

A Challenge to Socio-Ecological Resilience: Community Based Resource Management Organizations' Perceptions and Responses to Cannabis Cultivation in Northern California

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Local nonprofit organizations in the Pacific Northwest have stepped up to fill a leadership void in forest management since the Timber Wars of the 1980s and 1990s. Community based resource management groups (CBRM) have focused on stewardship of ecosystem services, and leading efforts to employ local workers to restore forest ecosystems and watershed functions. In Northern California, even as CBRM capacity has grown since the Timber Wars, a new transformative challenge threatens community and landscape adaptive capacity. Cannabis cultivation, which can have significant environmental and social impacts, has become a pervasive economic driver. I used interviews to explore CBRM leaders' perceptions of environmental and social impacts of cannabis cultivation on their communities, and CBRM groups' responses to these impacts. Respondents agreed that illegal cannabis cultivation on public land (trespass grows) and partially legalized and often poorly managed cannabis cultivation on private land threatens the progress that CBRM groups have made toward restoring forests and watersheds. They also described changing community relations resulting from the rapid influx of newcomers drawn to the economic opportunity of cannabis cultivation. They discussed wide-ranging approaches CBRM groups are taking to address emerging challenges. These interviews indicate that local partnerships between CBRM groups and government agencies are not sufficient to address the negative impacts of illegal cultivation especially on federal lands. Even if legalization of cannabis succeeds in creating a regulated market for a portion of California's crop, the enormous national black market may continue to drive illegal cultivation on federal lands and unregulated private holdings. It will take Federal government re-investment in neglected national forests, rural landscapes and communities working to sustain critical ecosystem services, and federal legalization of cannabis to reverse the destruction resulting from illegal cannabis production on public lands.

Keywords: Socio-ecological resilience, CBRM, cannabis, federal lands, restoration

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dapting to change and remaining resilient is critical to communities' sustainability (Magis 2010). In the contemporary West, as a result of complex tenure

relations which may include federal or state lands and large corporate holdings in addition to non-industrial private ownerships, rural natural resource-dependent communities are often subject to transformative decisions about land management made beyond their

control. The Timber Wars of the 1980s to 1990s in the Pacific Northwest were a case in point, with social, economic and environmental upheaval cutting across this jurisdictional tapestry and affecting communities dependent on public and private lands alike (Kusel et al. 2000; Speece 2016).

In response, from the late 1980s on, hundreds of community-based resource management (CBRM) groups emerged (Brosius, Tsing and Zerner 2005). Also called ‘community forestry groups’ or ‘community-based ecosystem management groups’ and ‘watershed councils’ (Gray, Enzer and Kusel 2001; Kusel and Adler 2003; Lurie and Hibbard 2008; Weber 2003), they developed their communities’ capacity to respond creatively and effectively to a wide range of natural resource management and interlinked social and economic development challenges. In this research, I used the term CBRM groups very broadly to encompass place-based nonprofit organizations working on public, private and/or tribal lands who seek to enhance local socio-ecological resilience, and are involved in all aspects of environmental management, from working in the woods, to holding conservation easements in trust for future generations, to engaging in policy and advocacy. They have been leaders in efforts to restore ecosystems and support their communities. In Northern California, these groups have been at the epicenter of the latest transformation, the cannabis (*Cannabis indica* and subspecies) green rush.

Cannabis cultivation had long been a large though underground component of rural economies in the back-to-the-land communities of the region. However, beginning in the mid-1990s, with the legalization of medical cannabis in California, cannabis quickly became a highly visible booming industry in California’s ‘Emerald Triangle’ of Humboldt, Mendocino and Trinity Counties. By 2016, cannabis had a huge national black market largely supplied from California, with

the Emerald Triangle as its primary source. The rapid growth in industrial-scale cannabis production brought with it transformative change for socio-ecological systems in the region. Then, in 2016, California voted to legalize cannabis for recreational use from 2018 onward.

This study examines these transformations and their implications for socio-ecological resilience in the Emerald Triangle. I first explore these historical changes and the drivers behind them. I then provide a qualitative analysis of data from interviews with CBRM group leaders focusing on their assessment of the impacts of the cannabis boom on their communities and landscapes and on how they have worked to respond to these changes. I conclude with a synthesis of their bleak prognoses for future socio-ecological resilience in the region barring federal action on two fronts: to legalize cannabis to undercut the black market, and to reinvest in National Forests.

The Timber Wars Leave a Governance Gap

The Timber Wars changed forest management practices in a multi-jurisdictional landscape. In much of the West, public lands managed by federal agencies make up a large proportion of rural landscapes. This includes 46% of California (Ballotpedia 2017). The U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) manage most forested federal lands. In addition, there are public lands held by the states and tribal reservations. Industrial owners manage neighboring private forest lands. Rural communities with small private landowners are scattered in between, usually at very low population densities.

In rural communities around the West, the Timber Wars pitted neighbors against each other. In the Pacific Northwest

(PNW), on 24 million acres of federally managed public lands in California, Oregon and Washington, forest management mandates shifted to ecosystem management in response to law suits brought by environmental interests and a court ordered injunction to protect the habitat of the endangered northern spotted owl (*Strix occidentalis caurina*) (USDA 1994). Vociferous opposition to the changes under the Northwest Forest Plan (NWFP) emerged from forest industry, forest workers and communities (Maier and Abrams 2018). Timber harvests from federal lands were suddenly reduced to less than 10% of previous annual outputs and the supply of timber from federal lands declined from 25% of all U.S. timber output in 1990 to less than 5% in 2000 (Charnley, Donoughue and Moseley 2008; Phillips 2006). At the same time, forest industry consolidated and mechanized and there were fewer jobs. The trend has lasted. In Oregon, for example, between 1990 and 2016 average annual employment in the industry decreased by 51% (Oregon Employment Department 2018). In Northwest California, another Timber Wars' flashpoint was the fate of the last of the privately held old growth redwood forest and the hostile takeover of Pacific Lumber Company by Texas-based corporate raider Maxxam (Speece 2016). These upheavals contributed to the overall slump in the timber industry in the region.

Economic decline followed the reduction in logging on federal lands and industry restructuring on private forestlands in many PNW forest-dependent communities. With the reduced timber harvest on public lands, the federal treasury saw a loss in receipts, which in turn, led to a decline in congressional investment for management of national forests and BLM lands. Between 1993 and 2000, the USFS closed or downsized 23% of its field offices and 36% of its workforce in the NWFP area (Charnley 2006). As

local forest and ranger district staff and operating budgets dwindled, agency capacity for active forest management was seriously compromised. USFS spending on contracts for forest work, much of which had previously been done by workers in forest-dependent communities, was \$103 million in 1991 and only \$35 million in 2001 (Moseley and Reyes 2008). In many communities, as USFS district offices closed, the once vital federal presence was all but eliminated. Related timber industry restructuring and mechanization simultaneously reduced the workforce on private lands (Phillips 2006). Many forest-dependent communities were left with logged out or poorly managed lands and shattered economies (Kusel et al. 2000). Their local governments struggled as well.

Counties that included large acreages of federal land had little influence over how public lands were managed. Yet they still served their national forest-embedded communities, and maintained highways and other infrastructure. In the past, under the 1908 Payments to Counties Act, counties with large federal forest land holdings received a 25% share of timber receipts from those lands to make up for the tax base lost (USDA 2018), as lands in government ownership are not subject to local property taxes or other local assessments (e.g. for schools, social services, and police). These federal payments to counties peaked at over \$200 million in the late 1980s at the height of timber harvesting on federal lands. As logging declined with the shift to ecosystem management, revenues from federal payments to counties shrank drastically leaving schools, road maintenance, police and social services underfunded (Phillips 2006). During the following decade, in Northwest California expanding cultivation of cannabis began to replace some of the regional income lost in the wake of the logging downturn. However, as an untaxed crop, it made no direct contributions to local government revenue.

CBRM Leadership Emerges

In counties where both federal and local governance institutions had been weakened as logging declined, new CBRM leadership emerged to help communities weather the transition – taking on ‘institutional work’ and creating new adaptive governance roles where federal, state and local governance were spread thin (Abrams, Davis and Moseley 2015; Charnley et al. 2008). It began with individual community residents from both sides of the Timber Wars making the effort to talk to their neighbors, to share meals and consciously refocus polarized community discourse on what they could agree upon to move forward (Brick, Snow and Van De Wetering 2001; Wondolleck and Yaffee 2000). Many of these emerging groups struggled to figure out how communities’ existing skills and values could adjust to the region’s new rural economic realities. By facilitating communication among residents, these leaders harnessed human and social capital and community capacity to respond to daunting challenges from economic revitalization to supporting rural schools (Flora and Flora 2008; Magis 2010; Weber 2003). These were place-based efforts to work toward socio-ecological resilience (Berkes and Folke 1998; Folke 2006) in which people see themselves as part of their ecosystems and choose to organize to adapt to changes and persist, even through fundamentally transformative events (Holling 1973; Walker and Salt 2006).

CBRM groups who organized quickly were able to draw upon governmental and philanthropic foundation support from beyond their communities and soon began to network with one another. One catalyst for these incipient CBRM groups in the region under the federal NWFP was \$1.2 billion in federal funding available under the Northwest Economic Adjustment Initiative (NEAI) for economic development focused on forest

industry workers and families, and investment in communities and infrastructure, business, and ecosystems (Raettig and Christensen 1999). While the five-year NEAI was less successful than its proponents had hoped, new CBRM organizations emerged to capture the bounty in communities with the capacity to come up with ideas and write grant proposals (Kusel, Cortner and Lavigne 2007). As they faced financial and policy roadblocks, local groups began to learn from one another by developing partnerships with each other, often supported by local, state and federal agencies (Abrams et al. 2015; Maier and Abrams 2018). They brought in funding for natural resources and community development projects from government agencies and from philanthropic organizations. The Ford Foundation, for example, funded a range of leadership and capacity building workshops and provided several years’ worth of operational funding for CBRM groups in the 1990s (Christoffersen et al. 2008). These partnerships and opportunities to meet leaders from other CBRM groups supported emerging networks of CBRM groups. The CBRM leaders soon identified common challenges and grievances, particularly where federal management policies were concerned and set out to work together to affect them with rapidly growing local organizing capacity. Communicating with allied nation-wide organizations in Washington DC, local place-based groups began collaborating to develop white papers analyzing issues of common concern and recommending detailed policy initiatives. Using these informal networks, they began to send representatives to Congress every year (Cromley 2005). These initially local and regional networks expanded over time including by 2001, e.g. the Rural Voices for Conservation Coalition of over 80 non-profit, public and private organizations from around the West (RVCC 2017).

Such coalitions have made rural community voices heard in statehouses and in

Congress, influencing policy decisions made from afar by state and federal government and private industry with profound effects on forest and community health and local access to forest resources and jobs (Abrams et al. 2015; Baker and Kusel 2003; Charnley et al. 2014). The Secure Rural Schools and Community Self Determination Act of 2000 (SRS Act) for example, was a response to these efforts. It addressed the loss in federal payments to rural counties resulting from the decline in timber harvests under the NWFP. Under this law, from 2000 Congress compensated forest dependent counties initially based on the peak payments they had received in the late 1980s (USDA 2018). However, the SRS Act has been a stopgap measure requiring frequent re-authorization and resulting in declining payments after 2007.

As they did in the 1990s, CBRM groups continue to fill in where local governments are weak, with a strong focus on ecosystem restoration. Today CBRM groups operate across a spectrum of stakeholder participation involving private landowners or non-governmental organizations working in collaboration with local government, state or federal agencies on private or public lands (Danks 2008; Lurie and Hibbard 2008; Mountjoy et al. 2016). These groups typically employ a ‘consensus-based radical-center philosophy,’ agreeing to set aside their political differences and work together to achieve common land stewardship goals (Charnley et al. 2014). Since the late 1980s locally-oriented efforts have expanded to actively restore ecosystem functions where they have been degraded due to prior resource extraction or poor land management (SER 2018). The scale of the locally-based restoration economy nationally has been estimated as employing 126,000 workers and generating \$9.5 billion in economic output annually with additional indirect linkages nearly doubling this value (Bendor et al. 2015). The economic value of restoration to rural economies

in Oregon is approximately 16 jobs per million dollars of investment (Nielson-Pincus and Moseley 2013). The restoration economy has contributed to a landscape of socio-ecological resilience by creating networks of diverse actors, commitment to application of science and development of best management practices, and supporting the emergence of an institutional infrastructure for restoration activities (Baker 2005; Baker and Quinn-Davidson 2011). In many forest-dependent communities, CBRM groups have led this movement.

Groups including the Watershed Research and Training Center (WRTC 2018); the Mid Klamath Watershed Council (MKWC 2018); Sanctuary Forest Inc. (SFI 2018); the Sierra Institute for Community and Environment (SICE 2018), the Applegate Partnership and Watershed Council (APWC 2018) and Wallowa Resources (WR 2018) and many others have been active restoration leaders in the PNW. They have partnered with and sometimes contracted with federal agencies to carry out National Environmental Policy Act (NEPA) analyses required for planning and permitting actions (e.g. WRTC 2018). They have worked to restore forests, woodlands, meadows and watersheds, by implementing fuels treatments and using prescribed fire (e.g. MKWC 2018; WRTC 2018), planting trees, removing invasive species and enhancing fish and wildlife habitat (e.g. SFI, 2018; WRTC 2018; MCWC 2018, APWC 2018). They have developed locally scaled wood utilization, and biomass energy options (e.g. SICE 2018; WRTC 2018; WR 2018; Miller-Adams 2002). They have developed community capacity focused on enhancing rural food security; job creation and on-the-job training, and youth programs, (e.g. MKWC 2018; WRTC 2018; SICE 2018). They have been leaders in formal and informal collaborative partnerships with state and federal agencies including the Trinity County Collaborative (2018), the Western

Klamath Restoration Partnership (Harling and Tripp 2014) and the Burney Hat Creek Community Forest and Watershed Group (SICE 2018).

The specific institutions and applications emerging are place-based and vary with key issues addressed and with land tenure and jurisdiction, for example from areas of largely public lands to those predominantly in private hands. These CBRM groups have acted to achieve greater socio-ecological resilience at the local level, by restoring landscape functions, diversifying local economics and developing decentralized adaptive governance institutions for resource management in their bioregions (Chaffin, Gosnell and Consens 2014; Huitema et al. 2009) or ‘problemsheds’ (Chaffin et al. 2014; Mollinga, Meinen-Dick and Merry 2007). In some cases, CBRM groups have collaborated with local tribes, beginning to heal generations of suspicion and violence (e.g. Harling and Tripp 2014). CBRM groups have become community leaders in extensive rural counties with small populations and limited tax base partially compensating for a relative vacuum of national, state and local governance capacity on federal and private lands. A number of these organizations have grown from small part-time or volunteer groups scrambling to pay for office space to major local employers managing multi-million dollar budgets with full-time year-round staff as well as a seasonal work force. Thus, local restoration groups and consortia became locally and regionally influential in the 1990s and 2000s, and nationally-networked players in resource governance and management. Through all of these actions, they made their communities more socio-ecologically resilient, providing jobs that have helped them to recover from the shock of the Timber Wars, doing the on-the-ground work to implement ecosystem management, and becoming the heart of restoration-based economies.

Then, just as they were establishing their leadership, a new challenge arrived in their problemsheds. The rapid expansion of cannabis cultivation threatened to overwhelm their efforts by dewatering and polluting streams, degrading watersheds, killing wildlife and destroying forests in the same areas where CBRM groups had been struggling for the previous decade to restore and protect them.

Cannabis Cultivation Challenges Restoration

The industrial-scale boom in cannabis cultivation has emerged to challenge land management and emerging post-Timber Wars social cohesion in many rural communities in Northern California. Cannabis, also known as marijuana, refers to *Cannabis indica* and its ssp *indica* and *afghanica*; and *Cannabis sativa*, originally hemp, and their hybrids (Rahn 2014). It is a Schedule I Federally Controlled Substance under the Comprehensive Drug Abuse Prevention and Control Act of 1970 (U.S. Government Publishing Office 2018). While remaining federally prohibited, since the 1990s the legal status of cannabis has changed in many states, with medical use of cannabis decriminalized in 20 states plus Washington D.C. and Puerto Rico and recreational use now legal in eight (Short Giannotti et al. 2017). In California, the 1996 California Compassionate Use Act (SB 215) allowed the use of cannabis as medicine under state rules, with local governments increasingly setting standards for allowable growing and distribution (e.g. California S.B. 420). The conflict between federal and state laws has created a huge black market for cannabis products, estimated at \$45-50 billion. One 2017 report speculated that if federally legalized, cannabis receipts would outsell ice cream (Borchardt 2017). With California consumers using only one-sixth of the cannabis grown in the state, California growers

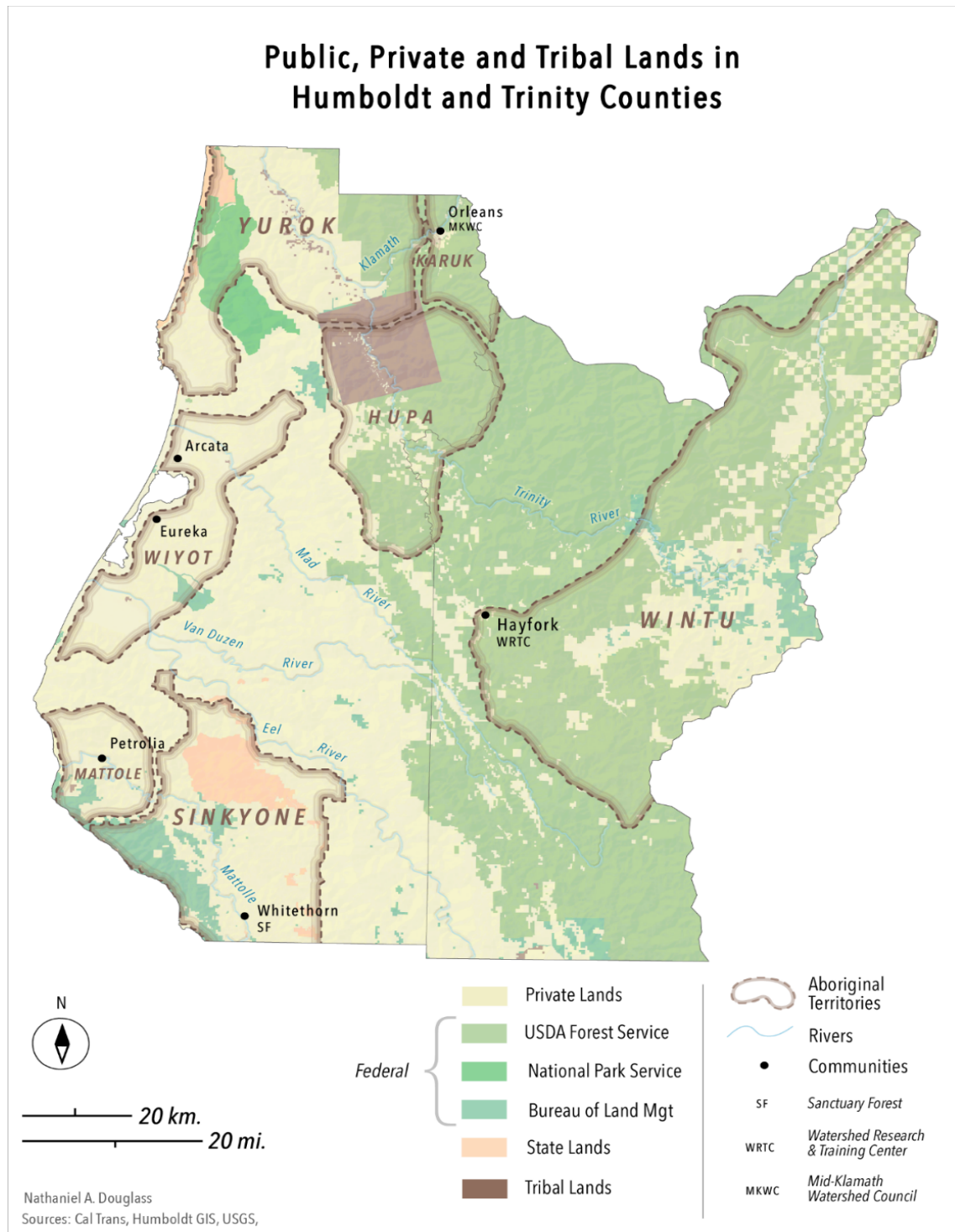


Figure 1. Land Tenure in Humboldt and Trinity County with CBRM Locations

produced an estimated 79% of the supply for the national black market (Corva 2014; Soboroff and Koss 2017). The California crop's estimated value in 2014 was \$31 billion, the

equivalent of the top 10 agricultural crops in the state combined (Harkinson 2014). The economic boom in cannabis has been partic-

ularly strong in the Northern California Emerald Triangle counties that had been struggling economically with the decline in the timber industry.

The economically depressed, rugged region has long been conducive to widespread underground cannabis production. Northwestern California is mountainous, densely forested and geographically remote. Reported per capita incomes are below the state average. The region's counties, including Humboldt and Trinity, are thinly populated with small community centers distributed along key rivers and highways (Figure 1). Recently, Humboldt County (at 4,052 square miles and 80% forested) had a population of 136,754 (US Census 2018). The reported median household income in 2016 at \$42,685 was significantly lower than for California at \$67,739. In neighboring Trinity County, the population was 13,744 people living in 3,207 square miles and the median reported income was \$35,270 (Department of Numbers 2018). These counties suffered significant economic impacts resulting from the Timber Wars and the decline in the timber industry. Humboldt County still produces 20% of the timber on the California market, largely from private lands. However, 50% of private sector employment was in timber in the 1950s and by 1997 the industry represented only 7.8% of county employment (Hackett 1999). Furthermore, nearly 30% of Humboldt County and 75% of Trinity County are federal lands (Trinity County Transportation Commission 2017). The decline in timber harvest from National Forests since the early 1990s was dramatic and as noted above there has been a concomitant decline in payments to counties under the SRS Act, leaving them to struggle to govern with reduced budgets (Figure 2). Trinity County for example, received over \$7.5 million dollars in 2003 and 2004 at the peak of the SRS Act payments and less than \$30,000 by 2016 (USDA 2017).

The decline in federal presence, including both forest management and law enforcement activity, opened the way for trespass cannabis growing to take root in significant areas of federal land, especially national forest. Beyond the coastal cities around Humboldt Bay, law enforcement capacity was limited. Inadequate law enforcement capacity on federal lands in general was no secret to the U.S. Government (USGAO 2010). On the ground in the Emerald Triangle, the implications are that the 'Wild West' remains wild. According to one source, in 2016, the Trinity County Sheriff had between 1 to 4 deputies covering 3,200 square miles with response times up to two hours (McDaniel 2016).

In addition to the timber industry decline, weakening of local government finances and lack of law enforcement capacity, the region has a physical and cultural climate conducive to cannabis cultivation. The history of cannabis cultivation here is linked to the 'back-to-the-land' movement, merging with a socially libertarian culture that has included primarily small-scale 'mom and pop' growing on private lands since the 1970s (Raphael 1985). While outwardly surrounded by a culture of secrecy, many financially successful cannabis growers were community leaders and made major under-the-table contributions to Emerald Triangle community causes from tiny rural schools to community centers (Raphael 1985). From 1983 to 2012 the Campaign Against Marijuana Planting (CAMP), a California Bureau of Narcotic Enforcement led multi-agency paramilitary effort to eradicate cannabis grows, primarily on private lands in Southern Humboldt and Mendocino Counties, created tense conditions and very negative relationships between law enforcement and many rural communities (Corva 2014; McCubbrey 2007).

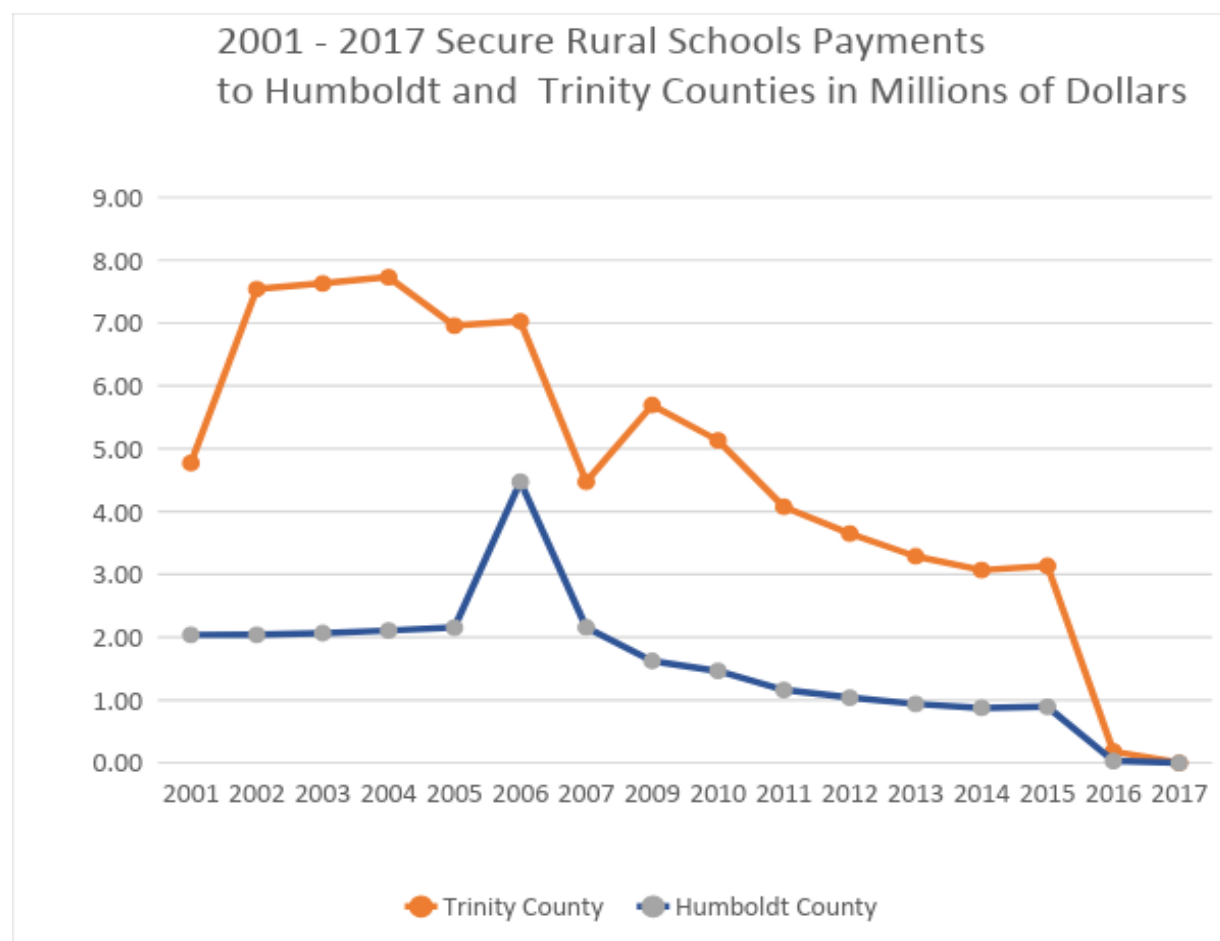


Figure 2. SRS Act Payments to Humboldt and Trinity County; data source: USDA Forest Service 2017 Secure Rural Schools Payment Reports

Today, cannabis is grown on private lands, tribal reservations¹ and federal public lands. There are an estimated 4,000 trespass grows on federal lands and 10,000 grows on private lands in Humboldt County alone (Butsic and Brenner 2016; Squier 2018). With the expansion of a quasi-legal ‘medical marijuana’ industry after 1996, the mix of legal medical cannabis and illegal black market ‘green rush’ has been notoriously difficult to quantify but Humboldt County estimates suggest that the street value of cannabis produced in Humboldt lies anywhere from \$1-4

billion per year (Humboldt County 2016). In 2017 sales generated by the cannabis industry in the City of Eureka, the Humboldt County seat, were estimated to comprise over 25 percent of the city’s economy, generating approximately \$415 million in annual sales from both outdoor and indoor grows (Peppers and Hutchinson 2017). Real estate prices were another indicator of the rush – over a four-year period from 2012-2016, realtors reported increased property values of 90-150% (Houston 2017).

¹ For over 10,000 years, the region has been the ancestral home of several Native American tribes including the Hupa, Karuk, Mattole, Sinkyone, Wintu, Wiyot and Yurok. The tribes do not condone Cannabis cultivation on their reservations.

California and national news media have covered virtually all aspects of the cannabis boom, and the new legal industry has spawned its own promotional media outlets. While the economic potential is undeniable, the scale and nature of environmental and social impacts of cannabis cultivation and the increasingly corporate character of the industry are also discussed. Local media as well as academic and government publications have compared cannabis cultivation to conventional agriculture in impact with respect to landscape fragmentation and soil erosion (Butsic and Brenner 2016). Effects of water diversions and degradation of habitat for fish species listed under the state and federal Endangered Species Act are of major concern, especially during the summer low flow period where cultivation demands can exceed streamflow (Bauer et al. 2015). With the summer dry Mediterranean climate and ongoing drought, the effect of cultivation on scarce water supplies is a major issue. At about 6 gallons of water per plant per day over 150 watering days, a trespass grow site with 10,000 plants diverts 60,000 gallons of water per day, or 9 million gallons in a season (Turner 2014). Contamination is also severe. In 2012, in California's national forests, authorities found 315,000 feet of plastic hose, 19,000 pounds of fertilizer and 180,000 pounds of trash on more than 300 illegal marijuana plantations (Turner 2014). The energy use and greenhouse gas emissions from indoor grows are significant. Seventy gallons of diesel fuel are required to grow one cannabis plant (Mills 2012). Indoor cultivation electricity use is equal to 1 million average California homes and greenhouse-gas emissions equal to those from 1 million average cars (Mills 2012). Reports on the impacts of the industry on communities, labor relations and social dynamics are emerging (Adelman 2013; August, 2012; Brady 2013).

In 2016, the game changed yet again when California voters passed Proposition 64, the Adult Use of Marijuana Act, effective January 2018. It legalized recreational use of cannabis, despite the continuing federal prohibition. In the months preceding passage of this law, city, county and state authorities scrambled to put a cascade of new regulations in place. In Northwestern California, local governments received all manner of feedback ranging from supportive to highly critical from growers' associations and CBRM groups as the authorities sought to craft rules that they hoped would lead (eventually) to a well-regulated, sustainable cannabis economy (e.g. Mintz 2017a; Mintz 2017b). Even as the regulatory process for cannabis grown on private land was slowly being established, illegal cultivation 'trespass grows' or 'guerrilla grows' on federal public lands continued.

As leaders in their communities who have championed ecosystem restoration efforts and socio-ecological resilience after the Timber Wars, CBRM groups have lived the green rush from its inception. This research focuses on what the recent Cannabis boom has meant for rural communities in the Emerald Triangle's Humboldt and Trinity Counties from the point of view of leading CBRM practitioners, and draws implications for socio-ecological resilience in the region.

Methods

In this research, I applied mixed methods, including formal interviews with eight representatives of five different CBRM groups in Humboldt and Trinity Counties in summer 2017²; and informal discussions with members of four additional groups. I am a twenty-five year resident of the region and a long-term board member of two local CBRM

² Research was approved by the Humboldt State University Institutional Review Board for the Protection of Human Subjects # IRB 16-257.

groups. My experiences in that context inform my research approach. Research questions focused on the character of each CBRM group and its role in the community, the emergence of local cannabis cultivation and respondents' perceptions of environmental, economic and social impacts of cultivation on their communities, and the choices each group has made with respect to its responses to cannabis. I further asked respondents to envision the future role of cannabis cultivation in their community in the short and longer term. I compiled notes taken during interviews immediately after each interview. Results were coded to identify key themes and patterns across responses. The research was also informed by participant observation at public meetings and ongoing review of the grey literature and published documents, including popular news media, scholarly documents, public agency reports, and materials from the CBRM organizations.

CBRM Perspectives on Environmental, Social and Economic Impacts of Cannabis on Communities

CBRM groups' voices from Humboldt and Trinity Counties represent the epicenter of the cannabis boom in California. With two exceptions, the consensus among the voices reported here was that cannabis poses significant challenges that would be reduced if its production, distribution and consumption were legalized and regulated at both state and federal levels. Cannabis is an agricultural crop that shows promise for medicinal uses, and could be managed in ways comparable to alcohol in the recreational market. The two people who held a differing view said that cannabis is a gateway drug and should remain illegal. However, they also explained that current state and local law enforcement efforts to control cannabis use were clearly not working. The major themes that emerged from the interviews on impacts of cannabis

centered on trespass grows, environmental impacts – especially on water supplies of cannabis grows in general, and social and economic effects experienced by communities.

Trespass Grows

Early in the interview process in summer and fall 2017, it became clear that respondents held different views, often emphatically different, of cannabis cultivation by land owners on private lands versus trespass grows. While their views of growing on private lands were complex, respondents were adamantly and unanimously opposed to trespass grows on state lands, on federal lands managed by the USFS or BLM and on tribal lands including the Hoopa and Yurok Reservations.

Respondents indicated that these grows were typically initiated by shadowy financiers, often referred to as linked to 'drug cartels' who provided the capital to set up cultivation and brought in laborers, often illegal immigrants, to tend the plants. Growers were said to clear patches in the forest or forest understory, divert water from surface streams and use herbicides and pesticides to protect their crops. There was unanimous concern about impacts on downstream drinking water supplies of highly toxic, federally banned chemicals. Respondents said that the workers would poach wildlife for food or kill any wildlife perceived to be a threat to the crop. Interviews revealed widespread concern, frustration and anger regarding the environmental impacts of these grows, particularly from members of groups that have spent the last decades working on stream restoration and fish habitat conservation. One respondent in Trinity County made a sweeping gesture to encompass the national forest surrounding the Hayfork Valley noted, "Every creek near a road has a grow." Grow sites were seen as dangerous and disruptive to ongoing restoration work. One respondent noted that their CBRM group's summer field

crew had to postpone work on a post-fire monitoring and restoration project next to the Trinity Alps Wilderness for a year when a large trespass grow was found where they were working. Another, who had personally worked on grow-site clean-up on federal lands, indicated:

The trespass grows are the worst. They draw on seeps and springs for water which really impacts the fish downstream. They use carbofuran [banned by U.S. EPA in 2008 for use in agriculture in the U.S.], which is a highly toxic insecticide that is being used to kill all manner of pests...a quarter teaspoon will kill a bear. You need a hazmat suit to remove it.

Several CBRM groups and organizations such as the Integral Ecology Research Center, and also tribes including the Karuk Tribe, have worked in collaboration with local sheriffs and state and federal agency law enforcement on cleaning up trespass grows. I interviewed wildlife biologist Mourad Gabriel who has extensively documented impacts of grows on the forest and on often rare or threatened wildlife species including Pacific fisher (*Martes pennanti*) and the federally endangered northern spotted owl (Gabriel et al. 2018; Gabriel et al. 2017). According to Gabriel (2017), while there had been efforts to destroy grows on federal lands in the past, efforts to really clean up the sites in a way that would not invite repeat growing only began around 2012. Gabriel estimated that only one-in-10 trespass grows was addressed. Many sites from which cannabis plants had been eradicated in the past were not otherwise cleaned up, leaving a legacy of rusting diesel and biocide canisters behind. Gabriel noted that the cost of clean-up was considerable, including careful hazardous materials removal by trained and equipped staff, and removal of tons of garbage and miles of pipes

left by laborers who live at grow sites for months at a time. In Gabriel's estimates, federal and state agencies and county sheriffs were overwhelmed, with far too few law enforcement officers to effectively patrol the millions of acres of often very remote forest and wilderness. He estimated that it would take \$120-180 million to clean up the grows on federal lands in Northern California alone. Other interview respondents discussing trespass grows expressed concern about the increasing danger of encountering people with weapons in the national forest. They further noted that when grows were destroyed by law enforcement, the real culprits financing the grows were not found, only the laborers, who were an exploited workforce.

A few interview respondents indicated that the best approach to addressing the trespass grow problem would be to provide more funding for law enforcement and eradication efforts. Most indicated that more funding for eradication in the short term would be critical to protect drinking water supplies and endangered salmon runs. However, most argued that the problem is so widespread that law enforcement will not be able to curtail it, and the only way to get rid of trespass grows in the long term will be to legalize cannabis at the federal level and undercut the black market.

Cannabis Growing on Private Land

CBRM respondents' opinions about cannabis cultivation on private land, often immediately next to their own homes, were more nuanced. They avoided condemning cannabis growers and instead focused their comments on environmental impacts and changes in community life and economies. Environmental impacts discussed included land fragmentation, water diversion, sedimentation of streams, forest clearing and impacts of chemicals.

The green rush of incoming cannabis prospectors fueled a demand for land that drove real estate values up. Land changed hands for unprecedented prices and in some areas large acreages zoned rural agricultural were rapidly subdivided into 40 acre parcels. CBRM respondents were concerned about the land fragmentation, expansion of roads and loss of wildlife habitat, and also about the type of newcomer taking control of such lands. As one respondent put it:

One environmentalist here sold his land for \$1 million. That land had been managed carefully for decades to produce good wine and protect the fish. The new owner is into growing weed and is not a land steward.

The greatest common environmental concern voiced among respondents was over water. The drought of 2012-2017 was very fresh in peoples' minds during my interviews in summer 2017. They spoke of streams, rivers and wells running dry in the summer growing season, and attributed the problem both to drought and to increased water diversions for cannabis grows. One CBRM group member noted, "Those big grows in the headwaters have taken our household drinking water supply."

They also noted that fertilizers, fungicides and pesticides poison fish and other wildlife. One knowledgeable hunter stated that the pesticide levels in deer and wild pigs are now to the point where he and his family no longer eat wild game. The same chemicals pollute headwaters of fish bearing streams and drinking water sources. Forest clearing for growing platforms and road construction leads to sedimentation of streams. Respondents differentiated between growers they identified as environmentally responsible (often long-time residents) and those who were not. One CBRM restoration manager indicated:

Many newcomers are ignorant – they don't know how to manage with natural resources or just don't care. They will cut down oak trees because they think they are dead. They will mix fertilizer in the creek.

All of the respondents were very worried about the impacts of growing on the environment. Respondents held more mixed views on how the green rush affected their communities.

Social Change in Communities

Respondents discussed a range of effects of cannabis growing on their communities not just recently, but since the legalization of medical cannabis in 1996 when the big rush began. These included competition for land and water, a rise in population and associated criminal activities, increased free-riding on public services and lack of participation in community affairs.

Interviewees noted that the green rush had created a real estate boom. In some areas, long-term residents and recent arrivals had sold their land for unheard-of prices. In some areas locals had tried to stay on their land but ended up selling out to get away from neighborhoods of newly-established cannabis grows. Several respondents, especially from communities surrounded by federal lands where private land parcels do not change hands frequently, remarked that the spike in the price of real estate had encouraged more people to sell. However, the prices were so high that young local residents waiting to buy land in their own communities could not compete. In one Northern Humboldt County community, a buyer from the East Coast purchased three rarely-available properties and turned them into industrial grows. Several respondents in the summer of 2017 indicated that the land speculation boom had been

huge, but that there were signs that it was slowing down. By the end of 2017, properties that would have been snapped up within a few months earlier had been on the market for some time. Interest in land seemed to be declining.

Water use remained a central issue. All respondents mentioned the declining availability and competition for water in the dry summer months. Increasing numbers of long-time residents' wells were going dry and they had to fill tanks at springs on federal land or purchase water in town and truck it home. Several respondents in Trinity County noted that access to public springs had at times been commandeered by growers who held other users off at gun-point until their tanks were filled. A low point indicative of competition for water in Humboldt County was the theft of over 10,000 gallons of water from Bridgeville School over Labor Day Weekend in September 2013 (Sims 2013). As one respondent said "Who would steal from our kids?"

Respondents also noted that community life changed with the influx of new growers and increasing numbers and visibility of seasonal 'trimmigrants', migrant workers who appear for a few weeks in the fall to help harvest and prepare the crop for market, including manicuring buds by trimming off leaves. Several interviewees discussed the increase in criminal activity associated with a high value, illegal crop. Most indicated that the main problem was people stealing cannabis from growers or arguing over deals. Several respondents also mentioned the increase in opioid use with people trading cannabis for methamphetamine or heroin. People interviewed also said that many residents were afraid. One woman noted that her grandchildren visited her for a month every summer but that this year, they would not be coming

due to the gun violence and 'scary people' next door. Another said that where children roamed free across their rural community 20 years ago, now her teenaged son and his friends could no longer cut across neighbors' lands to visit one another for fear of dogs and unfriendly neighbors. A CBRM member from a ranch in Humboldt County noted, "Women whose families have lived in the area for generations do not feel safe when they are out on their land." There were numerous references to foreigners, including 'Bulgarians' or 'Russians,' who were purported to be taking over land in remote areas. Several people interviewed noted the cultural shift from close-knit, community-minded, rural residents to people arriving with the cannabis boom. One noted:

The newcomers are just here for the money – they don't adjust to existing community life – they behave like thugs: reckless driving, pit bulls running free, guns, menacing behavior, high fences, noise of generators, bright lights all night. Intense grows are a problem.

Yet not all newcomers were feared or disparaged. CBRM members in Trinity County discussed its relatively recent sizeable Hmong community with respect its members seen as working to 'fit in.'

Several respondents noted that some newly-arrived growers used community services without paying taxes or participating in the voluntary service organizations that keep a small community going. One of the first points CBRM members were concerned about with regard to cannabis in Trinity County was the effect on a small local school district. Overall, there was a decline in enrollment in the schools after the Timber Wars³.

³ The Mountain Valley Unified School District for example, serving a portion of rural Trinity County, now has 296 pupils a decline of 12% in the last five years (Public School Review 2018)

However, the seasonal growers and migrant population of trimmers included children who were required by law to go to school. One respondent noted that this led to radical swings in enrollment in schools:

At the beginning of the school year (during harvest season) there can be 30 to 50 new kids that suddenly need teachers that were not budgeted for. A few months later they are gone.

In a smaller community in Humboldt, however, a respondent noted that where growers and their families come in to settle year-round, the increased school population was very welcome and was helping to keep the school open.

Another concern was that indoor grows often overload electrical systems in rural settlements. In these communities, fire departments are staffed by volunteers. As a respondent noted: "There has been an increase in structure fires and 9 out of 10 are due to indoor grows – Volunteer Fire Departments have to respond." Yet respondents claimed that few new residents were stepping up to the responsibility of joining the local Volunteer Fire Departments.

While CBRM leaders pointed out numerous challenges, some were also hopeful that the economic opportunities associated with cannabis would benefit their communities. Rural counties had been struggling with population decline in the wake of timber mill closures. Describing the demographic changes for a Trinity County community, one respondent noted that the leadership and power structure in town had changed and become more diffuse. "Many good parts of the community have left – especially the retired and about to retire folks who were the ones who volunteered for everything." In light of these changes, most people interviewed were pleased to see new people coming to town. As one respondent said, "There are new,

more diverse people now – some try to make the community work – but there is less cohesion. At the same time there are some great new young families willing to step into new roles ...we'll see if they stay."

Cannabis has certainly created new divisions in communities. One respondent from Trinity County indicated:

Anyone in the community can be a grower – old, young, rich, poor, but there is a divide in the community between people who grow or are supportive and the people who are against it or at least who are very concerned about impacts.

With regard to economic impacts to communities, CBRM respondents held mixed views. One respondent from a very small community noted, "There are more people in the community. They have money and spend some of it here, they give to community causes." There may be some economic leakage, however. A respondent from a larger community said:

There is less economic benefit than we had thought at first. At first, there were lots of restaurants, but most have shut down or are only open for a few hours or for a short season. Hardware, grocery and garden stores have done well. There are lots of dollars here, but the money doesn't stay here or get reinvested – they take their money and go to Thailand or Hawaii until next year. Also there are absentee owners who have people working for them here – that money all goes."

I also asked CBRM members how the cannabis boom had affected their work and organizations specifically. They all had major concerns about environmental impacts of cultivation on local watersheds for the reasons

discussed above. One common complaint of CBRM respondents was that high wages in the cannabis industry took the labor force away from their forest and watershed restoration efforts. As one CBRM leader said, “Who is willing to work for a standard wage in watershed restoration, fuel reduction and trail building? It is much easier for young people to make more money tending grows or trimming.”

Several people noted that cannabis business consulting is a new opportunity. With legalization, regulatory compliance with rules on stream protection, road construction and the like is a challenge for growers. Local resource management professionals are finding work helping cannabis producers clean up their grows and fulfill the intense, constantly changing and often bewildering documentation demands of the compliance process. Respondents from three different CBRM groups said their organizations had discussed the idea of adding this lucrative side-line to their operations, but decided not to engage. They indicated that communities’ views on the cannabis industry were too divided, and that CBRM groups who have worked for years to create common ground did not wish to be perceived as taking sides by consulting on growing.

CBRM Responses to Cannabis

As advocates for socio-ecological resilience, CBRM groups have struggled to respond in meaningful ways to the transformation cannabis has wrought in their landscapes and communities. CBRM groups have used a range of creative approaches from addressing trespass grows on federal lands to working with private land owners on conservation easements, water-use forbearance, and publicizing best management practices for reducing environmental impacts of cannabis growing. Several CBRM groups and local tribes, particularly from communities surrounded by

federally managed national forests, have been actively involved in trespass grow clean up, working in close cooperation with federal and state land management and law enforcement agencies.

Combatting land fragmentation and conserving natural and working landscapes through placing conservation easements on willing landowners’ lands is local land trusts’ preferred approach. Over the last two decades, they have worked to encourage large landowners to place easements on their lands in exchange for tax relief or outright payment for development rights rather than fragmenting their holdings by selling off parcels of working forest and ranch lands to incoming growers or other land developers. Tens of thousands of acres have been conserved in perpetuity. The Northcoast Regional Land Trust for example, by 2017 held easements on 25,000 acres in Humboldt and Trinity Counties and was poised to double that acreage in 2018 (NRLT 2017). Avoiding further expansion of cultivation of cannabis or any other agricultural crop on the region’s naturally forested, steeply dissected mountain slopes and sensitive soils is something their constituent ranchers, environmentalists and community members in general can agree on.

Water conservation has been a primary focus of SFI, founded in 1987, one of several active CBRM groups in the Mattole River Watershed of Humboldt County. This watershed is 86% privately owned. The communities in the Mattole are comprised primarily of ranchers and of 1970s-era migrants from urban areas. After intensive logging in the 1960s and 1970s, the focus on restoration and land conservation on private land was spearheaded by the back-to-the-land communities beginning in the 1970s. Tree planting, watershed and salmon restoration efforts including micro-hatcheries for native fish, environmental education programs with local schools, environmental theater and all man-

ner of community engagement were hallmarks of CBRM in the Mattole (House 1999). Then in early 2000, the creeks in the Mattole headwaters began running dry in summer, due, respondents indicated, to a combination of drought and too many people withdrawing water for domestic and agricultural uses, including cannabis gardens. SFI leaders working in partnership with other local CBRM groups, residents and the state Wildlife Conservation Board and the North Coast Water Quality Control Board developed an innovative approach to watershed restoration including enhancing groundwater recharge, water conservation, storage and forbearance.

Because nearly all precipitation falls between November and April in Northern California, one approach to reducing draw-down of creeks in summer is to store water during the wet months to use in summer. With state agency support and funding, SFI pioneered a program of providing large water storage tanks to landowners willing to fill tanks in winter and forgo tapping creeks for water in summer (SFI N.d). Today, 42% of landowners in 28 square miles of the headwaters of the Mattole River practice forbearance as part of the Sanctuary Forest Storage and Forbearance Program and the community employs a multifaceted public relations campaign aimed at further expanding landowner participation and promoting all forms of water conservation (Scavarda 2017). In addition to the forbearance program, SFI is actively working on innovative watershed restoration and groundwater recharge with support and funding from other CBRM partners: Humboldt County, the North Coast Regional Water Quality Control Board, the Wildlife Conservation Board and the BLM (Newlander 2016). The water conservation programs spearheaded by SFI demonstrate the leadership roles of place based CBRM groups who have the ability to combine innovative ideas, technical expertise, political savvy, and deep

commitment to the land in working with local communities and with local governments, state and federal agency partners toward greater socio-ecological resilience.

CBRM groups have also reached out to incoming growers to share local knowledge, demonstrate and encourage best management practices to reduce environmental impacts of cannabis cultivation. In 2016, the Humboldt County-based Environmental Protection Information Center (EPIC) compiled information from local sources and published a well-received Farmers' Environmental Compliance Guide that has been distributed far and wide in the Emerald Triangle. EPIC also collaborated with local radio station KHUM and Humboldt County Planning Department staff to broadcast programs on cannabis compliance (EPIC 2018). CBRM groups in remote communities trying to contact growers at first found it difficult to attract growers to local events where information about best practices for cultivation could be exchanged. One group addressed the challenge with 'Growing Greener' workshops, as described by an organizer: "We scheduled the workshop with a reggae band and held it at the local coffee shop. The band played a set, then we talked about stewardship and then the band played the second set. There were over 200 people there!" CBRM staff members indicated that at first growers argued about the impacts – "They had no idea." However, in this case after the initial resistance a core of 30-40 growers kept coming to workshops. They were happy to have a place to speak openly about cannabis and get some positive feedback. Non-growers in the community also attended workshops according to the organizer:

At first community members, especially the seniors who were very opposed to cannabis, perceived our workshops as being pro-cannabis, but when

we made it clear that our goal was better land and water stewardship and they came to the workshops, they understood.

CBRM groups have walked a fine line in their communities, negotiating between strong stances for and against cannabis cultivation and struggling to continue their land stewardship. The workshops, many clean-up efforts and countless other activities the groups undertake in this regard are largely unfunded aspects of the groups' operations. The challenges were already daunting when in fall 2016, Californians voted to legalize cannabis for recreational use beginning in January 2018.

Legalization and Regulation of Cannabis in California

Respondents ranged from wary to hopeful with respect to legalization. When I asked respondents how they expected the influence of cannabis on their communities to be influenced by legalization, they were hopeful that new registration and regulation processes would expand state efforts to reduce environmental impacts and begin to tax the industry to pay for enforcement and environmental restoration. Several wondered whether there would be sufficient agency presence on the ground, e.g. from the California Water Quality Control Board, to enforce the environmental protection rules. Several pointed out that the county-level efforts to register growers was falling far short of the actual number of growers. For example, in Humboldt County, by January 2018 only 2,000 growers had tried to register to become legal growers, leaving an estimated 8,000-13,000 growers still out of compliance (Houston, 2018a; Humboldt County 2017). CBRM respondents noted that while the new California regulations sought to track all legal cannabis production, the black market demand in and

outside of California was still huge and that unless federal legalization occurs, impacts of growing on the Northwestern California watersheds and communities would continue. There was also concern about the likely economic impacts of legalization on Emerald Triangle Counties as large grow operations are set up in the Central Valley, Salinas and other conventional agricultural regions that are expected to outcompete smaller scale growers.

Respondents said that grows should be regulated so that the crop is grown on appropriate (agricultural, not forest) land and water is conserved, use of chemicals is minimized and environmental impacts are addressed. One CBRM leader noted: "A regulated market place is the best way to reduce environmental impacts." Many respondents shared this expectation that stronger regulations and taxation will help to reduce the negative social impacts on communities. They also said they hoped some of the economic boom cannabis has brought will stay and not crash, leaving their rural communities yet again struggling as they did after the Timber Wars.

Discussion

Natural resource-dependent communities have commonly had to adapt to boom and bust cycles, often driven by economic forces beyond their control (Long 2009; Magis 2010). Under these circumstances, maintaining socio-ecological resilience (Berkes and Folke 1998; Folke 2005) is challenging, and there are many ghost towns to illustrate the failures. The Timber Wars shocked the previous system of resource extraction and forced a transition into a new state where logging was no longer the economic driver in a large region of the West. After federal investment and corporate industrial resources declined, communities and local governments struggled to adapt. CBRM groups emerged as

place-based leaders focused on collaborative approaches to working with state and federal agencies to restore their local landscapes and economies (Brick et al. 2001; Wondolleck and Yaffee 2000). They demonstrated that people of place have a vested interest in long term socio-economic resilience and sustainable use of local resources beyond the interests of state and federal governments or corporations. Local communities understand and bring local and ‘traditional’ knowledge to bear for effective resource management in their local environments (Brosius et al. 2005).

In Northwestern California, CBRM groups – like groups in other parts of the West – worked for over a decade to develop their restoration economy. Unlike groups in most other parts of the West, they have also experienced a cannabis boom affecting both public and private lands.

In interviews, CBRM leaders discussed the environmental, social and economic implications of the cannabis boom for their communities and landscapes, their efforts to respond to these impacts, their hopes and fears for the future as cannabis is legalized in California and the implications of legalization in California for trespass grows on federal and tribal lands. Most respondents interviewed here were well aware of and non-judgmental about the past history of underground cannabis in their communities. However, they were equivocal in discussing how the recent cannabis boom has affected their communities. They valued the increased economic activity for local businesses, where it occurred. They welcomed the influx of some new, younger people with energy to be involved in community life. They also struggled with what they perceived as the lawlessness, greed and lack of willingness to contribute to the social capital of rural community life that went along with the rapid expansion of cannabis cultivation after 1996. Conflict between ‘newcomers’ and ‘old-timers’ is

common as rural communities change (e.g. Walker and Fortmann 2003; Kranich, Luloff and Field 2011), however the characterization here better fits the case of an economic boom in terms of the stressful scale of growth and demand on resources (Petrova and Marinova 2014). Respondents were horrified at the environmental impacts of industrial scale growing, especially on scarce summer water supplies and salmon bearing watersheds. While 2017 and 2018 have been better water years, variable precipitation with increasing effects of climate change are to be expected in future. Interview participants described how CBRM groups have been peacemakers between long-time residents, some of them growers, and newly-arriving growers and trimmigrants. CBRM groups have tried to promote best management practices for cannabis gardens, instigated community-wide voluntary water forbearance, and cleaned up trespass grows.

Legalization in the State of California, while welcomed by most as a way to reign in the excesses and lawlessness feared by community members, was also fraught with uncertainty. CBRM members hoped that with legalization, many challenges would be addressed, that there would be stronger regulation, and taxes would help to pay for enforcement, restoration and community services. It seems likely that this will materialize for a portion of the private lands, for those growers who wish to become legal and have the capacity to go through the complicated and very expensive transition period which may last for several years (Yakowicz 2018). Now it appears that much of the cultivation is shifting to large industrial agricultural areas of California, depressing prices. As prices declined rapidly in 2017, many illegal growers on private lands quickly scaled up with grows doubling in size and environmental impact (Bauer 2018) further dampening the California market. How many growers on private

lands in the Emerald Triangle will remain after this second economic bust will depend, in part, on how legalization is institutionalized.

By early 2018 in the new regulatory environment, counties were scrambling to implement their new permitting rules at the same time as the state (Houston 2018b). With over 2,000 growers applying for permits in a few short months in this uncertain environment, Humboldt County was challenged to process them all. While the issues of legalization on private lands in California remain to be worked out, not much has changed for the trespass growers on federal lands that are likely to continue to supply the huge black market in the rest of the United States. Local governments and CBRM groups seeking to restore watersheds and support socio-ecological resilience in their communities surrounded by federal lands are powerless. In terms of socio-ecological resilience, cannabis has proven to be a force beyond local communities' capacity to control (Long 2009) and it may yet prove to be beyond their capacity to adapt to it.

It is clear that current levels of federal effort, even combined with collaboration from CBRM groups, local and state government are not sufficient to exclude illegal cannabis cultivation on federal lands in these counties. California lawmakers have repeatedly sought funds and have sent agency support for clean-up, including \$1.5 million allocated in 2017 (Burns 2017), and have newly created a Bureau of Environmental Justice that will focus on communities enduring a disproportionate share of environmental pollution and public health hazards, including those resulting from cannabis cultivation (Squier 2018). Despite these efforts however, and if the failure of CAMP is any indication (Corva 2014), it seems unlikely that law enforcement will ever be sufficient to counter the black market juggernaut. Federal legalization and reinvestment in public lands may be the only force capable of protecting forests

and watersheds and endangered species in Northwestern California watersheds.

Conclusion

The U.S. black market demand for cannabis threatens socio-ecological resilience in Northwestern California. The failure of the federal government to act on two fronts, the post Timber War disinvestment in the federal forest lands that the USFS and other agencies are responsible for managing, and maintaining cannabis on the list of Schedule I Drugs, has fueled a cancer that requires Congressional attention. This article focused on CBRM groups' responses to such challenges in the Emerald Triangle, but similar scenarios were being played out in California's Sierra Nevada (Turner 2014), which supplies water for urban areas and agriculture throughout the state.

CBRM groups may yet lead the way to initiate the necessary changes at the federal level. In Northwestern California, they were beginning to organize and talk to each other across networks and the region. If they call on their national networks and join forces with other voices for legalization, they may be able to influence federal policies as they have in the past. Whether they do and whether they are successful in time for affected endangered species and rural communities remains to be seen.

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