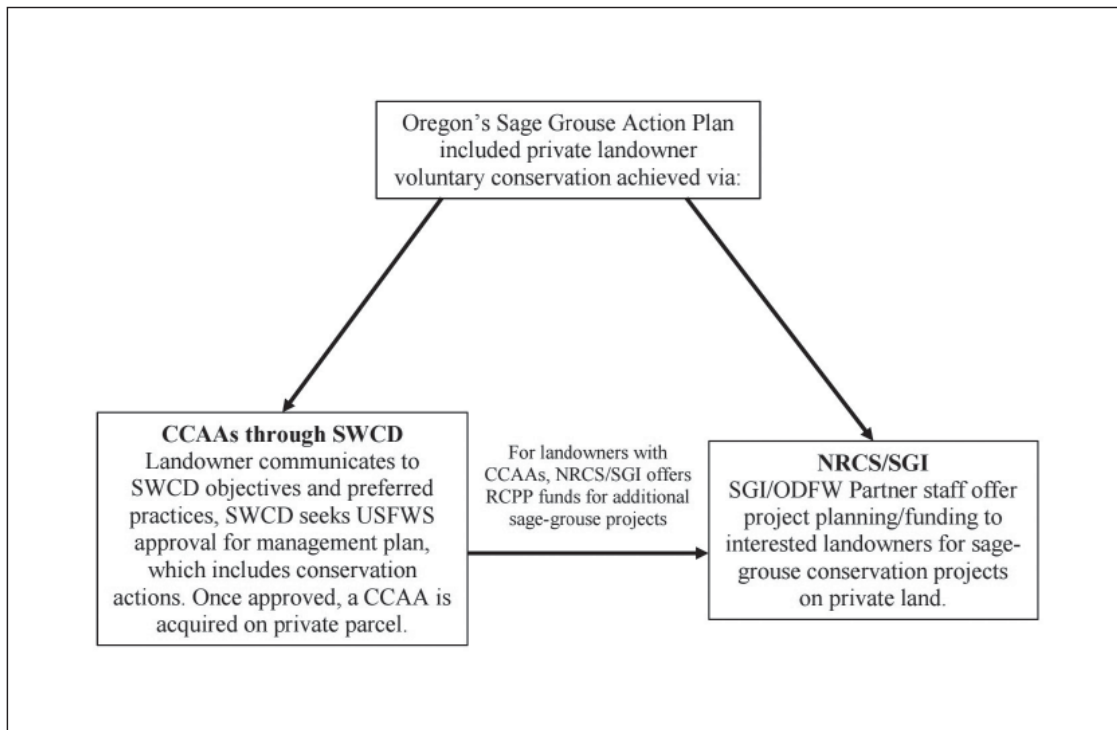


Figure 1. Candidate Conservation Agreements with Assurances (CCAA) and the Natural Resource Conservation Service's (NRCS) Sage Grouse Initiative (SGI) were 2 mechanisms through which Oregon landowners participated in greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) conservation. The NRCS/Oregon Department of Fish and Wildlife (ODFW) Partners provided financial and technical assistance for project implementation through SGI, and Oregon Soil and Water Conservation Districts (SWCDs) facilitated CCAAs between landowners and the U.S. Fish and Wildlife Service (USFWS), which specified voluntary conservation actions to be undertaken on enrolled private lands.

“candidate” for future protection (USFWS 2010a). The USFWS identified habitat loss and fragmentation as the primary reasons for sage-grouse population declines.

Sage-grouse habitat in Oregon has diminished by 21% since European settlement, and today the species is found to varying extents in 7 Oregon counties located on the northern edge of the Great Basin (Hagen 2011). The leading causes of habitat loss in Oregon are juniper encroachment (*Juniperus occidentalis*), the invasion of medusa head (*Taeniatherum caputmedusae*) and cheatgrass (*Bromus tectorum*), and subsequently altered wildfire regimes (Hagen 2011). Wildfires have been found to occur 4 times as frequently on cheatgrass-dominated landscapes than in all other types of ground cover combined (Balch et al. 2013).

Although 76% of sage-grouse core and low-density habitat is under federal management in Oregon counties, the mesic riparian habitat, ideal for brood-rearing (Copeland et al. 2013, Donnelly et al. 2016), is largely in private ownership because such areas were highly

sought by homesteaders as they settled the American West in the late nineteenth century (Wilson 2014). Private landowners have, thus, been identified as key partners in sage-grouse conservation as the threat of a potential listing resonated in Oregon's ranching community (Hagen 2011).

Following the 2010 USFWS determination that listing sage-grouse under the ESA was “warranted but precluded,” Oregon developed a plan to address the factors identified by the USFWS before the next status review in 2015 (Brownscombe et al. 2015). These efforts culminated in the Sage Grouse Conservation (SageCon) Partnership and their resultant Sage Grouse Action Plan (Action Plan), which received state approval through an executive order by Oregon Governor Kate Brown in 2015. The Action Plan used a collaborative and integrative approach to planning and implementation to align state, federal, and local government programs to encourage voluntary conservation efforts by private landowners (Brownscombe et al. 2015). The Action Plan encouraged

private landowner participation in sage-grouse conservation with funding provided by the Oregon Department of Agriculture for Soil and Water Conservation Districts (SWCDs), Oregon Department of Forestry for Rangeland Fire Protection Associations, and Oregon Watershed Enhancement Board for SWCDs and Watershed Councils. When the USFWS determined in 2015 that sage-grouse did not warrant listing under the ESA, the agency recognized "...the aligned framework of tools, rules, and protocols across local, state, and federal processes [that] will ensure that coordinated mitigation and voluntary actions conserve the species across all land ownerships in Oregon" (USFWS 2015). The USFWS determined that the Action Plan effectively addressed threats on state and private lands through regulatory measures and noted that the voluntary conservation efforts underway, in concert with the state and federal plans, adequately addressed threats to the species.

The USFWS 2015 listing decision also lauded the voluntary conservation efforts of landowners for addressing threats to the species (USFWS 2015). These included the Natural Resource Conservation Service's (NRCS) Sage Grouse Initiative (SGI) and Candidate Conservation Agreements with Assurances (CCAAs; Figure 1). Since 2010, SGI has provided technical knowledge and financial resources to landowners to protect or improve sage-grouse habitat. To address conifer encroachment in Oregon, SGI provided financial assistance to private landowners through Farm Bill programs, such as the Environmental Quality Incentives Program (EQIP), and removed conifers from >81,000 ha of sage-grouse habitat on private land between 2010 and 2015 (NRCS 2015). In addition to these efforts, Oregon's SWCDs facilitated the formation of CCAAs between private landowners and the USFWS, which protect enrolled landowners from incidental take incurred by otherwise lawful practices on private land should sage-grouse be listed under the ESA in the future. The CCAA participation is voluntary and provides guidance for ranch management practices to ensure that enrolled lands maintain quality, contiguous habitat. For example, strategic salt and water locations, specified in each landowner's CCAA, can improve livestock distribution and reduce

impacts to riparian areas during summer months when female sage-grouse are brooding. Landowners may notify their SWCD and opt out of these agreements at any time. In return for participation, landowners are granted 30 years of protection from any additional regulations on their enrolled private parcels as well as access to additional SGI funds through NRCS's Regional Conservation Partnership Program (RCP). Across Oregon's sage-grouse habitat, >150 private landowners enrolled in CCAAs between 2010 and 2015, constituting >900,000 ha of sage-grouse habitat on private lands (Brownscombe et al. 2015).

We identified features of voluntary conservation programs in Oregon that motivate participating landowners who must balance sage-grouse conservation with their production goals. By examining alternatives to federal regulation for wildlife conservation in a production-oriented context where landowners depend primarily on the land for their livelihoods, we highlighted features of a novel situation in which a potential ESA listing and voluntary conservation effort intersect.

Study area

We used an embedded, single-case study design in which Lake County, Oregon was selected as a critical case (Yin 2014). Lake County was chosen because it contains most of Oregon's high-quality sage-grouse habitat (e.g., Lakeview Bureau of Land Management [BLM] District contains 30.5% of the total sage-grouse population in the state; Foster 2016), is among the top livestock-producing counties in Oregon, and has experienced high private landowner subscription to CCAA programs (i.e., approximately 47% of private ranches in Priority Habitat and General Habitat Management Areas or identified by Oregon Department of Fish and Wildlife [ODFW] and the BLM have signed an agreement). Private ownership constitutes 23% of the county, which is fairly typical of eastern and south-central Oregon land tenure, especially in those counties involved in cattle production. Additionally, these communities have had previous experiences with enforcement of the ESA. Regulation of the federally threatened Warner sucker (*Catostomus warnerensis*), endemic to the Warner Valley of Lake County, has been a

Table 1. Landowner, non-governmental organization (NGO), state and federal agency participants interviewed in Oregon between October 2016 and April 2017.

Interviewee category	Participants	Interviews
Landowner	19	11
Lake County state and federal agencies, NGO	7	6
Oregon state and federal agencies, NGO	3	3
Total	29	20

factor for decades in many ranching operations in the area.

Lake County is on the northwestern edge of the Great Basin in the high desert (elevation ranges from 1,259–2,574 m). It is among Oregon's largest counties in land area at 2.1 million ha; 74% of the county is managed by state and federal government agencies (Lake County 2011). Although the USFWS manages the 110,000-ha Hart Mountain National Antelope Refuge, most of the rangelands in the county are administered by the BLM and U.S. Forest Service (USFS), and are leased to ranchers for livestock grazing. Livestock ranching is the dominant land use in this area and typically relies on a combination of private land, and USFS, BLM, and state permitted lands.

Methods

We chose a qualitative case study approach because it is flexible, interactive, and can achieve depth by providing context and description for how people experience the research topic in question (Mack et al. 2005). This approach can yield culturally specific information in the context of a rural population, such the ranching community of Lake County, where trust and accessibility may be challenges (Legard et al. 2003, Sayre 2004, Mack et al. 2005). The low population density in Lake County also made other methods, such as surveys and secondary demographic data analysis, unsuitable for this study. We used a combination of interviews, document analysis, and qualitative induction and deduction to address our research objectives. Though case studies are not statistically generalizable, in-depth understanding gained through a qualitative case study can clarify the relation of a particular set of results to broader theory on rancher motivation to participate

in voluntary conservation and determine if alternative explanations in the literature are more relevant (Yin 2014). Study design also reflected guidance and feedback from managers and partners engaged in Oregon's Sage Grouse Action Plan; Oregon Consensus, a neutral forum through which the SageCon Partnership was assembled; Oregon Cattlemen's Association; and BLM contributors to the final Action Plan.

We targeted 3 categories of interviewees: 1) individuals who owned or managed land used for cattle production in Lake County, 2) state and federal agency employees and other local NGO staff in Lake County whose positions involved working with landowners, and 3) state and federal agency employees and other non-governmental organization (NGO) staff outside of Lake County operating at the state level. Sampling was not random; individuals who were known to have salience to the subject matter were sought through purposive sampling (Ritchie et al. 2003). In this rural and remote setting, access to landowners was difficult, and a gatekeeper—an individual in a position of official authority in the ranching community—was used (Mack et al. 2005). This individual, as well as a government employee in Lake County, provided contact information for landowners who had participated in sage-grouse conservation programs or enrolled in CCAAs (16 ranches in Lake County as of October 2016, when fieldwork was completed). Twelve ranches were successfully reached. Of landowners and governmental and NGO staff contacted, none refused to be interviewed. As a result, sampling was based on subjects' availability for an interview.

Twenty semi-structured, conversational interviews were conducted in October 2016 and April 2017 with 29 participants (Table 1). Some of the landowner interviews included family groups sharing ranch operation responsibilities (informed consent was obtained for each individual); 1 agency interview was jointly conducted with 2 staff at their request. Each interview lasted 30–90 minutes and consisted of 10–12 questions, designed to be non-leading and to prompt open-ended exploration of the topic. Interviews were audio recorded with the exception of 2 interviews wherein participants did not consent to recording and handwritten notes were instead taken. Questions for landowners

Table 2. Demographics of participants interviewed in Lake County, Oregon, October 2016.

Age of participants	27–68 years old
Total private acreage	2,540–30,000
Land uses	Cattle grazing, hay production, guest ranch, timber, "improve diversity," wildlife habitat
Technical assistance: Lake County agencies or NGOs	
Federal agencies	BLM, USFS, NRCS, USFWS, Army Corps of Engineers
State agencies	OR Department of State Lands, OR Department of Fish and Wildlife, OR Department of Agriculture, Farm Service Agency, Lake County Soil and Water Conservation District
NGO	Lake County Watershed Council, The Nature Conservancy
Financial assistance: Funding received for private lands conservation	NRCS/SGI (Environmental Quality Incentives Program, Agricultural Conservation Easement Program, Conservation Stewardship Program, Wildlife Habitat Incentive Program), USFWS Partners Program, OR Department of Fish and Wildlife (Access and Habitat Grant, cost-share), Oregon Department of Forestry cost-share, U.S. Department of Agriculture Drought Assistance Program

included where and how they had conducted sage-grouse conservation activities on their private property, if and how they had adjusted their other practices, ranch and conservation goals, experiences working with federal agencies and local organizations to achieve conservation objectives, and specific challenges in reconciling livestock production and conservation. We used a structured worksheet to document the conservation activities each landowner interviewee had completed on private land and the programs and associations in which they had participated (Table 2). Agency and NGO interviews were designed to document participant perspectives and their experiences with private landowners and achieving sage-grouse conservation in Lake County. Thus, the interviews included questions identical to those used in landowner interviews as well as additional questions about how agencies and organizations provided resources for voluntary private lands conservation, how coordination with private landowners and other organizations was achieved, and whether and how they were effective. Given that CCAAs are confidential agreements among the landowner, the SWCD administrator, and the USFWS, we relied on descriptive accounts offered by landowners and generalizations about CCAAs provided by the SWCD. Finally, we gathered documentation from 2010 through 2015, including the Action Plan, the USFWS 2015 listing decision, and other state and federal publications to seek references

about voluntary sage-grouse conservation efforts of Oregon landowners.

We transcribed audio-recorded interviews verbatim using ExpressScribe Transcription Software and Rev, an online audio-transcription service. We developed a list of potential thematic categories based on research literature (i.e., a priori themes) and interview content (Maxwell 1996). Broad categories included structural and descriptive features of these voluntary arrangements as described by interviewees, conditions under which voluntary conservation is pursued by private landowners, and how the voluntary arrangements were perceived to actually work and their associated outcomes. These categories were then narrowed to specifically defined codes, which the lead author used to code all transcripts, notes, and documentation with NVivo qualitative analysis software. A coherent narrative was developed by identifying relationships between coded statements and references regarding features of the voluntary arrangements and reasons landowners chose to participate in them within the context of this study (Maxwell 1996). This involved description and identification of the frequency and occurrence of perceived features of voluntary arrangements as well as explanations for landowner participation among interviews (Spencer et al. 2003), followed by triangulation across interviews, structured worksheets, and published research (Maxwell 1996, Ritchie et al. 2003, Denzin and

Lincoln 2005).

We did not conduct any statistical analyses of our data because of the small sample size, non-random sample, and open-ended nature of the interview questions. We used basic descriptive statistics in Microsoft Excel to characterize some interview results, such as proportions of different categories of interviewees citing a particular theme. For the worksheets, we removed identifying information and entered worksheet data into Microsoft Excel to characterize the private landowner population interviewed. Discussion of programs, funds, and land management activities that emerged in interviews was validated by document analysis (Maxwell 1996).

Results

Our results are limited to landowners who were already inclined to participate in voluntary conservation in Lake County, Oregon. The proportions of interviews in which features of the voluntary arrangements were described are summarized (Table 3). The features referenced in the most landowner interviews as reasons for participation in voluntary arrangements for sage-grouse conservation were retention of property rights, alignment with production goals, receiving financial assistance, and promotion of rangeland health. For agencies and NGOs, features referenced in the most interviews were retention of property rights, proactive, receiving financial assistance, and leadership. Qualitative analysis highlighted the overlapping, interactive nature of these features. Below, we describe in detail some of these features, including: 1) alignment with production goals, 2) retention of private property rights, 3) institutional support, and 4) flexibility in implementation. Although flexibility in implementation was not frequently referenced as a reason for landowner participation in voluntary arrangements, it was used to characterize the arrangements in 50% of interviews and was a frequent theme in document analysis. Financial assistance, the second most referenced feature in all interviews as a reason for landowner participation, emerged in analysis as a factor that intersected with several of these themes.

Alignment with ranch production goals

For landowners, one of the most referenced reasons for landowner participation in voluntary

conservation arrangements was consistency with ranch production goals, occurring in 40% of interviews as an explanation for participation. The voluntary conservation activities supported by the offered programs appeared to be aligned with what landowners said they would like to be doing on their properties to improve operations, but had not previously had the financial means to do. A government employee in Lake County explained: “[Landowners] want to see [sage-grouse] out there but they also want to be able to use their property. But they’re all really sustainable ranchers so I think that’s what makes it easy for them to do the voluntary stuff, because it’s stuff they already want to do...And then people want to throw money at it which makes it even easier” (Interview #2).

Funding was offered for various conservation activities that also helped with ranch productivity, including juniper removal, invasive annual grass control, and water development for better stock distribution. One landowner said: “We realized for a long time that the junipers take a lot of water, destroy the range, and everything else. So we were always interested in cutting the junipers. But when you have to fund it yourself and the cattle market is not good, we just couldn’t...So when they came out with these programs for the sage-grouse that have the money available to help a guy, that’s when we really started cutting juniper” (Interview #7).

Some landowners also described “accidental” or incidental conservation, wherein they felt that they ran their operations in a way that happened to also be beneficial to sage-grouse, but without the explicit intention of doing so. For example, some landowners wished to further spring development on their properties, which can provide water for livestock and brood-rearing habitat for sage-grouse (Donnelly et al. 2016). Landowners felt that conservation actions suggested to improve sage-grouse habitat did not require substantial changes to their operations. One landowner described: “[Participation] was a bonus way to accomplish goals I had already. My goals and what’s needed for the sage-grouse matched...I mean, most of the projects we’re looking at are range improvement that, as a side, benefits sage-grouse...It’s a nice thing that there’s money to do all these things I’d love to do anyway” (Interview #9). Assistance with

Table 3. General descriptive features of voluntary arrangements for greater sage-grouse (*Centrocercus urophasianus*) conservation in Oregon, proportions of landowner and state and federal agency/non-governmental organization (NGO) interviewees who identified them, and proportion of interviewees who cited each feature as a reason for landowner participation in voluntary arrangements.

Features	Proportion of interviewees who referenced feature			Proportion of interviewees who cited each feature as a reason for landowner participation		
	Landowner	Agency/ NGO	Combined	Landowner	Agency/ NGO	Combined
Promotes rangeland health	0.64	0.11	0.40	0.55	0.00	0.30
Retains property rights	0.82	0.56	0.70	0.64	0.33	0.50
Aligned with production goals	0.64	0.22	0.45	0.64	0.11	0.40
Flexible	0.55	0.44	0.50	0.18	0.11	0.15
Lacks flexibility	0.27	0.11	0.20	0.00	0.00	0.00
Proactive	0.27	0.33	0.30	0.09	0.22	0.15
Institutional:						
Financial assistance	0.73	0.56	0.65	0.64	0.22	0.45
Technical assistance	0.45	0.56	0.50	0.27	0.11	0.20
Leadership	0.64	0.56	0.60	0.36	0.22	0.30

project planning and financial support offered through sage-grouse conservation programs were perceived as bonuses or a win-win.

Landowners' production goals and their desire to achieve general rangeland health were also found to be interrelated. Specifically, when landowners referenced their production goals, 86% of these statements also contained references to the health of the broader system. For example, "We want to continue ranching, so we don't want to damage the land" (Interview #4, landowner). Some interviewees in all categories characterized sage-grouse conservation programs as funding general rangeland health, rather than a species-specific program. Further, the SGI Oregon Implementation Strategy 2014–2019 explicitly stated that NRCS, the administrator of SGI programs and funds, will, "Provide opportunities for ranchers to apply a holistic planning approach to their land." In contrast to this, 2 landowners (Interview #11) were critical of the effort and said that it would be more appealing to them if the program providing resources to area landowners was not called the SGI (i.e., it denoted to them notions of single-species management historically implemented by some federal agencies), and that they would prefer a more inclusive title that highlighted an effort to improve general rangeland health. However, this view was not expressed by other

interviewees.

Retention of private property rights

Eighty-two percent of interviews with Lake County landowners included references to property rights, and 64% of landowner interviews contained references to the retention of them as an explanation for why they participated in voluntary sage-grouse conservation. Fifty-six percent of state and federal agency employees and other NGO staff in Lake County alluded to retention of autonomy and landowner property rights in interviews, and 33% of interviews with agency and NGOs related retention of property rights to why they believed voluntary arrangements may be appealing to Lake County landowners.

All interviewees believed the current arrangements were preferable to an ESA listing, though some referenced a paradox: the threat of the ESA inspired urgency and subsequent participation in the voluntary arrangements, while the continual threat of regulation through the ESA (in addition to other land management restrictions that were perceived to be increasing in recent decades) had potential to diminish enthusiasm for participation and fuel frustrations. Although 1 landowner said of fellow ranchers, "They need to have this hammer [the threat of a listing]

held over their heads” (Interview #12), some landowners cited reluctance to partner with the federal government or accept federal funding for private lands projects because of concerns about strings attached (i.e., a loss of autonomy).

Several landowners interviewed had property or BLM grazing allotments proximal to the Warner Valley, Oregon. These interviewees, in particular, expressed negative views of regulation by the USFWS and BLM, and referenced the 1985 ESA listing of the Warner sucker as a threatened species, with critical habitat. This historical critical habitat designation included up to 15 m on either side of the stream bank in some areas. In the listing decision, the USFWS cited predation by non-native fish species and watershed degradation as reasons for decline. The USFWS wrote in its 1985 finding, “The Service has considered the critical habitat designation in light of relevant additional information obtained and concludes that no significant economic or other impacts are expected to result from the designation” (Federal Register 1985:39121). As a result, conservation measures included alteration of BLM and USFS grazing management plans, fencing streams, and riparian vegetation restoration. The USFWS recommended, “Consultations with the BLM may be necessary for actions involving grazing leases along streams designated as critical habitat,” and at the time of the listing decision, the BLM had already reduced or eliminated cattle grazing along portions of some streams (Federal Register 1985:39120).

Thus, landowners in this area described that for decades, the species has been a consideration in cattle operations, and Animal Unit Months (AUMs; i.e., the metric used to calculate the amount of forage needed by an animal unit grazing for 1 month) were reportedly lost from allotments on public lands in the area as a result of the species’ status. Among landowners in this area, in particular, questions about their perceptions of the future of sage-grouse conservation in Oregon yielded responses that referenced past experiences with litigation, grazing elimination or reduction on public land, and the burden to protect wildlife borne by landowners. One non-governmental employee in Lake County said: “Our Warner Valley landowners have definitely been inundated with all kinds of different issues

and I think sometimes they feel overwhelmed. It may be Warner sucker here, and now we’re worried about sage-grouse. When is it going to stop? Because it is constantly knocking on their door...I think it’s exhausting at times for them...we’re adding different layers to their lives” (Interview #17).

Although generally welcoming the assistance in implementing conservation on their private lands to potentially preclude the need for listing, some landowners described a lack of autonomy as part of a broader narrative (i.e., public lands management in the context of the USFWS listing decision). Such sentiments from landowners were due to a perceived lack of uniform effort for conservation applied across public and private lands: some landowners felt their participation in voluntary conservation was largely responsible for preventing the species from being listed, and surrounding federal land administrators struggled to achieve habitat conservation on the ground. One landowner described private landowners’ fates being inescapably linked to conservation successes on surrounding public lands: “In Lake County, there’s so little private land as compared to public land. So we can do all we can on our private lands, but it’s still going to be the public lands that’s going to dictate what happens to private lands” (Interview #4).

Institutional support

Technical and financial assistance, combined with leadership of the individuals representing institutions involved in the effort, were the second most cited reason for why participating landowners opted to be involved in sage-grouse conservation. Local agency staff and NGOs were regarded as facilitators of the effort, and references to their leadership in the community were more often mentioned than the technical assistance they provided. For example, a landowner reflected: “It is nice that we have so many agencies that are willing to help landowners now. I remember as a kid, no one did anything” (Interview #15).

In addition to agency and organization personnel, an NGO representative and landowner were mentioned in 70% of landowner interviews as a factor in why they decided to participate in sage-grouse conservation. Local agency and NGO interviewees also recognized

the individual's influence in garnering participation, as a government employee in Lake County described: "There were a few big key players early on. I mean [the leader], how huge he is with everything. Looking back, I don't know if SGI would have been so successful in this county if he hadn't been [among the early participants]—because of his influence" (Interview #6).

Flexibility in participation and implementation

The flexibility found in the planning process, in the voluntary arrangements themselves, and in landowners' CCAAs was linked to the broader theme of retention of property rights that was prevalent in interviews and discussed above. Flexibility in ways to achieve private lands conservation was referenced in the USFWS 2015 listing decision; the agency credited NRCS's "flexibility in conservation approaches" as ensuring continued improvement of private lands for sage-grouse conservation (USFWS 2015). In 10 of the 20 interviews, the formation or implementation of CCAAs or other conservation activities for sage-grouse were characterized as flexible for landowners or the agencies involved. Flexibility was perceived by interviewees in different ways. To begin with, many participants did not differentiate between programs through which they completed conservation projects. This was evident when landowners were asked to list programs through which they had received either technical or financial assistance for project planning or implementation on the structured worksheet; many expressed uncertainty about whether they received assistance through SGI, RCPP, or other sources.

Flexibility was also noted in landowner participation in CCAAs. The CCAAs are voluntary, and several landowners stated in interviews that they would not have signed a CCAA if it were difficult to extract themselves from the contract. A Lake County government employee explained that the content of a CCAA could be added to or modified at any time according to landowner requests and acquisition of approval of the USFWS. In addition to this, the agreements can be terminated without penalty, a feature frequently referenced favorably by landowners. This was generally cited as a motivation for

signing an agreement: "The flexibility, really, is the ability to back out of [the CCAA] anytime if things get bad with the government... You give [the SWCD] 30 days' notice and you're out of it. No strings attached... That's the only reason I signed it" (Interview #12, landowner).

Next, flexibility was found in the development of the content of their individual CCAAs. One landowner explained that in response to climatic variation and variation in year-to-year forage production, "What we like is flexibility [in our grazing plans] because no two years are the same. [The CCAA program] was good about that as far as with our grazing plans. For running cows... our main concern was that we had flexibility within this program so that we could still change to some extent" (Interview #1).

Interviews also revealed that development of required grazing management plans for CCAAs was a flexible, interactive process with communication among producers, Lake County SWCD, and the USFWS; proposed adjustments were acceptable to all parties before a CCAA was finalized. For example, 2 interviewees operating a ranch said they objected to some initial content in their proposed CCAA, in which they were required to attach fence markers to prevent sage-grouse collision mortalities on fencing immediately adjacent to the ranch headquarters where there was a great deal of activity and where sage-grouse had never before been seen. The SWCD corresponded with the USFWS about the landowners' objection to the proposed fence marking, and the USFWS subsequently offered that in the amended CCAA, fence marking in that particular area would not be necessary unless landowners began observing sage-grouse in the immediate area.

In addition to this, the SGI strategy also contained substantial flexibility in its approach. Document analysis revealed in the SGI Oregon Implementation Strategy (2014–2019) that NRCS and partners were explicitly charged with working one-on-one with landowners to assess threats to sage-grouse on their property, and then develop site-specific conservation plans in cooperation with landowners to make the arrangements more flexible and more likely to be adopted. Flexibility was also reported in the sage-grouse conservation project development process with landowners on their private land,

in which either: 1) landowners identified goals or actions that they wanted to pursue for sage-grouse habitat improvement and submitted requests to NRCS for approval and access to funds, or 2) NRCS approached landowners with a project idea and then interactively developed a plan with the landowner before submitting it for SGI funding. However, less flexibility was found in the kinds of projects that may qualify for funding. For example, observing distances from leks for salt placement was found to be fairly rigid. A government employee in Lake County described this: “[NRCS] has a set practice list that we have to follow. And if [the landowner] wants to do something that’s, say, not on that practice list, then [SGI funds] can’t cover that” (Interview #6). The interviewee also specified that though landowners have the right to construct new fencing anywhere on their private property, for example, if its intention was to improve grazing management to benefit sage-grouse and if the landowner desired SGI funds for the project, the fence location must first be approved by NRCS. These Conservation Practice Standards for NRCS administration of SGI are found in the 2010 USFWS Conference Report for the NRCS’s SGI Program (USFWS 2010b). A comprehensive analysis of each Conservation Practice Standard and a set of guidelines for NRCS employees are detailed, including the purpose, potential beneficial and adverse effects to sage-grouse, and the conservation measures.

Flexibility was also reported in how SGI funds, received for specific projects, could be spent. This flexibility was oriented around an outcome-based approach: funds were awarded for juniper removal on specified parcels of the private property, and landowners were paid a set amount per acre (determined by thickness of juniper to be removed and other factors). Landowners were given the flexibility with these funds to hire a contractor of their choosing or do the labor themselves. In addition to this, any money not spent in the course of completion of the project may be applied to other improvements (e.g., spraying invasive annual grasses or cutting juniper on other private parcels).

Perceived challenges and limitations

Some of the challenges described by landowners included disagreement with

agencies and the public about how to conserve sage-grouse: “We’re doing our part with how we’re trying to graze cattle. If we’re putting out that effort, is there effort being put out by other groups?...You’ll hear from one organization that cows are the enemy and you’ve got to get grazing off the ground. At the same time, that same organization is...against predator control. The fact is, if you add up how many sage-grouse a cow has killed compared to how many sage-grouse a bobcat [*Lynx rufus*], a cougar [*Puma concolor*], or a coyote [*Canis latrans*] has killed, there’s a lot bigger issue than what the cattle are doing” (Interview #1). Similarly, some landowners described some misalignment in the kinds of conservation activities they would like to do on their lands and those that qualify for SGI or are acceptable actions under their CCAA. For example, a landowner wished to stabilize cheatgrass-invaded, eroded, or burned areas while also providing cattle with forage by planting disturbed areas with crested wheatgrass (*Agropyron cristatum*) or forage kochia (*Bassia prostrata*): “If you’ve got a disturbance, you can stabilize the site rather than get an annual grass monoculture that will burn every other year for the next 40 or 50 years till we figure out what to do about that...for a lot less money and for a lot more certainty we can take these native or these annual grass systems and turn them into crested wheat and then we can manage crested wheat toward a sagebrush system and then over time the native grasses will come back. I think some of these biologists don’t like to go that route but I think they should get over it because of the scale of the problems occurring on them” (Interview #5). This critique was validated by a government employee, who acknowledged that programs, such as SGI, are less apt to fund such efforts of landowners due to a perceived “risk” (i.e., wasting funds on an effort that is believed to have only marginal success, especially in contrast to projects like juniper removal).

Discussion

We used a qualitative, in-depth case study to explore the features that promoted landowner participation in voluntary sage-grouse conservation in southeastern Oregon. This region is rural, remote, and home to extensive rangeland grazing and cattle production. Our findings relate to existing knowledge about

private landowner participation in voluntary conservation in several ways.

First, we found that most commonly, landowners were willing to participate because they saw features of these arrangements as complementary to their already-existing cattle production goals, and because funding and technical assistance were available. That is to say, the program outcomes were important in whether landowners chose to participate (Breetz et al. 2005). In general, promoting rangeland health was important to landowners, which incidentally benefits sage-grouse. Thus, the offered interventions (e.g., juniper removal) were perceived to be a more appropriate strategy than regulation and possible restrictions, which broadly contributed to participation (May 2005). This finding may be fairly obvious, but it confirmed that species conservation in this context may be much easier to achieve if actions that help conserve the species are also compatible with landowners' goals. It is less clear if landowners would participate if conservation actions did not add benefit to their operations; even if the actions were not seen as directly incompatible, they could be viewed as nuisances or detracting from their livelihoods. Future design and implementation of conservation programs that rely on landowner engagement can learn from Oregon's strategy, which was reflective of the needs of those affected by use of the ESA on the ground.

Second, we found that a key community member's involvement in the formation of the programs and implementation of them on his own property, as well as program administration by respected agency and organizational representatives, had been a factor in nearly a majority of landowners' decisions to participate. It is well documented in the literature that rural residents often demonstrate skepticism and distrust of federal regulations, such as the ESA (e.g., Conley et al. 2007). For that reason, local leadership including local-level federal and state agencies and NGO personnel, who are perceived to be trustworthy and have access to reliable knowledge, were critical in landowner subscription to the programs. Specifically, these agencies, organizations, and community leaders in Oregon's sage-grouse conservation effort were found to be acting as intermediaries,

instrumental in facilitating interactions between landowners and regulatory bodies, such as the USFWS (Cash 2001, Breetz et al. 2005, May 2005, York and Schoon 2011). These interactions promoted trust in agency representatives, which was important in determining whether a landowner chose to participate in voluntary conservation that involved both government funds and coordination with government agencies. The flexibility found in this process also contributed to landowners' widespread adoption of these arrangements, and the interactive project planning process between landowners and agencies also potentially increased landowners' perceived legitimacy of the conservation effort (Cocklin et al. 2007, Cooke et al. 2012). Our study largely confirmed the importance of the role of intermediaries in policy uptake at lower levels of governance.

Third, we found that the threat of the use of the ESA in this community provided an additional impetus for landowner participation in voluntary conservation, serving as more of a "stick" than the "carrots" of other incentives we have described. Several landowners exhibited resistance to an ESA listing, referencing its historical use in their immediate area and experience with reductions in grazing or loss of other property rights. This is similar to other studies that suggest historical implementation of the ESA can be a "social memory" among landowners, carrying with it fear of potential land use restrictions (e.g., Sorice et al. 2012). In this case study, some fear of restrictions was geographically aligned in an area of the county that had directly experienced previous regulation through the ESA (i.e., the Warner Valley). Although some authors (e.g., Langpap and Wu 2004) have examined how "background threat" of regulation affects landowner participation in voluntary conservation, more research could help examine the relative importance of direct experience and proximity to previous regulation versus a more general sense of threat from regulation in affecting landowner participation. A perceived lack of autonomy among landowners in the ESA context was related to references to the abundance and proximity of extensive acreages of public lands and lack of control over their management. For example, the USFWS 1985 decision to list the Warner sucker explicitly stated that the USFWS

did not believe designating critical habitat would carry significant economic impacts, despite the BLM reducing or eliminating AUMs on permits within the species' range. Thus, interviewees were highly motivated to participate because of the assurances provided through CCAAs, for example, against future regulation (Langpap and Wu 2004). Further, Conley et al. (2007) found that permittee opposition to ESA listings was correlated with negative perceptions of the federal government, rather than with the number of listed species on the allotments or potential restrictions that may be enacted. Such attitudes can impede private landowner participation and make coordinating conservation efforts difficult. Today, even with this example of voluntary arrangements precluding the use of regulatory protections, landowners in this study did not fully feel that they had control over the fate of their operations because of their economic reliance on grazing allotments administered by federal land management agencies.

In summary, our findings suggest that voluntary programs instead of federal regulation may provide ranchers in production contexts with a sense of empowerment and autonomy that encourages participation. The potential of these voluntary strategies to prevent listing of sage-grouse under the ESA promoted landowner subscription through involvement in informal policy-making processes such as the development of flexible grazing plans and contracts with the USFWS (Cooke et al. 2012). Support from trusted local personnel and leaders and programs that included flexibility and regulatory certainty, promoted a sense of retention of autonomy and control over the futures of landowners' operations. These types of incentives for participation do not all neatly fit into the categories described in previous studies (e.g., regulatory assurances, bureaucratic processes, and financial incentives were drivers of participation in Langpap 2006, Sorice et al. 2011); here, we found that they are overlapping and interactive. Although we did find that monetary incentives of cost sharing and subsidies were indeed important (consistent with Sorice et al. 2011), financial assistance was referenced within a broader narrative in which it was welcomed because it helps landowners achieve their goals and

protect the futures of their operations through retention of their autonomy. This suggested that in a production-oriented context, alignment of conservation actions with economic and cultural values (i.e., assurance, and the desire to continue ranching into the future) may be a more substantive incentive than specific measures or resources. The Oregon strategy for incentivizing voluntary conservation was aligned with landowners' economic goals (continuing to make a living ranching without government interference) as well as cultural values (i.e., retention of autonomy is consistent with individual independence, characteristic of a Western ranching identity).

Management implications

Following the "warranted but precluded" listing finding for sage-grouse in 2010, Oregon's rangeland communities experienced intensified, targeted financial and technical assistance that interacted with an already-heightened urgency to prevent the species' listing. This effort, in part, led to the USFWS decision in 2015 to not list the species under the ESA. In this study of participating landowners, opting to voluntarily conserve to retain private property rights was found to be a major impetus for participation in voluntary arrangements. This raises larger questions of just how voluntary some voluntary arrangements may in fact be. Such intersections of regulatory influences, even averted ones, with voluntary measures may create situations in which incentives for landowner participation are complex combinations of "carrots" and "sticks." Moreover, the cultural and economic context in which landowners reside must be considered in the future design and implementation of conservation programs that rely on landowner engagement for success.

Acknowledgments

This research was conducted with approval of the Institutional Review Board at Oregon State University (IRB #7679). We sincerely thank Lake County landowners, state and federal agency employees, and NGO staff for their participation in this study. We also thank advisors at Oregon Consensus, Oregon Cattlemen's Association, and members of the Sage Grouse Conservation Partnership for their thoughtful feedback in the development of this research. Thanks also

to M. Needham and J. Abrams who provided valuable feedback on previous drafts of this manuscript. Finally, we thank 2 anonymous reviewers and M. Chamberlain, *HWI* associate editor, for constructive comments that greatly improved our manuscript.

Literature cited

- Balch, J. K., B. A. Bradley, C. M. D'Antonio, and J. Gómez-Dans. 2013. Introduced annual grass increases regional fire activity across the arid western USA (1980–2009). *Global Change Biology* 19:173–183.
- Breetz, H. L., K. Fisher-Vanden, H. Jacobs, and C. Schary. 2005. Trust and communication: mechanisms for increasing farmers' participation in water quality training. *Land Economics* 81:170–190.
- Brownscombe, B., T. Burcsu, J., and J. Cupples, editors. 2015. *The Oregon sage-grouse action plan*. Governor's Natural Resources Office, Salem, Oregon, USA.
- Brunson, M. W., and L. Huntsinger. 2008. Ranching as a conservation strategy: can old ranchers save the New West? *Rangeland Ecology and Management* 61:137–147.
- Cash, D. W. 2001. "In order to aid in diffusing useful and practical information": agricultural extension and boundary organizations. *Science, Technology, and Human Values* 26:431–453.
- Cocklin, C., N. Mautner, and J. Dibden. 2007. Public policy, private landholders: perspectives on policy mechanisms for sustainable land management. *Journal of Environmental Management* 85:986–998.
- Conley, J. L., M. E. Fernandez-Gimenez, G. B. Ruyle, and M. Brunson. 2007. Forest Service grazing permittee perceptions of the Endangered Species Act in southeastern Arizona. *Rangeland Ecology and Management* 60:136–145.
- Cooke, B., W. T. Langford, A. Gordon, and S. Bekessy. 2012. Social context and the role of collaborative policy making for private land conservation. *Journal of Environmental Planning and Management* 55:469–485.
- Copeland, H. E., A. Pocewicz, D. E. Naugle, T. Griffiths, D. Keinath, J. Evans, and J. Platt. 2013. Measuring the effectiveness of conservation: a novel framework to quantify the benefits of sage-grouse conservation policy and easements in Wyoming. *PLOS ONE* 8(6):1–14.
- Denzin, N. K., and Y. S. Lincoln. 2005. *The SAGE handbook of qualitative research*. SAGE, Thousand Oaks, California, USA.
- Donnelly, J. P., D. E. Naugle, C. A. Hagen, and J. D. Maestas. 2016. Public lands and private waters: scarce mesic resources structure land tenure and sage-grouse distributions. *Ecosphere* 7:1208–1213.
- Federal Register. 1985. Endangered and threatened wildlife and plants; Determination that the Warner sucker is a threatened species and designation of its critical habitat. *Federal Register* 50:39117–39123. Department of the Interior, Washington, D.C., USA.
- Federal Register. 2015. Endangered and threatened wildlife and plants; 12-month finding on a petition to list greater sage-grouse (*Centrocercus urophasianus*) as an endangered or threatened species. *Federal Register* 80:59857–59942. Department of the Interior, Washington, D.C., USA.
- Foster, L. 2016. Oregon greater sage-grouse spring population monitoring: 2016 annual report. Oregon Department of Fish and Wildlife, Hines, Oregon, USA.
- Hagen, C. 2011. Greater sage-grouse conservation assessment and strategy for Oregon: a plan to maintain and enhance populations and habitat. Oregon Department of Fish and Wildlife, Bend, Oregon, USA.
- Huntington, H. P. 2000. Using traditional ecological knowledge in science: methods and applications. *Ecological Applications* 10:1270–1274.
- Huntsinger, L., N. F. Sayre, and J. D. Wulffhorst. 2012. Birds, beasts and bovines: three cases of pastoralism and wildlife in the USA. *Pastoralism: Research, Policy and Practice* 2(12):1–28.
- Jackson-Smith, D., U. Kreuter, and R. S. Krannich. 2005. Understanding the multidimensionality of property rights orientations: evidence from Utah and Texas ranchers. *Society and Natural Resources* 18:587–610.
- Knapp, C. N., J. Cochran, F. S. Chapin III, G. Kofinas, and N. Sayre. 2013. Putting local knowledge and context to work for Gunnison sage-grouse conservation. *Human–Wildlife Interactions* 7:195–213.
- Knapp, C. N., F. S. Chapin III, and J. O. Cochran. 2015. Ranch owner perceptions and planned actions in response to a proposed Endangered Species Act listing. *Rangeland Ecology and Management* 68:453–460.
- Lake County. 2011. *Lake County facts and stats:*

- land ownership. Lake County, Oregon, USA, <<http://www.lakecountyor.org/business/geography.php>>. Accessed April 30, 2017.
- Langpap, C. 2006. Conservation of endangered species: can incentives work for private landowners? *Ecological Economics* 57:558–572.
- Langpap, C., and J. Wu. 2004. Voluntary conservation of endangered species: when does no regulatory assurance mean no conservation? *Journal of Environmental Economics and Management* 47:435–457.
- Legard, R., J. Keegan, and K. Ward. 2003. In-depth interviews. Pages 138–169 in J. Ritchie and J. Lewis, editors. *Qualitative research practice: a guide for social science students and researchers*. SAGE, Thousand Oaks, California, USA.
- Lemos, M. C., and A. Agrawal. 2006. Environmental governance. *Annual Review of Environment and Resources* 31:297–325.
- Lueck, D., and J. Michael. 2003. Preemptive habitat destruction under the Endangered Species Act. *Journal of Law and Economics* 46:27–60.
- Mack, N., C. Woodson, K. M. MacQueen, G. Guest, and E. Namey. 2005. *Qualitative research methods: a data collector's field guide*. Family Health International, Research Triangle Park, North Carolina, USA.
- Maestas, J. D., R. L. Knight, and W. C. Gilgert. 2003. Biodiversity across a rural land-use gradient. *Conservation Biology* 17:1425–1434.
- Maxwell, J. A. 1996. *Qualitative research design: an interactive approach*. SAGE, Thousand Oaks, California, USA.
- May, P. J. 2005. Regulation and compliance motivations: examining different approaches. *Public Administration Review* 65:31–44.
- Messmer, T. A. 2013. Lessons learned from the greater sage-grouse: challenges and emerging opportunities for agriculture and rural communities. Policy Brief 6, National Agricultural and Rural Development Policy Center, Michigan State University, East Lansing, Michigan, USA.
- Natural Resources Conservation Service. 2015. Sage grouse initiative 2.0: investment strategy, FY 2015–2018. U.S. Department of Agriculture, Washington, D.C., USA.
- Pierre, J. 2012. Governance and institutional flexibility. Pages 187–200 in D. Levi-Faur, editor. *The Oxford handbook of governance*. Oxford University Press, New York, New York, USA.
- Prukop, J., and R. J. Regan. 2005. The value of the North American model of wildlife conservation—an IAFWA position. *Wildlife Society Bulletin* 33:374–377.
- Raymond, L., and A. Olive. 2008. Landowner beliefs regarding biodiversity protection on private property: an Indiana case study. *Society and Natural Resources* 21:483–497.
- Ritchie, J., J. Lewis, and G. Elam. 2003. Designing and selecting samples. Pages 77–108 in J. Ritchie and J. Lewis, editors. *Qualitative research practice: a guide for social science students and researchers*. SAGE, Thousand Oaks, California, USA.
- Sayre, N. F. 2004. Viewpoint: the need for qualitative research to understand ranch management. *Journal of Range Management* 57:668–674.
- Selinske, M. J., J. Coetzee, K. Purnell, and A. T. Knight. 2015. Understanding the motivations, satisfaction, and retention of landowners in private land conservation programs. *Conservation Letters* 8:282–289.
- Sorice, M. G., W. Haider, J. R. Conner, and R. B. Ditton. 2011. Incentive structure of and private landowner participation in an endangered species conservation program. *Conservation Biology* 25:587–596.
- Sorice, M. G., J. R. Conner, U. P. Kreuter, and R. N. Wilkins. 2012. Centrality of the ranching lifestyle and attitudes toward a voluntary incentive program to protect endangered species. *Rangeland Ecology and Management* 65:144–152.
- Sorice, M. G., C. Oh, T. Gartner, M. Snieckus, R. Johnson, and C. J. Donlan. 2013. Increasing participation in incentive programs for biodiversity conservation. *Ecological Applications* 23:1146–1155.
- Spencer, L., J. Ritchie, and W. O'Connor. 2003. Analysis: practices, principles, and processes. Pages 199–218 in J. Ritchie and J. Lewis, editors. *Qualitative research practice: a guide for social science students and researchers*. SAGE, Thousand Oaks, California, USA.
- U.S. Fish and Wildlife Service. 2010a. Endangered and threatened wildlife and plants; 12-month finding for petitions to list the greater sage-grouse (*Centrocercus urophasianus*). *Federal Register* 75:13910–13598.
- U.S. Fish and Wildlife Service. 2010b. Conference report for the Natural Resources Conservation Service's Sage Grouse Initiative. Department

- of the Interior, Washington, D.C., USA.
- U.S. Fish and Wildlife Service. 2015. Endangered and threatened wildlife and plants; 12-month finding on a petition to list greater sage-grouse (*Centrocercus urophasianus*) as an endangered or threatened species. Federal Register 80:59857–59942.
- Van der Heijden, J. 2012. Voluntary environmental governance arrangements. *Environmental Politics* 21:486–509.
- Wilcove, D. S., M. J. Bean, R. Bonnie, and M. McMillan. 1996. Rebuilding the ark: toward a more effective Endangered Species Act for private land. Environmental Defense Fund, Washington, D.C., USA.
- Wilson, R. K. 2014. America's public lands: from Yellowstone to Smokey Bear and beyond. Rowman and Littlefield, Lanham, Maryland, USA.
- Yin, R. K. Case study research: design and methods. SAGE, Thousand Oaks, California, USA.
- York, A. M., and M. L. Schoon. 2011. Collective action on the western range: coping with external and internal threats. *International Journal of the Commons* 5:388–409.

Associate Editor: Michael Chamberlain

KATHERINE L. WOLLSTEIN is a doctoral research assistant with the Policy Analysis Group in the Department of Natural Resources and Society at the University of Idaho in Moscow. She received her M.S. degree in forest ecosystems and society at Oregon State University. Her research interests include rangeland policy and governance, alternative models for natural resource management, and ranching and public lands administration.



EMILY JANE DAVIS (photo unavailable) is an assistant professor and extension specialist in the Department of Forest Ecosystems and Society at Oregon State University. Her research and technical assistance focuses on collaborative governance and partnerships in the fields of forestry, watershed restoration, and wildfire risk management. She holds a Ph.D. degree and M.A. degree from the University of British Columbia.