

Articles

Weed and Water Law: Regulating Legal Marijuana

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Marijuana is nearing the end of its prohibition in the United States. Arguably the country's largest cash crop, marijuana is already legal for recreational use in Colorado, Washington, Oregon, Alaska, and Washington, D.C. Between now and election day 2016, an additional fourteen states might place marijuana legalization initiatives on their ballots. In addition, twenty-three states and Washington, D.C. have legalized medical marijuana, with up to seven more states pending legislation. The era of marijuana prohibition is rapidly coming to a close.

At the same time, traditional doctrines of water law are struggling to cope with the modern realities of water scarcity. Administrative agencies lack capacities to monitor and enforce water rights in real time amid rapidly changing conditions. As marijuana cultivation leaves the black market and enters state regulatory frameworks, legal doctrines and administrative agencies will need to adapt in order to balance existing water rights with the demands of marijuana production. Failure to do so will encourage farmers to remain clandestine while perpetuating existing conflicts between legal and illegal water users. At present there is a gap in understanding the relationship between water rights and marijuana legalization, despite their rapid convergence.

This Article is the first to systematically address that gap. Parts I and II begin by describing status quo marijuana cultivation taking place outside the context of state water law doctrines, and the unsustainable conditions that often result. Parts III and IV envision a legal marijuana market governed by the predominant doctrines of U.S. water law: prior appropriation and riparianism. In Part V the theoretical becomes reality, as California's complex water laws are put to the test by the largest marijuana cultivation community in

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the United States. Part VI concludes with recommendations for states in the process of legalization. Broadly speaking, this Article finds that both common law and regulatory approaches to water allocation are capable of accommodating legal marijuana cultivation, but to minimize disruptions to existing water rights and the marijuana industry, state agencies will need to proactively adapt to the new realities of the legal marijuana economy.

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INTRODUCTION

In late June of 2015, a convoy of vehicles carrying enforcement officers from four different counties of northern California drove up and into the remote and rugged slopes of Island Mountain.¹ The mountain had been given its name by eighteenth century settlers who observed that it was nearly surrounded by the waters of the Eel River and its tributaries.² Today it represents “the dark green heart of the Emerald Triangle,” a region known for its prolific cultivation of marijuana.³ The enforcement officers conducted open field searches on private lands, and by the end of the weeklong “Operation Emerald Tri-County,” had confiscated 86,578 marijuana plants.⁴

While police raids of marijuana farms are nothing new for the area, this particular operation raised some eyebrows. Unusually for a raid of this magnitude, no federal officials were involved—the raid was a wholly state operation.⁵ Since legalizing the medicinal use and cultivation of marijuana in 1996,⁶ California has been reticent to allocate state resources toward marijuana enforcement, decriminalizing possession of small amounts statewide in 2010 and capping civil fines at \$100.⁷ Also unusual were the lands being targeted by the county officers. Seventy percent of marijuana plants seized by law enforcement are illegally grown on public lands,⁸ but this operation went after privately held marijuana grows with some measure of legal protection under the state’s Compassionate Use Act.⁹ Until this point, a state raid of private lands was uncommon. The raid thus signaled a shift in the enforcement of marijuana laws, but not because the counties were cracking down on marijuana per se. Marijuana, like every other crop in the state, had fallen victim to water scarcity.

Months earlier, in January of 2014, the governor of California, Jerry Brown, issued a drought state of emergency in response to ongoing

1. Andrew Goff, *Major Multi-Agency Marijuana Raid in Island Mountain Today*, LOCAL COAST OUTPOST (June 22, 2015, 1:38 PM), <http://lostcoastoutpost.com/2015/jun/22/major-marijuana-raid-island-mountain-today/>.

2. NANCY CAPACE, THE ENCYCLOPEDIA OF CALIFORNIA 285 (8th ed. 1999).

3. See Goff, *supra* note 1.

4. Adam Randall, *Tri-County Pot Raids Net 86,578 Plants*, UKIAH DAILY J. (June 29, 2015, 11:10 AM), <http://www.chicoer.com/general-news/20150629/tri-county-pot-raids-net-86578-plants>.

5. Adam Randall, *Operation ‘Emerald Tri-County’ Nets 86,578 Marijuana Plants*, UKIAH DAILY J. (June 26, 2015, 5:01 PM), <http://www.ukiahdailyjournal.com/general-news/20150626/operation-emerald-tri-county-nets-86578-marijuana-plants>.

6. See California Compassionate Use Act of 1996, CAL. HEALTH & SAFETY CODE § 11362.5 (Deering 1996).

7. S. 1449, 2010 Leg., Reg. Sess., ch. 708 (Cal. 2010).

8. *Marijuana and Methamphetamine Trafficking on Federal Lands Threat Assessment*, NAT’L DRUG INTELLIGENCE CTR. (Feb. 2005), <http://www.justice.gov/archive/ndic/pubs10/10402/index.htm>.

9. HEALTH & SAFETY § 11362.5.

shortfalls in freshwater supplies.¹⁰ The declaration asked state agencies and officials to “take all necessary actions to prepare for these drought conditions.”¹¹ Since then, the drought in California and across the United States has become a mainstream topic of conversation, dominating headlines¹² and forcing governments to reexamine their water regulations.¹³ Water scarcity affects virtually all sectors of economic life, and as an agricultural commodity, marijuana is not immune. There is a paucity of research on marijuana and water supplies, almost certainly due to the covert nature of marijuana production.¹⁴ But in March of 2015, the first credible scientific study of the impacts of cultivation on water resources found that the demand for water to irrigate marijuana plants often outstripped water supplies.¹⁵ Data from the study came from the Eel River watershed.¹⁶

“Operation Emerald Tri-County” is the clearest sign yet that the rapidly evolving forces of marijuana legalization and water scarcity are about to collide. The enforcement officers might not have been joined by federal officials, but they were accompanied by personnel from the state Department of Fish and Wildlife on suspicion of water abuses.¹⁷ Later the four counties claimed the raid itself was motivated by violations of state water regulations, not marijuana cultivation.¹⁸ After finding unpermitted stream bed alterations, diversions, and reservoirs, the officials moved to confiscate the privately grown plants.¹⁹

In the aftermath of the raid, it became clear that the environmental intentions of the state might not have produced the greenest long-term consequences. Several victims of the raids were members of a political action group working with the counties to draft ordinances that would increase transparency and bring growers into compliance with

10. *Governor Brown Declares Drought State of Emergency*, CA.Gov (Jan. 17, 2014), <https://www.gov.ca.gov/news.php?id=18368>.

11. *Id.*

12. See *Drought Headlines*, NAT'L DROUGHT MITIGATION CTR., <http://drought.unl.edu/NewsOutreach/DroughtHeadlines.aspx> (last visited Apr. 10, 2016).

13. *Id.*

14. One researcher at the Humboldt Institute for Interdisciplinary Marijuana Research, Anthony Silvaggio, described the situation succinctly: “At my university, there is nobody who will even go near it.” Josh Harkinson, *The Landscape-Scarring, Energy-Sucking, Wildlife-Killing Reality of Pot Farming*, MOTHER JONES (Apr. 2014), <http://www.motherjones.com/environment/2014/03/marijuana-weed-pot-farming-environmental-impacts>.

15. See generally Scott Bauer et al., *Impacts of Surface Water Diversion for Marijuana Cultivation on Aquatic Habitat in Four Northwestern California Watersheds*, 10 PLOS ONE 1 (Mar. 2015) (indicating that water demand for marijuana cultivation has the potential to divert substantial streamflow).

16. *Id.* at 10.

17. See Goff, *supra* note 1.

18. See Randall, *supra* note 5.

19. *Id.*

environmental laws.²⁰ The group's director was dismayed that the raid would force growers back into the shadows, away from the state and county's regulatory framework.²¹ A previous effort in 2010 was successful in partnering private growers with county officials to monitor plants and facilitate regulatory compliance, but a federal raid and subpoena of the program's paperwork shut it down and broke up the partnership.²² While states can and should enforce water laws in the marijuana industry, doing so without alienating the regulatory targets will be challenging.

This is especially true when considering the pace and mechanism of marijuana legalization initiatives. Marijuana is already legal for recreational use in Colorado,²³ Washington,²⁴ Oregon,²⁵ Alaska,²⁶ and Washington D.C.²⁷ Between now and election day 2016, an additional fourteen states might place marijuana legalization initiatives on their ballots.²⁸ In addition, twenty-three states and Washington D.C. have legalized medical marijuana, with up to seven more states pending legislation.²⁹ The fact that legalization is largely taking place through ballot initiatives suggests that the public will not be waiting for state governments to get their regulatory ducks in a row. A majority of Americans favor marijuana legalization,³⁰ raising the likelihood that state water law doctrines will be tested sooner rather than later.

Reconciling marijuana legalization within the structures of water laws and regulations reveals two broad conclusions. First, for many states the legalization of marijuana is likely to strain existing water regulation resources, disrupt water markets, and interfere with water rights. Marijuana is arguably the largest cash crop in the United States,³¹ and while

20. Ryan Burns, *Yesterday's Pot Bust Involved Members of California Cannabis Voice Humboldt*, LOCAL COAST OUTPOST (June 23, 2015, 11:09 AM), <http://lostcoastoutpost.com/2015/jun/23/yesterdays-pot-bust-involved-members-california-ca/>; Josh Harkinson, *Police Say the Biggest Pot Raid in Years Wasn't Really About Pot*, MOTHER JONES (June 30, 2015, 5:00 AM), <http://www.motherjones.com/environment/2015/06/emerald-triangle-marijuana-raid-water-drought>.

21. Burns, *supra* note 20.

22. See Harkinson, *supra* note 14.

23. COLO. CONST., art. XVIII, § 16.

24. Washington Marijuana Legalization and Regulation, Initiative 502 (codified as amended in scattered chapters of WASH. REV. CODE §§ 69, 46).

25. Oregon Legalized Marijuana Initiative, Measure 91 (codified as amended in scattered chapters of OR. REV. STAT.).

26. Alaska Marijuana Legalization, Ballot Measure 2 (codified as amended in ALASKA STAT. § 17.38010).

27. Washington D.C. Marijuana Legalization, Initiative 71 (codified as amended in D.C. CODE § 48-904).

28. *Marijuana on the Ballot*, BALLOTPEdia, http://ballotpedia.org/Marijuana_on_the_ballot (last visited Apr. 10, 2016).

29. *Id.*

30. *In Debate over Legalizing Marijuana, Disagreement over Drug's Dangers: In Their Own Words: Supporters and Opponents of Legalization*, PEW RES. CTR. (Apr. 14, 2015), <http://www.people-press.org/2015/04/14/in-debate-over-legalizing-marijuana-disagreement-over-drugs-dangers/>.

31. See *infra* notes 72–75.

the industry has already been using significant water resources, simply enshrining historical uses is not a viable option for many jurisdictions. On the other hand, states must bring marijuana producers into the fold lest the industry continue to operate in the shadows, and doing so will require some accommodations for producers to use water resources.

Second, and conversely, water scarcity will play an increasingly large role in the development of the marijuana industry. The tri-county raid set a precedent that more law enforcement officers and state agencies are likely to follow in order to safeguard precious water supplies. Even well-established water rights in the agricultural sector have been cut and renegotiated,³² and marijuana producers joining the regulatory fray will need to navigate the various idiosyncrasies of centuries-old water laws to maximize their allocations. States are likely to place increased scrutiny on producers who choose to grow or irrigate outside of legal channels.

These broad conclusions stem from a systematic analysis that addresses the gap in understanding the relationship between water rights and marijuana legalization. Part II begins by describing status quo marijuana production taking place outside the context of state water law doctrines. While marijuana can be grown sustainably, unregulated production often leads to illegal and destructive water practices affecting downstream rights holders.

Parts III and IV envision a legal marijuana market governed by the predominant doctrines of U.S. water law: prior appropriation and riparianism. Each system presents a unique set of legal and regulatory challenges, and for states like Colorado, these challenges are already evident. In the American West, prior appropriation states will need to adapt to the relatively rigid nature of priority water rights, as well as the federal government's outsized role in water allocation and marijuana prohibition. States employing riparianism or regulated riparianism will have a slightly easier time incorporating marijuana cultivation into existing systems, as long as the doctrinal or regulated administration of water rights is holistically applied to the legal marijuana industry.

In Part V the theoretical becomes reality. California's uniquely mixed system of riparian and appropriative rights provides a number of opportunities for marijuana cultivators to come into compliance with water laws. However, the state's decentralized and haphazard approach to marijuana regulation creates uncertainty in the marijuana industry. That uncertainty bleeds into the administration of water rights despite the intentions of both cultivators and regulators.

Part VI concludes with recommendations for states in the process of legalization. By applying water laws to the emerging legal marijuana

32. Ryan Stoa, *Regulating the Drought in California, Ctd.*, RYAN STOA (June 1, 2015), <http://ryanstoa.com/blog/2015/6/1/regulating-the-drought-in-california-ctd>.

industry, this study identifies a number of key trade-offs states must make in reconciling marijuana cultivation with water scarcity. This Part considers the costs and benefits of decentralization, restrictive cultivation licensing, and the “no action alternative.” While water laws will occasionally clash with the new marijuana economy, this Article identifies opportunities to smooth the transition.

I. WEED AND WATER LAW: HOW DID WE GET HERE?

A. HISTORICAL ORIGINS OF WEED AND WATER LAWS IN THE UNITED STATES

The vital importance of water for human survival, especially for drinking and crop production, necessitated rules establishing rights to water in times of scarcity for the earliest human civilizations, from hunter-gatherers to the first agriculturalists.³³ In some cases, these rules might have predated property laws for land.³⁴ Jewish water laws can be traced as far back as 3000 B.C.³⁵ and are similarly prevalent in the earliest Islamic legal texts.³⁶ English common law formed the baseline for water rights regimes in the early days of U.S. sovereignty.³⁷ The English “natural flow” doctrine prohibited landowners from making any use of water resources that would impair the quantity or quality of water flowing past riparian lands, with the exception that riparian landowners could use water for domestic purposes, such as drinking, washing, livestock rearing, or small-scale farming.³⁸

Eventually states would recognize the limitations on development of the natural flow doctrine,³⁹ and two water law regimes were created to facilitate water use. In states east of the Mississippi River, jurisdictions established the doctrine of riparianism, in which a “reasonable use” of water is permitted on lands riparian to a watercourse.⁴⁰ As with the English common law, domestic uses are given priority.⁴¹ Lands west of the Mississippi River had a rockier transition, shifting initially from

33. Ryan B. Stoa, *Droughts, Floods, and Wildfires: Paleo Perspectives on Disaster Law in the Anthropocene*, 27 *GEO. INT'L ENVTL. L. REV.* 393, 407 (2015).

34. James Salzman, *Thirst: A Short History of Drinking Water*, 18 *YALE J.L. & HUMAN.* 94, 98 (2006).

35. *Id.* at 99.

36. *Id.* at 100.

37. BARTON H. THOMPSON, JR. ET AL., *LEGAL CONTROL OF WATER RESOURCES* 55 (5th ed. 2012).

38. *Id.* (citing *Merritt v. Parker*, 1 N.J.L. 460, 463 (1795) (“[W]hen a man purchases a piece of land, through which a natural water-course flows, he has a right to make use of it, in its natural state, but not to stop or divert it to the prejudice of another.”)).

39. See Morton J. Horwitz, *The Transformation in the Conception of Property in American Law 1780–1860*, 40 *U. CHI. L. REV.* 248, 253 (1973).

40. See, e.g., *Tyler v. Wilkinson*, 24 F. Cas. 472, 474 (D.R.I. 1827) (requiring, per Justice Story’s opinion, that riparians be allowed a reasonable use of water).

41. THOMPSON ET AL., *supra* note 37, at 33.

communal resource regimes of the Native Americans and Spanish settlers to traditional riparianism in step with eastern states,⁴² before eventually adopting the doctrine of prior appropriation. Originally developed by gold rush miners, prior appropriation creates a temporal right to water: “first in time, first in right.”⁴³ The domestic use priority of riparianism was abandoned, replaced instead with the requirement that water be continually put to beneficial use.⁴⁴ Today states east and west of the Mississippi River implement their own models of these traditional water law doctrines through administrative agencies and regulatory systems.

Marijuana enjoys a similarly storied history. One of humanity’s oldest cultivated crops, marijuana can be traced back 12,000 years to hunter-gatherers who appreciated its nutritious and psychoactive properties.⁴⁵ In Neolithic times it traveled from its roots in China and Siberia along the Silk Road to the Middle East and Europe.⁴⁶ Once there, it flourished in classical Greek, Roman, and Arab societies.⁴⁷ European colonialism cemented marijuana as a global commodity, spreading its cultivation, trade, and use throughout the Western Hemisphere and into what is now the United States.⁴⁸

Marijuana in the United States was for many years overshadowed by the other major derivative of its taxonomic species *cannabis sativa*: hemp.⁴⁹ While marijuana is primarily grown and used for its medicinal or recreational psychoactive properties, hemp strains are grown to produce food, textiles, paper, and other materials.⁵⁰ Queen Elizabeth required large landowners throughout the British Empire to grow hemp to

42. *Id.* at 188–90; *see also* ROBERT G. DUNBAR, *FORGING NEW RIGHTS IN WESTERN WATERS* (1st ed. 1983).

43. DUNBAR, *supra* note 42, at 61.

44. THOMPSON ET AL., *supra* note 37, at 190–91.

45. Barney Warf, *High Points: An Historical Geography of Cannabis*, 104 *GEOGRAPHICAL REV.* 414, 418–19 (2014) (citing ERNEST L. ABEL, *MARIHUANA: THE FIRST TWELVE THOUSAND YEARS* (1st ed. 1980)).

46. *Id.* at 420.

47. *Id.* at 423 (citing James L. Butrica, *The Medical Use of Cannabis Among the Greeks and Romans*, in *THE HANDBOOK OF CANNABIS THERAPEUTICS: FROM BENCH TO BEDSIDE* 23–42 (Ethan B. Russo & Franjo Grotenhermen eds., Routledge 1st ed. 2006)); *see also* ABEL, *supra* note 45; D.C.A. HILLMAN, PH.D., *THE CHEMICAL MUSE: DRUG USE AND THE ROOTS OF WESTERN CIVILIZATION* (1st ed. 2008); FRANZ ROSENTHAL, *THE HERB: HASHISH VERSUS MEDIEVAL MUSLIM SOCIETY* (1st ed. 1971).

48. JONATHON GREEN, *CANNABIS* (2002); James H. Mills, *Cannabis in Colonial India: Production, State Intervention, and Resistance in the Late Nineteenth-Century Bengali Landscape*, in *DANGEROUS HARVEST: DRUG PLANTS AND THE TRANSFORMATION OF INDIGENOUS LANDSCAPES* 221–31 (Michael K. Steinberg et al. eds., 2004); Warf, *supra* note 45, 425–26 (citing WILLIAM L. PARTRIDGE, *CANNABIS AND CULTURAL GROUPS IN A COLOMBIAN MUNICIPIO* (Sol Tax ed., 1975)).

49. For a review of the taxonomy of marijuana and hemp, *see generally*, Ernest Small & Arthur Cronquist, *A Practical and Natural Taxonomy for Cannabis*, 25 *TAXON* 405 (1976) and Shannon L. Datwyler & George D. Weiblen, *Genetic Variation in Hemp and Marijuana (Cannabis sativa L.) According to Amplified Fragment Length Polymorphisms*, 51 *J. FORENSIC SCI.* 371 (2006).

50. *See generally* ROWAN ROBINSON, *THE GREAT BOOK OF HEMP: THE COMPLETE GUIDE TO THE ENVIRONMENTAL, COMMERCIAL, AND MEDICINAL USES OF THE WORLD’S MOST EXTRAORDINARY PLANT* (1996) (discussing uses and forms of hemp).

counter Britain's reliance on Russian hemp imports;⁵¹ later the Jamestown colonists would be required to do the same.⁵² Both George Washington and Thomas Jefferson were hemp growers, and the U.S. Constitution was written on hemp.⁵³ John Adams was a prominent supporter of hemp cultivation, writing frequently about its benefits.⁵⁴ "Seems to me if grate Men dont leeve off writing Pollyticks, breaking Heads, boxing Ears, ringing Noses and kicking Breeches, we shall by and by want a world of Hemp more for our own consumshon," Adams wrote.⁵⁵

Hemp and marijuana would continue to be grown throughout the nineteenth and early twentieth centuries.⁵⁶ Like any other legal agricultural commodity, marijuana would have been subject to variations in state water law doctrines concerning agriculture. In jurisdictions east of the Mississippi River, for example, marijuana cultivation would have been permitted as long as it was reasonable vis-à-vis other riparians.⁵⁷ In small quantities, marijuana farming could have qualified as a protected domestic use. The fact that a water rights dispute before the Supreme Court of Pennsylvania in 1852 involved a contractual obligation to use water solely for certain purposes that included a hemp mill was found unremarkable by the court.⁵⁸

In western states, marijuana cultivation—perceived as agriculture—would have met the requirements of beneficial use, thereby vesting temporal water rights. An early Colorado case establishing the prior appropriation doctrine noted "the doctrine of priority of right by priority of appropriation for agriculture is evoked, as we have seen, by the imperative necessity for artificial irrigation of the soil."⁵⁹ In 1947, a California tax dispute involved the development of wells for purposes of irrigating hemp.⁶⁰ The court thought the plan could "prove a profitable industry," before moving on to the legal matter at issue.⁶¹

The widespread use of both hemp and marijuana in the United States catalyzed opposition to *cannabis sativa*'s legality from multiple angles. On the one hand, marijuana's early popularity with immigrants

51. Warf, *supra* note 45, at 426.

52. MARTIN A. LEE, *SMOKE SIGNALS: A SOCIAL HISTORY OF MARIJUANA—MEDICAL, RECREATIONAL, AND SCIENTIFIC* 16 (2012).

53. *Id.*

54. Corliss Knapp Engle, *John Adams, Farmer and Gardner*, 61 *ARNOLDIA* 9, 10 (2002).

55. John Adams, *Humphrey Ploughjogger to the Boston Evening Post*, MASS. HIST. SOC'Y (June 20, 1763), <http://www.masshist.org/publications/apde2/view?&id=PJA01dgt>.

56. By some accounts, it became the third largest cash crop in the United States by the mid-nineteenth century. LEE, *supra* note 52, at 17.

57. *See, e.g.*, *Hendrick v. Cook*, 4 Ga. 241, 256 (1848) ("Each riparian proprietor is entitled to a reasonable use of the water, for domestic, agricultural and manufacturing purposes.").

58. *Washabaugh v. Oyster*, 18 Pa. 497, 505 (1852).

59. *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443, 449 (1882).

60. *Lerdo Land Co. v. Comm'r.*, 6 T.C.M. (CCH) 1285 (Tex. 1947).

61. *Id.* at 7.

and bohemian communities produced reactionary prejudices that prompted crude public campaigns to criminalize the drug.⁶² On the other hand, hemp's industrial versatility was a threat to the cotton industry and other producers of textiles.⁶³ Despite strong support in the medical and pharmaceutical industries, twenty-nine states banned *cannabis* between 1914 and 1931.⁶⁴ The federal government then passed the Marihuana Tax Act of 1937, creating barriers to marijuana production, sale, and consumption.⁶⁵ The Supreme Court's ruling in *Leary v. United States* overturned the Marihuana Tax Act on the grounds that compliance would violate a person's right against self-incrimination.⁶⁶ The decision prompted Congress to repeal the Act and replace it with the Comprehensive Drug Abuse Prevention and Control Act of 1970, which categorized marijuana as a Schedule I narcotic with prohibitions on cultivation, sale, possession, and use.⁶⁷ Marijuana has been a black market crop ever since.

B. WEED AND WATER ON THE BLACK MARKET

Because states developed modern regulatory regimes for managing water rights in the latter half of the twentieth century,⁶⁸ after marijuana was criminalized, those regimes have never regulated the marijuana industry. If they had there is little reason to believe marijuana cultivation would have been any more challenging than the regulation of other crops. Regulation by federal agencies like the Food and Drug Administration⁶⁹ and the Department of Agriculture⁷⁰ would have been likely, while states may or may not have developed marijuana-specific water allocation policies.⁷¹ Preliminary marijuana legalization initiatives have forced water

62. Warf, *supra* note 45, at 429; *see also* REEFER MADNESS (Motion Picture Ventures 1936) (depicting the graphic horrors of marijuana use in ways that would appear satirical today).

63. Warf, *supra* note 45, at 429.

64. Collin B. Walsh & Daniel T. Nau, *The History, Law, and Psychology of Criminalizing Marijuana: A Comparative Analysis with Alcohol and Tobacco* 19 (Ind. Univ., Research Paper No. 274, 2013).

65. Marihuana Tax Act of 1937, Pub. L. No. 75-238, 50 Stat. 551 (1937).

66. *Leary v. United States*, 395 U.S. 6, 26-27 (1969).

67. Comprehensive Drug Abuse Prevention and Control Act of 1970, Pub. L. No. 91-513, 84 Stat. 1236 (1970); *see also* Walsh & Nau, *supra* note 64, at 23.

68. *See, e.g.*, Ryan B. Stoa, *Florida Water Management Districts and the Florida Water Resources Act: The Challenges of Basin-Level Management*, 7 KY. J. EQUINE, AGRIC. & NAT. RESOURCES L. 73, 78 (2015).

69. The FDA regulates prescription and pharmaceutical drugs, among other products, affecting public health. *See, e.g.*, Federal Food, Drug, and Cosmetic Act of 1938, Pub. L. No. 75-717, 52 Stat. 1040 (1938).

70. The USDA provides "leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on sound public policy, the best available science, and efficient management." *USDA Strategic Plan FY 2014-2018*, U.S. DEP'T OF AGRIC. (Jan. 1, 2014), <http://nifa.usda.gov/resource/usda-strategic-plan-fy-2014-2018>.

71. In regulated riparian jurisdictions, agencies can issue permits, or legislatures can craft laws, in a manner that gives preference to one use over another, or in some cases, one crop over another. *The*

management agencies to consider the marijuana industry anew, but those efforts remain limited. In order to determine how marijuana will fit into modern water law regimes, it is necessary to understand how the marijuana industry has evolved on the black market, and how its evolution has impacted water resources.

The size of the marijuana industry today, like any rooted in the black market, is notoriously difficult to estimate, and lacking in peer-reviewed research. A 2006 pro-marijuana study focused on valuation pegged the total value of domestic marijuana production at \$35.8 billion, based on an estimate of over fifty-six million plants grown annually.⁷² If accurate, the figures would make marijuana the largest cash crop in the United States and a top five cash crop in thirty-nine states.⁷³ In 2012, a generalist book on legalization questioned those results, claiming the industry production value is closer to \$4.3 billion.⁷⁴ A 2015 study on the nascent legal marijuana market was more bullish, finding annual sales of legal products topping \$2.7 billion and growth outpacing any other industry.⁷⁵

While the precise size of the marijuana industry might be an elusive figure, even low estimates make clear that the transition from black market to legalized and regulated production will transfer a burgeoning agricultural commodity into regulatory systems. At least initially, this transfer might not occur all at once. Aggressive taxation of producers and consumers of marijuana might keep less expensive black market opportunities alive and well.⁷⁶ In Colorado's legal marijuana market, an estimated forty percent of consumers still purchase marijuana on the

Regulated Riparian Model Water Code, for example, proscribes the following preferences among water rights: (1) water for human health; (2) water to protect crops and livestock; and (3) all other uses. The latitude agencies and legislatures have to interpret what is a "reasonable use" may facilitate agricultural favoritism. *THE REGULATED RIPARIAN MODEL WATER CODE: FINAL REPORT OF THE WATER LAWS COMMITTEE OF THE WATER RESOURCES PLANNING AND MANAGEMENT DIVISION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS* (Joseph W. Dellapenna ed., 1997) [hereinafter *REGULATED RIPARIAN MODEL WATER CODE*]. In Florida, for example, the influence of the citrus industry has strained efforts to protect the Everglades. Stoa, *supra* note 68, at 83–85.

72. Jon Gettman, *Marijuana Production in the United States*, *BULLETIN OF CANNABIS REFORM*, Dec. 2006, at 1, 24.

73. *Id.* at 13.

74. JONATHAN P. CAULKINS ET AL., *MARIJUANA LEGALIZATION: WHAT EVERYONE NEEDS TO KNOW* 41 (2012); see also Michael Montgomery, *Marijuana Not Top U.S. Cash Crop: Book*, NBC BAY AREA (Aug. 14, 2012, 6:14 AM), http://www.nbcbayarea.com/news/local/New_book_discounts_theory_of_marijuana_as_top_US_cash_crop-166081066.html.

75. PATRICK REA ET AL., *EXECUTIVE SUMMARY: THE STATE OF LEGAL MARIJUANA MARKETS* (Arcview Market Research 3d ed. 2014).

76. Robert W. Wood, *Feds Propose Taxing Marijuana, True Cash Crop*, *FORBES* (Dec. 10, 2014, 1:41 AM), <http://www.forbes.com/sites/robertwood/2014/12/10/feds-propose-taxing-marijuana-true-cash-crop/>. See generally JANE G. GRAVELLE & SEAN LOWRY, CONG. RESEARCH SERV., *FEDERAL PROPOSALS TO TAX MARIJUANA: AN ECONOMIC ANALYSIS* (2014) (focusing on issues surrounding potential federal marijuana tax).

black market, likely due to lower prices.⁷⁷ While that might be a disappointment to law enforcement and tax revenue authorities, administrative agencies regulating water resources may benefit from a gradual transition to legalization. On the other hand, if obtaining water use permits is perceived to be excessively onerous by producers, water regulations might themselves contribute to the perpetuation of the black market. What evidence exists on the relationship between black market marijuana production and water use suggests that sustainable water resources management is more likely in a legal, regulated environment.

Marijuana can be grown in many different ways, in many different places, and under many different growing conditions. It can be grown indoors or outdoors, in arid or humid climates, with rain fed or irrigated water.⁷⁸ Cultivation sites range from one or two plants grown for personal use to small-scale farms to large-scale grows on public lands. Because the marijuana industry is so fragmented and diverse, it is difficult to draw conclusions about marijuana and water use. Water's complex hydrological characteristics compound this challenge.⁷⁹

The aforementioned 2015 Eel River watershed study started with the assumption that one marijuana plant consumes six gallons of water per day during the growing season, but acknowledged that estimates vary widely, from as little as one to as many as fifteen gallons per day.⁸⁰ The differences for purposes of water management are substantial when extrapolated over time and frequency. Using the six gallons per day estimate, Bauer found that in several river systems the demand for water to irrigate marijuana plants was greater than the supply of water during the lowest periods of flow (which usually coincide with the peak of the growing season).⁸¹ If accurate, the reduced flows would have severe consequences on endangered species, riverine ecosystems, and downstream water rights holders.⁸² The National Marine Fisheries Service's recovery plan for the Coho salmon in Oregon and California pegs marijuana cultivation as a threat to the salmon's survival due to reduced river flows,

77. Katie Lobosco, *Colorado's Missing Marijuana Taxes*, CNN MONEY (Sept. 2, 2014, 8:01 AM), http://money.cnn.com/2014/09/02/news/economy/marijuana-taxes-colorado/index.html?section=money_topstories.

78. ROBERT CONNELL CLARKE, MARIJUANA BOTANY, AN ADVANCED STUDY: THE PROPAGATION AND BREEDING OF DISTINCTIVE CANNABIS 163 (1981).

79. The very existence of groundwater doctrines is a product of hydrological ignorance, as the connection between surface and groundwater systems was not widely recognized until after separate legal regimes had been developed. THOMPSON ET AL., *supra* note 37, at 444 (citing *Acton v. Blundell*, 152 Eng. Rep. 1223, 1233 (1843)) (“[N]o man can tell what changes these under-ground sources have undergone in the progress of time.”). Even today most Californians have little access to meaningful groundwater data. *See, e.g., Stoa, supra* note 32, at 434.

80. Bauer et al., *supra* note 15, at 8.

81. *Id.* at 11–14.

82. *Id.* at 17–19.

though again little data exists to draw firm conclusions.⁸³ A 2013 study on wildlife mortality found a link between rodenticide found in dead mammals and the density of nearby marijuana farms, suggesting that pesticides and fertilizers may be seeping into the broader environment, including water resources.⁸⁴ And the deforestation, land terracing, and road building associated with large marijuana grows contributes to erosion and sediment loading of streams, according to a 2012 study of western public lands.⁸⁵ Despite these preliminary studies, the leading scientists on the issue have observed the nonexistence of research on the marijuana environment nexus and called for more attention to the issue.⁸⁶

My own discussions with marijuana farmers in northern California revealed significant variation in water use practices, with several questioning the six gallons per day assumption.⁸⁷ Colorado's guidelines for marijuana farmers estimates that each plant consumes only one quarter gallon per day.⁸⁸ Hezekiah Allen, the individual responsible for putting the six gallon per day figure into public discourse, has since clarified that plants typically require only one gallon per day, a number Bauer conceded to me could be realistic.⁸⁹ That figure would make marijuana one of the least water-intensive agricultural products. One of the challenges presented by marijuana prohibition is that farmers are reticent to participate in scientific studies common for other crops.⁹⁰ One global-scale study of water footprints found hempseed to have a low demand for water compared to similar plants,⁹¹ but the literature on marijuana strains remains undeveloped.

Statistical uncertainties notwithstanding, there is ample anecdotal evidence to suggest that unregulated marijuana production can lead to

83. NAT'L MARINE FISHERIES SERV., U.S. DEP'T OF COMMERCE, FINAL RECOVERY PLAN FOR THE SOUTHERN OREGON/NORTHERN CALIFORNIA COAST EVOLUTIONARY SIGNIFICANT UNIT OF COHO SALMON 3-27 (2014).

84. Craig Thompson et al., *Impacts of Rodenticide and Insecticide Toxicants from Marijuana Cultivation Sites on Fisher Survival Rates in the Sierra National Forest, California*, 7 CONSERVATION LETTERS 91, 96 (2014).

85. Jennifer K. Carah et al., *High Time for Conservation: Adding the Environment to the Debate on Marijuana Legalization*, 65 BIOSCIENCE 822, 824-25 (2015) (citing Jim F. Milestone et al., *Continued Cultivation of Illegal Marijuana in U.S. Western National Parks*, in GEORGE WRIGHT SOCIETY CONFERENCE ON PARKS, PROTECTED AREAS, AND CULTURAL SITES (2012)).

86. *Id.* at 827.

87. Interviews with marijuana farmers in Humboldt Cty., Cal. (May 2015).

88. COLO. DIV. OF WATER RES., WELL AND WATER USE IN REGARDS TO AMENDMENT 64 AND CULTIVATION OF MARIJUANA (Oct. 2014).

89. Chris Roberts, *Dry High: Despite Law Enforcement Reports, Marijuana Is Relatively Water-Friendly*, S.F. WKLY. NEWS (Apr. 29, 2015), <http://www.sfweekly.com/sanfrancisco/chem-tales-sanfrancisco-marijuana-weed-cannabis-water-drought-police/Content?oid=3574066>; Interview with Scott Bauer, Senior Environmental Scientist, Cal. Dep't of Fish and Wildlife (Sept. 10, 2015).

90. See, e.g., M. M. Mekonnen & A. Y. Hoekstra, *The Green, Blue and Grey Water Footprint of Crops and Derived Crop Products*, 15 HYDROLOGY EARTH SYST. SCI. 1577 (2011).

91. *Id.* at 1587.

unsustainable water use. For the most part, the worst water practices are taking place on large growing operations that far exceed the limits of most states' personal or medicinal cultivation allowances. In April 2015, authorities in central California seized 12,000 plants from a private operation making illegal withdrawals of groundwater.⁹² Most legal water users in the region were facing cutbacks in water allocations, many by as much as thirty-six percent.⁹³ In July 2015, Sacramento County officials seized 900 plants from property drawing water from an illegal streambed alteration.⁹⁴ A week later, the county declared marijuana cultivation in excess of legal limits a violation of wastewater regulations.⁹⁵ Municipal water violations and leaks have been a frequent gateway into police raids of indoor marijuana grows across the country.⁹⁶ What could be the largest marijuana bust in Texas history took place on property with highly sophisticated irrigation systems.⁹⁷ Routine marijuana raids now frequently report abusive water practices untethered to any water rights.⁹⁸ At a California Senate hearing in July 2015, Senator Mike McGuire stated his belief that while most marijuana farmers want regulation, egregious violators are responsible for water diversions sucking rivers dry.⁹⁹

The inability of state water laws to adequately regulate the marijuana industry—because they are either undeveloped or in a state where marijuana production remains an entirely illegal activity—is a

92. Rick Montanez, *30 Arrested in Massive Tulare County Pot Grow Bust*, ABC ACTION NEWS (Apr. 24, 2015), <http://abc30.com/news/30-arrested-in-massive-tulare-county-pot-grow-bust/680291/>.

93. Molly Peterson & Kris Keller, *Comparing Tulare Lake Cutbacks Called for in State Water Conservation Proposals*, S. CAL. PUB. RADIO (July 2, 2015), <http://projects.scpr.org/applications/monthly-water-use/region/tulare-lake/reduction-comparison/>.

94. *Six People Arrested in Large Scale Marijuana Grow, Bird Fighting Bust*, ABC 10 NEWS (July 7, 2015, 9:46 AM), <http://www.abc10.com/story/news/2015/07/07/six-people-arrested-in-large-scale-marijuana-grow-bird-fighting-bust/29814275/>.

95. Gamaliel Ortiz, *County Declares Marijuana Cultivation Form of Water Waste*, KCRA 3 (July 15, 2015, 6:42 AM), <http://www.kcra.com/news/county-declares-marijuana-cultivation-form-of-water-waste/34168056>.

96. *Emergency Call About Water Leak Leads Cops to 40 Pot Plants, Hefty Bags Full of Weed*, NBC N.Y. (July 14, 2015, 11:43 AM), <http://www.nbcnewyork.com/news/local/Marijuana-Grow-House-Bust-New-York-Police-Plants-Water-Apartment-New-York-Bronx-314962811.html>; Asher Klein, *Broken Water Pipe Leads Police to Extensive Indoor Marijuana Grow*, NBC L.A. (Apr. 11, 2015, 10:02 AM), <http://www.nbctv.com/news/local/Arcadia-Police-Marijuana-Grow-Water-Pipe-299450631.html>.

97. Amanda Castro-Crist, *109k-Plant Marijuana Bust Could Be Largest of Its Kind in Texas History*, AMARILLO GLOBE NEWS (June 9, 2015, 10:32 PM), <http://amarillo.com/news/latest-news/2015-06-09/109k-plant-marijuana-bust-could-be-largest-its-kind-texas-history>.

98. See, e.g., Greg Capps, *Authorities Raid 4000-Plant Marijuana Grow Near Rancho Cucamonga*, INLAND VALLEY DAILY BULL. (July 24, 2015, 4:27 PM), <http://www.dailybulletin.com/general-news/20150724/authorities-raid-4000-plant-marijuana-grow-near-rancho-cucamonga>; Hunter Cresswell, *Weitchpec Marijuana Searches Net Thousands of Plants*, TIMES-STANDARD (July 20, 2015, 5:58 PM), <http://www.times-standard.com/general-news/20150720/weitchpec-marijuana-searches-net-thousands-of-plants>.

99. Jennifer Savage, *'Fish, Flows and Marijuana Grows': Live-Blogging Senator McGuire's Hearing Examining Impacts of Marijuana Grows on State's Fisheries*, LOCAL COAST OUTPOST (July 1, 2015, 8:06 AM), <http://lostcoastoutpost.com/2015/jul/1/fish-flows-and-marijuana-grows-live-blogging-senat/>.

detriment to the otherwise law-abiding marijuana farming community. Marijuana farming groups claim the newfound concern for water violations has led to small-scale operations being swept into the water raid campaigns.¹⁰⁰ One pending case claims \$600,000 in penalties for water violations.¹⁰¹ In 2010, Mendocino County, California, created a permitting program in which marijuana farmers paid permitting and administrative fees to finance county monitoring and compliance.¹⁰² In exchange the farmers were deemed legal and compliant with, among others, environmental and water resource laws.¹⁰³ The pilot program raised almost \$1 million in two years through the participation of more than ninety farmers, but a federal probe and grand jury subpoenas shut down the program and disclosed the identities of the participants.¹⁰⁴ A legislator at the California Senate hearing succinctly stated the impact heavy-handed or inconsistent regulatory enforcement would have on the marijuana industry: “[Y]ou have to be careful. An industry that’s been in the shadows and then is hit with a heavy regulatory burden may go further underground.”¹⁰⁵ My own discussions with marijuana farmers in the region largely support the proposition that legal water regulation is desirable but remains elusive.¹⁰⁶ To some, water permits represent a prestigious mark of legitimacy, and the lack of direction from state water laws creates uncertainty and a reliance on improvised irrigation schemes.¹⁰⁷

Adopting water policies that promote sustainable use of resources while bringing marijuana producers into the fold remains a necessary task for both water regulators and the marijuana legalization movement. In June 2015, leading scientists published an article in *BioScience* with an appeal to the law and policy community:

[W]e argue that . . . the environmental harm caused by marijuana cultivation merits a direct policy response, . . . current approaches to governing the environmental effects are inadequate, and . . . neglecting discussion of the environmental impacts of cultivation when shaping future marijuana use and possession policies represents a missed opportunity to reduce, regulate, and mitigate environmental harm.¹⁰⁸

In the following Parts, traditional doctrines of water law and their regulatory systems are analyzed in order to capitalize on opportunities to

100. *Id.*

101. Jim Carlton, *California Pot Growers Raid Waterways*, WALL ST. J. (July 7, 2015, 6:19 PM), <http://www.wsj.com/articles/california-pot-growers-raid-waterways-1436307538>.

102. Mary Callahan, *Mendocino County to Turn over Medical Marijuana Records*, PRESS DEMOCRAT (Oct. 16, 2013, 8:02 PM), <http://www.pressdemocrat.com/news/2221120-181/mendocino-county-to-turn-over>.

103. *Id.*

104. *Id.*

105. Savage, *supra* note 99.

106. Interviews with marijuana farmers, *supra* note 87.

107. *Id.*

108. Carah et al., *supra* note 85, at 822.

regulate the marijuana industry in the interests of sound water resources management.

II. PRIOR APPROPRIATION

The first application for a water permit to cultivate recreational marijuana might have originated on the banks of the Roaring Fork River in western Colorado. There, in August 2014, High Valley Farms, LLC submitted an application to withdraw water for purposes of cultivating a 37,500-foot marijuana greenhouse.¹⁰⁹ Colorado became the first state to adopt a pure prior appropriation doctrine when *Coffin v. Left Hand Ditch Co.* abolished riparian rights in 1882.¹¹⁰ Since then, water rights have been adjudicated according to temporal priority, as well as a determination that the appropriation is “beneficial.”¹¹¹ Colorado statute further defines beneficial use: “that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made.”¹¹²

The problem for High Valley Farms is that marijuana cultivation—while lawful in Colorado—remains unlawful under federal law.¹¹³ The application thus posed a dilemma to Colorado’s Division of Water Resources, tasked with reviewing the application: can it be legal to grow marijuana plants in Colorado, but illegal to water them? The agency threw the question back to High Valley Farms,¹¹⁴ and the case is ongoing.¹¹⁵ For the rest of the state’s marijuana farmers, water has been obtained through existing water rights, or leased from rights holders with existing water rights. While this is the first time an application has been

109. Application for Underground Water Right, Surface Water Right, and Plan for Augmentation (No. 2014CW33095) (2014).

110. *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443, 449 (1882). The Colorado Constitution had established the prior appropriation doctrine prior to the case, but riparian rights were lingering. COLO. CONST. art. XVI, § 5 (“The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation as hereinafter provided.”).

111. Again the Colorado Constitution lays out the working principles of prior appropriation. COLO. CONST. art. XVI, § 6 (“The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose[.]”).

112. COLO. REV. STAT. § 37-92-103(4) (2014).

113. Comprehensive Drug Abuse Prevention and Control Act of 1970, Pub. L. No. 91-513, 84 Stat. 1236 (1970).

114. COLO. DEP’T OF NAT. RES., REPORT OF THE DIVISION ENGINEER, SUMMARY OF CONSULTATION WITH HIGH VALLEY FARMS, LLC 2 (Nov. 12, 2014).

115. See, e.g., Response to Division Consultation Report, High Valley Farms, LLC (No. 14CW3) (2014) (not addressing the “beneficial use” dilemma); May 2015 Resume, Water Division 5 (2015) (resubmitting amended application to water clerk).

submitted to cultivate marijuana with a new water right,¹¹⁶ it almost certainly will not be the last.

Prior appropriation doctrine is followed in most states west of the Mississippi River,¹¹⁷ including states now grappling with marijuana legalization, such as Colorado, Oregon, and Alaska. Much of the American West is arid and unfriendly to irrigated agriculture,¹¹⁸ but the region also contains remote landscapes with a culture rooted in individual freedoms and the sanctity of private property, a recipe that has fostered marijuana cultivation for decades.¹¹⁹ In this Part on marijuana and the doctrine of prior appropriation, three questions are explored: (1) How can the marijuana industry be integrated with water markets and existing water rights regimes?; (2) How will the federal government's marijuana prohibition policies impede the development of western water rights?; and (3) What can Colorado's trailblazing experience with marijuana legalization teach other prior appropriation states about their water regulation frameworks?

A. MARIJUANA'S IMPACT ON WESTERN WATER MARKETS

The prior appropriation doctrine as classically applied is relatively straightforward. A water right is obtained by taking surface water and applying it to a "beneficial use."¹²⁰ As the High Valley Farms case illustrates, beneficial use is a broad term within which a variety of interpretations can be extracted, but typically the term implies that a water right must meet a certain threshold of productivity and efficiency. If that threshold is met, the place of diversion or use is of no import.¹²¹ Once the water right is obtained, priority between users is predicated on seniority.¹²² Traditionally this means that prior appropriation jurisdictions do not invoke equity to reduce appropriations pro rata when water is scarce. Instead, the most

116. Brent Gardner-Smith, *Can Colo. Approve a Water Right to Grow Marijuana?*, ASPEN TIMES (Aug. 12, 2015), <http://www.aspentimes.com/news/14455352-1113/valley-marijuana-farms-colorado> (noting that this was the first time this type of application has been filed according to Alan Martello of the Division of Water Resources).

117. THOMPSON ET AL., *supra* note 37, at 14–15. *But see* Reed D. Benson, *Alive but Irrelevant: The Prior Appropriation Doctrine in Today's Western Water Law*, 83 U. COLO. L. REV. 675, 690 (2012).

118. Nicolas Barbier, *Vulnerability to Water Shortages in the 21st Century's Arid and Semi-Arid American West*, 218 WATER AND VULNERABILITY IN THE AMERICAS 2 (2015).

119. Nick Johnson, *Rocky Mountain High: An Environmental History of Cannabis in the American West* (2014) (unpublished M.A. thesis, Colorado State University) (on file with author).

120. THOMPSON ET AL., *supra* note 37, at 169–70; *see also* Gregory J. Hobbs, Jr., *Reviving the Public Ownership, Antispeculation, and Beneficial Use Moorings of Prior Appropriation Water Law*, 84 U. COLO. L. REV. 97, 105 (2013).

121. THOMPSON ET AL., *supra* note 37, at 170.

122. *Id.* at 171; *see also* Reed D. Benson, *Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite the Rules of Prior Appropriation*, 28 ENVTL. L. 881, 917 (1998); Charles J. P. Podolak & Martin Doyle, *Conditional Water Rights in the Western United States: Introducing Uncertainty to Prior Appropriation?*, 51 J. AM. WATER RES. ASS'N 14, 17 (2015).

senior rights holders are entitled to their entire share of water, while junior rights holders receive only what is left over. The concept is embodied in the expression “first in time, first in right.”¹²³ The common law doctrine of “abandonment” ensures that if a rights holder no longer uses her water allocation, the right itself is lost or forfeited.¹²⁴ If the waters of a watercourse are completely allocated, or if a junior water right is not sufficient for a given purpose, one can purchase a water right or land on which a property right to water has vested.¹²⁵

If the legal marijuana industry were to enter this traditional conception of prior appropriation, it is very likely that many marijuana farmers would remain on the black market by virtue of the priority afforded to senior rights holders. Many marijuana farms today are located on properties that lack established water rights.¹²⁶ Many of these farms are also located in watersheds experiencing high levels of water scarcity.¹²⁷ Those factors make it unlikely that junior water rights would provide sufficient water to grow marijuana, if they provide water at all. For these farmers to acquire a sufficient water right it would need to be purchased from another water rights holder. Although the cost of doing so varies by jurisdiction, water rights can be prohibitively expensive. In 2006 the town of Prescott Valley, Arizona sold effluent-based water rights at auction for \$24,650 per acre-foot (\$19.98 per cubed meter).¹²⁸ Water rights are not always so expensive,¹²⁹ but with droughts plaguing much of the American West, the costs of obtaining water rights are increasing.¹³⁰ Marijuana farms in operation today without water rights might find it easier to remain on the black market (and make illegal water diversions) than pay the market price for water.

Existing water rights holders with an eye toward the legal marijuana market might have had an easier time with traditional applications of the

123. Moses Lasky, *From Prior Appropriation to Economic Distribution of Water by the State—via Irrigation Administration*, 1 ROCKY Mtn. L. REV. 161, 192 (1929) (referring to nineteenth century adjudication procedures).

124. *Id.* at 181 (citing *Bowers v. McFadzean*, 82 Colo. 138, 142 (1927)) (“In case of a loss or abandonment thereof by the appropriator, they [water rights] become a part of the unappropriated waters . . . subject to a new and distinct appropriation by a citizen who might file upon them.”).

125. *Id.* at 172–73 (describing the difficulty of adjudicating this type of system as far back as 1874).

126. Bauer et al., *supra* note 15, at 15–16 (finding low numbers of registered water diversions in the Eel River watershed area).

127. *Id.* at 20.

128. Christopher Scott, *Effluent Auction in Prescott Valley, Arizona*, in U.S. ENVIRON. PROTECTION AGENCY, 2012 GUIDELINES FOR WATER REUSE D-18, D-18 (2012).

129. See DENNIS WICHELNS, ORG. FOR ECON. CO-OPERATION & DEV., AGRICULTURAL WATER PRICING: UNITED STATES 19 (2010) (noting that a 1991 California trading market saw average prices of \$0.14 per meter).

130. See Steve Lynn, *Water Prices Reach Historic Highs: Rate Increases Come Despite the Colorado-Big Thompson Project's Abundant Supply of H₂O*, BIZWEST (Feb. 6, 2015), <http://bizwest.com/water-prices-reach-historic-highs/>.

prior appropriation doctrine. Agriculture has long qualified as a beneficial use in western states,¹³¹ while farmers can and do modify which crops are grown with their scarce water allocations.¹³² While the federal marijuana prohibition might complicate beneficial use determinations for states like Colorado, other states have more ambiguous definitions of beneficial use that could facilitate a smooth transition to marijuana cultivation for existing rights holders.¹³³

In reality the traditional prior appropriation model has long been transformed by the rise of the administrative regulation of water resources.¹³⁴ Prior appropriation remains a default rule in small-scale disputes and a guiding principle in large-scale water management planning, but the doctrine's lasting power is that it represents the worst-case scenario when stakeholders are negotiating complex allocation schemes.¹³⁵ The doctrine served as the backdrop to negotiations that eventually created Idaho's Snake River Water Rights Agreement,¹³⁶ for example, or the Southern Nevada Water Authority.¹³⁷

Prior appropriation's evolution is particularly meaningful in two respects. First, strict enforcement of priority between users has been loosened, with agencies finding other ways to manage expectations and reduce risks in ways that are less costly or reactive than the common law.¹³⁸ Second, agencies manage groundwater distinctly from surface water in many jurisdictions. While this was originally due to scientific ignorance,¹³⁹ the flexibility of groundwater doctrines allows agencies to

131. Some states, like Colorado and Montana, have enshrined agriculture as a priority use in their constitutions or statutes.

132. Lesley McClurg, *Squeezed by Drought, California Farmers Switch to Less Thirsty Crops*, NPR (July 28, 2015, 5:05 AM), <http://www.npr.org/sections/thesalt/2015/07/28/426886645/squeezed-by-drought-california-farmers-switch-to-less-thirsty-crops>.

133. In Montana, for example, beneficial use is defined as "a use of water for the benefit of the appropriator, other persons, or the public." MONT. CODE ANN. § 85-2-102(4) (1985). Alaska defines beneficial use as "a use of water for the benefit of the appropriator, other persons or the public, that is reasonable and consistent with the public interest." ALASKA STAT. § 46.15.260(3) (1966).

134. Moses Lasky was one of the first to observe the shift: "Looking backwards it seems naive that it should ever have been thought possible for the original prior-appropriation doctrine to exist at all." Lasky, *supra* note 123, at 173. Scholars continue to make the point. See Charles F. Wilkinson, *In Memoriam: Prior Appropriation 1848-1991*, 21 ENVTL. L. xxix (1991); Benson, *supra* note 122.

135. A. Dan Tarlock published a number of articles describing this transition. See, e.g., A. Dan Tarlock, *The Future of Prior Appropriation in the New West*, 41 NAT. RESOURCES J. 769, 775 (2001) [hereinafter Tarlock, *The Future of Appropriation*]; A. Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881, 883 (2000) [hereinafter Tarlock, *Prior Appropriation*].

136. *The 2004 Snake River Water Rights Agreement (Nez Perce Agreement)*, IDAHO WATER RESOURCES BOARD (May 15, 2004), <http://www.idwr.idaho.gov/waterboard/WaterPlanning/nezperce/>.

137. See *About SNWA*, S. NEV. WATER AUTHORITY, http://www.snwa.com/about/about_us.html (last visited Apr. 10, 2016).

138. Tarlock, *Prior Appropriation*, *supra* note 135, at 898.

139. THOMPSON ET AL., *supra* note 37, at 444 (quoting *Acton v. Blundell*, 152 Eng. Rep. 1223 (1843)) (stating that groundwater "does not flow openly in the sight of the neighboring proprietor, but through the hidden veins of the earth beneath its surface: no man can tell what changes these under-

accommodate new water users, particularly in the agricultural sector.¹⁴⁰ Groundwater is now the primary source of irrigation water in Kansas, Oklahoma, Nebraska, Texas, and South Dakota, and collectively the American West is responsible for two-thirds of groundwater irrigation withdrawals in the United States.¹⁴¹

The transition to administrative regulation of appropriative rights has implications for the regulation of legal marijuana. In some ways the flexibility of modern regulatory systems will create opportunities for agencies to incorporate the marijuana industry. The common law doctrine of prior appropriation presents a barrier to entry for prospective entrants to water rights markets, a group in which many marijuana farmers currently belong.¹⁴² If administrative agencies can usher black market cultivators into the regulatory system, it will be easier to monitor water use and reduce water stress created by illegal water diversions. In addition, adjudicating water rights disputes through judicial decisions might be confusing in light of contradictory state-federal positions regarding marijuana legalization, leading to inconsistent applications of water doctrine with little precedential value. Administrative agencies can set policies specific to the marijuana industry and address potential conflicts proactively. Administrative regulation of water rights might liberate states to experiment with policies that promote marijuana cultivation in certain regions, seasons, or methodologies so as to promote efficiency and flexibility in water use.¹⁴³ Some of these policies are proposed in Part V below.

On the other hand, the administrative regulation of water rights in prior appropriation states might lead to perverse results. Prior appropriation doctrine was developed, after all, in regions where small-scale irrigated farms (characteristic of marijuana farms) needed an efficient allocation scheme.¹⁴⁴ It is possible that state regulatory systems will go too far to accommodate the marijuana industry, or conversely, impose restrictions that are incompatible with the industry. Recent cases in Washington and New Mexico, for example, have made it easier to obtain water rights to the point that the sustainability of the resource might be compromised.¹⁴⁵ Already some states appear to be granting fairly permissive allowances for marijuana cultivators to use water

ground sources have undergone in the progress of time"); *see also* MORTON J. HORWITZ, *THE TRANSFORMATION OF AMERICAN LAW 1780–1860*, at 105 (1977) (explaining that the distinction flowed from laissez-faire assumptions made by American judges).

140. Tarlock, *The Future of Appropriation*, *supra* note 135, at 777.

141. MOLLY A. MAUPIN ET AL., U.S. DEP'T OF THE INTERIOR, *ESTIMATED USE OF WATER IN THE UNITED STATES IN 2010*, at 25 (2014).

142. *See* Bauer et al., *supra* note 15, at 15–16.

143. *See generally* Benson, *supra* note 122.

144. *See* Tarlock, *The Future of Appropriation*, *supra* note 135, at 776.

145. Benson, *supra* note 122, at 884 n.13.

resources. In Washington, for example, marijuana cultivation is not expected to require any water permits.¹⁴⁶ The state provides water permit exemptions for commercial activities using up to 5000 gallons per day,¹⁴⁷ enough to accommodate the cultivation of 900 to 10,000 plants.¹⁴⁸ The state anticipates that all legal marijuana farms will fall within these limits.¹⁴⁹ In addition, rainwater and unused groundwater can be stored for use during the growing season.¹⁵⁰ In Colorado preliminary guidelines are more severe. Marijuana cultivation for personal use is allowed under household well permits, but only if the plants are grown indoors, a restriction that might be difficult to enforce.¹⁵¹ In addition, Colorado's existing irrigation permits, which can be used to supply water to commercial marijuana grows, often have seasonal water use restrictions that would preclude year-round cultivation of marijuana.¹⁵²

The evolution of the doctrine of prior appropriation provides administrative agencies in the American West with new tools to usher in the legal marijuana industry. But the departure from doctrine also places more responsibility on agencies to adapt to marijuana legalization, as current water systems are predicated on negotiating cooperative management schemes that work for the parties involved. If marijuana farmers face unreasonable water restrictions, a return to the black market will become more enticing. On the other hand, excessively permissive allocations for marijuana cultivation might risk creating unsustainable expectations of water availability, especially at a time when scientific understanding of the relationship between marijuana and water is so undeveloped. States will need to innovate to balance these dynamics, and even then, the federal government's marijuana prohibition will continue to frustrate reform.

B. FEDERAL MARIJUANA PROHIBITION AND WESTERN WATER POLICY

The federal government has played an outsized role in the development of the American West for centuries. Shortly after independence, Congress sent surveyors to western lands to document the vast region's potential.¹⁵³ After securing land from foreign governments

146. WASH. REV. CODE § 90.44.050 (1987); see also *Frequently Asked Questions: Water Resources Rules and Regulations for Marijuana Growing in Washington State*, WASH. DEP'T OF ECOLOGY (July 2014), <https://fortress.wa.gov/ecy/publications/documents/1411003.pdf>.

147. See *Frequently Asked Questions*, *supra* note 146.

148. Depending on water consumption levels.

149. See *Frequently Asked Questions*, *supra* note 146.

150. *Id.*

151. Outdoor cultivation may be permitted if the household well permit explicitly provides for outdoor gardening and irrigation. *Well and Water Use*, *supra* note 88.

152. Marijuana can be grown year-round in greenhouses or indoor facilities. *Id.*

153. Dwight L. Agnew, *The Government Land Surveyor as a Pioneer*, 28 MISS. VALLEY HIST. REV. 369, 369 (1941).

and tribes, the Homestead Act of 1862 ignited western migration by granting land to settlers at minimal cost.¹⁵⁴ Shortly afterwards, the federal government realized that in order to reap the full economic rewards of western expansion, agricultural development would require federal involvement in building dams, reservoirs, and irrigation systems.¹⁵⁵ That led to the Reclamation Act of 1902, which dedicated federal funds toward the “construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands” in western states and territories,¹⁵⁶ states that traditionally followed the doctrine of prior appropriation. The Bureau of Reclamation would expand its mandate to include energy production, navigation, flood control, and municipal water supply,¹⁵⁷ missions the Bureau still carries out to this day. Despite operating in only seventeen states in the American West, the Bureau is the largest wholesale water supplier in the United States.¹⁵⁸ It provides irrigation water to one-fifth of western farmers, and municipal, residential, and industrial water to 31 million people.¹⁵⁹

The federal government’s involvement in western water development is not limited to constructing hydrologic infrastructure, however. By creating large-scale reservoirs and irrigation schemes that supplied water more consistently, the Bureau of Reclamation secured water rights in a way that reactive litigation invoking doctrinal water laws could not.¹⁶⁰ As long as the federal government does not disrupt those rights, it retains the flexibility to manage water resources through a variety of approaches.¹⁶¹ In principle, the federal government’s water management flexibility could provide water regulators in prior appropriation states with a powerful partner with which to adapt to the influx of marijuana cultivators without disrupting existing rights holders.

In practice, the Bureau of Reclamation has not been cooperative to states legalizing marijuana cultivation. In May of 2014, the Bureau announced that it would not allow water supplies or facilities it controls

154. Homestead Act of 1862, Pub. L. No. 37-64, 12 Stat. 392 (1862).

155. John Wesley Powell’s 1878 *Report on the Lands of the Arid Region of the United States* was commissioned by Congress and called for the federal government to increase its role in western water development. J. W. POWELL, REPORT ON THE LANDS OF THE ARID REGION OF THE UNITED STATES WITH A MORE DETAILED ACCOUNT OF THE LANDS OF UTAH WITH MAPS iii–v (2d ed. 1879).

156. Newlands Reclamation Act of 1902, Pub. L. No. 57-161, 32 Stat. 388 (1902) (codified as amended at 43 U.S.C. §§ 371–616yyy (1976)).

157. See, e.g., Reclamation Project Act of 1939, Pub. L. No. 76-260 (codified as amended at 43 U.S.C. § 485h (1956)).

158. *About Us—Fact Sheet*, U.S. BUREAU OF RECLAMATION, <http://www.usbr.gov/main/about/fact.html> (last visited Apr. 10, 2016).

159. *Id.*

160. Tarlock, *Prior Appropriation*, *supra* note 135, at 893.

161. See *id.*

to be used for purposes of cultivating marijuana.¹⁶² That includes the 475 dams, 337 reservoirs, and 8116 miles of irrigation canals it controls, and the water those facilities supply.¹⁶³ The prohibition has confused water rights holders throughout prior appropriation jurisdictions. The Bureau of Reclamation provides water to two-thirds of Washington's irrigated lands, for example, where recreational and medicinal marijuana cultivation has been legal since 2012.¹⁶⁴ But it is not clear how farmers growing multiple crops on those lands would be regulated if one of those crops is marijuana. Said one state manager for the Roza Irrigation District, "[t]hese kinds of details have not been fleshed out."¹⁶⁵ The state's regulatory agency with primary jurisdiction over marijuana claims that it would be impossible to determine how many marijuana farmers are using Bureau of Reclamation waters.¹⁶⁶

The Bureau of Reclamation provides water to even more lands in Colorado,¹⁶⁷ where regulators are similarly confused. One water supplier insisted that its water supplies could not be interfered with despite having to pass through a Bureau of Reclamation dam facility.¹⁶⁸ By contrast, a water district in the same area imposed a moratorium on marijuana irrigation in reaction to the federal policy, before lifting the moratorium despite the policy.¹⁶⁹

The federal government's involvement in western water law implicates the broader jurisdictional battle between the states and federal government over marijuana legalization.¹⁷⁰ In this case, the Bureau of

162. *Reclamation Manual Policy Temporary Release*, U.S. BUREAU OF RECLAMATION 2 (May 16, 2014), http://www.usbr.gov/recman/temporary_releases/pectrmr-63.pdf.

163. *About Us—Fact Sheet*, *supra* note 158.

164. Rob Hotakainen, *With No Federal Water, Pot Growers Could Be High and Dry*, McCLATCHY WASH. BUREAU (Apr. 27, 2014, 3:00 AM), <http://www.mcclatchydc.com/news/nation-world/national/article24766780.html>.

165. *Id.*

166. Nicholas K. Geranios & Gene Johnson, *Feds Don't Want Irrigation Water Used to Grow Pot*, DENV. POST (May 20, 2014, 11:18 AM), http://www.denverpost.com/marijuana/ci_25799421/.

167. Matt Ferner & Mollie Reilly, *Feds May Cut off Water for Legal Marijuana Crops*, HUFFINGTON POST (May 19, 2014, 7:40 AM), http://www.huffingtonpost.com/2014/05/19/federal-water-marijuana_n_5335219.html.

168. *Id.*

169. *See, e.g.*, St. Charles Mesa Water District: Use of Water in Conjunction with Cultivation, Growing, Manufacture, Processing, Research and Development, Distribution, Testing and Sale of Industrial Hemp, Medical Marijuana, Retail Marijuana, Medical Marijuana-Infused Products, and/or Retail Marijuana-Infused Products Regulation, § 5.08 (2016) [hereinafter St. Charles Mesa Water District].

170. A comprehensive analysis of marijuana federalism is outside the scope of this study, though several recent articles provide a thoughtful review of the evolving relationship between states and the federal government. *See, e.g.*, TODD GARVEY, CONG. RESEARCH SERV., *MEDICAL MARIJUANA: THE SUPREMACY CLAUSE, FEDERALISM, AND THE INTERPLAY BETWEEN STATE AND FEDERAL LAWS* (2012); Todd Grabarsky, *Conflicting Federal and State Medical Marijuana Policies: A Threat to Cooperative Federalism*, 116 W. VA. L. REV. 1 (2013); Sam Kamin, *Cooperative Federalism and State Marijuana*

Reclamation's policy applies insofar as it reports violations to the U.S. Department of Justice ("DOJ"), whose attorneys are responsible for using prosecutorial discretion to determine if violations merit legal action on behalf of the federal government.¹⁷¹ The Justice Department, in providing guidance regarding enforcement of the Controlled Substances Act ("CSA") to its attorneys, has articulated a policy that is focused on prosecuting the more criminal elements of marijuana cultivation, such as sale to minors, interstate distribution, and cultivation on public lands.¹⁷² It is not clear if violations of the Bureau of Reclamation's policy on marijuana irrigation would constitute such an enforcement priority.¹⁷³

Even if they do, the legislative branch of the federal government may limit the executive's ability to enforce the Bureau of Reclamation policy. A federal law passed in December 2014 prohibited the DOJ from using federal funds to interfere with state implementation of medical marijuana laws.¹⁷⁴ The law was intended to prohibit federal prosecutors from pursuing medical marijuana patients, providers, and regulators,¹⁷⁵ but the DOJ interpreted the provision to prohibit federal prosecutors from pursuing only state officials, claims implicating state laws, or the state itself.¹⁷⁶ The interpretational dispute is currently before the Ninth Circuit Court of Appeals,¹⁷⁷ though even if the DOJ's narrow reading is correct, the law might effectively limit the federal government's enforcement of Bureau of Reclamation policy because many water suppliers that contract with the Bureau are state agencies or political subdivisions of state governments. Washington's irrigation districts,¹⁷⁸ for example, could not be prosecuted for providing Bureau of Reclamation water to farmers cultivating marijuana for medical purposes. The same is

Regulation, 85 U. COLO. L. REV. 1105 (2014); David S. Schwartz, *High Federalism: Marijuana Legalization and the Limits of Federal Power to Regulate States*, 35 CARDOZO L. REV. 567 (2013).

171. "Reclamation does not have a responsibility or designated role in actively seeking enforcement of the CSA." See *Reclamation Manual Policy Temporary Release*, *supra* note 162, at 2.

172. Memorandum from James M. Cole, Deputy Att'y Gen., on Guidance Regarding Marijuana Enforcement (Aug. 29, 2013) (on file with author).

173. When the Bureau of Reclamation's policy was announced, the Department of Justice would only say: "The Department of Justice will continue to enforce the Controlled Substances Act and will focus federal resources on the most significant threats to our communities." Geranios & Johnson, *supra* note 166.

174. Consolidated and Further Continuing Appropriations Act of 2015, Pub. L. No. 113-235, § 538, 128 Stat. 2130 (2014).

175. Letter from Dana Rohrabacher & Sam Farr, Members of Cong., to Eric Holder, U.S. Att'y Gen., U.S. Dep't of Justice (Apr. 8, 2015) (on file with author).

176. Memorandum from Patty Merkamp, Appellate Section Chief, on Guidance Regarding the Effect of Section 538 of the Consolidated and Further Continuing Appropriations Act of 2015 on Prosecutions and Civil Enforcement and Forfeiture Actions Under the Controlled Substances Act (Feb. 27, 2015) (on file with author).

177. Joel Rubin, *Convicted Medical Pot Seller Finds Congressional Allies in Legal Appeal*, L.A. TIMES (May 13, 2015, 5:00 AM), <http://www.latimes.com/local/politics/la-me-lynch-marijuana-20150513-story.html>.

178. See WASH. REV. CODE § 87.03 (2002).

true for irrigation districts and other public agencies contracting with the Bureau in Arizona, California, Colorado, Montana, Nevada, Oregon, and Utah.¹⁷⁹

The DOJ's interpretation also concedes that its prosecutors would likely be barred from taking legal action against state officials who violate the CSA by taking regulatory actions such as issuing permits.¹⁸⁰ In this case, that likely absolves water agencies from federal prosecutions arising from the issuance or renewal of permits, even if the state agency permits water allocations that are supplied or facilitated by the Bureau of Reclamation. Nonstate entities, such as marijuana farmers or private water suppliers, would still be vulnerable to federal prosecution, but to date the DOJ does not appear to be prioritizing enforcement of the Bureau of Reclamation's marijuana prohibition policy.

Of course, the Bureau would still be within its rights to use its own influence to affect marijuana irrigation. The Bureau works with state officials to construct, maintain, and operate large-scale hydrological projects.¹⁸¹ As such, its authority is sufficiently broad that policy preferences can be accommodated into management decisions.¹⁸² In negotiating contracts and payment schemes with irrigation districts,¹⁸³ the Bureau could leverage its authority to require that districts prohibit irrigation of marijuana. Dictating to states what crops they should or should not grow would be unusual for the Bureau of Reclamation, but does not appear to be out of line with the agency's federal powers. Regardless of how stringently the Bureau enforces its own marijuana prohibition policy, the mere articulation of it might be leading water providers to question the legality of permitting federal water withdrawals for purposes of marijuana cultivation. That was the case for High Valley Farm's application review, where the state appeared to interpret the Bureau's policy as prohibiting issuance of a permit that depended on federal waters, but allowing a permit that depended only on nonfederal waters.¹⁸⁴

As water resources in the American West have shifted from being governed by prior appropriation doctrine to state and federal

179. These states are both serviced by the Bureau of Reclamation and identified in Section 538 as legalized medical marijuana. For a review of the status of irrigation districts, see U.S. BUREAU OF RECLAMATION, STATUS OF THE IRRIGATION DISTRICTS WITH RESPECT TO FEDERAL RECLAMATION LAW (Mar. 10, 2015).

180. "Section 538 would also appear to bar criminal actions against individual State or local officials who violate the CSA through activities taken to implement their State's medical marijuana laws, such as issuing licenses, accepting fees according to their State regimes, and testing marijuana." See Memorandum from Patty Merkamp, *supra* note 176, at 6.

181. See U.S. BUREAU OF RECLAMATION, *supra* note 179.

182. See, e.g., 43 U.S.C. § 390 (1944).

183. See U.S. BUREAU OF RECLAMATION, *supra* note 179.

184. Gardner-Smith, *supra* note 116.

administrative regulation, the federal government's role in setting water policy in prior appropriation states has grown. This is true for marijuana cultivation as well, where the Bureau of Reclamation's marijuana irrigation prohibition threatens to undermine state efforts to regulate the marijuana industry's water use. In the future, however, the Bureau's role will also present an opportunity for the American West to adapt to the legal marijuana industry in an integrated manner by facilitating regulation of marijuana irrigation on the watershed level.

C. THE COLORADO EXPERIMENT

Two prior appropriation states—Washington and Colorado—were the first to legalize the recreational use of marijuana. Of the two, Colorado's marijuana economy is much further developed.¹⁸⁵ In addition, Colorado remains the strictest adherent to traditional conceptions of the prior appropriation doctrine.¹⁸⁶ As a result, the state provides a useful case study of the growing pains that prior appropriation states can expect to face when regulating legal marijuana.

Colorado voters approved Amendment 64 in November 2012, legalizing the recreational use of marijuana.¹⁸⁷ Because legalization was promulgated by referendum, state officials (many of whom opposed the amendment) did not have regulatory frameworks in place and were required to develop rules and regulations very quickly.¹⁸⁸ The complex regulatory burden marijuana legalization would place on the state was anticipated by opponents of the amendment, who raised the issue in the months leading up to the election.¹⁸⁹ To address the challenge the state created a task force to investigate legal and regulatory issues and to propose legislative and executive actions.¹⁹⁰ The task force appropriately identified some environmental issues, such as the need to regulate pesticides and waste products, but water was never mentioned.¹⁹¹ Nonetheless, the task

185. See Phillip A. Wallach & John Hudak, *Legal Marijuana: Comparing Washington and Colorado*, BROOKINGS (July 18, 2014, 9:51 AM), <http://www.brookings.edu/blogs/fixgov/posts/2014/07/08-washington-colorado-legal-marijuana-comparison-wallach-hudak>.

186. See generally Gregory J. Hobbs, Jr., *Colorado Water Law: An Historical Overview*, 1 U. DENV. WATER L. REV. 1 (1997) (reviewing the major historical and legal occurrences of Colorado's water experience); see also Hobbs, *supra* note 120.

187. COLO. CONST. art. XVIII, amended by COLO. CONST. art. XVIII, § 16 (2012).

188. See John W. Hickenlooper, Commentary, *Experimenting with Pot: The State of Colorado's Legalization of Marijuana*, 92 MILBANK Q. 243, 243–44 (2014).

189. David Blake & Jack Finlaw, *Marijuana Legalization in Colorado: Learned Lessons*, 8 HARV. L. & POL'Y REV. 359, 360 (2014).

190. See generally JACK FINLAW & BARBARA BROHL, TASK FORCE REPORT ON THE IMPLEMENTATION OF AMENDMENT 64, REGULATION OF MARIJUANA IN COLORADO (2013) (recommending a robust regulatory scheme for marijuana in Colorado).

191. *Id.* at 47, 66.

force's recommendations were largely adopted by the state legislature and passed in May 2013.¹⁹²

The laws allow for small-scale home cultivation without a license, licensed commercial cultivation under a tiered plant allowance system, and an option for local governments to add their own (potentially more restrictive) regulations.¹⁹³ To ease the burden of monitoring and enforcement on state regulators, laws also mandated the “vertical integration” of marijuana production by requiring cultivators and retailers to grow or sell their own products.¹⁹⁴ Finally, the state imposed a number of taxes on cultivators, retailers, and consumers.¹⁹⁵ The laws did not address water rights, water permits, or water use regulations, presumably assuming that the state's existing water law infrastructure would be sufficient to handle any potential water issues.

Predictably a number of challenges have emerged, including federal enforcement of the CSA and a lack of access to banking for marijuana businesses.¹⁹⁶ Access to water has not been as prominently discussed, but has presented ongoing obstacles to state and local regulators. The Bureau of Reclamation's marijuana prohibition policy has been confusing to local governments tasked with determining if (or which of) their waters should be considered federal.¹⁹⁷ Neither the state nor the federal government has issued guidelines to help local governments determine if their waters are part of the Bureau's jurisdiction. Nor has the state provided guidance on how local water authorities should approach marijuana cultivation. Pueblo County has made its own determinations, setting aside water it has deemed nonfederal for the cultivation of marijuana.¹⁹⁸ It has since been proactive in issuing permits to cultivators, including a lease sale of 3.26 million gallons to a single operation in March 2015,¹⁹⁹ despite acknowledging that the county has little data on marijuana cultivation's water consumption patterns.²⁰⁰

The High Valley Farms case demonstrates that the state is equally in the dark when it comes to creating new water rights for marijuana

192. See, e.g., S.B. 13-283, 69th Gen. Assemb., Reg. Sess. (Colo. 2013); H.B. 13-1317, 2013 Gen. Assemb. (Colo. 2013); see also Blake & Finlaw, *supra* note 189, at 366.

193. Bryce Pardo, *Cannabis Policy Reforms in the Americas: A Comparative Analysis of Colorado, Washington, and Uruguay*, 25 INT'L J. DRUG POL'Y 727 (2014).

194. *Id.*

195. See H.B. 13-1318, 2013 Gen. Assemb. (Colo. 2013).

196. For a discussion of these issues, see Blake & Finlaw, *supra* note 189.

197. See Ferner & Reilly, *supra* note 167; St. Charles Mesa Water District, *supra* note 169.

198. Chris Woodka, *Board Eyes Water for Marijuana*, PUEBLO CHIEFTAIN (June 17, 2014, 6:38 AM), <http://www.chieftain.com/special/marijuana/2649149-120/marijuana-pueblo-federal-board>.

199. Chris Woodka, *Water Board Fires up Another Pot Lease*, PUEBLO CHIEFTAIN (Mar. 19, 2015, 11:30 PM), <http://www.chieftain.com/special/marijuana/3438614-120/pueblo-acre-marijuana-board>.

200. Chris Woodka, *Water for Grass Not a Big Dip: Pot Growing Would Use Less than Golf Courses*, PUEBLO CHIEFTAIN (Sept. 16, 2015, 8:07 PM), <http://www.chieftain.com/special/marijuana/3826866-120/pueblo-marijuana-county-growers>.

cultivators. Although the state has not been shy in pushing the boundaries of states' rights and federal supremacy by legalizing marijuana,²⁰¹ federal marijuana prohibition is still confusing the state's interpretation of its own water laws. The state definition of "beneficial use" includes the requirement that the purpose of the appropriation is "lawfully made."²⁰² Neither the state nor one of its water courts has determined if the federal marijuana prohibition would render marijuana cultivation in Colorado an unlawful purpose with respect to the beneficial use requirement. The issue has only been raised because High Valley Farms requested a new water right from the state, whereas some state officials have implied that marijuana cultivators with existing water rights, or who acquire existing water rights, would not face the same problem.²⁰³ This might be accurate from an administrative point of view, as the state's water regulators are most active in making a beneficial use determination at the time of application and are unlikely to throw the marijuana industry into chaos by stripping marijuana cultivators of existing water rights.

As a legal matter, however, Colorado water law does not differentiate between existing and prospective water rights with respect to the beneficial use requirement.²⁰⁴ Furthermore, state law prevents the sale or transfer of water rights to prospective appropriators that do not have a "legally vested interest" in the lands or facilities to be served by the appropriation.²⁰⁵ If marijuana cultivation is not a beneficial use because it is unlawfully made under federal law for water rights applicants, it is not a beneficial use for water rights holders or prospective buyers of those rights either. The state's Department of Water Resources acknowledges that obtaining new water rights might be close to impossible given water scarcity in the region,²⁰⁶ and this reality certainly places scrutiny on the water permit application process. Strictly speaking, however, a judicial determination that marijuana cultivation does not qualify as a beneficial use would apply to cultivators in every stage of the permit process, including existing rights holders, prospective buyers, and permit applicants, a ruling that could disrupt not only the marijuana industry but Colorado's water rights system in general. Other prior appropriation states define beneficial use without expressly requiring the

201. See Blake & Finlaw, *supra* note 189, at 368.

202. COLO. REV. STAT. § 37-92-103(4) (2015).

203. Gardner-Smith, *supra* note 116.

204. COLO. REV. STAT. § 37-92-103(3)(a) (2015); see Hobbs, *supra* note 120, at 105 ("The premise that birthed prior appropriation water law is that water users in a water-scarce region undergoing a population increase must need the water for an actual and continuing beneficial use in order to obtain and retain a share of the public's water resource.") (emphasis added).

205. COLO. REV. STAT. § 37-92-103(3)(a) (2015).

206. *Well and Water Use*, *supra* note 88 ("Unless your water right is very old (which may mean from the 1800's), there may be very limited times of the year when water can be legally diverted from a stream or spring . . .").

purpose of the use to be lawful,²⁰⁷ though it would not be a reach for courts to read the lawful purpose requirement into those definitions.²⁰⁸ A legislative amendment to clarify that marijuana cultivation is a beneficial use of the state's water resources might become necessary for Colorado and other prior appropriation states to resolve the ambiguity.

Other aspects of Colorado's marijuana law framework do not directly address water rights but have indirect impacts on the resource. While commercial outdoor cultivation is permitted, Colorado produces much of its marijuana indoors, in warehouses, greenhouses, or private residences.²⁰⁹ And, personal marijuana cultivation must take place in an enclosed, locked space.²¹⁰ There are justifications for these policies, such as ensuring that cultivation is not a public act where underage minors can access the plants. But growing marijuana indoors has significant environmental consequences as well. Indoor grows consume vast quantities of electricity to power lights that mimic the sun's photosynthetic energy.²¹¹ That energy is often provided by hydroelectric power that places demands on water resources and aquatic ecosystems.²¹² Several states in the American West receive the majority of their energy from hydroelectric dams,²¹³ and increasing the demand on energy supplies as a result of indoor marijuana cultivation will have implications for water security throughout the region.²¹⁴ While outdoor cultivation has its own

207. In Montana, for example, beneficial use is defined as "a use of water for the benefit of the appropriator, other persons, or the public." MONT. CODE ANN. § 85-2-102(4) (1985). Alaska defines beneficial use as "a use of water for the benefit of the appropriator, other persons or the public, that is reasonable and consistent with the public interest." ALASKA STAT. § 46.15.260(3) (1966).

208. The beneficial use standard is a relatively low threshold to meet, but agencies and courts have denied water permits on the basis that the intended use was not feasible. *See, e.g.,* Cookinham v. Lewis, 114 P. 88, 91 (Or. 1911) (denying a water permit because the beneficial use was not financially realistic); *see also* Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935) (holding that beneficial use is a flexible term that can change under time or circumstances).

209. CHRISTIAN HAGESETH, *BIG WEED: AN ENTREPRENEUR'S HIGH-STAKES ADVENTURES IN THE BUDDING LEGAL MARIJUANA BUSINESS* (2015).

210. COLO. CONST. art. XVIII, § 16(3)(b).

211. Professor Gina Warren provides an excellent analysis of marijuana's energy needs and potential regulatory reforms. *See* Gina S. Warren, *Regulating Pot to Save the Polar Bear: Energy and Climate Impacts of the Marijuana Industry*, 40 COLUM. J. ENVTL. L. 385 (2015).

212. Jordan Macknick et al., *The Water Implications of Generating Electricity: Water Use Across the United States Based on Different Electricity Pathways Through 2050*, 7 ENVTL. RES. LETTERS 1, 4 (2012); Robert I. McDonald et al., *Energy, Water and Fish: Biodiversity Impacts of Energy-Sector Water Demand in the United States Depend on Efficiency and Policy Measures*, 7 PLOS ONE 1 (2012); Dan Tarlock, *Hydro Law and the Future of Hydroelectric Power Generation in the United States*, 65 VAND. L. REV. 1723, 1735-36 (2012).

213. *E.g.,* Idaho, Oregon, and Washington. *Western U.S. Hydro Generation Profile, 2013*, NAT'L HYDROPOWER ASS'N, <http://www.hydro.org/why-hydro/available/hydro-in-the-states/west/> (last visited Apr. 10, 2016).

214. Warren, *supra* note 211, at 407-08.

environmental challenges,²¹⁵ Colorado's indoor growing policy is likely to increase the demand for energy and water resources.

The pace with which Colorado's marijuana regulations have developed has been ambitious, yet early reviews of the legal framework are generally positive.²¹⁶ Stakeholder participation, holistic policymaking, and a willingness to innovate have been cited as reasons for the strong rollout.²¹⁷ Unfortunately, the integrated nature of Colorado's marijuana laws has yet to meaningfully consider environmental regulations, and in particular, the impacts that marijuana cultivation and state water laws have on each other. Some local governments are taking matters into their own hands,²¹⁸ and given the nascent state of the marijuana industry experimentation should not be discouraged. But sooner or later the marijuana industry, as well as the legal framework for water resources, will benefit from a more proactive resolution of emerging ambiguities and uncertainties.

III. RIPARIANISM

Compared to the doctrine of prior appropriation, which gives priority to water users on the basis of seniority, the doctrine of riparianism allows water users to take water as long as the uses are reasonable. The primary advantage of the riparian doctrine under common law is that it is more flexible than prior appropriation, adjusting to changing conditions on the basis of equity. The disadvantage is that riparianism provides less security of right than a senior water user would have in a prior appropriation jurisdiction. What both systems share is a modern reality in which administrative agencies have asserted themselves, providing a measure of flexibility to prior appropriation systems and a measure of security to riparian systems. Nonetheless, the common law continues to form the basis for contemporary administration of water rights and permits in eastern states, and the components of a riparian water right have implications for marijuana cultivation, just as the marijuana industry will force some riparian jurisdictions to reexamine their water allocation systems.

The aridity of the American West necessitated a strict allocation scheme that could provide investment security, a factor that gave rise to

215. For example, fertilizer runoff.

216. See, e.g., JOHN HUDAK, CTR. FOR EFFECTIVE PUB. MGMT. BROOKINGS, COLORADO'S ROLLOUT OF LEGAL MARIJUANA IS SUCCEEDING 1-2 (2014); Jeffery Miron, Marijuana Policy in Colorado (Oct. 23, 2014) (working paper, CATO Institute); Josh Voorhees, *A Blazing Start*, SLATE (Jan. 16, 2015, 5:40 PM), http://www.slate.com/articles/news_and_politics/politics/2015/01/one_year_in_colorado_s_great_pot_experiment_has_been_a_sweeping_success.html.

217. HUDAK, *supra* note 216, at 2.

218. See Hotakainen, *supra* note 164; St. Charles Mesa Water District, *supra* note 169; *supra* notes 198-201 and accompanying text.

the prior appropriation doctrine.²¹⁹ The relatively water-rich climates of the east, on the other hand, were able to maintain or slightly modify riparianism's roots in the English common law. The English "natural flow" doctrine prohibited landowners from making any use of water resources that would impair the quantity or quality of water flowing past riparian lands,²²⁰ reflecting the English preference for using property for its aesthetic or personal qualities.²²¹ Small-scale domestic uses provided an exception,²²² an absolute right of priority that has been maintained and reaffirmed to this day.²²³

The first evolution in eastern water law was a shift from natural flow principles to a loose set of rules that enabled economic developments such as water-powered mills and irrigated crops.²²⁴ Owners of property abutting a water resource could use water as long as it did not unreasonably interfere with other riparian interests.²²⁵ This basic articulation of riparian rights remains the law of water use in many eastern states.²²⁶ The second evolution, occurring in the mid-twentieth century, was prompted by an increase in the demand for water resources just as water supplies were becoming more unreliable.²²⁷ Administrative agencies stepped in to create permit systems that were more nimble than the common law.²²⁸ In many eastern states water rights are now merely usufructuary.²²⁹

Water laws of the eastern United States now exhibit all three stages of doctrinal evolution. The priority for domestic uses of water remains supreme, with potential to support marijuana cultivation for personal use. Some states still rely on the common law doctrine of riparianism, and for these jurisdictions, commercial marijuana cultivation will have to qualify as a reasonable use of water resources, as ambiguous as that might be. Finally, many states employ regulated riparianism to consider water permit applications administratively, adding a political dimension to marijuana cultivation.

219. POWELL, *supra* note 155.

220. THOMPSON ET AL., *supra* note 37, at 55.

221. Horwitz, *supra* note 39, at 253.

222. For example, drinking, washing, livestock rearing, or small-scale farming. *See supra* note 38 and accompanying text.

223. *See Tunison v. Harper*, 690 S.E. 2d 819 (Ga. 2010).

224. *See, e.g., Martin v. Bigelow*, 2 Aik. 184 (Vt. 1827).

225. JOSEPH W. DELLAPENNA, TOWARD A SUSTAINABLE WATER FUTURE, VISIONS FOR 2050, at 86 (Walter M. Grayman et al. eds., 1st ed. 2012); *see also* Tyler v. Wilkinson, 24 F. Cas. 472, 474 (D.R.I. 1827) (requiring, per Justice Story's opinion, that riparians be allowed a reasonable use of water).

226. DELLAPENNA, *supra* note 225, at 90.

227. *Id.* at 87.

228. For example, by placing expiration dates on permits or tying water allocation to observed flow rates.

229. *See, e.g., REGULATED RIPARIAN MODEL WATER CODE*, *supra* note 71.

A. PERSONAL MARIJUANA CULTIVATION AS A COMMON LAW DOMESTIC USE

Even the English natural flow doctrine—prohibiting riparians from making any use of water that would impair water quantity or quality—provides an exception for “domestic” or “natural” uses of water. These uses included small-scale activities that sustain human life, such as drinking, bathing, gardening, or raising small quantities of livestock.²³⁰ The common law doctrine of riparianism, while evolving to require reasonable withdrawals or diversions of water, maintained the supremacy of domestic use. In *Evans v. Merriweather*, the Illinois Supreme Court went so far as to rule that domestic uses may consume all the water resources of a stream, even if downstream riparians would receive no water at all.²³¹

[A]n individual owning a spring on his land, from which water flows in a current through his neighbor's land, would have the right to use the whole of it, if necessary to satisfy his natural wants. He may consume all the water for his domestic purposes, including water for his stock.²³²

Other courts have articulated a similarly absolute right to use water for domestic purposes,²³³ including the right to use water for a garden or greenhouse.²³⁴

The supremacy of domestic uses in riparian jurisdictions should allow states to accommodate personal marijuana cultivation without significantly disrupting existing water rights or marijuana laws. No state with a pure (or relatively pure²³⁵) common law application of riparianism has legalized personal marijuana cultivation for recreational use,²³⁶ but several have legalized personal cultivation for medicinal use.²³⁷ Some of these states allow medical marijuana patients to grow their own supply. Maine allows patients to grow up to six plants at a time,²³⁸ Vermont allows patients to grow nine plants,²³⁹ and Michigan allows patients to

230. THOMPSON ET AL., *supra* note 37, at 33.

231. *See Evans v. Merriweather*, 4 Ill. 492, 496 (1842).

232. *Id.*

233. *See, e.g., City of Baltimore v. Appold*, 42 Md. 442, 456 (1875); *City of Philadelphia v. Collins*, 68 Pa. 106, 123 (1871); *Wadsworth v. Tillotson*, 15 Conn. 366, 373 (1843); WATERS AND WATER RIGHTS § 7.02(b)(1) (LexisNexis, 3d ed. 2013).

234. *Watson v. Inhabitants of Needham*, 37 N.E. 204, 204 (Mass. 1894) (ruling that water used in operation of a greenhouse is a domestic use).

235. *See Joseph W. Dellapenna, The Evolution of Riparianism in the United States*, 95 MARQ. L. REV. 53 (2011) (noting that a pure application of the doctrine of riparianism is elusive).

236. Several have marijuana legalization initiatives on their ballots for 2016. *See Marijuana on the Ballot, supra* note 28.

237. *See, e.g., 23 Legal Medical Marijuana States and DC*, PROCON.ORG, <http://medicalmarijuana.procon.org/view.resource.php?resourceID=000881> (last visited Apr. 10, 2016).

238. Michigan Medical Marijuana Program, Mich. Pub. Acts 512–514, tit. 22, ch. 558-C § 2423(a)(1)(b) (2008).

239. VT. STAT. ANN. tit. 18, ch. 86, § 4471 (2007).

grow twelve.²⁴⁰ All three states employ a relatively traditional version of the common law of riparian rights.²⁴¹ The extent to which riparians can cultivate marijuana for personal use remains limited by law,²⁴² making it unlikely that personal marijuana cultivation could push the boundaries of riparianism's domestic use allowance for small-scale gardening. A narrow reading of *Evans v. Merriweather* may call into question the necessity of recreational marijuana and therefore its qualification as a "natural" use of water,²⁴³ but recent interpretations are more permissive of small-scale gardening.²⁴⁴ Marijuana's medicinal properties also further its domestic qualifications.²⁴⁵

A more ambiguous question is whether marijuana cultivated on behalf of medical marijuana patients would qualify as a domestic use of water resources. In many states where patients can grow their own marijuana plants for medicinal use, patients may instead designate a primary caregiver to grow plants on their behalf. In Maine, for example, a caregiver may be compensated for growing six plants per patient, for a maximum of five patients.²⁴⁶ Michigan has similar provisions restricting caregivers to grow plants for up to five patients.²⁴⁷ Added to their own medicinal allowance, a Michigan caregiver could legally grow a sizable marijuana garden of up to seventy-two plants.

Would an operation of this scale cross the boundary between natural and artificial uses of water? It would seem logical that if a caregiver is growing plants on behalf of a patient, and if that patient's cultivation allowance constitutes a domestic use, then the caregiver's cultivation should qualify as a domestic use as well. But taken to its extreme this logic appears untenable: a large-scale cultivator of tomatoes does not have absolute domestic riparian rights because those tomatoes are then sold to consumers who could have cultivated tomatoes using their own domestic use rights. The answer might turn on the nature of the caregiver's cultivation. A small-scale garden or greenhouse should

240. MICH. COMP. LAWS § 333.26424(4)(a) (2008).

241. DELLAPENNA, *supra* note 225, at 90.

242. Even in states where recreational use is permitted, personal cultivation is restricted. In Colorado, for example, personal cultivation for recreational use is limited to six plants. COLO. CONST. art. 18, § 16.3(b).

243. *Evans v. Merriweather*, 4 Ill. 492, 495 (1842) ("Natural are such as are absolutely necessary to be supplied, in order [sic] to his existence These wants must be supplied, or both man and beast will perish.").

244. *E.g.*, *Tunison v. Harper*, 690 S.E.2d 819 (Ga. 2010); *Harris v. Brooks*, 283 S.W.2d 129 (Ark. 1955); *Taylor v. Tampa Coal Co.*, 46 So. 2d 392, 394 (Fla. 1950); *Watson v. Inhabitants of Needham*, 37 N.E. 204, 204 (Mass. 1894).

245. R. Jan Gurley, Richard Aranow & Mitchell Katz, *Medical Marijuana: A Comprehensive Review*, 30 J. PSYCHOACTIVE DRUGS 137 (1998).

246. ME. REV. STAT. tit. 22, ch. 558-C, § 2423(A)(2)(b)(c).

247. *See State v. McQueen*, 828 N.W.2d 644 (Mich. 2013).

fall within the boundaries of natural use, whereas an irrigated marijuana crop may not.²⁴⁸

In states that employ a regulated riparianism framework based on the Regulated Riparian Model Water Code, marijuana cultivation for personal use (whether grown by or on behalf of the user) is likely to qualify for a permit exemption as long as withdrawals are limited to 100,000 gallons per day.²⁴⁹ While the exemption would not apply in common law riparian jurisdictions, the figure is relevant to the extent that it provides a sense of what a “small-scale” use might constitute. The cultivation restrictions in place today are likely to keep personal marijuana cultivation in the realm of domestic uses of water resources. As those restrictions are lifted and personal cultivation expands, or in cases where marijuana cultivation takes on a more commercial nature, the comforts of domestic use supremacy will give way to the limits of reasonable use.

B. COMMERCIAL MARIJUANA CULTIVATION AS A COMMON LAW REASONABLE USE

Early cases exploring the contours of riparian doctrine interpreted the absolute right to use water for domestic uses to include irrigation.²⁵⁰ Downstream riparians injured by upstream irrigators had no cause of action regardless of the reasonableness of the irrigation scheme.²⁵¹ Courts have moved away from that interpretation, and withdrawals for irrigation must now be reasonable vis-à-vis other riparians.²⁵² Many states have expressly ruled that irrigation is a reasonable riparian use,²⁵³ but because reasonable use determinations are so fact specific, much jurisprudence has little precedential value.²⁵⁴ Marijuana cultivation that does not qualify as a domestic riparian use must therefore be reasonable with respect to other riparian rights on a case-by-case basis.

Despite this limitation it is possible to speculate that marijuana cultivation in many circumstances can make reasonable use of water

248. See *Mastenbrook v. Alger*, 68 N.W. 213, 214 (Mich. 1896) (finding that irrigation does not qualify as a domestic riparian use).

249. REGULATED RIPARIAN MODEL WATER CODE, *supra* note 71, § 6R-1-02(1).

250. See, e.g., *Blanchard v. Baker*, 8 Me. 253, 266 (1832); *Weston v. Alden*, 8 Mass. 136, 137 (1811).

251. *Weston*, 8 Mass. at 136 (“The owner of land adjoining to an ancient brook of running water may lawfully divert the water for the purpose of irrigating his close; and an owner of a close below, which becomes less productive by that means, has no cause of action therefor.”).

252. See, e.g., *Mastenbrook*, 68 N.W. at 213; *Baker v. Brown*, 55 Tex. 377, 379 (1881); see also *The Development of Riparian Law in Alabama*, 12 ALA. L. REV. 155, 157–58 (1959).

253. E.g., *Pyle v. Gilbert*, 265 S.E.2d 584 (Ga. 1980); *Harris v. Brooks*, 283 S.W.2d 129 (Ga. 1955).

254. See *Taylor v. Tampa Coal Co.*, 46 So. 2d 392, 394 (Fla. 1950) (enjoining irrigation of a citrus grove on the grounds that it unreasonably impaired other riparian water users).

resources. While water use estimates for marijuana plants vary,²⁵⁵ riparian jurisdictions typically receive more water than their western counterparts,²⁵⁶ a generalization that has two implications for marijuana cultivation. First, strains capable of being grown outdoors are likely to receive more direct precipitation and require less irrigation, increasing the efficiency of marijuana cultivation.²⁵⁷ Second, the relative abundance of water resources in riparian jurisdictions makes it less likely that marijuana cultivation will unreasonably interfere with other riparian rights. Thus even marijuana grown indoors can be accommodated into existing riparian rights frameworks. In determining whether marijuana cultivation constitutes a reasonable use, state preferences for agriculture may help marijuana cultivation take precedence over other competing uses. In Minnesota, for example, irrigated agriculture will take precedence over all other competing uses of water except domestic water supply and small-scale uses.²⁵⁸

More commonly courts in riparian jurisdictions use a balancing test that uses a mix of factors to reconcile competing water uses.²⁵⁹ The Restatement (Second) of Torts articulates one such list of factors, among which include the purpose, economic value, and social value of the water use.²⁶⁰ Evidently it is difficult to predict how reasonable use determinations will turn out given the broad parameters of these balancing tests.²⁶¹ While “agriculture” generally speaking is recognized as having economic and social value, for example, it is not clear that a court would see marijuana cultivation the same way. One might assume that if a state legalizes the commercial cultivation of marijuana its economic and social value would be validated, but when measured against other uses it is difficult to predict with any certainty how much value marijuana cultivation will be afforded on a case-by-case basis.

255. See Bauer et al., *supra* note 15; see *supra* text accompanying notes 80–81. *But see* CLARKE, *supra* note 78.

256. See Thomas C. Peterson et al., *Monitoring and Understanding Changes in Heat Waves, Cold Waves, Floods, and Droughts in the United States*, 94 BULL. AM. METEOROLOGICAL SOC'Y 821 (2013). *But see* Jonathan Chenoweth, *A Re-Assessment of Indicators of National Water Scarcity*, 33 WATER INT'L 5, 5 (2008).

257. That precipitation might otherwise flow into watercourses from which riparians derive their water rights, but watering via precipitation represents a more efficient method of supplying water than irrigation.

258. MINN. STAT. § 103G.261(a) (2014).

259. See, e.g., *Harris v. Brooks*, 283 S.W.2d 129 (Ga. 1955).

260. RESTATEMENT (SECOND) OF TORTS § 850A (AM. LAW INST. 1979).

261. This is an often-noted drawback of riparian rights. See, e.g., THOMPSON ET AL., *supra* note 37, at 35 (citing T. E. Lauer, *Reflections on Riparianism*, 35 MO. L. REV. 1 (1970)). *But see* Robin Kundis Craig, *Defining Riparian Rights as “Property” Through Takings Litigation: Is There a Property Right to Environmental Quality?*, 42 ENVTL. L. 115 (2012) (noting the productive potential of takings jurisprudence to define the status and nature of water rights).

Despite the uncertainty, the commercial cultivation of marijuana is likely to be deemed a reasonable use sooner or later, if only because marijuana legalization and implementing regulations will represent a public or legislative affirmation of its value. The paradox of the High Valley Farms case—wherein growing marijuana plants is legal while watering them might not be—may present itself in riparian jurisdictions if the federal marijuana prohibition becomes a factor in what constitutes a reasonable use, but more likely is that marijuana legalization allows commercial cultivators to make uses of water resources that are reasonable with respect to the correlative rights of other riparians.

C. REGULATED RIPARIANISM AND THE POLITICS OF MARIJUANA

Just as state legislatures are continuously passing legislation that builds on or modifies legal doctrines in a variety of fields, so too are they modifying their doctrines of water law. Given the drawbacks of riparianism—namely that dispute resolution is case specific and reactive in nature—many states have modified the common law of riparianism to give state officials more tools to manage water resources more proactively.²⁶² At some point the modifications tip the scales and a state is applying some form of regulated riparianism instead of the common law. Where a state lies on that spectrum is disputed, but as many as nineteen eastern states now feature a regulated riparian system of water allocation.²⁶³ These states typically administer a permit system wherein water agencies determine at the time of application if a proposed use is reasonable.²⁶⁴ The issued permits are affixed with expiration dates that allow agencies to reevaluate water uses under changing conditions when the permits are up for renewal.²⁶⁵

In theory regulated riparianism offers many advantages, allocating resources more efficiently, quantifying rights and reducing uncertainty, and allowing agencies to proactively manage their system of water rights.²⁶⁶ These advantages should confer on marijuana cultivators just as they do cultivators of other crops. The precision and security of a water permit is particularly important to the development of the marijuana industry, however, as investors will be hesitant to commit resources to an uncertain legal market. The more certainty marijuana cultivators can

262. See Robert H. Abrams, *Charting the Course of Riparianism: An Instrumentalist Theory of Change*, 35 WAYNE L. REV. 1381 (1988).

263. Jesse J. Richardson, Jr., *Agricultural Preferences in Eastern Water Allocation Statutes*, 55 NAT. RESOURCES J. 329 (2014). *But see* Dellapenna, *supra* note 225, at 90.

264. DELLAPENNA, *supra* note 225, at 87.

265. *Id.* at 87–88.

266. See Robert H. Abrams, *Water Allocation by Comprehensive Permit Systems in the East: Considering a Move Away from Orthodoxy*, 9 VA. ENVTL. L.J. 255 (1990).

have regarding their inputs (water being one of the most important), the smoother the transition from prohibition to legalization will be.

If marijuana is treated like any other agricultural commodity, regulated riparianism will be even friendlier to cultivators. In most regulated riparian states, agriculture receives preferential treatment compared to other sectors.²⁶⁷ Agricultural water users are expressly defined as reasonable in many states,²⁶⁸ while four states even provide exemptions to agricultural water users that allow them to make withdrawals without permits or extensive reporting requirements.²⁶⁹ In South Carolina, for example, agricultural water users avoid the permit process altogether as long as they register their withdrawals with the state.²⁷⁰ If marijuana cultivation qualifies as agriculture in these states, the marijuana industry will have an easier time fitting into existing regulatory frameworks. It bears noting, however, that these systems are not necessarily managing their water resources sustainably by giving agricultural users such open-ended water rights. States with little to no checks on agricultural water users are ill equipped to promote water efficiency during periods of water scarcity or drought.²⁷¹ The introduction of large-scale marijuana cultivation is likely to exacerbate these vulnerabilities.

The Regulated Riparian Model Water Code provides another avenue for the marijuana industry to come into compliance with existing water laws. The Code exempts water users making daily withdrawals of less than 100,000 gallons from state permitting requirements.²⁷² Given the water needs of marijuana plants, this would allow cultivation of around 17,000 to 100,000 marijuana plants. Much like Washington's permit exemption ceiling,²⁷³ the Code's exemption for small-scale withdrawals is likely to encompass much or all of the marijuana cultivation community by current growing standards. If the exemption were applied to the marijuana industry upon legalization, cultivators would be ushered into water regulation frameworks smoothly. But, like permit exemptions for agriculture, unchecked water withdrawals do little to address water scarcity. Even with low ceilings water permit exemptions have been shown to have significant cumulative impacts that put stress on water resources.²⁷⁴

267. Richardson, *supra* note 263.

268. *Id.* at 341.

269. Those states are Kentucky, New York, South Carolina, and Virginia. *Id.* at 339.

270. Robert H. Abrams, *Water Law Transitions*, 66 S.C. L. REV. 597, 616 (2015).

271. *Id.* at 618.

272. REGULATED RIPARIAN MODEL WATER CODE, *supra* note 71, § 6R-1-02(1).

273. See Washington Marijuana Legalization and Regulation, Initiative 502 (codified as amended in scattered chapters of WASH. REV. CODE §§ 69, 46).

274. Robert E. Beck, *The Regulated Riparian Model Water Code: Blueprint for Twenty First Century Water Management*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 113, 149 n.328 (2000) (citing *Domestic Well Permits on Hold in New Mexico*, U.S. WATER NEWS, July 1996, at 16).

In theory regulated riparianism has the potential to provide a smooth transition from black market cultivation to legal regulation because agencies have more flexibility to administer water rights, but in practice the drawbacks of agency control might manifest themselves in ways that undercut the marijuana industry.²⁷⁵ Because administrative agencies have significant discretion when making water permit decisions, the influence of state and local politics might play a larger role in determining water rights in regulated riparian jurisdictions than common law jurisdictions.²⁷⁶ This political side of marijuana regulation may play a particularly strong role when agencies are interpreting a key feature of regulated riparianism, the “public interest” standard.²⁷⁷ The standard is frequently included in regulated riparian statutes, and allows agencies to consider the various implications of a permit application holistically.²⁷⁸ But the term is ambiguous, and can easily serve to advance political interests.²⁷⁹ Often agencies cannot find the right balance between approving and denying water permits,²⁸⁰ and the emerging marijuana industry will present an additional political and regulatory challenge for agencies to navigate.

The flip side is true, of course, in that states seeking to cater to the marijuana industry may streamline or facilitate the permit process, but at least in the early stages of marijuana legalization it seems more likely that state agencies and political appointees would limit permits for marijuana cultivation. In Florida, for example, proposed regulations would limit marijuana cultivation permits to a select group of well-connected business consortiums.²⁸¹ A similar plan in Ohio prompted legislators to propose a countermeasure that would nullify the marijuana legalization initiative altogether.²⁸² One advantage of restricting

275. Abrams, *supra* note 266.

276. Stoa, *supra* note 32.

277. See REGULATED RIPARIAN MODEL WATER CODE, *supra* note 71, §§ 1R-1-01, 3R-1-01 to 3R-2-05, 4R-2-01 to 4R-3-05, 7R-3-01 to 7R-3-07.

278. Dellapenna, *supra* note 235, at 87.

279. Stoa, *supra* note 68, at 83–84.

280. Dellapenna, *supra* note 235, at 88.

281. In Florida, one consortium includes former legislators, lobbyists, and investors with connections to the citrus industry, state universities, and Florida Governor Rick Scott. The state is limiting cultivation licenses for businesses interested in participating in the limited medical marijuana business. See Dara Kam, *Tallahassee Insiders Take Aim at Medical Marijuana License*, SPACE COAST DAILY (Aug. 3, 2015), <http://spacecoastdaily.com/2015/08/tallahassee-insiders-take-aim-at-medical-marijuana-license/>; Scott Powers, *Medical-Marijuana Program Draws 24 Applicants*, ORLANDO SENTINEL (July 9, 2015, 5:35 PM), <http://www.orlandosentinel.com/news/politics/os-charlottes-web-license-applicants-20150709-story.html>.

282. Ohio is grappling with a marijuana legalization initiative that would allow a select group of consortiums to grow and sell marijuana to the public. The exclusive nature of the amendment has prompted push back from the legislature, which has proposed its own ballot initiative that would prohibit monopolies from being written into the state constitution. See Jackie Borchardt, *What*

cultivation to a small number of licensed businesses is that it reduces the amount of stress on water resources and regulatory agencies because the number of licensed cultivators is low and easy to monitor. A major disadvantage is that the majority of state residents and businesses are shut out of the marijuana industry, while black market cultivators are not incentivized to join the regulatory framework.

Restricting cultivation might buy agencies time while they develop their regulatory frameworks, but does not offer a long-term solution. Existing regulated riparian frameworks are capable of welcoming marijuana cultivators without significantly disrupting existing water rights and permit holders. The potential scale of cultivation, however, raises broader questions about the sustainability of those water management frameworks. There are two paths of least resistance: The first would accommodate the marijuana industry by allowing cultivators to qualify for permit exemptions or agricultural perks. The second would limit water stress by licensing only a very small number of marijuana cultivators. Unfortunately, neither of these paths addresses the realities of water scarcity and the emerging marijuana industry together.

This is not the first time that riparian jurisdictions have been challenged by the sudden emergence of an industry (for example, consider “fracking” for natural gas)²⁸³ and agencies in regulated riparian jurisdictions will have more flexibility to make adjustments than their common law counterparts. At the time of writing no riparian jurisdiction had legalized the recreational use of marijuana, and those that permit medicinal use have not allowed the industry to spread its wings.²⁸⁴ It seems likely that legalization will come sooner or later to riparian states, and when it does, both common law and regulatory applications of the doctrine will need to find the right balance between protecting existing water rights, accommodating the marijuana industry, and reducing water scarcity.

IV. THE CALIFORNIA DOCTRINE

As a general rule, water rights in the American West are governed by the doctrine of appropriation, while the doctrine of riparianism controls those in the American East. In reality most states are an exception to this rule, blending traditional common law principles with modern administrative regulations.²⁸⁵ Some states are more of an exception than others, with mixed systems that invoke both riparian and

Happens If Both Marijuana Legalization and Anti-Monopoly Amendments Pass?, CLEVELAND.COM (Aug. 17, 2015, 10:25 AM), http://www.cleveland.com/open/index.ssf/2015/08/what_happens_if_both_marijuana.html.

283. See, e.g., Laura Springer, *Waterproofing the New Fracking Regulation: The Necessity of Defining Riparian Rights in Louisiana's Water Law*, 72 LA. L. REV. 225 (2011).

284. See 23 *Legal Medical Marijuana States and DC*, *supra* note 237.

285. See Dellapenna, *supra* note 235; see *supra* notes 134–135 and accompanying text.

appropriation principles in ways that defy categorization.²⁸⁶ The most prominent of these is California, which not only features a notoriously complex water law system, but also the largest and most developed marijuana cultivation industry in the United States.²⁸⁷ California was the first state to legalize medical marijuana,²⁸⁸ but since then attempts to regulate the marijuana industry have been feeble.²⁸⁹ At the same time, perpetual drought has placed renewed attention on the state's scarce water resources, including water used by marijuana farmers.²⁹⁰ These facts make California the most illuminating case study of the convergence of water law and marijuana legalization, a collision that illustrates the difficulties other states may face in developing their own regulatory frameworks.

In May 2015, one month before Operation Emerald Tri-County raided marijuana farms on Island Mountain, California's North Coast Regional Water Quality Control Board held a workshop in the area to discuss the Board's proposed water quality regulations for marijuana cultivation.²⁹¹ The goal was to solicit input from marijuana farmers and invite them to participate in a mutually beneficial regulatory scheme. Farmers would be asked to clean up their operations and invest in water quality technologies, and in exchange, the Board would give farmers cover to address water quality issues openly and legally.²⁹² The farmers in attendance were skeptical, but after decades of operating in the shadows many were hopeful, too.²⁹³ Regulatory efforts like the water quality program can help turn marijuana farmers from outlaws into law-abiding businesspersons with little to fear from government enforcement agencies. The workshop ended on a promising note,²⁹⁴ but several weeks later, local sheriff's departments and the California Department of Fish

286. Riparian rights remain a meaningful feature of prior appropriation jurisdictions like California, Nebraska, and Oklahoma. *See, e.g., Franco-American Charolaise, Ltd. v. Oklahoma Water Res. Bd.*, 855 P.2d 568 (Okla. 1990).

287. EMILY BRADY, HUMBOLDT: LIFE ON AMERICA'S MARIJUANA FRONTIER 71 (1st ed. 2013) (citing that by 2010 "79 percent of all marijuana consumed in the United States came from California").

288. *See California Compassionate Use Act*, CAL. HEALTH & SAFETY CODE § 11362.5 (West 2007).

289. Despite being "the largest medical market in the country, California[] is no longer a model for medical cannabis legalization because of its lack of statewide regulation." REA ET AL., *supra* note 75.

290. *See McClurg, supra* note 132; Stoa, *supra* note 32; *Governor Brown Declares Drought State of Emergency, supra* note 10; *see also* MARK BALDASSARE ET AL., PUB. POLICY INST. OF CAL., CALIFORNIANS AND THEIR GOVERNMENT 3 (2015).

291. Press Release, Cal. Water Bds., North Coast Water Board to Hold Workshop May 7 on Marijuana Cultivation (May 4, 2015) (on file with author).

292. Adrian Fernandez Baumann, *A Carrot and Stick for Pot Farmers*, EAST BAY EXPRESS (Aug. 12, 2015), <http://www.eastbayexpress.com/oakland/a-carrot-and-stick-for-pot-farmers/Content?oid=4454890>.

293. *Id.*

294. One farmer noted, "The water board staff are our preferred regulators because they don't carry guns and badges." *Id.*

and Wildlife conducted the Island Mountain raids targeting farmers allegedly violating environmental regulations.²⁹⁵

The incident showed that without a clear framework for regulating marijuana cultivation, state and local agencies are taking matters into their own hands, subjecting the industry to an overlapping and often contradictory set of mandates. How marijuana farmers are supposed to comply with these demands in order to legally irrigate their crops remains an open question. If the California doctrine of water allocation has the potential to integrate the marijuana industry into existing water rights frameworks, it is not being reached by the state's approach to marijuana cultivation.

A. CALIFORNIA WATER LAW AND POLITICS

California water law has been ambivalent since at least 1857,²⁹⁶ when the Supreme Court recognized riparian rights two years after having done the same for appropriative rights.²⁹⁷ The mixed system has been controversial ever since, notably in 1886 when the Court affirmed the dual existence of riparian and appropriative rights in *Lux v. Haggin*²⁹⁸ in the longest opinion in California history.²⁹⁹ The opinion clarified that riparian rights do not depend on use, but rather appurtenance to land,³⁰⁰ safeguarding inchoate water rights. Appropriative rights became regulated by the state in 1914, requiring a permit to make water diversions.³⁰¹ Later the duality was enshrined in the California Constitution by limiting water rights to "such water as shall be reasonably required for the beneficial use to be served."³⁰² A separate, though similar, dual system of riparian and appropriative rights was created for groundwater.³⁰³

As if these mixed doctrines did not create enough controversy over water rights, California's demographic development in the early twentieth century created a massive allocation problem: while most of the state's water resources were located north of Sacramento, almost all

295. See Goff, *supra* note 1; Randall, *supra* note 4; Randall, *supra* note 5.

296. See *Crandall v. Woods*, 8 Cal. 136 (1857).

297. See *Irwin v. Phillips*, 5 Cal. 140 (1855).

298. See *Lux v. Haggin*, 69 Cal. 255 (1886).

299. THOMPSON ET AL., *supra* note 37, at 202. The decision set off a political firestorm, with anti-riparian organizations and the state governor attempting to remove justices of the court from office. *Id.* at 206; see also SIDNEY TWICHELL HARDING, *WATER IN CALIFORNIA* 39 (1st ed. 1960).

300. *Lux*, 69 Cal. at 391; see also Mark T. Kanazawa, *Efficiency in Western Water Law: The Development of the California Doctrine, 1850-1911*, 27 J. LEGAL STUD. 159 (1998).

301. Water Commission Act, California Proposition 29 (1914).

302. CAL. CONST. art. X, § 2; see also Brian E. Gray, "In Search of Bigfoot": *The Common Law Origins of Article X, Section 2 of the California Constitution*, 17 HASTINGS CONST. L.Q. 225 (1989).

303. See *City of Los Angeles v. City of San Fernando*, 537 P.2d 1250 (Cal. 1975); *Katz v. Walkinshaw*, 74 P. 766 (Cal. 1903).

of its population was located to the south.³⁰⁴ In the 1960s southern California had sixty percent of the population and only two percent of its water resources.³⁰⁵ The situation was untenable, and the ensuing water transfer battles created rifts between the north and south, and between rural and urban communities, that today still fuel resentment and animosity.³⁰⁶

When the dust settled two water projects transformed California's water landscape. The Central Valley Project—controlled by the Bureau of Reclamation—transfers water from the northern reaches of the state to the arid and agricultural Central Valley.³⁰⁷ The California State Water Project—controlled by the state Department of Water Resources—brings water from northern California to the urban centers of the state, including San Francisco and Los Angeles.³⁰⁸ Opposition to these projects was fierce in areas where water was being taken, but the flexibility of riparian rights allowed the California Supreme Court to find that large-scale water transfers did not unreasonably interfere with existing or future rights given the social and economic importance of water to the rest of the state.³⁰⁹ The appropriative system gave the state another mechanism to transfer water by acquiring rights or permits from previous users on a large scale.³¹⁰

For the past several years, drought has placed additional stress on California's water resources and web of rights and regulations.³¹¹ The state has imposed cuts to appropriative water allocations across the board, including appropriative rights that predate the 1914 water code, which was previously thought safe from cutbacks.³¹² Riparian rights,

304. Measurements taken between 1894 and 1947 showed the region north of Sacramento—including Mendocino, Trinity, and Humboldt counties—contained seventy-three percent of the state's water resources. Gordon R. Miller, *Shaping California Water Law, 1781 to 1928*, 55 S. CAL. Q. 9 (1973).

305. *Id.*

306. Counties in Northern California and Southern Oregon have gone so far as to advocate for independence as a separate U.S. state. Concerns over natural resources exploitation fuel the grievances. See *Northern California County Board Votes for Succession from State*, CBS S.F. BAY AREA (Sept. 4, 2013, 3:50 PM), <http://sanfrancisco.cbslocal.com/2013/09/04/northern-california-county-board-votes-for-secession-from-state/>.

307. See *About the Central Valley Project*, U.S. BUREAU OF RECLAMATION, <http://www.usbr.gov/mp/cvp/about-cvp.html> (last visited Apr. 10, 2016).

308. See *California State Water Project Overview*, DEPT OF WATER RESOURCES, <http://www.water.ca.gov/swp/> (last visited Apr. 10, 2016).

309. *Joslin v. Marin Mun. Water Dist.*, 429 P.2d 889 (Cal. 1967); see also Brian E. Gray, *The Modern Era in California Water Law*, 45 HASTINGS L.J. 249, 257 (1993).

310. See *Nat'l Audubon Soc'y v. Superior Court of Alpine Cty.*, 658 P.2d 709 (Cal. 1983); see also Dave Owen, *The Mono Lake Case, the Public Trust Doctrine, and the Administrative State*, 45 U.C. DAVIS L. REV. 1099 (2012).

311. See *Stoa*, *supra* note 33.

312. Fenit Nirappil & Scott Smith, *California Delta Farmers Offer to Cut Water Usage 25%*, SEATTLE TIMES (May 20, 2015), <http://www.seattletimes.com/business/california-delta-farmers-offer-to-cut-water-usage-for-guarantee/>.

being correlative with other riparians, are being reduced pro rata.³¹³ Politically, the state's drought disaster declaration in 2013 put water on the agenda of virtually every agency in the state.³¹⁴ Public opinion has witnessed a similar shift: Californians now list 'water and drought' as the most important issue facing the state, nearly twice as important as 'jobs and the economy.'³¹⁵ As is often the case when communities are facing a shortage of natural resources, blame for the water crisis is being liberally apportioned,³¹⁶ with marijuana representing a convenient scapegoat.³¹⁷

B. CALIFORNIA MARIJUANA LAW AND POLITICS

Marijuana's legal history in the state is not as longstanding, but the cultivation of marijuana has been similarly difficult to regulate. In a roundabout way, marijuana came to dominate the remote regions of northern California in the 1960s and 1970s, when the back-to-the-land movement inspired urban youth to rediscover rural living and self-sufficiency. At the furthest reaches of the arm of the law, marijuana cultivation became a financially feasible way to live off the grid, especially in northern California where the land was remote and the logging industry had left behind roads and open spaces for farms to populate.³¹⁸ Around the same time, demand for domestically grown marijuana grew as the United States and Mexico began spraying Mexican marijuana crops with toxic herbicides that alarmed the public.³¹⁹ Marijuana cultivation in California has flourished in the years since—by

313. See *Jordan v. Santa Barbara*, 54 Cal. Rptr. 2d 340 (1996).

314. See *Governor Brown Declares Drought State of Emergency*, *supra* note 10; see also Paul Stanton Kibel, *In the Field and in the Stream: California Reasonable Use Law Applied to Water for Agriculture*, 46 MCGEORGE L. REV. 87 (2014).

315. BALDASSARE ET AL., *supra* note 290, at 3.

316. See, e.g., Sharon Bernstein, *In Drought, Californians Lacking Water Meters Let It Flow*, REUTERS U.S. (Apr. 8, 2015, 7:47 PM), <http://www.reuters.com/article/us-usa-california-drought-idUSKBN0MZ14V20150408>; Jack Dolan, *DWP Trusts Paid for Steak Dinners, Trips to Hawaii, Las Vegas, Audit Finds*, L.A. TIMES (Apr. 30, 2015, 6:23 PM), <http://www.latimes.com/local/lanow/la-me-ln-dwp-nonprofits-20150430-story.html>; Andrew Gumbel, *California Drought Spurs Protest over 'Unconscionable' Bottled Water Business*, GUARDIAN (Apr. 19, 2015, 11:25 PM), <http://www.theguardian.com/us-news/2015/apr/19/california-drought-protest-bottled-water>; Nathan Rott, *Drought Politics Grip California's Central Valley*, NPR (Feb. 14, 2014, 4:00 PM), <http://www.npr.org/2014/02/14/277011247/drought-politics-grip-californias-central-valley>.

317. Josh Harkinson, *Illegal Pot Farms Are Literally Sucking California Salmon Streams Dry*, MOTHER JONES (Mar. 27, 2015, 3:06 PM), <http://www.motherjones.com/blue-marble/2015/03/marijuana-farming-drought-salmon-california>.

318. See EDWIN C. BEARSS, DIV. OF HISTORY, OFFICE OF ARCHEOLOGY AND HISTORIC PRES., NAT'L PARK SERV., U.S. DEP'T OF THE INTERIOR, REDWOOD NATIONAL PARK: HISTORY AND BASIC DATA 155 (photo. reprint 1982) (1969).

319. See, e.g., *Panic over Paraquat: The Bizarre Case of the Polluted Pot*, TIME, May 1, 1978, at 28; Philip J. Landrigan et al., *Paraquat and Marijuana: Epidemiologic Risk Assessment*, 73 AM. J. PUB. HEALTH 784 (1983); Kathy Smith Boe, *Paraquat Eradication: Legal Means for a Prudent Policy?*, 12 B.C. ENVTL. AFF. L. REV. 491 (1985).

2010 nearly eighty percent of marijuana consumed in the United States came from California.³²⁰

California's dominance in the marijuana supply market was aided by the Compassionate Use Act of 1996, which was established by ballot initiative Proposition 215, legalizing the cultivation, distribution, and retail use of marijuana for medical purposes.³²¹ What the Act did not do, however, was create a detailed regulatory framework that would guide compliance and enforcement. Proposition 215 does not specify how much marijuana a patient can cultivate, or on behalf of how many patients a caregiver can cultivate.³²² Subsequent cultivation "guidelines" were established by the legislature³²³ before being declared inadmissible for criminal conviction by the California Supreme Court.³²⁴ In addition, local governments (cities and counties) are free to establish their own regulatory programs, by expanding or restricting marijuana cultivation guidelines.³²⁵ The end result is that marijuana cultivation regulations are unclear and vary from jurisdiction to jurisdiction.

The ambiguities in marijuana law did not prevent federal and state law enforcement officials from raiding marijuana grows. At first many of the targets were blatantly illegal operations. In 2010 most of the plants seized by authorities were illegally grown on public lands.³²⁶ "Operation Full-Court Press" in 2012 confiscated 632,000 plants from public land sites.³²⁷ More recently law enforcement officials have turned their attention to marijuana cultivated on private property, and impacts to water resources have been an oft-stated justification.³²⁸ There is reason to be skeptical, though, as marijuana cultivation organizations have pointed out that state regulators have not been consistent in pursuing water rights violations against illegal diversions made by vineyards further south,³²⁹ suggesting that law enforcement agencies are still primarily concerned with marijuana, not water rights. Regardless, there has been a

320. Emily Brady, *How Humboldt Became America's Marijuana Capital*, SALON (June 30, 2013, 9:30 AM), http://www.salon.com/2013/06/30/how_humboldt_became_americas_marijuana_capital.

321. California Compassionate Use Act, CAL. HEALTH & SAFETY CODE § 11362.5 (West 2007).

322. *See id.*

323. S.B. 420, 2003 S., 2003–04 Sess., § 11362.77(a) (Cal. 2003) (limiting cultivation to six mature or twelve immature plants per qualified patient).

324. *People v. Kelly*, 22 P. 3d 186 (Cal. 2010).

325. S.B. 420, 2003 S., 2003–04 Sess., § 11362.77(c) (Cal. 2003).

326. Joe Mozingo, *Cultivating a Pot Puzzle*, L.A. TIMES, Dec. 26, 2012, at A1.

327. *Mendocino Marijuana Raid: 'Operation Full Court Press' Seizes 632,000 Marijuana Plants*, HUFFINGTON POST (Oct. 9, 2011, 5:12 AM), http://www.huffingtonpost.com/2011/08/09/mendocino-marijuana-raid-operation-full-court-press_n_922804.html.

328. *E.g.*, Randall, *supra* note 5.

329. *See Harkinson, supra* note 20 ("There are 2,200 un-permitted water diversions for wine grapes in the Central Valley [...] so I am curious when we are going to see the sheriff show up and chop down un-permitted vines. If we are agnostic about what the crop is, the same crime should lead to the same activity. That is all we are asking, just to be treated like any other crop.").

shift toward enforcement and monitoring of marijuana cultivation on private lands, and with it, the need to regulate the water rights of marijuana landowners.

C. RECONCILING THE CALIFORNIA DOCTRINE WITH MARIJUANA CULTIVATION

Unfortunately, there does not appear to be a clear path toward compliance with the state's complex water laws for marijuana cultivators, nor do agencies have clear mandates. Both groups are traveling through unchartered territory without a map to guide them. In theory California water law could provide several mechanisms for marijuana cultivators to obtain water rights. Much of the marijuana cultivation industry in California is located in the water-rich northern regions, where streams and rivers fall across the mountainous landscape. The topography makes it likely that many cultivators are on lands with dormant riparian rights that can be exercised despite a history of nonuse.³³⁰ Lands overlying groundwater would have similar rights of use.³³¹ The reasonable use provision has been promoted as a mechanism to crackdown on irresponsible irrigation,³³² and the state has the authority to deem riparian rights unreasonable that could be invoked to limit riparian rights on marijuana farms,³³³ but the water demands of marijuana are modest compared to the large-scale agricultural lands of the Central Valley whose water use practices are largely upheld.³³⁴ In addition, personal cultivation would likely qualify for the state's domestic use water allowance.³³⁵

Alternatively, cultivators could apply for an appropriative permit from the state for unappropriated waters.³³⁶ Agriculture is a well-established beneficial use, with no distinction made between crops.³³⁷ Like Colorado's High Valley Farms case, a California court could take issue with the legally ambiguous nature of marijuana cultivation to find that it does not constitute a beneficial use, but state courts have rarely made

330. See *In re Waters of Long Valley Creek Stream System*, 559 P.2d 656 (Cal. 1979) (noting that riparian rights are dormant and cannot be extinguished due to nonuse).

331. See *Katz v. Walkinshaw*, 74 P. 766 (Cal. 1903).

332. Kibel, *supra* note 314.

333. See *Light v. State Water Res. Control Bd.*, 173 Cal. Rptr. 3d 200 (2014) (finding that the California Water Resources Control Board has the authority to deem riparian uses of water unreasonable).

334. *But see id.* (holding that the state's limitation on water used to protect grapes from frost was valid).

335. CAL. CODE REGS. tit. 23, § 660 (2009).

336. CAL. WATER CODE §§ 1250–1259.4 (West 2009).

337. WATER § 13050(f); CAL. CODE REGS. tit. 23, § 661 (2009); see also Dana Kelly, *Bringing the Green to Green: Would the Legalization of Marijuana in California Prevent the Environmental Destruction Caused by Illegal Farms?*, 18 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 95, 102 (2012).

nonbeneficial use findings.³³⁸ The Rainwater Capture Act of 2012 even allows rainwater to be collected from rooftops without an appropriation permit.³³⁹

The problem, then, may not lie with the letter of the state's water laws, but in the way that those laws interact with the politics and policies that govern marijuana cultivation. The patchwork of local and state marijuana regulations has created confusion regarding the water rights of marijuana cultivators.³⁴⁰ For an industry that has operated in the shadows for decades, it still seems easier to use water clandestinely than to expose oneself to prosecution.³⁴¹ For every regional water board trying to work with marijuana farmers to improve water management,³⁴² there is a law enforcement agency whose budget depends on asset forfeiture laws to obtain cash and assets from marijuana raids.³⁴³ Agencies with jurisdiction over public lands have little incentive to crack down on blatantly damaging growing operations if they are responsible for incurring clean-up costs.³⁴⁴

Water scarcity blamed on marijuana cultivation may even be the result of forces outside the control of marijuana farmers and regulatory agencies. The area was extensively logged in the nineteenth and twentieth centuries, reducing soil quality and replacing old growth forests with thirsty young trees.³⁴⁵ And the region's waters have long been diverted to agricultural and urban lands to the south. Even the Eel River itself—the degradation of which was the focus of the Island Mountain raids—is diverted south to Sonoma and Mendocino's wine-producing regions.³⁴⁶

The marijuana farming community is, strangely enough, actively pushing for stronger regulation of the industry.³⁴⁷ In part this is because

338. *But see* Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 45 P.2d 972 (Cal. 1935).

339. Rainwater Capture Act of 2012, Assemb. B. 1750, 2012 Cal. Assemb., 2012–13 Sess., § 7027.5 (Cal. 2012).

340. Telephone Interview with Hezekiah Allen, Chair & Exec. Dir., Emerald Growers Ass'n (Aug. 20, 2015).

341. Interviews with marijuana farmers, *supra* note 87; *see also* Bauer et al., *supra* note 15 (noting that most lands in the Island Mountain area do not have registered water permits).

342. *See* Press Release, Cal. Water Bds., *supra* note 291; *see also* Baumann *supra* note 292.

343. *See* Karis Ann-Yu Chi, *Follow the Money: Getting to the Root of the Problem with Civil Asset Forfeiture in California*, 90 CALIF. L. REV. 1635 (2002); *see also* Baumann, *supra* note 292.

344. Telephone Interview with Adrian Baumann, Reporter & Editor, East Bay Express (Aug. 14, 2015).

345. *See* ANDREW STUBBLEFIELD ET AL., SUMMER WATER USE BY MIXED-AGE AND YOUNG FOREST STANDS, MATTOLE RIVER, NORTHERN CALIFORNIA, U.S.A. 183 (2012); LARRY P. MAURIN & ANDREW P. STUBBLEFIELD, *Channel Adjustment Following Culvert Removal from Forest Roads in Northern California, USA*, 29 ECOLOGICAL RESTORATION 382 (2011).

346. *Flows in the Eel River and the Potter Valley Project*, POTTER VALLEY IRRIGATION DISTRICT, <http://www.pottervalleywater.org/flows.html> (last visited Apr. 10, 2016).

347. Telephone Interview with Hezekiah Allen, *supra* note 340; Interviews with members of California Cannabis Voice Humboldt (Sept. 10, 2015).

the absence of a clear and comprehensive framework is prompting agencies to take marijuana irrigation regulation into their own hands, creating uncertainty in the legal marijuana market. These various regulatory initiatives are often at cross-purposes, and the disconnect between the water quality control board and the department of fish and wildlife is but one example of the deficiencies in California's regulatory approach. One investment guide found that despite being the largest marijuana market in the country, "California[] is no longer a model for medical cannabis legalization because of its lack of statewide regulation."³⁴⁸

California's experience with marijuana legalization and water scarcity suggests that a laissez-faire approach to regulation might be ineffective when competing demands for water resources are combined with a proliferation of local cultivation laws and agency initiatives. The decentralized nature of regulation in California does have the potential to foster innovation as agencies experiment with different regulatory approaches, but so far an integrated vision has not emerged. Three complementary bills were signed into law in October 2015 to promote marijuana reform.³⁴⁹ One of these, AB 243, addresses marijuana cultivation and environmental impacts.³⁵⁰ The bills empower California's state agencies to work together to create an integrated regulatory framework, but it remains to be seen if that framework will come to fruition. In the meantime, recreational marijuana legalization might appear on California's ballot on election day 2016.³⁵¹ The state's rocky experience with regulating water use for marijuana cultivation to date suggests that an integrated and proactive approach is needed to ensure a smooth transition to full-blown legalization.

V. BLAZING A TRAIL TO SUSTAINABLE MARIJUANA FARMING

The early record of marijuana irrigation regulation in Colorado and California suggests that states have not given sufficient thought to the challenge of regulating water use on marijuana farms. While some jurisdictions have made initial attempts to implement regulations, it is clear that a consensus approach or time-tested framework has not emerged. Aside from these early experiences, the theoretical applications of water law doctrine to marijuana cultivation explored above raise a number of potential issues and legal ambiguities that are likely to frustrate agencies and cultivators in the future.

348. See REA ET AL., *supra* note 75.

349. Assemb. B. 243, 2015 Assemb., 2014-15 Sess. (Cal. 2015); Assemb. B. 266, 2015 Assemb., 2014-15 Sess. (Cal. 2015); S.B. 643, 2015 S., 2014-15 Sess. (Cal. 2015).

350. See, e.g., Assemb. B. 243, 2015 Assemb., 2014-15 Sess., § 12029 (Cal. 2015).

351. *California 2016 Ballot Propositions*, BALLOTPEDIA, https://ballotpedia.org/California_2016_ballot_propositions (last visited Apr. 10, 2016).

Fortunately, in jurisdictions where marijuana cultivation is legal to some degree, agencies and cultivators have expressed the same goal: to create a regulatory framework that is equitable and predictable, and that promotes sustainable marijuana farming.³⁵² The approaches or doctrinal applications explored above tend to fail at least one of these prongs. In this Part the costs and benefits of three common regulatory approaches are analyzed. More than likely states will need to consider the trade-offs of these approaches as they develop their marijuana irrigation regulations. While the characteristics of each state will dictate which of these approaches strike the right balance, the clandestine nature of the marijuana industry raises the stakes for states to get it right. If there is too little regulation and water rights will remain ambiguous and poorly managed. If there is too much regulation and marijuana cultivators may stay in the shadows altogether.

A. POWER DISTRIBUTION AND THE TRADE-OFFS OF DECENTRALIZATION

While the multitude of local regulations in California has been confusing to many (and unevenly applied), there is a solid basis for decentralized regulation. Distributing power between local agencies engages those agencies in the regulatory process. In doing so, the regulatory framework capitalizes on the localized expertise, heightened awareness of changing ecological conditions, and existing relationships between local stakeholders that collectively form a promising recipe for good governance.³⁵³ Simply put, local actors are knowledgeable about their community and provide legitimacy to local regulations. Conversely, there is often resistance to top-down policies that do not reflect local realities, resistance that can manifest itself in noncompliance with regulatory requirements.³⁵⁴ A final benefit is that by allowing local agencies to create their own policies or manage their own natural resources, the collective whole develops resilience by experimenting with different

352. These sentiments were echoed by Hezekiah Allen, Executive Director of the Emerald Growers Association, and Alan Martellaro, District Engineer of the Colorado Department of Water Resources, among others. See Telephone Interview with Hezekiah Allen, *supra* note 340.

353. See Ryan B. Stoa, *Subsidiarity in Principle: Decentralization of Water Resources Management*, 10 *UTRECHT L. REV.* 31, 34 (2014).

354. In *Democracy in America*, Alexis de Tocqueville remarked in his comparison of early America with contemporary England that “central administration enervates the nations in which it exists by incessantly diminishing their public spirit. If such an administration succeeds in condensing at a given moment, on a given point, all the disposable resources of a people, it impairs at least the renewal of those resources. It may ensure a victory in the hour of strife, but it gradually relaxes the sinews of strength. It may contribute admirably to the transient greatness of a man, but it cannot ensure the durable prosperity of a nation.” ALEXIS DE TOCQUEVILLE, 1 *DEMOCRACY IN AMERICA* 84 (Henry Reeve trans., 1850).

strategies or approaches, some of which might fail while others foster successful innovations that can be replicated in other jurisdictions.³⁵⁵

These benefits of decentralization generally are particularly applicable to regulating marijuana cultivation and its corresponding water needs. Marijuana remains a controversial political issue, the liberalization of which benefits from allowing legalization opponents to enact policies they are more comfortable with.³⁵⁶ In regions like northern California where a large cultivation community exists in a remote and unique social setting, local officials are better suited to engage an introverted industry than state or federal officials. They are also more likely to develop regulations that reflect the realities of marijuana cultivation, on the one hand, and the water resources supply of the region on the other hand. The North Coast Water Quality Control Board, for example, has put forth a water quality regulation program for marijuana cultivation that was modified based on feedback from marijuana farmers in the north coast region.³⁵⁷ The Central Valley Water Quality Control Board did the same in the Central Valley.³⁵⁸ Both programs are integrated into an interagency, statewide strategy for marijuana irrigation regulation that should facilitate coherence across regions.³⁵⁹ This type of regulatory structure is especially helpful when states are regulating an industry—like marijuana—that is new or unfamiliar, with few established blueprints for success.

If states pursue a decentralization strategy, however, they will be exposed to certain vulnerabilities. Local agencies and jurisdictions might be authorized to develop and enforce their own regulations, but they might not have the institutional capacity to do so. Regulating water used for marijuana cultivation implicates complex tasks, like hydrological modeling or drug trafficking enforcement, which local agencies may be ill-equipped to handle.³⁶⁰ Even when they are, significant reforms might

355. Stoa, *supra* note 353, at 34; *see also* Graham R. Marshall, *Nesting, Subsidiarity, and Community-Based Environmental Governance Beyond the Local Level*, 2 INT'L J. OF THE COMMONS 77 (2008); Elinor Ostrom, *Coping with Tragedies of the Commons*, 2 ANN. REV. OF POL. SCI. 493, 526 (1999).

356. The city of Galt, California, for example, has banned the indoor or outdoor cultivation of marijuana. Jennifer Bonnett, *Galt's Medical Marijuana Rule Takes Effect*, LODI NEWS-SENTINEL (Mar. 5, 2013, 6:10 AM), http://www.lodinews.com/news/article_7173905e-c341-11e4-bega-23987e765448.html.

357. CAL. REG'L WATER QUALITY CONTROL BD., NORTH COAST REGION: EXECUTIVE OFFICER'S SUMMARY REPORT (2015).

358. CAL. REG'L WATER QUALITY CONTROL BD., CENTRAL VALLEY REGION: WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR DISCHARGE OF WASTE ASSOCIATED WITH MEDICAL CANNABIS CULTIVATION ACTIVITIES, ORDER R5-2015-XXXX (2015).

359. *See, e.g.*, CAL. WATER BDS., STRATEGY FOR REGULATION AND ENFORCEMENT OF UNAUTHORIZED DIVERSIONS: DISCHARGES OF WASTE TO SURFACE AND GROUNDWATER CAUSED BY MARIJUANA CULTIVATION (2014).

360. Emily Brady's chronicles of a Humboldt County Deputy Sheriff underline the solitary and seemingly futile efforts to enforce ambiguous marijuana laws in the region. BRADY, *supra* note 287, at 48.

constitute an impermissible government taking requiring compensation, which local agencies might not be able to afford.³⁶¹ Regulation requires investments in human, infrastructural, and technological resources that states might not be able to provide to local agencies, resulting in some jurisdictions with well-funded agency operations, and others with little to no regulatory capacities.

A corollary of the institutional capacity challenge is that local agencies might not be equipped to regulate on two dimensions simultaneously, as the marijuana-water nexus requires. Colorado's Marijuana Enforcement Division, for example, is defined by its regulatory identification with marijuana, but not water resources.³⁶² The state's Department of Water Resources, conversely, is equipped to handle traditional water cases but has received little guidance on how to address marijuana cultivation.³⁶³ Both institutions are state-level agencies that do not have sufficient interdisciplinary expertise. The challenge can be more pronounced at local levels where it can be difficult to establish regulatory capacity on one dimension, much less two.

Efforts to decentralize power away from a central government and toward local governments can also, if hastily or sloppily designed, look more like power abdication (in which governments shift an unwanted burden of regulation onto another jurisdiction) or power fragmentation (in which regulatory authorities are ambiguously spread between many different agencies). The former is a problem because while transferring power from state to local agencies has its benefits, the state retains an important role to play by supporting and coordinating local initiatives.³⁶⁴ Fragmentation can also be a problem when it leads to overlapping mandates, uncoordinated regulation, or counterproductive policies.³⁶⁵ In northern California, the state's water quality regulators were trying to get marijuana farmers to buy into their program at the same time that

361. See, e.g., *Koontz v. St. Johns River Water Mgmt. Dist.*, 133 S. Ct. 2586 (2013); Craig, *supra* note 261.

362. See ENF'T DIV., COLO. DEP'T OF REVENUE, MARIJUANA: ANNUAL UPDATE (2015).

363. Telephone Interview with Alan Martellaro, Div. Eng'r, Colo. Div. of Water Res. (Aug. 19, 2015).

364. To take a broader view of this point, cooperative federalism frameworks between the federal and state governments (such as the regulatory structures for the Clean Water Act or Clean Air Act) have been effective at utilizing the federal government's funding streams and establishment of minimum standards to support state-level programs that remain relatively coherent from a national perspective. See, e.g., Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. ENVTL. L.J. 179 (2005); Douglas Williams, *Toward Regional Governance in Environmental Law*, 46 AKRON L. REV. 1047 (2013); Ryan B. Stoa, *Cooperative Federalism in Biscayne National Park*, 56 NAT. RESOURCES J. (forthcoming 2016).

365. See also Ryan B. Stoa, *Water Governance in Haiti: An Assessment of Laws and Institutional Capacities*, 29 TUL. ENVTL. L.J. (forthcoming 2016).

sheriff's departments were conducting raids and making arrests.³⁶⁶ If local agencies are authorized to develop regulations concerning marijuana cultivation and water allocation, the authorizations should clearly articulate which agency has that responsibility, and what the relationship is between that agency, other agencies, and the state's broader regulatory framework.

B. CULTIVATION LICENSING AND THE TRADE-OFFS OF REGULATING BARRIERS TO ENTRY

An easy way for states to gradually incorporate legal marijuana cultivation into their regulatory frameworks is to dramatically limit the number of cultivation licenses available. While California struggles to regulate tens of thousands of marijuana farms, states like Florida,³⁶⁷ New York,³⁶⁸ and Ohio³⁶⁹ would limit cultivation licenses to less than a dozen. This type of approach allows the state to carefully select responsible cultivators, makes it easy to monitor cultivation, reduces pressure on water rights and water resources, and buys time before presumably shifting to a more expansive model. With so few cultivators, states can lavish regulatory attention on the licensees to ensure environmental compliance, or craft site-specific rules depending on the water needs and cultivation infrastructure of the operation.³⁷⁰ And in a sense the system is predictable by making it clear that only a select number of businesses may cultivate marijuana. There is no ambiguity with respect to water rights if the purpose of the water use is not permitted in the first place.

There are two major drawbacks to this model. Although limiting cultivation licenses might promote sustainability and reduce the regulatory burden, it is hard to find equity when the state permits only a small handful of cultivators to participate in the market. Ohio's constitutional amendment to legalize marijuana includes a list of landowners who would have exclusive rights to cultivate marijuana in the state.³⁷¹ The attempt to control the market prompted some legislators to

366. See Baumann, *supra* notes 292–294 and accompanying text; McClurg, *supra* 132; Stoa, *supra* note 32; *Governor Brown Declares Drought State of Emergency*, *supra* note 10; Press Release, Cal. Water Bds., *supra* note 291.

367. S.B. 1030, 2014 S., 2014 Sess. (Fla. 2014).

368. Assemb. B. 6357, 2014 Assemb., 2013–14 Sess. (N.Y. 2014); see also Catherine Rafter, *New York State Just Granted Five Medical Marijuana Licenses*, OBSERVER NEWS (July 31, 2015, 3:00 PM), <http://observer.com/2015/07/new-york-state-just-granted-five-medical-marijuana-licenses>.

369. CONSTITUTIONAL OFFICES SECTION, OHIO ATT'Y GEN., INITIATIVE PETITION: LEGALIZE MARIJUANA AND HEMP IN OHIO (Apr. 28, 2015).

370. In principle states can tailor any number of water or agricultural permits, but there is a limit to how extensive the specifications can be when administering large volumes of permit applications. See Gary D. Lynne et al., *Water Permitting Behavior Under the 1972 Florida Water Resources Act*, 67 LAND ECON. 340 (1991).

371. The amendment's text includes the tax parcel numbers of the properties in question: "Subject to the exceptions set forth herein, there shall be only ten MGCE facilities, which shall operate on the

introduce a constitutional amendment of their own that would prohibit the state's constitution from being used to create economic monopolies.³⁷² Even if the state transitions to a more permissive model eventually, the previously licensed cultivators will have a government-given leg up on the competition. And while the state may have developed the capacity to create site-specific regulations for water management under the restrictive model, those capacities would be less relevant when cultivation proliferates and a more comprehensive regulatory approach is needed.

More importantly perhaps, severe limitations on cultivation licenses ignore the existence and persistence of black market cultivators and their impacts on water resources. If marijuana cultivation were not occurring to begin with, a limited licensing approach might be sensible. But marijuana is widely available in part because domestic cultivation is increasing across the United States, particularly on private lands.³⁷³ With legalization efforts gaining momentum and spreading knowledge on cultivation methods, it seems unlikely that marijuana cultivation will remain dormant for long. There is no ambiguity with respect to water taken for illegal marijuana cultivation (it would not qualify as a beneficial or reasonable use), but water resources and water rights holders nonetheless incur the costs of illegal diversions if the state cannot ensure compliance. Considering the size and growth of the marijuana industry, eradication of unlicensed marijuana cultivators is unlikely.³⁷⁴ Limiting cultivation to a small handful of businesses offers transitional benefits, but is unlikely to be a sound long-term solution.

C. THE NO ACTION ALTERNATIVE

The benefits of regulating water allocation have led many states to manage their water rights systems administratively, but some have been content to let the common law drive the process on the grounds that the drawbacks of administrative regulation outweigh the benefits of intervention.³⁷⁵ The drawbacks apply just as well to the potential regulation of water use on marijuana farms, a consideration that might tempt states to take little or no action by allowing marijuana to be subject to the same rules and regulations as any other agricultural commodity.

following real properties: (1) Being an approximate 40.44 acre area in Butler County, Ohio, identified by the Butler County Auditor, as of February 2, 2015, as tax parcel numbers Q6542084000008 and Q6542084000041[...].” CONSTITUTIONAL OFFICES SECTION, *supra* note 369.

372. H.R.J. 4, 131st Gen. Assemb., Reg. Sess. (Ohio 2015).

373. DRUG ENF'T ADMIN., U.S. DEP'T OF JUSTICE, NATIONAL DRUG THREAT ASSESSMENT SUMMARY 25 (2014).

374. The DEA has described the shift in cultivation practices toward private lands as an obstacle to law enforcement and eradication. *Id.* at 26.

375. *See, e.g.,* DELLAPENNA, *supra* note 225, at 90.

One advantage of the no action alternative is monetary—creating and supporting administrative agencies requires significant investment of state funds. The South Florida Water Management District’s Fiscal Year 2015 budget was \$720.4 million, for example.³⁷⁶ A scathing audit of Colorado’s Marijuana Enforcement Division criticized the agency’s unsustainable funding model and poor fiscal management.³⁷⁷ Even if states avoid the cost of creating new agencies by placing the burden of marijuana-specific regulation on existing agencies, they will need to invest in staff, infrastructure, and technologies that supply the agency with sufficient expertise.³⁷⁸ California put \$3.3 million of state funds toward supplementing the marijuana regulation capacities of agencies in northern California, including the North Coast Regional Water Quality Control Board.³⁷⁹ Moving forward, the board’s regulatory programs for marijuana cultivation will need to secure enough participation from farmers that administrative fees can support the agency’s expenses.³⁸⁰

The second advantage of the no action alternative is that it avoids the possibility that administrative control will lead to poor decisionmaking or inefficient market outcomes. In states where water is abundant and marijuana cultivation will have little to no impact on water resources or existing rights, administrative regulation is unnecessary and a poor use of scarce resources.³⁸¹ Washington has more or less adopted this view by assuming that all marijuana cultivators will qualify for well water permit exemptions.³⁸² South Carolina has taken a similarly permissive stance with respect to agriculture in general.³⁸³ And the legal ambiguity of California’s cultivation guidelines demonstrates that state interventions

376. Press Release, S. Fla. Water Mgmt. Dist., SFWMD 2015 Budget Includes Major Support from the State to Protect and Restore the Everglades and Coastal Estuaries (Sept. 23, 2014) (on file with author).

377. In one key finding, the audit found that

the Division laid off a majority of its staff in Fiscal Year 2012 due to revenue shortfalls. Specifically, in Fiscal Years 2011 and 2012, the Division experienced 19 consecutive months of net losses, including a loss of about \$2.3 million in June 2011 because of large capital purchases, such as furniture, computer equipment, and software for a marijuana plant tracking system. Weaknesses in the Division’s fee-setting, strategic planning, and expense controls contributed to its funding problems.

COLO. OFFICE OF THE STATE AUDITOR, MEDICAL MARIJUANA REGULATORY SYSTEM PART I (Mar. 2013); see also John Ingold, *Colorado Recreational Marijuana Regulations Need Money, Officials Say*, DENV. POST (Mar. 26, 2013, 1:25 PM), http://www.denverpost.com/breakingnews/ci_22874999/colorado-recreational-marijuana-regulations-need-money-officials-say.

378. For an analysis of water governance capacities at the extreme low end of the spectrum, see Stoa, *supra* note 365.

379. Baumann, *supra* note 292.

380. *Id.*

381. Abrams, *supra* note 266.

382. See *Frequently Asked Questions*, *supra* note 146 (discussing Washington’s permit exemption for marijuana).

383. See Abrams, *supra* note 270.

might create more confusion than clarity.³⁸⁴ From another perspective, a laissez faire approach to water management takes advantage of free market forces by allocating water rights wherever they are most valued.³⁸⁵ By this logic, marijuana cultivation will receive whatever amount of water rights the market dictates, maximizing efficiency of use. In riparian jurisdictions, courts would be capable of determining if marijuana cultivation has sufficient economic and social value to justify impacts on co-riparians.

The no action alternative might be ideal in states where water is abundant and marijuana cultivation is limited. That might be the case as states are transitioning to marijuana legalization, especially when cultivation licenses are tightly controlled.³⁸⁶ But sooner or later cultivation is likely to take root on a larger scale, and ignoring the impact that the marijuana industry will have on water rights would be unwise. The costs of regulation might be significant, but so are the taxes and fees generated by regulation.³⁸⁷ The audit of Colorado's Marijuana Enforcement Division did not conclude that fiscal mismanagement was an issue inherent with marijuana regulation,³⁸⁸ and the agency has since streamlined its operations.³⁸⁹ From a broader perspective, marijuana might be the largest cash crop in the United States,³⁹⁰ and some regulatory expertise on this unique crop should be developed even if regulatory challenges are less severe than anticipated.

Claims that free markets will resolve allocation problems fail to appreciate the characteristics of both water and marijuana that make the no action alternative a questionable approach. As a scarce natural resource, water has never been an ideal example of the sustainability of free market principles.³⁹¹ Similarly, marijuana's history as a black market commodity means that in the absence of oversight, cultivators of marijuana might be

384. See S.B. 420, 2003 S., 2003–04 Sess., § 11362.77(a), (c) (Cal. 2003); *People v. Kelly*, 22 P. 3d 186 (Cal. 2010).

385. See, e.g., Dustin Garrick et al., *Understanding the Evolution and Performance of Water Markets and Allocation Policy: A Transaction Cost Analysis Framework*, 88 *ECOLOGICAL ECON.* 195 (2013); Jason F. L. Koopman et al., *The Potential of Water Markets to Allocate Water Between Industry, Agriculture, and Public Water Utilities as an Adaptation Mechanism to Climate Change*, *MITIGATION AND ADAPTATION STRATEGIES FOR GLOBAL CHANGE* (2015).

386. See *supra* note 281 and accompanying text.

387. *Colorado Marijuana Tax Data*, COLO. DEP'T OF REVENUE, <https://www.colorado.gov/pacific/revenue/colorado-marijuana-tax-data> (last visited Apr. 10, 2016).

388. See *Flows in the Eel River and the Potter Valley Project*, *supra* note 346.

389. Eric Gorski, *State Marijuana Regulators Pledge Stronger Enforcement*, *DENV. POST* (Mar. 26, 2014, 12:01 AM), http://www.denverpost.com/marijuana/ci_25420620/state-marijuana-regulators-pledge-stronger-enforcement.

390. See Gettman, *supra* notes 72–73; CAULKINS ET AL., *supra* note 74; REA ET AL., *supra* note 75; see also *supra* note 76.

391. See, e.g., Joseph W. Dellapenna, *Adapting Riparian Rights to the Twenty-First Century*, 106 *W. VA. L. REV.* 539 (2003); M. Alexander Pearl, *The Tragedy of the Vital Commons* (Mar. 6, 2015) (unpublished manuscript, Texas Tech University of Law), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2574870.

more comfortable making illegal diversions of water resources than cultivators of other crops. And while allowing marijuana cultivation to qualify for permit exemptions (on the grounds that it constitutes agriculture or does not consume unsustainable quantities of water) will make it easy for farmers to transition to legalization, there are reasons to question the long-term viability of such open-ended approaches.³⁹² Today, there is little research on marijuana water use on any scale,³⁹³ nor is it clear how the industry will evolve. Given these uncertainties, states with significant potential for marijuana cultivation or water scarcity may find that, at the very least, proactive monitoring of marijuana cultivation and water use is a more sound approach than taking no action at all.

CONCLUSION

Marijuana legalization in the United States is proceeding at a brisk pace. Marijuana is already legal for recreational use in Colorado,³⁹⁴ Washington,³⁹⁵ Oregon,³⁹⁶ Alaska,³⁹⁷ and Washington, D.C.³⁹⁸ Between now and election day 2016, an additional fourteen states might place marijuana legalization initiatives on their ballots.³⁹⁹ In addition, twenty-three states and Washington, D.C. have legalized medical marijuana, with up to seven states pending legislation.⁴⁰⁰ There might be setbacks along the way,⁴⁰¹ but it appears unlikely that states will return to the era of marijuana prohibition when cultivation was entirely prohibited and, therefore, conducted on the black market. Of the many regulatory challenges implicated by legalizing a popular and lucrative agricultural commodity in such a short timeframe, water use is one that is important for both the marijuana industry and the water rights system. It is also a regulatory challenge to which states have, so far, not given much thought. There is some potential for existing water laws to accommodate marijuana legalization without requiring regulatory intervention from

392. Abrams, *supra* note 270.

393. For example, on the plant, farm, or watershed level.

394. COLO. CONST., art. XVIII, § 16.

395. Washington Marijuana Legalization and Regulation, Initiative 502 (codified as amended in scattered chapters of WASH. REV. CODE §§ 69, 46).

396. Oregon Legalized Marijuana Initiative, Measure 91 (codified as amended in scattered chapters of OR. REV. STAT.).

397. Alaska Marijuana Legalization, Ballot Measure 2 (codified as amended in ALASKA STAT. § 17.38010).

398. Washington D.C. Marijuana Legalization, Initiative 71 (codified as amended in D.C. CODE § 48-904).

399. *Marijuana on the Ballot*, *supra* note 28.

400. *Id.*

401. Jacob Sullum, *Which States Will Legalize Marijuana This Year and Next?*, FORBES (Apr. 9, 2015, 7:00 PM), <http://www.forbes.com/sites/jacobsullum/2015/04/09/which-states-will-legalize-marijuana-this-year-and-next>.

the state,⁴⁰² but more than likely, states will need to develop a regulatory framework (or modify an existing one) that responds to the unique demands that legal marijuana cultivation places on water resources and water rights.

In the American West, where prior appropriation still forms the basis for most state water law frameworks, states will need to balance the temptation to provide marijuana farmers with water access (lest they make illegal appropriations or move out-of-state) with existing appropriative rights that give priority to senior rights holders. The federal Bureau of Reclamation will make this particularly difficult as long as the federal marijuana prohibition persists. Fortunately, most prior appropriation states administer water rights through a regulatory agency that could address the issue proactively, without significantly interfering with existing rights. The prior appropriation doctrine will make it challenging to appease a brand new agricultural subsector, but states have more flexibility than strict doctrinal applications would suggest.

Riparian doctrine states should have a slightly easier time adjusting to legal marijuana cultivation, as riparian rights are not fixed but accommodate reasonable uses of shared waters. Regulated riparian states might not have as much flexibility in the short term if existing permits allocate all of the available water resources of a watercourse, but in the longterm agencies retain the flexibility to shape water use in the state by controlling the permit process. The flexibility should provide ample room to maneuver in the new marijuana economy.

In many states the challenges of regulating marijuana water use remains theoretical. In California, however, the issue is very real. Water is already a scarce and fiercely controlled resource, with a complex system of riparian, appropriative, and groundwater rights. The various water rights regimes of the California doctrine provide multiple opportunities to create or recognize rights to water for marijuana cultivators, but the complexity of the system will make it challenging to capitalize on those opportunities. California's decentralized approach to marijuana regulation, meanwhile, is allowing local governments to move in many different directions, sometimes at cross-purposes. The size of the marijuana cultivation industry in California is the largest in the United States, and given the scarcity of water resources in the state, a more proactive and integrated approach to regulating marijuana irrigation is justified.

Two themes emerge from this study of water doctrine and marijuana cultivation. First, theoretical applications of water law to legal marijuana cultivation demonstrate that while these doctrines are often

402. *See supra* Part V.C.

criticized for being rigid and antiquated, there is room in the law for jurisdictions to provide enough water to marijuana farmers that they will participate in the regulatory process without significantly disrupting existing water rights. This is particularly true in jurisdictions that adopt a modified or regulatory version of traditional doctrine that softens the rigidities of the common law. The second theme is that in practice, the initial signs coming from states where marijuana cultivation is legal to some degree suggest that the theoretical ability of water law doctrine to incorporate marijuana cultivation is not sufficient to ensure a smooth transition. There are too many legal ambiguities in both water laws and marijuana laws for the application of both simultaneously to be able to function coherently and consistently. In order to promote sustainable, responsible, and legal marijuana cultivation, while administering water rights equitably, states will need to adjust their regulatory frameworks to address the challenges that marijuana legalization presents.

This study focused on prior appropriation, riparianism, and the California doctrine when analyzing the relationships water rights regimes will have with marijuana cultivation. These are not the only laws that address water resources, however, and further research can build on these findings by exploring the ways in which marijuana cultivation will interact with groundwater rights, tribal reserved rights, or water quality standards. Tribal jurisdictions, for example, hold reserved rights to use water resources to irrigate crops,⁴⁰³ as well as significant discretion to craft marijuana policy.⁴⁰⁴ But it is not clear if tribes have reserved rights to use water to violate a federal marijuana prohibition. There is great uncertainty, similarly, regarding the impact of marijuana cultivation on water quality. The federal Clean Water Act has not been particularly effective at regulating agricultural runoff,⁴⁰⁵ but if states are creating regulatory frameworks for marijuana cultivation, there may be an opportunity to rethink agricultural water quality regulations.

Research for this study was informed and supplemented by interviews with state regulators, local politicians, and marijuana farmers from Colorado to California. Across the board, these stakeholders lamented the absence of a clear regulatory framework that could clarify and fairly apportion water rights while promoting the sustainable cultivation of marijuana. There is uncertainty in the application of traditional doctrines and regulations to the unknown and quickly evolving marijuana industry. That uncertainty is putting farmers at risk

403. See *Arizona v. California*, 460 U.S. 605 (1983); *Winters v. United States*, 207 U.S. 564 (1908).

404. See Memorandum from Monty Wilkinson, Dir., U.S. Dep't of Justice, Policy Statement Regarding Marijuana Issues in Indian Country (Oct. 28, 2014) (on file with author) (stating that the Justice Department will not focus its resources on prosecuting marijuana cultivation on tribal lands).

405. See, e.g., Thomas C. Brown & Pamela C. Froemke, *Nationwide Assessment of Nonpoint Source Threats to Quality Water*, 62 *BIOSCIENCE* 136 (2012).

despite their often commendable intentions, and forces agencies to address the issue without guidance or a broader vision for integration. Said one stakeholder and long-time resident of northern California: “the lack of regulation is creating an enforcement crisis, an investment crisis, and an environmental crisis.”⁴⁰⁶ This study has shown that state water laws have the capacity to address marijuana cultivation, but states and their regulatory agencies will need to play a role in the process in order to ensure a smooth transition.

406. Allen, *supra* note 340.