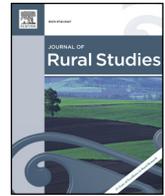


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The economic and cultural importance of cannabis production to a rural place

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1. Introduction

Many researchers have documented a substantial shift in rural economies and land uses in the western United States, from agriculture and commodity production toward service-based industries, with attendant political and social changes (e.g., [Larsen and Hutton, 2012](#); [Morzillo et al., 2015](#); [Walker and Fortmann, 2003](#)); however, few have considered how cannabis production fits into this rural shift. One reason may be the difficulty of studying the socioeconomic implications associated with a federally illegal drug; another may be dismissiveness toward cannabis because of its reputation as broadly criminal and harmful. However, we assert that its importance within many rural places makes it relevant to rural researchers. Cannabis production has been, and will continue to be, an important land use and economic activity in many rural places, with implications for economic development, culture and identity, politics, and human-land relationships.

This manuscript emerged from a research project focused on the ecological restoration sector, which includes economic activity (i.e., jobs, revenue, and resources) associated with the repair of ecological damage. During the course of our research, we found inextricable links between the two sectors in the region we studied: one legal (restoration), the other mostly illegal (cannabis production). In this paper, we describe the themes that emerged from our research regarding the economic and cultural dimensions of cannabis production, including how it intersected with the restoration sector. Because we only interviewed those in the restoration sector (“restorationists”), this examination of cannabis production is told through a particular lens. We note, however, that most restorationists in our study also participated in cannabis production. We explore two questions: 1. From the viewpoint of people involved in the restoration movement, how has the cannabis sector changed over time, and how has cannabis production intersected with the restoration sector? 2. What are the perceived possibilities for the two sectors in light of legalization of recreational cannabis in California?

We base our research in Humboldt County, one of three counties that form the “Emerald Triangle” region of northern California. This is a region with a complicated identity rooted (in part) in cannabis

production, radical politics, environmentalism, and anti-authoritarianism. The Emerald Triangle has relied on cannabis production as its dominant economic sector for decades; in 1990, cannabis production was estimated to have an annual value of \$1 billion in the county, dwarfing the other natural resource sectors in the region such as ranching, milk production, and timber ([Leeper, 1990](#)). Cannabis production concentrated in the region through a combination of several factors: cultural acceptance; clustering of human and physical/built capital utilized for its production, processing, and distribution; and remoteness, which has minimized surveillance and enforcement from authorities. While some natural resource sectors in the region have persisted alongside cannabis, most have declined over time, particularly in terms of employment. Our case study is the Mattole River Watershed (Mattole), an isolated, rural watershed that is notable for its thriving restoration sector ([Baker and Quinn-Davidson, 2011](#)), which was established almost in tandem with cannabis production. We therefore describe the two sectors in terms of their shared history, and eventual divergence.

For purposes of this paper, the cannabis sector consists of the production and sale of cannabis for both legal and illegal markets, though we recognize that, in the eyes of the federal U.S. government, cannabis production (aside from hemp production) remains illegal. We are examining the cannabis industry at a time of significant change, as recreational use has become legal in 10 U.S. states plus the District of Columbia and medical use is now legal in many more. This is therefore a key moment to reflect on the role of cannabis in rural economic development and culture. In the text, we refer to privately-owned cannabis farms as “grows” and farmers (who are generally landowners) as “growers,” in keeping with the local lexicon. Cannabis production in the Mattole is generally outdoor in greenhouses set on “pads” (flattened areas, often dug into hillsides), with often intensive cultivation methods, including use of soil amendments, supplemental lights and light manipulation, irrigation, and additives such as fertilizers and pesticides.

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1.1. Rural restructuring

Across the United States, Europe, and other parts of the Global North, rural communities have experienced dramatic and rapid socio-economic restructuring since the 1970s, marked by the decline of traditional sectors such as agriculture, ranching, manufacturing, logging and mining, and the rise of service-based (“post-industrial”) economies (Burton et al., 2013; Hibbard and Lurie, 2013; Krannich et al., 2011; Sherman, 2018; Stauber, 2001). Rural restructuring has been accompanied by counter-urbanization in many places: the movement of people from cities to rural places, often for natural amenity purposes such as recreation opportunities, or to pursue a rural lifestyle (Gosnell and Abrams, 2011; Krannich et al., 2011; Sherman, 2018; Ulrich-Schad and Duncan, 2018). These trends have occurred unevenly, with economic development following divergent trajectories (Morzillo et al., 2015).

Rural places have faced profound challenges during this restructuring, with counter-urbanization leading to rising housing costs and the displacement of long-time residents by “newcomers,” as well as a growing social divide economically and culturally (Burton et al., 2013; Frank and Reiss, 2014; Sherman, 2018). Despite counter-urbanization, the decline of traditional economic sectors has led in some places to a significant out-migration of middle-class families and educated young people to metropolitan areas, resulting in a rural brain drain (Carr and Kefalas, 2010; Frank and Reiss, 2014) and a bifurcated class system, with (often white) wealthy amenity migrants on one side and (often Hispanic) low-income service workers on the other (Nelson et al., 2015).

In addition, rural restructuring has contributed to political and cultural disputes over land use and natural resource management (Larsen and Hutton, 2012; Robbins et al., 2009; Walker, 2003). Questions of land use and natural resource management have revolved around differing social constructions of the landscape and conflicting ideas about the appropriate relationships between humans and nature (Hamilton et al., 2014; Nelson, 2002; Walker and Fortmann, 2003).

Rural restructuring literature has so far largely overlooked the role of cannabis production in rural places undergoing restructuring, despite the likelihood that cannabis production has been especially notable in remote areas with little “legitimate” economic development. As traditional natural resource sectors declined in importance, it is likely that in many places, cannabis production took their place, both as a land use and in terms of economic and cultural importance.

1.2. A virtuous enterprise: ecological restoration in the countryside

There has been increasing research interest in the restoration economy, both because of its promise in terms of rural economic development, and evidence of its growth in terms of funding, jobs, and capacity in communities across the U.S. (Baker and Quinn-Davidson, 2011; BenDor et al., 2015; Davis et al., 2011; Egan et al., 2011). BenDor et al. (2015) found that there were more workers directly employed in restoration in the U.S. than coal mining, logging, and steel production, and that restoration projects tended to create localized, relatively well-paying jobs. The benefits of the restoration economy are particularly notable in rural communities historically dependent on extractive industries: where traditional industries surrounding natural resources have declined, restoration can generate new economic opportunity (Baker, 2005; Dabson, 2012; Davis et al., 2011; Nielsen-Pincus and Moseley, 2013).

Definitions of the restoration sector vary. Broadly, the sector includes jobs and resources focused on ecological restoration of degraded landscapes. This can be divided into: mitigation restoration, which is required by law to mitigate for development or resource extraction (e.g., Aronson et al., 2010; BenDor et al., 2015; Kimball et al., 2015); public lands restoration, which is restoration activities that occur on public lands and are conducted through government agencies like the

U.S. Forest Service (e.g. Daniels et al., 2018; Tidwell and Brown, 2011); and community-based restoration, in which restoration is primarily funded through competitive grants awarded by state or federal agencies to non-profit community groups, tribes, local government entities, or individual landowners (Baker, 2005; Davis et al., 2011; Lurie and Hibbard, 2008; Nielsen-Pincus and Moseley, 2013). Most of the restoration in the Mattole follows the community-based model, in which community members and non-profit groups are a central part of both restoration work and decision-making.

There is evidence that the community-based restoration sector has professionalized as it has grown, creating full-time, year-round consultants, engineers, and program managers in order to better capture competitive grants and implement complex projects (e.g., Baker and Quinn-Davidson, 2011; Higgs, 2005). However, many of the jobs within the sector (especially field crew positions) remain seasonal and depend on unstable flows of capital (e.g., through grants that vary from year to year). The restoration sector is therefore likely to be accompanied by other sectors within rural communities; in our case, this complementary sector has primarily been cannabis production.

1.3. An invisible enterprise: cannabis production in the countryside

Cannabis production is part of the shadow (or hidden, black, undocumented, informal) economy. All these terms describe economic activity that occurs outside the purview of the state (Williams, 2011). Most researchers focused on rural economic development have excluded cannabis production from analyses, leading to oversights regarding the role of cannabis production in community well-being, identity, and livelihoods. Even in research on radical or fringe elements of rural economies, cannabis production is rarely mentioned. Halfacree (2007) pointed toward the “radical rural” as an anti-capitalist, environmentalist space, but did not include cannabis production as part of this space. Gibson-Graham articulated a wide range of “alternative economic activities,” including legal activities such as gleaning and gift giving, and also illegal activities such as theft and poaching (Gibson-Graham, 2008), but they did not include drug production as an alternative economic activity.

When cannabis (or more broadly, drug) production is mentioned by researchers, it is often dismissed in terms of its contributions to rural places. In discussing the undocumented economy in Saskatchewan, Swanson and Bruni-Bossio (2019) lump together all “drug trade” as “illegal activities” and harmful. Somerville et al. (2015) characterized “illicit forms of entrepreneurship” as a threat to conceptions of the rural idyll, at odds with notions of rurality. Paoli et al. (2015) focused on the harms of cannabis production, including violence, theft, and corruption (though community and environmental impacts were not included). Others have noted cannabis production as an economic activity among “hippies,” but largely disregarded it as a central economic driver or vital component of rural well-being (e.g., Holmes and Argent, 2016). Cocklin et al. (1999) described a core-periphery model of drug production and consumption, with benefits mostly absent to cannabis producers.

Notable exceptions to this include a paper by Corva (2014) that traced the role of cannabis in helping residents form social networks and maintain solidarity in the face of federal surveillance and shared risk. Another exception was from research in Morocco, in which cannabis production was found to have positive impacts on rural landowners who could invest in infrastructure and stay in place (Afsahi, 2011).

While there is little research about the contributions of cannabis production in rural places, there is a relevant body of research focused on the characteristics of individual cannabis growers that has identified “ideology” (including community values) as one motivation for growing cannabis. Cannabis growers have been distinguished as either small-scale and “idealistic,” motivated by ideological factors; or large-scale, “commercially-oriented” and motivated by money (Decorte,

2010; Potter et al., 2011). Idealistic growers have been found to possess a “cannabis culture” (Hammersvik et al., 2012), which consists of emphasis on social solidarity and sharing of cannabis (Sandberg, 2012). While these studies on cannabis growers have implications for rural places, they do not explicitly address questions about rural economies or cultures. Our research begins to address this lack of academic attention on the role of cannabis production in rural places, especially those that are restructuring.

2. Methods

2.1. Case study

The Mattole is located in Humboldt County, in coastal northern California, USA. The watershed is remote, with no incorporated municipalities, professional police or fire department, or hospitals. The Mattole has experienced restructuring, with the loss of many young people to pursue educations and careers in other places; and at the same time significant in-migration, in part for the Mattole's natural amenities, but more typically drawn by economic opportunities in the cannabis industry. In the Mattole, cannabis production and the restoration sector have shared common actors, and flows of capital have moved between them.

The restoration sector in the Mattole has been guided since the 1980s by three non-profit community-based watershed restoration groups (watershed groups): Mattole Salmon Group (established 1980), Mattole Restoration Council (established 1983), and Sanctuary Forest (established 1987). Ecologically, the restoration sector has long focused primarily on restoring native salmon populations, which have dramatically declined after a century of Euro-American grazing, followed by industrial logging and road-building in the 1960s and 70s, which caused loss of riparian forests and erosion (House, 1999). Restoration projects led by the three watershed groups have included water conservation campaigns, native salmon propagation, and placing trees in streams to re-create complex habitat. Projects focused on upland habitats have included the purchase of land or creation of conservation easements to maintain intact forest ecosystems, and the reintroduction of native plant species. Both in-stream and upland projects have intersected biophysically with cannabis production because of the sector's well-documented environmental consequences, including the delivery of sediment into streams due to unpermitted hillslope contouring and road construction (Butsic and Brenner, 2016); water diversions, contributing to de-watered streams (Bauer et al., 2015); loss of habitat due to forest clearing (Butsic and Brenner, 2016); and poisoning of rare and endangered species as a result of rodenticide use (Gabriel et al., 2018). In addition, from 2012 to 2016, cannabis production increased notably in extent (in terms of area cultivated, and number of grow sites) in northern California, mostly in ecologically sensitive areas – near salmon-bearing streams, on steep slopes, and in remote areas (Butsic et al., 2018).

2.2. Interviews

Both authors have connection to the Mattole, and the research was informed by these connections. The first author was a board member of the Mattole Restoration Council and since 2015 has taught graduate-level field courses on rural social and economic change in the Mattole. That course has included multiple round-table discussions with cannabis growers and restorationists. The second author is a fifth-generation Mattole resident, and worked for Sanctuary Forest from 2010-2016 as their Education and Development Coordinator, as well as working periodically for the Mattole Salmon Group. Both authors therefore utilized their experiences and knowledge of the Mattole to create the case, identify interviewees, and conduct analysis. The second author conducted a series of 20 semi-structured interviews with key stakeholders involved in Mattole watershed restoration. The sample

therefore represents the *restoration* economy's view of the cannabis sector, not the general population's view. Several interviewees (n = 8) were central to the back-to-the-land movement (arriving in the 1960s and 70s), and helped to establish the three watershed groups. Other interviewees (n = 12) arrived more recently or were younger, but were likewise associated in some way with the three watershed groups, as staff, board members, and/or contractors. Most of the interviewees have been, at one point or another, involved in the cannabis production sector, either as growers or laborers. We recruited interviewees through email and phone calls.

The topic of cannabis production emerged through interviews as a key aspect of understanding the restoration sector. In interviews, we did not bring up cannabis; rather, questions focused on the restoration sector (e.g., how did you get involved with restoration work? Do you think restoration is a significant or notable economic presence in the watershed? How has the restoration economy changed? How do other community members participate in restoration?), but all 20 interviewees, without prodding, spoke of the linkages between restoration and cannabis production. This pushed us to consider the relationship of cannabis production to restoration.

Each interview lasted between 1.5 and 3 hours and took place in interviewees' homes and places of work, in restaurants, and at restoration sites. The interview process was approved by the Institutional Review Board at Humboldt State University under IRB 16-176. Interviews were digitally recorded and transcribed. During analysis, interviews were coded by hand by the second author, then codes were organized into an excel spreadsheet, with each code populated with quotes. One key informant was interviewed three times at different stages of data collection and analysis, and provided respondent validation by offering feedback on the development of key themes (Burnard et al., 2008). Themes relevant to cannabis were developed inductively, allowing for development of theory (Charmaz, 1996). These themes centered on the economic and cultural roles of cannabis production, and how cannabis intersected with restoration over time. During analysis, we identified three eras in the relationship between the cannabis and restoration sectors since about the 1960s: from 1. mutual support, to 2. competition and antagonism, to 3. potential for re-partnering.

3. Results

3.1. The creation of a radical economy: cannabis and restoration as mutually supportive

Back-to-the-landers were largely responsible for establishing both the cannabis and restoration sectors; they began arriving in the Mattole in the 1960s in a “conscious effort to start a new model” that rejected mainstream economic models and embraced idealized visions of rural living. As one interviewee said “we saw ourselves as re-inhabiting a landscape.” Back-to-the-landers were described as educated, middle-class, and urban, but seeking a life outside of middle-class norms: “A lot of [young people] decided to go back to the land. [They] had families that were probably middle class, and many of them had educations, some of them PhDs and masters. But everybody was dropping out.” What they encountered in the Mattole was a region that had undergone degradation, including a 90% loss of old-growth forest and severe sedimentation in the wake of a boom in industrial timber harvesting.

Interviewees indicated that, in their eyes, restoring the Mattole Watershed had dual meaning: restoration of streamflows and ecosystems, and cultural change. As one described: “an important part of restoration really isn't just fixing nature, it's restoring our balance and our proper attitude and relationship to nature.” This conscious effort to change culture and identity was connected to landscape restoration, as explained by another interviewee:

Most of us tend to think that (restoration) has to do with restoring the earth, restoring salmon habitat, restoring redwood forests... to

bring back those stores of things and renew them. I would submit that for many of us it was a pathway to help also to restore ourselves, and find our place in the puzzle.

This positioned the back-to-the-landers in conflict with many of the loggers and ranchers in the watershed, as industrial logging and ranching were characterized in this narrative as destructive. While the industrial timber companies were largely based outside the watershed by the 1960s, there were many loggers, smaller-scale timberland owners, and ranchland owners who remained within the watershed, leading to a cultural clash between the old-timers (ranchers and loggers) and newcomers (back-to-the-landers). This clash was a salient part of the back-to-the-landers' lives and the creation of the restoration sector (see also Raphael, 1985; House, 1999). It meant that the restoration sector was mostly established by newcomer back-to-the-landers, at times with resistance and even hostility from existing residents. In many cases, the very lands being restored were parcels previously owned by timber companies and ranchers that had been purchased by back-to-the-landers.

From the 1960s and extending into the early 1990s, interviewees described the cannabis sector as complementary to the restoration sector. In order to fund their vision of restoration, cannabis became a financial tool, in the words of one interviewee: “they kind of did restoration as a passion... they were growing weed, they had money to do these projects.” Generally small-scale, illegal cultivation provided the financial capital needed to allow residents to found community non-profit organizations, including the three watershed groups which formed in the 1980s out of volunteer efforts. These watershed groups remained primarily volunteer-based into the 1990s, raising enough money to do small projects:

Everybody just put in the time that they could... I think we enjoyed that out here for many years because we had, as a valley, an income source [cannabis] that didn't take a ton of our time that we could make a reasonable living doing, and then volunteer the rest of our time... that all kind of correlated with the start of the restoration movement.

Cannabis production enabled restoration because it funded the livelihoods of restorationists and helped to fund restoration projects. In the words of one back-to-the-lander, “in my mind, the restoration economy grew out of the weed economy. Weed allowed people to settle in the hills.”

Beginning around the 1990s, both sectors changed. The restoration economy shifted from a volunteer model, getting by with small grants, donations and a largely volunteer workforce that supplemented their incomes with cannabis, to a professional model. This involved obtaining more and larger grants, establishing professional staff with full-time living-wage jobs, and paying field crews and contractors, most of whom worked part-time and/or seasonally. The Mattole's three watershed groups became more tied to government agencies, both through grant writing and through the implementation of complex projects requiring environmental permits. Alongside this professionalized restoration sector emerged a new cannabis sector as large-scale, “industrial” cannabis grows and an influx of growers committed to profiting from cannabis production birthed the era of the “green rush” in the Emerald Triangle. The Mattole thus exited the radical rural space it had created, with one industry becoming more tied to the state and state funding, while the other became more tied to capitalist markets and consumer culture.

3.2. Challenging the restoration ethic: the green rush

In *Cash Crop*, written in 1985, Ray Raphael described a rapid growth in cannabis cultivation, what he termed a green rush. But in our research, most interviewees used this term to describe the changing profile of cannabis production in the region after the 1996 California

Compassionate Use Act, which legalized cannabis for medical use at the state level. Around this time, interviewees identified an “explosion” of cultivation, with increasing numbers of producers and area of land cultivated, along with a boom in the overall economic value of the industry. Many interviewees described a cultural turn at this time toward consumerism, embodied by new trucks, large houses, and the ability of many growers to migrate, living part-time in the Mattole but maintaining houses elsewhere.

According to interviewees, and also evident in round-table discussions, the green rush brought with it a division among cannabis growers: there were smaller-scale “mom and pop” growers, often described as throwbacks to the back-to-the-land time; and larger-scale growers operating “megagrows” and affiliated with the green rush. There were no bright lines to distinguish between mom-and-pop and green rush growers, and many growers undoubtedly defied these labels. We use the term “green-rush growers” to refer to the larger-scale growers. Interviewees mostly spoke of green-rush growers as in-migrants who came from “outside of the area” for the sole purpose of growing, though some acknowledged there were also green-rush growers from the Mattole, often descendants of back-to-the-landers. One interviewee explained that “mom and pop did it kind of benign, [but] grandsons of mom and pop, they're just like balls to the walls, big truck, just hit it with diesel [generators] and greenhouses and all that stuff.”

Thus, during the green rush, the restoration and cannabis sectors diverged. While many restorationists continued to grow cannabis, they distinguished themselves from green-rush growers. According to interviewees, the green-rush growers were focused on maximizing profits; they were growing cannabis as a way to “make a bunch of money and get out” as one interviewee put it. This turn toward industrialized, green-rush cannabis production was perceived by interviewees as a rejection of the culture of the restoration movement in the Mattole, and interviewees described the ecological impacts of green rush cannabis production (e.g., large-scale water diversions and erosion as a result of land clearing) as contradictory to the goals of restoration.

Young people drawn to the restoration sector continued to arrive in the Mattole during the green rush, largely because of the reputation and success of the three watershed groups. One interviewee described his arrival in the mid-90s: “It was the oldest citizen-led restoration effort, and it really fit my interests. I came out and met the people and saw the place, and the rest is history. I'm still here.” These new restorationists arrived in tandem with green-rush growers, resulting in what one interviewee described as “two different cultures,” as a few new restorationists sought out careers in watershed restoration and land conservation, while the more numerous green-rush growers lived in the area to pursue cannabis production. Several interviewees said the green-rush growers were not necessarily hostile to restoration, but were less committed to it. This was illustrated by an interviewee:

When you talk to [green-rush growers] about salmon in the river, they're like, oh yeah, totally support what you're doing, I'll throw \$1000 dollars out at a fundraiser but then go home and create another greenhouse pad... I think it would be more advantageous to have more deeply involved land stewards as community members. I think that's way more valuable than people doing things and then feeling like they can just like, you know, throw a little bit of cash at the restoration organizations so we can tread water and try to deal with the sort of broad, systemic impacts of poor land use.

This quote illustrates that there was some transfer of green-rush wealth to the restoration sector, though interviewees indicated this was not sufficient to address the ecological impacts of cannabis production. Several interviewees described the green rush as the latest in a series of land use and natural resource “booms” that needed to be addressed through ecological restoration. The gravity and extent of the ecological consequences of cannabis production continue to be debated within the Emerald Triangle, but were not doubted by our interviewees. They

consistently described cannabis production under the green rush as “a race to the bottom,” with large-scale cannabis cultivation at odds with the work of the restoration sector.

The cannabis sector was also viewed as directly competing with the restoration sector in terms of labor, as many of the original back-to-the-landers were aging, their children and grandchildren had left the watershed or were primarily growing cannabis, and a large proportion of new residents were there for cannabis production alone. One young restorationist said:

That era of those back-to-the-landers really taking the restoration and stewardship of this place into their own hands, I think that has passed, in a large degree. I certainly feel like I am trying to carry that on, and to a certain extent other local community members in my age class are as well, but very few of them... you have to look at what else they can be doing, which is cultivating cannabis and making more money than most of them would ever have made had they gone off to college and pursued a career somewhere else.

Interviewees indicated that whereas cannabis had once created time for people to engage in restoration, it became all-consuming as “everybody is putting everything into [cannabis production], and we don't have any time for managing our landscapes in a personal way.” This quote reflects that it was not only perceived that the restoration economy had suffered, but that the personal land ethic had changed. This was echoed by others: “that's a concern about the relationship between restoration and community, we're seeing a population that is less and less attuned to the needs of the watershed.”

Interviewees also indicated that there was a shift in alliances in the watershed, with new partnerships between the restoration sector and ranchers and timberland owners. One interviewee said that the cannabis sector created unease among long-time logging and ranching families, which united them with restorationists, as: “they too get dismayed when they see big grows coming into the area and people going up and down the road that, you know, aren't necessarily here for the greater good.” Several ranchers and loggers had joined the watershed groups as board members, and others worked as contractors for the groups, or cooperated with the groups as landowners. One restorationist said that the inclusion of ranchland owners in watershed group projects broadened participation in the restoration sector, while at the same time the cannabis sector moved away from restoration:

Once we started doing actual projects for landowners, then things really shifted... I mean we have a lot more people involved now and have had for the last decade and a half, since we started doing those kinds of projects that include the ranching demographic. And I think the struggle now is feeling disjointed from the cannabis economy, which is such a huge economy.

Though most of our interviewees participated in both the cannabis and restoration economies, they said that the green rush cannabis economy had come to compete with restoration economically, culturally, and in terms of land use priorities. Interviewees indicated that while the back-to-the-landers had introduced the cannabis economy to the Mattole, they had lost control of it and some found that former adversaries, the ranchers and loggers, were more in line with their restoration values. Cannabis production had transitioned from complementary with (and supportive of) restoration to challenging and competing with restoration.

3.3. Cannabis legalization and the potential for re-partnering with restoration

With legalization of cannabis for recreational purposes approved by California voters in 2016, the geography of production is anticipated to change as the competitive advantage of growing in remote regions such as the Emerald Triangle diminishes. Most of our interviewees stated that they hoped for a reduction in the scale of the cannabis industry:

Part of me hopes that after the green rush is over, there will be fewer people living here, fewer cars on the road, fewer areas of bare soil on steep unstable slopes that get drenched with 110 inches of rain every winter, and we're left with people who are more interested in living here, not because of all the money they can make, but because they are in love with this place. They love the quiet, they love the remoteness... and it could be people who are much more interested in stewardship as part of their daily and seasonal routine.

In reducing the scale of cannabis production, interviewees said that this might allow people to “return” to restoration. One interviewee said that he hoped cannabis could occupy a lesser but still important part of the economy: “maybe the hope and dream for the future is finding the balance where cannabis is a valuable source of income but it doesn't crowd out everything else. The old hippies talk about it, how there was a time when it was that way.” Many interviewees spoke nostalgically of returning to a time when landowners had “more of a connection” to the land.

In order to create this connection, the restoration economy was seen as a source of resilience and capacity for the region, helping landowners “come back together” to work toward a common vision. Some interviewees pointed toward the watershed groups as central to this reunification between cannabis and restoration:

Groups like Sanctuary Forest and the Mattole Restoration Council, who have these traditional kind of community outreach stewardship programs, [are] in a good position to help these landowners come together on tributaries and form road associations, form tributary collectives, work together to secure grant funding, to fix some of the problems [from cannabis production].

Many interviewees also expressed a hope for partnerships between the restoration and cannabis sectors as cannabis growers achieve regulatory compliance under legalization. The restoration economy funding could therefore shift (at least partially) from reliance on grants to cannabis growers seeking compliance. One interviewee indicated this was already happening, as “cannabis farmers are being forced into paying for restoration. So, it's a different economic funding source for restoration.” Another interviewee observed that the restoration economy itself could change, with for-profit businesses (e.g., engineering firms) benefiting from the new compliance-based restoration economy: “for-profit restoration groups are getting buried with jobs to help landowners comply with new cannabis regulations and permits.” Though the compliance model may involve new funding sources, actors, and objectives, one contractor at a for-profit company said that the restoration projects were similar:

[Cannabis] landowners pay us to come in and help them get into compliance ... You know road upgrades, getting up to industry standards, properly sized culverts... Pretty standard stuff. So that's the majority of the [compliance] restoration, and in fact that's all the restoration we did previously at the [watershed group], funded by the state.

While interviewees were generally optimistic about the effects of legalization for the restoration economy, this optimism was tempered by concerns about unintended consequences of regulating the industry. In particular, several expressed concern about the possibility that small-scale “mom-and-pop” grows would disappear because of regulatory requirements. These were the same grows that were seen by interviewees as generally environmentally benign, and which had substantially supported restoration and community groups over the years. As one interviewee said:

Right now, the cannabis farmers are being, especially the small, obedient guys, what do they call it, death by 1,000 cuts. [The regulatory framework] is de-incentivizing it, such that it's only going to be big, commercial operations anymore, and most of the people that

have come forward with applications that are small and medium wish they had never come forward.

Several interviewees who participated in both sectors were concerned that regulations would mean the end of the types of cannabis growers who had first forged the links between restoration and cannabis.

State-level legalization, though fraught with uncertainty, was described as a turning point for many interviewees for the renewal of the relationship between cannabis and restoration. Most interviewees expressed optimism about the effects of legalization, both for the funding of the restoration sector and for contributing to a renewed sense of land ethic and stewardship among residents.

4. Discussion and conclusions

The cannabis sector is invisible to many of the methods used by social scientists, making it a difficult sector to engage with. Yet it is an important part of many rural places, not only as a criminal enterprise, but as a part of their cultural, social, and economic fabric. In the Emerald Triangle, cannabis production is normalized enough that mainstream stores purchase public advertisements that refer to cannabis supplies and the cannabis market (Meisel, 2017). Others have pointed out the importance of informal or subsistence economies in rural places (e.g., Emery and Pierce, 2005; Swanson and Bruni-Bossio, 2019; Williams, 2011); we extend this to include explicitly illegal or marginally legal sectors, such as cannabis production.

This case demonstrates that the legal and illegal sectors in rural places interact in multiple ways, and that these interactions may be mutually supportive (complementary) or antagonistic. Other researchers have found complementary illegal and legal sectors in rural economies, such as between cannabis (Afsahi, 2011) or coca production (Perez et al., 2011) and farmer incomes, which can allow for income diversification. In our case, we found that cannabis production and restoration were so intertwined in every regard – from labor markets to land ethic – that they could not be separated in either the interviewees' minds nor in the research itself.

For many years in the Mattole, restoration work was complemented by cannabis production, facilitating the restoration sector's growth. The complementarity of the cannabis and restoration sectors was unsurprising, as both fit the counter-culture, back-to-the-land ethic, and both sectors drew on "traditional" or stereotypical rural skills involved in land management. The growth in scale of cannabis production, though, transformed the sector in the eyes of many restorationists, into a more cynical, profit-driven enterprise, creating a distinction between growers that mirrored the community-minded versus profit-driven growers described by others (e.g., Decorte, 2010). Cannabis production under the green rush was seen as disrupting and competing with the restoration sector in terms of labor markets, resources, land use, and cultural norms as cannabis production came to embody capitalist logic and the cultural milieu many back-to-the-landers had tried to escape. However, this narrative is complicated by several factors.

One, cannabis production may help to counter some of the negative impacts of rural restructuring. Counter-urbanization (or rural gentrification, described by Nelson et al., 2015) has generally been associated with the in-migration of wealthy retirees or high-income individuals pursuing an amenity-based rural lifestyle (see Gosnell and Abrams, 2011 for a review). As was evident in this case, though, counter-urbanization may also occur as people move to rural places to pursue new, sometimes illegal, avenues of valorization. This suggests that cannabis production, though perhaps problematic under the green rush, offers a potential avenue for rural entrepreneurialism. This may offset the "hollowing out" of middle class jobs in many rural places, which has been accompanied by rural brain drain and younger people moving away for opportunity in metropolitan areas (Carr and Kefalas, 2010; Frank and Reiss, 2014). Further, green rush growers, while criticized as

a group by the restorationists, are also a vital part of the community, with many fulfilling important volunteer roles (e.g., as firefighters for the volunteer fire departments), contributing funds to community activities and organizations, and supporting businesses through their spending.

Two, cannabis production seems to be part of a reconfiguration of alliances between different waves of settlement. There have been a number of land use disputes associated with rural restructuring and counter-urbanization, often framed in terms of production versus consumption, or old-timers versus newcomers (Sherman, 2018; Walker and Fortmann, 2003). Production (e.g., logging, ranching) is often associated with old-timers, and consumption (e.g., amenity migration, small-scale farming) with newcomers. But green rush newcomers upended this model, as they were involved in a productivist enterprise. Further, we saw evidence of a nascent coalition between former adversaries involved in land use disputes, as the ecological restoration and timber and ranching communities coalesced around a commonly-identified threat from large-scale industrial cannabis grows. This underlines that rural places are dynamic, and that the seemingly entrenched disputes between sub-groups can reconfigure in the face of new opportunities, and new threats.

Three, state-level legalization and the regulatory framework have created uncertainty and an opportunity for change within the cannabis sector. While many (perhaps most) growers are still operating in the black market (Bodwitch et al., 2019), this may change as wholesale and retail prices for cannabis decline (see Caulkins et al., 2018 for an analysis of Washington's legal market). The requirements for growers to come into compliance creates a path for re-partnering the two sectors. Non-profit organizations such as the watershed groups of this study have the knowledge and capacity to address the ecological harms associated with cannabis production, as well as expertise in writing grants, acquiring permits, and accessing and providing technical assistance. This could offset the concern expressed by interviewees that only growers with substantial capital would be able to achieve compliance, which includes extensive permitting and (often) hiring specialists to upgrade road systems and conduct necessary environmental assessments (Bodwitch et al., 2019; Short Gianotti et al., 2017).

State-level legalization also has profound implications for how cannabis-growing rural places will develop in the coming years. The geography of cannabis production may shift, as the crop no longer needs to be grown in isolated rural regions and hidden from law enforcement. This could move cannabis production to agricultural areas such as California's Central Valley, leaving historically cannabis-growing places struggling with the loss of this important economic sector. Maintaining economic opportunities in the legal cannabis market will be a challenge for many rural areas, which could see substantial economic downturns in coming years.

Finally, the liminal space of cannabis legalization offers an opportunity to create policies that address systemic economic and social equity concerns associated with cannabis production, including "the impact of racial, cultural, legal, and economic inequalities on who cultivates" (Polson, 2018, p. 246). It is likely that non-white minorities and disadvantaged socioeconomic groups, which were discriminated against within the illegal market and the war on drugs, have struggled disproportionately to establish themselves within the legal market. This reflects the privilege of dominant socioeconomic groups, which have the resources and political connections to shape market outcomes. It is important to consider whether and how the regulatory framework may be structured to help counter these inequities going forward.

We believe that the legalization of cannabis production, though tentative and geographically uneven, has created new opportunities for researchers to examine how the sector functions as a vital part of rural places. We acknowledge that our research has only begun to unpack its importance. Because we examined cannabis production through the lens of those involved in restoration, we have chronicled a partial but illuminating perspective of both industries and how they have

intersected over time. We excluded people who identify solely as cannabis producers (as opposed to restorationists who also produce cannabis). How do cannabis producers, including diverse types of producers, view their contributions to community, or their ecological and economic impacts? Who is migrating to rural places to grow cannabis, and how do these in-migrants change the places? What are the differential impacts of legalization and regulation on growers; for example, do compliance costs favor large-scale growers, as posited by our interviewees? Are there ways (or the political will) to protect small-scale production, which thrived under illegal markets but may now follow the path of other farming sectors into consolidation and conglomeration? What are indirect and induced economic impacts of cannabis production on other sectors, such as the service industry? Finally, while we referred to “growers” throughout this paper, we did not distinguish between producers (owners) and laborers, a shortcoming that can only be addressed through much more focused research within the cannabis production sphere. The questions we have suggested and more will help to clarify the impacts of this long-overlooked rural sector.

CRedit authorship contribution statement

Erin Clover Kelly: Conceptualization, Methodology, Writing - original draft, Writing - review & editing. **Marisa Lia Formosa:** Investigation, Formal analysis, Data curation.

Declaration of competing interest

None.

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