

Behavioral Assumptions of Conservation Policy: Conserving Oak Habitat on Family-Forest Land in the Willamette Valley, Oregon

A. PAIGE FISCHER* AND JOHN C. BLISS

Department of Forest Resources, 280 Peavy Hall, Oregon State University, Corvallis, OR 97331-5704, U.S.A

Abstract: *Designing policies that harness the motivations of landowners is essential for conserving threatened habitats on private lands. Our goal was to understand how to apply ethnographic information about family-forest owners to the design of conservation policy for Oregon white oak (Quercus garryana) in the Willamette Valley, Oregon (U.S.A.). We examined owners' knowledge, beliefs, values, and socioeconomic contexts through in-depth individual and focus-group interviews to understand their motivations to conserve oak. We then used Schneider and Ingram's (1990) policy analysis framework to compare owners' motivations to the logic of policy. Owners had complex motivations for conserving oak. Despite this complexity, all 5 categories of policy that Schneider and Ingram describe hold promise. Policies that use symbolism to inspire behavior and policies that build capacity can harness owners' stewardship ethics and moral obligations. Policies that offer tangible rewards can build on owners' utilitarian motives. Policies that permit and prohibit behavior can tap owners' concerns about rule violations. Policies that promote voluntary, collaborative efforts can accommodate owners' need for autonomy and flexibility.*

Keywords: conservation policy, family forests, policy design, private land, threatened habitat

Suposiciones Conductuales de las Políticas de Conservación: la Conservación de Hábitat de Roble en Tierras Forestales Familiares en el Valle Willamette, Oregon

Resumen: *El diseño de políticas que restringen las motivaciones de propietarios de tierras es esencial para la conservación de hábitats amenazados en tierras privadas. Nuestra meta fue entender como se aplica la información etnográfica de los propietarios de bosques familiares al diseño de políticas de conservación de Quercus garryana en el Valle Willamette, Oregon (E.U.A.). Examinamos el conocimiento, las creencias, los valores y la situación socioeconómica de los propietarios mediante entrevistas individuales y con grupos focales para entender sus motivaciones para conservar el roble. Posteriormente, utilizamos el marco de referencia para el análisis de políticas de Schneider e Ingram (1990) para comparar las motivaciones de los propietarios hacia el desarrollo de la política. Los propietarios tuvieron motivaciones complejas para la conservación del roble. No obstante esta complejidad, se cumplieron las cinco categorías de políticas que describen Schneider e Ingram. Las políticas que utilizan simbolismos para inspirar conductas y las políticas que forman capacidades pueden restringir las obligaciones morales y la ética de los propietarios. Las políticas que ofrecen recompensas tangibles pueden reforzar los motivos utilitarios de los propietarios. Las políticas que permiten y prohíben comportamientos pueden tocar la preocupación por la violación de reglas. Las políticas que promueven esfuerzos voluntarios, cooperativos pueden acomodar la necesidad de autonomía y flexibilidad.*

Palabras Clave: bosques familiares, diseño de políticas, hábitat amenazado, políticas de conservación, tierra privada

*email apfischer@oregonstate.edu

Paper submitted April 27, 2007; revised manuscript accepted August 27, 2007.

Introduction

In the United States many of the thorniest natural resource conflicts occur on private land. This is especially true in the Willamette Valley of western Oregon, where 96% of the land area and 4 of 5 threatened habitat types occur on private land (Oregon Biodiversity Project 1998). The valley's hallmark habitat type, Oregon white oak (*Quercus garryana*), which consists of savannas, woodlands, and thickets, is arguably the most vulnerable. In Oregon over 200 species, 45 of which are at-risk, are associated with Oregon white oak, making it one of the most biologically diverse habitat types in the state (Hagar & Stern 2001; Thysell & Carey 2001; Standiford 2002). Due to its location in prime areas for expansion of urban development, vineyards, and tree plantations, and the elimination of periodic fires to which it is adapted, the quantity and quality of oak habitat is in decline. Current estimates of the remaining oak habitat range from 24,921 to 69,684 ha, which is thought to represent perhaps 10% of what was once present (Atterbury Consultants 1992; Klock et al. 1998; Oregon Department of Fish and Wildlife 2006).

Much of the remaining oak habitat is on family forest lands. More than 106,432 ha (263,000 acres) of family-forest land support oak habitat in the Willamette Valley (Atterbury Consultants 1992). Family forest owners typically are knowledgeable about ecological systems and hold ecological objectives among their multiple management goals (Jones et al. 1995; Brunson et al. 1996; Johnson et al. 1999). Many are also skilled in active management practices necessary for conserving dynamic ecosystems such as oak. For these reasons family forest owners are important in any oak conservation strategy in the region. Nevertheless, their ability and propensity to conserve oak is conditioned by their limited ecological knowledge and competing economic objectives for their land (Fischer & Bliss 2006).

The success of any policy effort depends on the extent to which it embodies the values and perspectives of its target group (Schneider & Ingram 1990, 1993). People act toward things based on the meanings they have for them (Blumer 1937). These meanings are based on their beliefs and values (Rokeach 1973). Schneider and Ingram (1990) argue that policy makers design policy with expectations of how target groups will react based on assumptions about what might motivate them to engage in the behaviors that they seek to affect. They offer a framework for analyzing policy on the basis of the validity of these inherent assumptions. The framework divides policy into 5 categories by strategy or "tool" used to harness people's motivations to influence their behavior: authority tools assume people are motivated to obey laws; incentive tools assume individuals are utility maximizers and will make choices that will lead to tangible payoffs if they have adequate information, decision-making skill,

and opportunity; capacity tools assume people lack necessary information, skills, or other resources to make decisions; symbolic and hortatory tools assume people are motivated by beliefs that can be manipulated; and learning tools assume people are uncertain about the nature of a problem and its solution, but can learn to select appropriate tools.

Methods

We interviewed a total of 36 family forest owners in 18 in-depth, semistructured individual interviews and 3 structured focus-group interviews of about 6 owners each. The owners we interviewed were individuals or members of families that own parcels at least 4 ha in size that support oak habitat in the Willamette Valley, Oregon.

We chose the Willamette Valley because it is the primary location of the Oregon white oak habitat type in Oregon. Focusing on the Willamette Valley also provided an opportunity to study and contribute to an emerging policy issue; just before we began the interviews, oak conservation had become an emphasis of local land management and extension agencies. Oregon State University Forestry Extension had conducted a series of public presentations and the Bureau of Land Management had distributed a guide for oak management.

In the interviews we explored owners' knowledge and values about oak, views on the quality of and management options for examples of habitat we were looking at, and views on opportunities and constraints for conservation. Individual interviews lasted 2 to 3 h each and took place outside on owners' properties, which enabled us to refer to oak habitat conditions during our conversations. Focus-group interviews were 6-h long. Each took place at a local National Wildlife Refuge in a conference room and outside at the sites of several kinds of oak habitat. We conducted focus-group interviews in addition to individual interviews because focus groups promote collaborative inquiry, the bringing together of multiple perspectives on the same issues (Nyden et al. 1997), which we thought would be conducive to policy development. The interviews took place over the course of 9 months.

Sampling was purposive; we created a list of over 80 owners that had been in contact with Oregon State University Forestry Extension, Soil and Water Conservation Districts, state and federal natural resource agencies, land trusts, and watershed councils. We selected owners to interview on the basis of the balance they brought to our sample in terms of parcel sizes, types of oak habitats, and conservation attitudes. We determined the final size of the sample through theoretical saturation (i.e., we capped sample size when the collection of additional units of data yielded proportionally smaller units of findings) (Strauss 1987).

We used a qualitative protocol of coding, memo writing, and theory building to analyze the responses given in the interviews. Using the qualitative data analysis software Atlas.ti, we coded transcriptions of the interviews 3 times to identify owners' knowledge, beliefs, and values about oak; views about opportunities and constraints for conservation; and ideas for policy options. We conducted a first round of analysis by coding each interview shortly after it was completed to identify as many different ideas as possible. After finishing all the interviews we conducted a second and third round of analysis to consolidate the codes into thematic categories and develop theories about owners' motivations and policy preferences. We used pseudonyms to maintain informants' confidentiality.

Results

Three aspects of owners' knowledge, beliefs and values, and socioeconomic contexts were relevant to their motivations to conserve oak and responses to policy tools. First, owners perceived themselves as stewards of an ecological and cultural legacy. Second, owners couched their sense of moral duty in the traditional utilitarian terminology of tangible rewards. Third, owners prioritized self-determination and autonomy.

Stewardship

When asked to describe how they valued oak, owners mentioned wildlife habitat, family history, historical legacy, and aesthetics more than any other value. For example, Bill Waltmann, an owner of 263 ha (650 acres) of oak woodland, said his land-management goal is to rid his woodland of invasive pear and blackberry to achieve the open conditions his ancestors encountered when they homesteaded the property. He explained, "I'd like to restore it to the 1850s type where there was a lot of oak savanna... [when] my poor great-great grandparents... walked out here from Illinois... with a couple wagons..."

Similarly, Rosemary Dow, a widow in her early seventies, wanted to maintain the open savanna conditions that her family experienced on the property in order to provide a historical connection and sense of place for future generations. To do so, she leases her 121 ha (300 acres) of land for cattle grazing to keep the brush down to prevent invasive species from encroaching on the grassy understory. When asked why she wants her land to be maintained as an oak savanna in perpetuity, she said, "It's been like this in the family for a long time, and all the relatives that grew up here before me come back and visit and talk about when we did this and that... and what they're doing now. It's an ongoing family thing."

Not only did the owners want to protect the legacy of the past, but they also wanted to leave a legacy for

the future. Bill and Bonnie Dowd decided to preserve conifer wolf trees and a few acres of oak within their 58-ha (145-acre) timber property. They said, "Okay, we've got enough timber for us and the kids so let's dedicate some to nature. We want something for the grandkids so they can say these are our old growth."

Many owners only recently became aware of oak. For example, it was by receiving a landowner guide from the Bureau of Land Management a month before our interview that Bill Waltmann learned that open grassland scattered with oaks had a name other than "wasteland." Nevertheless, its rarity and endangerment seemed to be justification enough for many owners to make conservation a priority. Bob Jones, an architect who built a home on 48 ha (120 acres) of oak savanna, told this story,

I had a client in town here that just decimated a stand of oaks... I'm not a tree hugger by any means, but I always like trees where they should be... That's when I first became aware of white oaks, and that they were somewhat of an endangered tree... It's just a shame to cut them down.

Douglas-fir (*Pseudotsuga menziesii*) management also had a place in owners' values for stewarding ecological and cultural legacies, sometimes to the detriment of oak. In addition to being the region's dominant tree species and the cornerstone of the timber industry, it symbolized the importance of the forestry sector and pioneer efforts to make land productive in Pacific Northwest history. Even on marginal land, owners often prioritized Douglas-fir production at the expense of oaks. For example, Bill Dowd used to value Douglas-fir so much that he never noticed oak on his property. He said, "Quite honestly, I never knew the oak were there... When I walked in that area, the only thing I was looking at was Douglas-fir... After we logged, I was honestly amazed at how much oak we really had... I never saw it... I filtered it out."

Henry Sanders, who manages 324 ha (800 acres) of timberland for a living, was critical of industrial forestry for influencing the mindset of small woodland owners in favor of conifer plantations. He explained,

Industrial forestry has a big sway in Oregon, and it's in their interest to have the public believe that the only way to do things is the way [they're] doing it. To show that you can manage a forest in something other than a clear-cut regime... It would pressure... other people to do it.

Although many owners acknowledged that they had an affinity for Douglas-fir, they also said that the forestry profession had not offered alternatives. Extension foresters, agency foresters, and family forest interest groups have promoted Douglas-fir plantation management through

their programs (Sampson & DeCoster 1997; Fischer & Bliss 2006), sometimes at the expense of native biodiversity (Fischer & Bliss 2006). Dowd described how consulting foresters influenced their view of oak as an undesirable species when they first started managing their property,

We were told by one private consulting forester 'Get them out of here!' ... He cut ... some four-foot-diameter oak trees ... [and taught us] how to girdle those oaks and spray them with chemicals ... and get rid of them so that they don't mess up ... [the] Douglas-fir.

The centrality of Douglas-fir in owners' notions about good management in some cases made it hard for them to manage for the oak. Fritz Quinn is a retired forester who owns 95 ha (235 acres), on 14 (40 acres) of which oak is interspersed with Douglas-fir. He described how hard it is to thin Douglas-fir to release oak.

We [restored] five of the most obvious acres. We kept looking into the fir stand, and there were still a few oaks ... [My wife] said 'Enough is enough! We've done our duty.' Because to maintain that oak woodland, I have to go in there and pull fir seedlings.

The emphasis that owners placed on being stewards of ecological and cultural legacies indicates they are motivated by beliefs and values, the basis for policies that use symbolism to inspire behavior. The fact that they valued both oak and Douglas-fir—largely incompatible forest types—as cultural legacies revealed that they held competing notions about the forest conditions they should steward, a tension that symbolic policies could help resolve.

Utilitarianism

At the same time landowners in our sample wanted to conserve oak for altruistic reasons, they framed oak conservation in utilitarian terms. For example, Sandy Carpenter, who owns 36 ha (90 acres) of land, 6 ha (15 acres) of which are oak, said she found it difficult to make conservation decisions such as thinning Douglas-fir from oak when the benefits do not outweigh the costs. She said,

On the one hand, those Douglas-fir aren't worth enough ... to pay for the removal of them; on the other hand, I have a really hard time cutting down a big fir because I like trees ... and I know it has some value ... I need to know that ... it's really the right thing to do.

The high cost of oak restoration made it difficult for owners to rationalize oak conservation. According to a local county Soil and Water Conservation District, thinning and removing invasive brush and trees from oak stands can cost up to \$2000 and take up to 29 h/0.5 ha (i.e., 29

h/acre). In addition, the opportunity costs of conserving oak instead of growing timber or agricultural crops can be overwhelming. Finally, the habitat created through conservation may attract endangered species, inviting further restrictions and opportunity costs on land uses.

Many owners poked fun at themselves as being "crazy to do oak conservation." Four of the most conservation-minded owners interviewed recognized inherent risks and losses in oak conservation. Two of these landowners were so frustrated at not being able to reconcile their love for oak with their need for security that they have abandoned their conservation efforts. For example, Nancy Young purchased her 202 ha (500 acres) of land, 121 ha (300 acres) of which were oak woodland and savanna, with the intent of developing residential home sites. After living on the property for several years she became aware of oak and its ecological importance.

We own the land for economic reasons, but in my heart of hearts, I would rather see it not developed and valued for what it is: oak savanna ... I'm really torn about this because I'm very politically liberal; I've just fallen into this situation where my economic interests are directly opposed to what I believe.

Like Nancy Young, other owners viewed conservation in utilitarian terms. They referred to habitat as a social good worthy of compensation just like timber. For example Lance Norton justified restoring a dozen acres of oak in his 186-ha (460-acre) timber property as producing public benefits for which he is compensated. Mr. Norton said, "When I received the money from Fish and Wildlife Service, I looked at it in that regard, as compensation. I didn't get anywhere close to the maximum amount, but it was a pretty substantial amount of money they were prepared to pay people."

Although numerous owners saw opportunity in markets for environmental services, they also realized that being compensated for these services brought along more accountability requirements and public scrutiny. Mary Harten, who manages her 65 ha (160 acres) for timber production, habitat conservation, and recreation, thought compensation would be an incentive for owners to conserve oak for the public good. Yet she also acknowledged that the public is skeptical about paying for conservation's private benefits such as aesthetics and recreation enjoyed by the landowner. Ms. Harten said,

I think that's an issue that needs to be grappled with ... There isn't any clear line that can really separate public good from private good. But there needs to be some way of helping the public understand and feel comfortable with the use of their money on someone else's land.

Some owners thought that environmental services markets may make conservation more fair. They were concerned that regulation had eroded private property rights and inflated society's expectations for water quality, habitat, farm and forest products, and scenic beauty from working lands. Lacey Bidwell, whose family owns more than 1214 ha (3000 acres) of timberland, believed it was unfair to impose the burden of providing conservation on any one group, in part because conservation is not an exact science and management prescriptions are constantly evolving. She explained,

If society thinks it's that important, then everybody else has to pony up, not just the landowner... Because I'm not smart enough to know how many owls we need or how many oaks we need or how many squirrels we need. But I'm going to be a lot more agreeable if everybody else is pitching in.

Many of the landowners viewed themselves as assets to conservation, that they were the people most familiar and practiced with management of their land and the ones who were present and willing to do the work. They saw compatibility between oak conservation and human uses. Nancy Young believed that residential development could conserve oak on the urban fringe: "We all agree that oaks require perpetual maintenance and somebody has to pour money into these things. It's a great marriage to have people living on the property that care deeply about it and are connected to it and are putting money into it."

Several of the landowners proposed modifying Oregon's land-use system to allow more residential and business uses of the agriculture and forestry-zoned lands where oak is present. For example, Sandy Carpenter suggested developing spiritual or educational retreat centers as a way to generate income for landowners to justify not working their oak lands and give the public an opportunity to appreciate oak: "To me there's an opportunity to relax [restrictions on uses of oak land] a bit for landowners that are using it in another way that has public benefits and can be an economic factor as well and just you know, private benefits too."

The owners in our study managed for aesthetics and wildlife habitat yet justified management decisions in terms of utility. They rationalized oak conservation in terms of production, saw a role for compensation in conservation strategies, and believed oak conservation could be consistent with human uses. This indicates that they are motivated by tangible reward, the assumption of incentive policies.

Self-Determination

At the same time when many of the owners viewed themselves as stewards of oak and wanted financial support for their efforts, they valued self-determination in land-use decisions above all else. Even the most conservation-

minded landowners entered into programs and policy relationships with trepidation. Although owners wanted to see changes in regulations permit oak as a legitimate resource use and allow more flexibility in land uses, they did not want to be constrained by more new restrictions.

Henry Sanders developed his own program for monitoring the effects of his land-use activities on the environment. He recognized inherent risks in conservation, especially in cooperating with public biologists. He explained, "If you grow a more complex forest, species are attracted to those forests [and] there's an excellent chance you're going to be put out of business... Build it and they will come; don't build it and they won't come."

A minority of landowners interviewed had experienced negative repercussions from seeking assistance from public agencies with their voluntary conservation efforts. Will O'Brian invited Fish and Wildlife agency personnel onto his 162-ha (400-acre) property to explore options for restoration of his 109-ha (270-acre) oak woodland and savanna. During their visit he noted their special interest in assisting him with restoring the native prairie around his oak stands. Months later he realized he had inadvertently opened the door to species regulation; the federal critical habitat listing for the endangered Fender's blue butterfly (*Icaricia icarioides fenderi*) included the prairie portions of his property. Mr. O'Brian said,

Having been on our property and feeling they were invited, they had noted that in the report that they had seen the butterfly... I initially thought from a conversation with one of them that it was only a few, but then the biologist that I talked to the other day tried to tell me there were hundreds...

Most landowners framed fear about species regulation in terms of self-determination. Helen Rollins works closely with public agencies on wetland and oak restoration on her 121-ha (300-acre) property, which she manages as a residence and for habitat. Ms. Rollins said, "I think one of landowners' greatest fears is to have a police mentality with the people with whom they're partnering... We've had to say, Wait! We want to stop and step back here, because we are partners with you."

Owners' conservation efforts have collided with other regulations in addition to species protections. Oregon's Forest Practices Rules require minimum regeneration time frames and stocking levels after harvests. Oregon's land-use rules require owners to meet similar species and stocking level requirements to maintain special forestland tax assessments. Owners that clear or thin stands to release oak risk violating these regeneration requirements. Norman Peters, who owns several parcels of land as long-term real estate investments, encountered problems with regeneration requirements when he removed Douglas-fir from the understory of some of his oak stands. He related that [the agency] said, "Oh, yeah. You need

to apply for an alternate forest practice.' So I did. I spent a long time preparing it. It was denied . . . They thought I was trying to pull a fast one."

The importance of self-determination extends beyond landowners' views on working with the government to all private land management. All the owners emphasized a respect for the private interests of other landowners regardless of their practices. For example, despite Bob Jones' disgust with the clearing of oaks for houses and vineyards, he did not feel that society has a place in influencing individual land-use practices. When asked about the role of policy in oak conservation, he replied,

I believe that an individual should have the right to do with his property what he wants to do with it, and if that means tear down his oaks, I think he has that right. Now, I think we all have to be stewards of our own properties . . . but [not] say that I wish everybody would have kept all their oaks.

The importance of self-determination was also apparent in owners' preferences for organizational and learning styles. When asked what the best conservation strategy would be for oak, most landowners described education programs by and for landowners. Fritz Quinn explained the concept of grassroots landowner networks,

It's not going to get done unless we're involved, unless landowners want to do it. If the government came in tomorrow and said you've got to conserve every oak woodland in this valley, we'd say, "You can't make us go out there and pick those fir out" . . . But if we show [owners] that this is the right thing to do, then we do it.

Most of the landowners said they trust and learn best from other landowners. Many suggested grassroots landowner-led efforts as the ideal model for private-lands conservation. Paul Knopf, an owner of 24 ha (60 acres), a third of which is mixed oak-conifer forest, described how demonstrating conservation work to one's community can change landowners' views on conservation and their acceptance of people who think differently: "I think in some cases if you . . . do oak restoration . . . you're sort of ostracized. So it's a matter of educating everybody that it's something good to do. Once it gets started it kind of snowballs."

The owners' strong sense of self-determination was manifested in their fear of losing decision-making ability due to species regulation, distaste for prescriptive policies, reluctance to enter into relationships with the government, and preferences for grassroots landowner-driven conservation strategies. Owners' concerns about rule violations indicated that they were motivated to obey authority and the assumption of policies such as regulation, yet this motivation may be countered by a desire to maintain their autonomy; owners might be better served

by policies that employ learning tools, such as voluntary cooperative forums for conservation.

Discussion

Many of the owners interviewed saw oak as an ecological and cultural legacy from a bygone era. They viewed land as a family asset and framed oak conservation as part of their moral duty to steward the land. Their focus on amenity values is consistent with other research on family forest owners (Jones et al. 1995) and the general public (Manfredo et al. 2003). Nevertheless, just as biocentric values compelled landowners in their conservation activities, utilitarian values constrained them. Despite what owners described as the decreasing competitiveness of family forestry in the globalizing wood products sector, many owners still managed for commercial conifer production on at least some portion of their lands. These owners appeared to be driven by utilitarian rationales.

Other owners acknowledged they were not motivated by timber income at all, yet they still framed conservation decisions in a utilitarian manner. They described their management activities in terms of practical formulas to achieve predictable outcomes, such as ecological mandates or production of goods and services. These owners saw themselves as producing things for society that are worthy of compensation. They wanted financial and technical support for conservation, but were also concerned about associated risks and costs. They viewed partnering with public agencies and creating habitat as liabilities because of the risk of species regulation.

The owners' views on oak conservation embodied numerous contradictions. They framed their conservation motivations in terms of moral duty but relied on justifications of tangible reward when setting conservation goals. They recognized the intrinsic ecological and cultural value of oak but rationalized management decisions in a utilitarian manner. At the same time that they wanted to be compensated by society with financial rewards and regulatory relief, they wanted autonomy and independence from government oversight. These contradictions reflect the rich and complex worldviews of owners and the multitude of forces that drive their management decisions.

Policy makers can harness owners' values and beliefs about oak conservation despite their contradictions by pairing policy tools with the motivations that are best suited to the logic of those tools (Fig. 1). Assembling suites of policies in this way can take advantage of the intrinsic value that owners place on oak at the same time that they serve owners' needs for practical management rationales, compensation, and autonomy.

Owners' stewardship beliefs and values provide an opportunity for policies to be formed around symbolic tools (Fig. 1). Recognition, certification, and branding

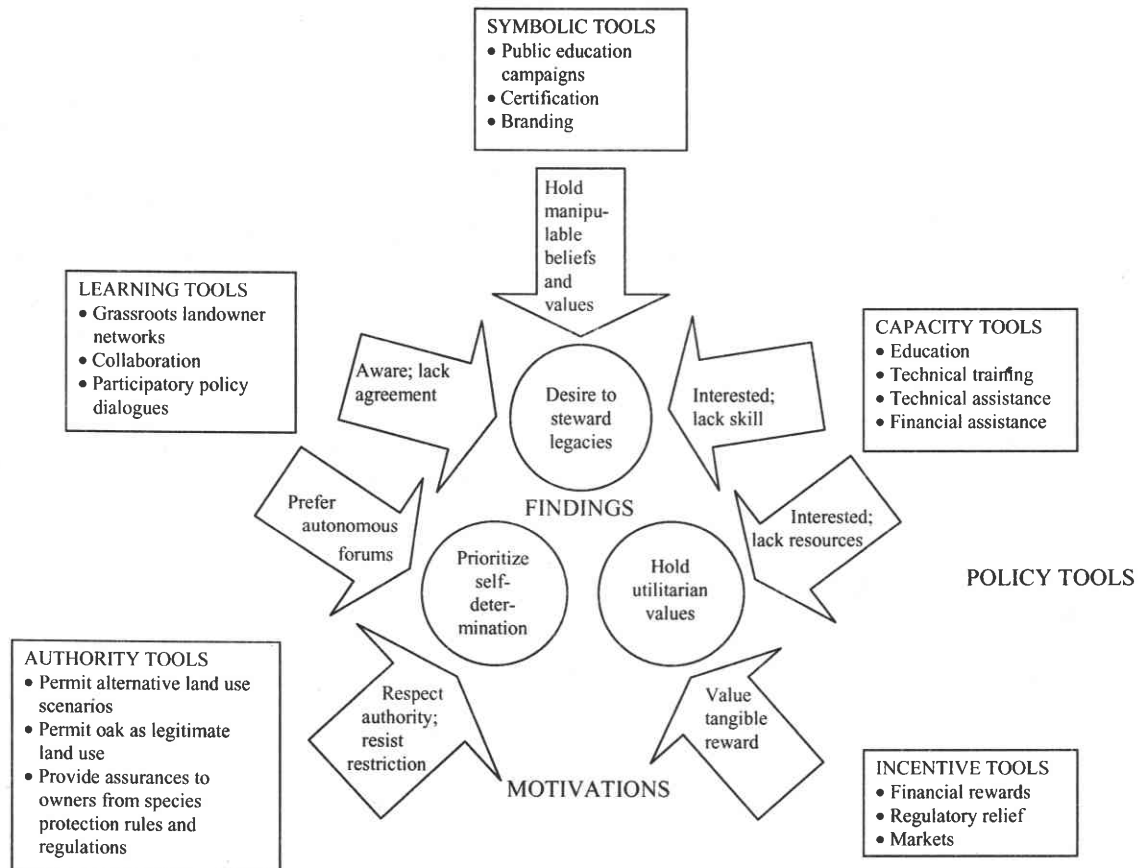


Figure 1. Conceptual model of our key findings (in circles) and the motivations (in arrows) that correspond with policy tools (in boxes) in Schneider and Ingram's (1990) policy analysis framework.

can make oak conservation attractive because these tools link conservation to owners' values for stewardship of ecological and cultural legacies. Inspirational campaigns can build on owners' values for land as a family asset and cultural symbol. Combined with an educational message, they can raise awareness about the importance of oak as a legacy from the time of Native American hunting and gathering and Western-European settlement. Such policies can also justify oak as an alternative to Douglas-fir management by depicting it as an embodiment of stewardship in the areas where oak was historically dominant. Branding products from operations that conserve oak can signal legitimacy to the public and landowners. Programs that recognize exceptional oak stewards can publicize the value of oak and reward owners that appreciate public gratitude.

Owners' interest in oak and desire for information indicate they may be receptive to improving their abilities to conserve oak through policies that use capacity tools (Fig. 1). Education and technical training can increase owners' awareness about the importance of oak, its ecological requirements, and options for management. Such programs can also give owners the skills and funds they need to be sure that their conservation efforts are produc-

tive, economical, and worthwhile, satisfying their utilitarian interests. They can also help owners incorporate scientific research into their management plans, providing legitimacy for their conservation efforts. Financial assistance can provide another level of legitimacy by helping owners feel compensated for their work. Cost sharing and grants can make oak conservation possible for landowners that treat conservation like any other production activity and cannot justify providing conservation benefits below cost. Finally, policies formed around capacity tools can also address the competition between oak and Douglas-fir in owners' ideals for stewardship. Technical and financial assistance can enable owners to manage for oak in stands once valued for Douglas-fir.

Owners' utilitarian concerns indicate a need for policy makers to explore incentives for conservation actions (Fig. 1). After capacity programs build knowledge and decision-making ability among owners, incentives can provide landowners with the income they need to justify choosing conservation over other income-generating activities. Incentive programs can provide tax benefits, rebates, payments, and above-cost rents to owners that require tangible rewards. Agencies can establish regulatory

infrastructure for environmental services markets, mitigation banks, and conservation banks. Agencies can also play a role in the creation of oak wood markets by providing tax relief and other benefits to producers that manage oak on a sustained yield basis. Finally, reforming land- and resource-use rules can help create incentives by allowing owners more opportunity to manage and garner value for oak through small-scale industries and alternative land-use scenarios.

Owners' fears of rule violations can be assuaged through the use of authority tool-based policies that legitimize oak conservation as a land use and remove disincentives imposed by species regulations (Fig. 1). For example, rules and regulations can recognize oak as a valuable tree in land- and resource-use laws without penalizing owners that harbor listed species. Land-use and forest-practice laws can provide owners more opportunity and flexibility to manage oak by permitting additional uses on forest- and farm-zoned lands. For example, owners can be allowed to develop small-scale industries such as production of wood and nontimber forest products, planned unit development, tourism, and fee recreation on lands where oak is being conserved explicitly.

Owner's values for autonomy and self-determination suggest that it may be more suitable for policy makers to engage owners in learning forums about oak conservation rather than to impose new rules (Fig. 1). Their awareness of oak's uniqueness and some of the constraints to its conservation suggests that although they may not know how to stem the decline of oak, they may be able to help generate solutions. Policies that involve learning tools can establish collaborative approaches to oak conservation through grassroots networks and participatory policy dialogues among landowners and with other stakeholder groups. Several owners referred to the Willamette Valley Ponderosa Pine Conservation Association as a model for private lands conservation. With the help of local Forestry Extension programs and timber companies, landowners initiated and carried out an effort to reestablish the historic range and genetic diversity of the native Willamette Valley variety of *Pinus ponderosa* for conservation and timber production purposes. Such voluntary cooperation can provide opportunities for owners to channel their stewardship values and awareness of oak's fragility to address some of the constraints they recognize are interfering with their conservation potential. Policy makers and public agencies can include oak owners in planning and decision-making regarding oak conservation. Agencies can also provide funding and administrative support to landowner-led oak conservation networks.

Conclusion

Incorporation of ethnographic information in policy analyses illuminates opportunities for the use of tools that pol-

icy makers may not have recognized following the more conventional technocratic approach. Incentives address the high costs and minimal financial return of conservation, and symbolic, capacity, authority, and learning tools also encourage oak conservation. In our study policy options did not come from biological assessments or economic analyses. Instead options hinged on an understanding of what policies may be acceptable or workable given owners' perceptions of their own capacities, motivations, and constraints. Such analyses incorporate variables that are essentially subjective constructions of reality, the reality to which owners respond when they make decisions about land management and policy.

In the case of oak, owners' motivations to conserve oak stem from the meanings they hold for the resource and their perceptions of the social and economic consequences of their decisions. Owners' perceptions of themselves as stewards of an ecological and cultural legacy implies that owners may be motivated to conserve oak out of altruism if policies can harness this altruism in compelling ways. Owners' dual sense of moral duty and utilitarianism suggests that policies have a greater chance of success if they can offer incentives while still couching the rationale for conservation in moral terms. Owners' values for autonomy and self-determination indicate that policies may be able to engage owners in conservation, either on their own or through programs, if they can assure owners that the oak habitat they enhance will not become a liability or an encumbrance.

Although Schneider and Ingram (1990) provide justification for exploring owners' perspectives on habitat conservation, they assume that motivations can be singled out and matched with policy tools. As evidenced by our results, people's motivations are complex, varied, and sometimes contradictory. In the area of oak conservation alone, many policy tools hold promise based on this constructionist analysis. This contradiction highlights a limitation to this study; it does not indicate a silver bullet for oak conservation policy. Nevertheless, the in-depth ethnographic information our study has produced will provide policy makers with a richer palette from which to select multiple policies for an overall conservation strategy. This will help policy makers and other stakeholders design strategies that appeal to target groups rather than alienate them.

Acknowledgments

A. P. F. was supported by a Starker Fellowship in Private and Family Forestry and a Ford Foundation Community Forestry Research Fellowship.

Literature Cited

Atterbury Consultants. 1992. Western Oregon non-industrial private forest land inventory. Atterbury Consultants, Beaverton, Oregon.

- Blumer, H. 1937. Social psychology. Pages 138-148 in P. S. Emerson, editor. *Man and society: a substantive introduction to the social science*. Prentice-Hall, New York.
- Brunson, M. W., D. T. Yarrow, S. D. Roberts, J. David, C. Guynn, and M. R. Kuhns. 1996. Non-industrial private forest owners and ecosystem management—can they work together? *Journal of Forestry* 94:14-21.
- Fischer, A. P., and J. C. Bliss. 2006. Mental and biophysical terrains of biodiversity: conservation of oak woodland on family forests. *Society and Natural Resources* 19:1-19.
- Hagar, C. J., and M. A. Stern. 2001. Avifauna in oak woodlands of the Willamette Valley, Oregon. *Northwestern Naturalist* 82: 12-25.
- Johnson, R. L., R. Alig, J. Kline, R. Moulton, and M. Rickenbach. 1999. Management of non-industrial private forest lands: survey results from western Oregon and Washington owners. Research contribution 28. Oregon State University, Corvallis.
- Jones, S. B., A. E. Luloff, and J. C. Finley. 1995. Another look at family forests: facing our myths. *Journal of Forestry* 93:41-44.
- Klock, C., S. Smith, T. O'Neil, R. Goggans, and C. Barrett. 1998. Willamette Valley map land use/land cover informational report. Oregon Department of Fish and Wildlife, Portland.
- Manfredo, M. J., T. L. Teel, and A. D. Bright. 2003. Why are public values toward wildlife changing? *Human Dimensions of Wildlife* 8:287-306.
- Nyden, P., A. Figert, M. Shibley, and D. Burrows. 1997. University-community collaborative research: adding chairs at the research table. Pages 3-14 in P. Nyden, A. Figert, M. Shibley, and D. Burrows, editors. *Building community: social science in action*. Pine Forge Press, Thousand Oaks, California.
- Oregon Biodiversity Project. 1998. *Oregon's living landscape: strategies and opportunities to conserve biodiversity*. Defenders of Wildlife, Portland, Oregon.
- Oregon Department of Fish and Wildlife. 2006. *Oregon conservation strategy*. Oregon Department of Fish and Wildlife, Salem.
- Rokeach, M. 1973. *The nature of human values*. Free Press, New York.
- Sampson, N. R., and L. A. DeCoster. 1997. *Public programs for private forestry: a reader on programs and options*. American Forests, Washington, D.C.
- Schneider, A., and H. Ingram. 1990. Behavioral assumptions of policy tools. *Journal of Politics* 52:510-529.
- Schneider, A., and H. Ingram. 1993. Social construction of target populations: implications for politics and policy. *American Political Science Review* 87:334-347.
- Standiford, R. B. 2002. California's oak woodlands. Pages 280-303 in W. J. McShea and W. M. Healy, editors. *Oak forest ecosystems: ecology and management for wildlife*. The Johns Hopkins University Press, Baltimore, Maryland.
- Strauss, A. L. 1987. *Qualitative analysis for social scientists*. Cambridge University Press, Cambridge, United Kingdom.
- Thyssel, D. R., and A. B. Carey. 2001. *Quercus garryana* communities in the Puget trough, Washington. *Northwest Science* 75:219-235.

