



# The quasi-legal challenge: Assessing and governing the environmental impacts of cannabis cultivation in the North Coastal Basin of California



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## ABSTRACT

The liberalization of cannabis policies is rapidly changing the cannabis industry. Though cannabis cultivation has environmental effects, little is known about how drug policy shapes knowledge about and efforts to mitigate those effects. We use a study of cannabis in the North Coastal Basin of California to examine how the legal status of cannabis shapes efforts to study and govern the environmental effects of cultivation. Drawing on interviews, a review of relevant rules and regulations, and existing literature, we review the state of the knowledge regarding the environmental effects of outdoor cannabis cultivation, document the range of governance tools that aim to mitigate those effects, and discuss the unique challenges to researching and governing cannabis cultivation. We argue that the quasi-legal status of cannabis and the mixing of black and medical markets create substantial barriers to the assessment and mitigation of the environmental effects of cannabis cultivation. We discuss the policy implications of these findings and highlight the importance of understanding the linkages between other semi-legal and illicit practices, governance, and the environment. The research shows the broad importance of examining ways that legal status and enforcement regimes surrounding semi-legal activities shape particular human-environment interactions.

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## 1. Introduction

The liberalization of cannabis is the subject of significant public debate and policy change across the Americas, Australia, and Europe (AP, 2014; Australia Dept. of Health, 2016). In 2013, Uruguay became the first country to legalize commercial cultivation and use of cannabis and active campaigns to legalize recreational cannabis nationally are underway in Mexico and Canada. Several countries, including Austria, Colombia, and France among others, have legalized cannabis for medical usage and many others have decriminalized cannabis use. In the United States, over 20 states and Washington D.C. have decriminalized or legalized the use of medical marijuana and eight states have legalized marijuana for recreational uses.

Much of the public debate surrounding liberalization focuses on public health and safety concerns associated with the use of cannabis and considerably less attention has been paid to production of cannabis (Carah et al., 2015). Yet, the cultivation and

trafficking of cannabis as well as other illegal drugs can have dramatic effects on land use and the environment (Armstead, 1992; Carah et al., 2015; McSweeney et al., 2014). Cannabis cultivation can involve a range of activities and land management practices that degrade the surrounding environment, including the clearing of native vegetation, illegal water withdrawals, road construction and grading, excessive use of fertilizers and pesticides, improper waste disposal, poaching of fish and wildlife, and energy use (Bauer et al., 2015; Carah et al., 2015; Gabriel et al., 2012; Mills, 2012; USDOJ NDIC, 2007).

In many ways the environmental effects of cannabis are similar to other agricultural crops. Unlike other agricultural crops, cannabis is often associated with a host of illegal and unpermitted activities that exacerbate these concerns. The landscape level effects of these practices depend both on the specific management practices (e.g., water source and rates of use, pesticide and fertilizer application) as well as the proximity of cultivation to sensitive habitat and species. While little is known about the precise management techniques or the reasons for the specific locations and patterns of cultivation sites (Butsic and Brenner, 2016), prior research provides compelling arguments that sub-national, national, and international drug policies influence the modes and patterns of production. For example,

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Corva (2014) shows how international and domestic drug policies and enforcement regimes influenced the modes of production and geography of cannabis in the North Coast of California. More broadly, in the United States, domestic cultivation of cannabis for medical purposes as well as for the black market has increased substantially alongside the liberalization movement (USDOJ NDIC, 2007). Yet little attention has been paid to direct and indirect ways that drug policies shape the environmental effects of the cannabis production.

In this paper, we address this gap through an examination of how the dynamic and conflicting legal status of cannabis influences research on and the governance of the environmental effects of cannabis cultivation in the North Coastal Basin of California, one of the largest cannabis producing regions in the United States (USDOJ NDIC, 2007). Cannabis production in the region is a quasi-legal activity – legal for medical purposes in California yet illegal at the federal level and for other uses at the state level. Over the past decade, the production of cannabis for both the medicinal and black markets has expanded exponentially and has received growing attention as a likely source of local environmental degradation (Bauer et al., 2015; State Water Board 2013). Natural resource agencies and non-profit organizations in the region have responded with a variety of regulatory and non-regulatory efforts to assess and reduce degradation from cannabis production but face numerous challenges stemming from the quasi-legal nature of the crop.

Our analysis draws on academic and gray literature, media coverage, review of relevant regulations and non-regulatory programs, and 21 interviews with staff at natural resource agencies and non-profit organizations as well as resident cannabis cultivators.<sup>1</sup> The interviews are particularly important for understanding the strategies actually employed to assess and govern the environmental impacts of cannabis cultivation and to show how the quasi-legality influences the day to day experiences of scientists and regulators. We argue that the relationship of cannabis and the environment is shaped by its dynamic, quasi-legal status. More specifically, the legal status of cannabis influences how and where it is produced, what is and can be known about the environmental effects of cannabis cultivation, and how cultivators interact with regulatory and non-regulatory agencies. We posit that the ongoing evolution of drug policies will continue to influence this relationship but will be unable to curb the environmental effects while the quasi-legality persists. While the paper focuses on specifically on cannabis, better understandings of the intersections of policy, research, and environmental governance are relevant for understanding other quasi-legal, extra-legal, and illicit practices and how they relate to land use and the environment.

## 2. Cannabis cultivation in the North Coastal Basin

Located in northwestern California, the North Coastal Basin is primarily comprised of Humboldt and Mendocino counties. The region is dominated by dense forests and steep, rugged terrain, and provides habitat for many sensitive ecosystems. The basin has

<sup>1</sup> Eight interviews with staff at natural resource agencies, local nonprofits, and a non-regulatory government organization were conducted in 2008 as part of a larger research project (see Short, 2010). The interviews queried respondents' concern about the environmental effects of cannabis and the actions their agencies or organizations were taking to address those concerns. We conducted thirteen additional interviews in 2014 including five staff at local nonprofit organizations, five staff and researchers at state and federal agencies, one academic researcher, and two resident growers. All respondents (except the resident growers) were asked about (a) the ways they or their organization address the environmental effects of cannabis cultivation through research, outreach, lobbying, or other activities and (b) the challenges of conducting research or administering programs linked to cannabis. The resident growers were asked to speak about the range of cultivation practices and environmental sensitivity among small-scale growers in their community.

a long history of modification by humans with recent influences dominated by extensive logging in the latter half of the 20th century (Sawyer, 2006). The extraction of timber remains a primary economic activity in the region, though its importance has decreased in recent decades. Other prominent economic activities include agricultural production, tourism and recreation, and commercial sport fishing (NCRWQCB n.d.). Cannabis production also plays an important and expanding economic role (Polson, 2013).

### 2.1. Patterns and modes of cannabis cultivation in the North Coastal Basin

California is believed to be the largest exporter of marijuana to other US states and is estimated to supply up to 79% of the marijuana consumed in the US (Corva, 2014). The North Coastal Basin is one of the highest-producing regions in the state and production plays an important role in the economy of the region. For example, recent estimates suggest that cannabis production contributes around \$1.6 billion to the county's \$3.5 billion economy (Humboldt County, 2012).

Cannabis cultivation in the region has been documented as far back as the 1960s when 'back-to-the-landers' – populations of countercultural urban immigrants who purposely chose to settle in rural areas – initiated small-scale cultivation on private lands (Regan, 2009). Since then, changes in international, domestic, and state level policies as well as economic and cultural changes have influenced the patterns and practice of cultivation. The scale and location of cultivation has shifted and both the cultivation techniques and actors involved have diversified. By the early 1980s, cultivation expanded to also involve larger for-profit enterprises, and pressures from international drug policies and increased enforcement pushed cultivation off of private lands and into public spaces (Corva, 2014). The legalization of medical marijuana in 1996 (see Section 2.2) again changed the legal and cultural circumstances surrounding cultivation and the patterns of production. Around this time, eradication efforts on private lands were reduced (Corva, 2014); the economic line between production for the black market and medical purposes blurred (Bauer et al., 2015); and cannabis cultivation became socially accepted throughout much of the region (Polson, 2013). These conditions facilitated the re-emergence of cultivation on private lands as well as an increase in the number and overall area of cultivation sites across the state (Bauer et al., 2015; Polson, 2013).

Though many of the details regarding modes of production are not known, cultivation of cannabis in the basin occurs through primary three modes of production: (1) indoor hydroponic, (2) outdoor greenhouse or hothouse production, and (3) fully exposed outdoor production (Butsic and Brenner, 2016). Though both small- and large-scale indoor production have been documented in urban areas of the basin and can have significant energy footprints (Mills, 2012), the scale of indoor production is unknown and a substantial proportion of cultivation in California is believed to be outdoors (Carah et al., 2015). The analysis that follows focuses on outdoor greenhouse and fully exposed outdoor cultivation. Within these broad categories, the scale of production ranges from small "mom and pop" production through much larger cultivation operations, some of which are associated with international drug cartels (Regan, 2009). Production occurs through sanctioned cultivation on private lands as well as through 'trespass grows' on public, tribal, and private properties.

### 2.2. The (Il)legality of cannabis cultivation in the North Coastal Basin

In 1996, California legalized medical marijuana through voter approval of Proposition 215, the Compassionate Use Act in 1996

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