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# FINANCIAL INCENTIVES FOR LAND RESTORATION IN THE UNITED STATES

*ENVP U9232 The Workshop In Applied Earth Systems Policy Analysis*

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# TABLE OF CONTENTS

Definitions and Acronyms	3
Executive Summary	4
Introduction	6
Background: Restoration Policy Drivers	8
Geography	9
Land Ownership	10
Land Use	12
Environmental Threats	12
Methodology	14
Overview: Project Goals	15
Literature Review and Data Collection	16
Expert Interviews	17
State Selection	18
Policy Selection	18
Database Development	19
Section 1: Federal Restoration Policies	20
Overview	21
Other Agencies	21
Section 2: State Restoration Policies	24
Overview	25
Case Study: California	26
Case Study: Colorado	30
Case Study: Maryland	34
Section 3: Trends in Aggregated Policies Across States	38
Discussion and Critical Considerations	46
Discussion	47
Critical Considerations	48
Recommendations and Next Steps for WRI	50
Conclusion	52
Briefings	52
Team Bios	54
Appendix A: Full policy database with all the states	56
Appendix B: Rapid Policy Analysis	62
Acknowledgements	64
Endnotes	65

# DEFINITIONS AND ACRONYMS

<b>Technical assistance:</b> non-financial assistance, such as sharing knowledge or expertise, skills or training	<b>CRP:</b> Conservation Reserve Program
<b>Grant:</b> financial sum that is awarded to groups or individuals for the completion of a public benefit project	<b>CSP:</b> Conservation Stewardship Program
<b>Cost-share:</b> agreement between the government and an individual in which the government agrees to fund a portion of an expenditure	<b>ECP:</b> Emergency Conservation Program
<b>Easement:</b> agreement between the government and an individual whereby the government purchases the rights to a piece of land for a fixed time period, while the individual retains ownership of the land	<b>EFRP:</b> Emergency Forest Restoration Program
<b>Credit/guarantee:</b> financial note that is issued in exchange for a good or service, and that can be traded to procure other goods or services	<b>EQIP:</b> Environmental Quality Incentive Program
<b>Direct payment (Payment for Ecosystem Services):</b> payment by the government for the provision of a specific ecosystem service, such as improved soil quality	<b>ERAL:</b> Ecosystem Restoration on Agricultural Lands
	<b>FIP:</b> Forestry Incentive Program
	<b>FSP:</b> Forest Stewardship Program
	<b>MACS:</b> Maryland Agricultural Water Quality Cost-Share Program
	<b>MD:</b> Maryland
	<b>NbS:</b> Nature-based Solutions
	<b>OECD:</b> Organization for Economic Cooperation and Development
	<b>US:</b> United States of America
	<b>UECA:</b> Uniform Environmental Covenant Act
	<b>UN:</b> United Nations
	<b>USDA:</b> US Department of Agriculture
	<b>USDOI:</b> US Department of the Interior
	<b>USEPA:</b> United States Environmental Protection Agency
	<b>USFA:</b> US Farm Agency
	<b>USFS:</b> US Forest Service
	<b>USFWS:</b> US Fish and Wildlife Service
	<b>WHIP:</b> Wildlife Habitat Incentives Program
	<b>WRE:</b> Wetland Reserve Easement
	<b>WRI:</b> World Resources Institute

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## EXECUTIVE SUMMARY

Land degradation is an urgent global threat affecting the livelihoods of 3 billion people. Caused by human activities such as agriculture, logging, and urbanization, land degradation is projected to worsen as the global population increases and climate change intensifies. The United Nations has recognized the need to address this problem through land restoration by declaring 2021-2030 the Decade of Ecosystem Restoration. There are various types of restoration, including reforestation, sustainable agriculture practices, wetland management, and more.

As part of a capstone project for the Columbia University's Master of Public Administration-Environmental Science and Policy degree program, students completed this report in the service of the World Resources Institute (WRI)'s goal to explore the restoration policy landscape in the United States. Restoration requires both policies that are appropriate, as well as a significant financial investment from governments. With its robust private financial system and well-resourced federal government, the U.S. has made strides in restoration that have the potential to be replicated in other countries.

This report examines state and federal level policies in the U.S. that contain financial mechanisms to incentivize land restoration in three sections:

- » **Section 1** of the report presents a stakeholder map of key federal restoration entities and the policies that they implement.
- » **Section 2** of the report provides a snapshot of the state-level restoration policy landscapes in the states of California, Colorado, and Maryland.
- » **Section 3** of the report summarizes and visualizes the trends and findings from a policy database of 60 federal and state-level policies across California, Colorado, and Maryland.

Specifically, the policy research focused on identifying policies that provide financial incentives for private landowners. The research found that:

1. The United States implements a variety of policies for land restoration with economic and financial incentives at the federal and state levels. These incentives include taxes, fees, grants, technical assistance, and credits and guarantees.
2. Due to the United States' federalized political system, the individual states hold significant power over creating, funding, and implementing restoration activities. Therefore, states often take unique approaches to addressing the issue.

This report provides WRI with a baseline understanding of financial incentives across three distinct geographies in the United States. These findings will support WRI in validating its own policy analysis tools and in identifying promising incentives that could be scaled globally.





# INTRODUCTION

**Columbia University students created this report in the service of the World Resources Institute (WRI)’s Global Restoration Initiative to identify policy incentives for land restoration efforts in the United States.**

WRI has a mission to advance the responsible management of natural resources and to preserve the environment for future generations. To accomplish this goal, WRI is building a global policy analysis tool that will identify financial and economic incentives for land restoration. Due to the United States’ size, geographic diversity, global influence, and advanced economy, the country holds potential policy lessons for WRI’s work in developing countries across the globe. In addition, in order to address the problem of land degradation, the United States has set an ambitious restoration target of setting aside 30% of American land and water for nature by 2030.<sup>1</sup> With the world entering into the United Nations (UN) Decade for Ecosystem Restoration and the Biden-Harris Administration taking office in 2021, it is an ideal time to take stock of incentives for land restoration in the U.S.

### *Financial Policy Incentives*

**Governments employ financial incentives to encourage positive behavior change within the population.** Since landowners may not be inclined to spend their own funds on restoration initiatives, policies are designed to provide them with monetary compensation for these activities. Examples of financial incentives include grants, cost-share programs, and technical assistance provided by the government. The United States has the largest number of financial policy incentives for restoration out of the 36 member countries in the Organization for Economic Cooperation and Development (OECD), making it a potentially rich research region for the WRI.<sup>2</sup>

### *Land Degradation*

**Land degradation is the diminishing productivity of land-based ecosystems from harmful human activities, such as deforestation, soil erosion, and abandonment.**<sup>3</sup> This lost productivity reduces the ability of degraded areas

to provide ecosystem services to neighboring communities.<sup>4</sup> Without services such as flood and storm protections, pollination, and soil fertility, people lose economic opportunities.<sup>5</sup> The U.S. Department of Agriculture estimates that soil erosion alone results in a loss of ecosystem services valued at \$44 billion annually in the United States.<sup>6</sup>

### *Nature-based Solutions (NbS)*

**The adverse economic impacts of land degradation have led to increased efforts to restore the U.S.’s ecosystems through Nature-based Solutions (NbS).** Restoration efforts take the form of a variety of NbS, which rely on natural processes for restoration rather than technological solutions.<sup>7</sup> NbS rehabilitate forests and landscapes through methods such as regrowing forests, revitalizing soils on agricultural lands, and restoring coastal wetlands. In addition to restoring land, NbS bring economic benefits by creating an estimated 7 to 40 jobs per \$1 million invested, creating a strong economic incentive for restoration.<sup>8</sup>

**This report provides insight into the restoration policy landscape in the United States by gathering and analyzing data from the federal government and the states of California, Colorado, and Maryland.** These states were selected as a sample for the country because of their longstanding restoration efforts, mix of land ownership, and size ranges. Policies from these states were gathered into a policy database and analysis framework, forming the basis for this report. Moving forward, they provide WRI with a platform for continued research into additional states and regions throughout the U.S. Additionally, the identified policy instruments for financial and economic restoration demonstrate some of the pioneering restoration efforts potentially adoptable by other countries of interest to WRI.



# BACKGROUND: RESTORATION POLICY DRIVERS

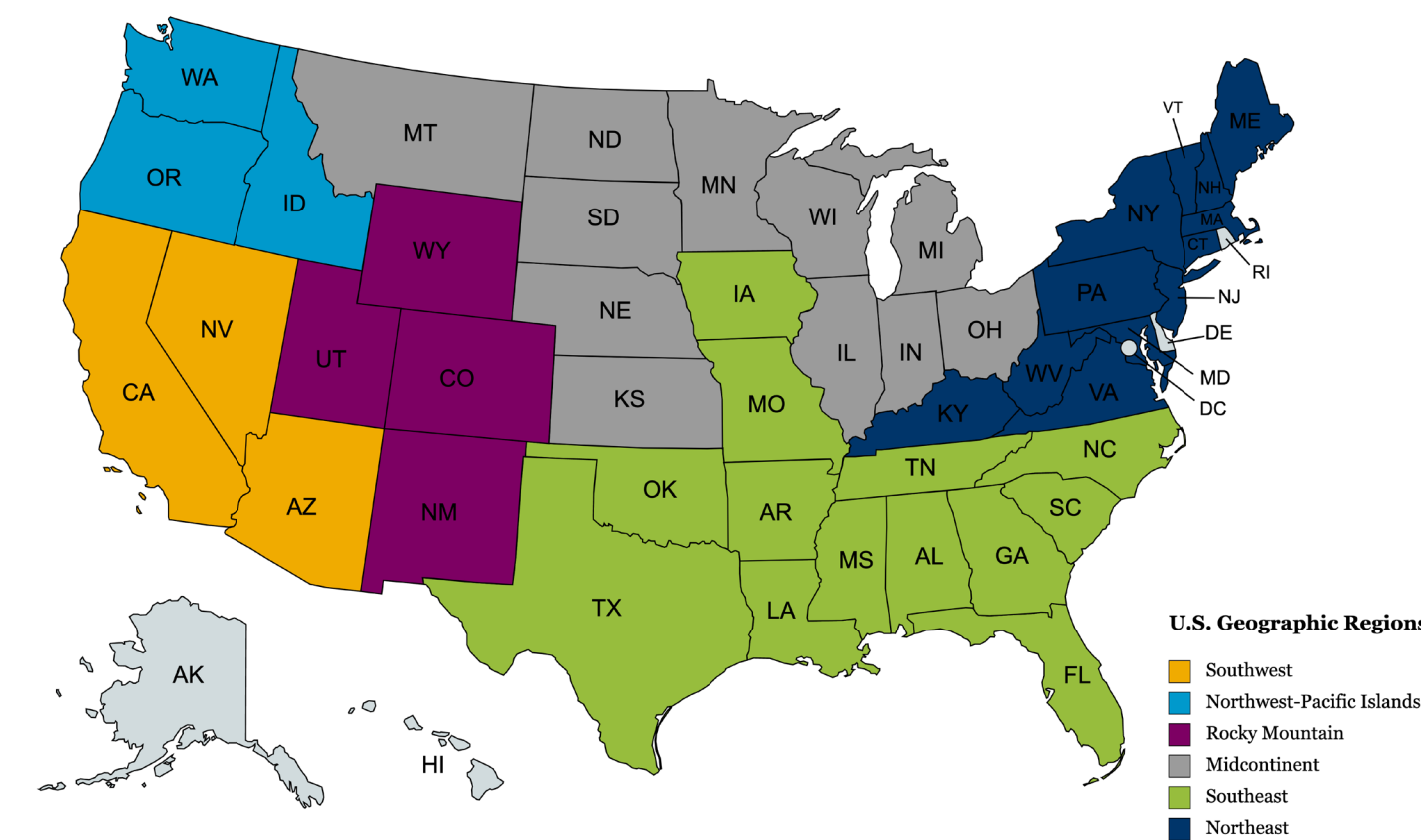
Background research and interviews identified several key drivers that influence the creation of restoration policy in the United States: geography, land ownership, land use, and environmental threats. This section provides an overview of these drivers and highlights how they informed the research design and policy analysis framework.

## GEOGRAPHY

The United States of America is the world’s third largest country in terms of land area, making up 6.1% of global land mass.<sup>9</sup> Located in North America, the United States is bordered by the Pacific Ocean on the west coast, the Atlantic Ocean on the east coast, Canada along the northern border, and Mexico on the southern border. The geography and topography

of the land is highly diverse, ranging from hills and low mountains in the East, to vast central plains, to high and rugged mountain ranges and deserts in the west. The states of California, Colorado, and Maryland were selected for this report’s analysis due to their unique geographical features that are typical of the Southwest, Rocky Mountain, and Northeast regions.

Figure 1: U.S. Geological Survey Geographic Regions of the United States



Source: Created with mapchart.net using U.S. Geological Service data



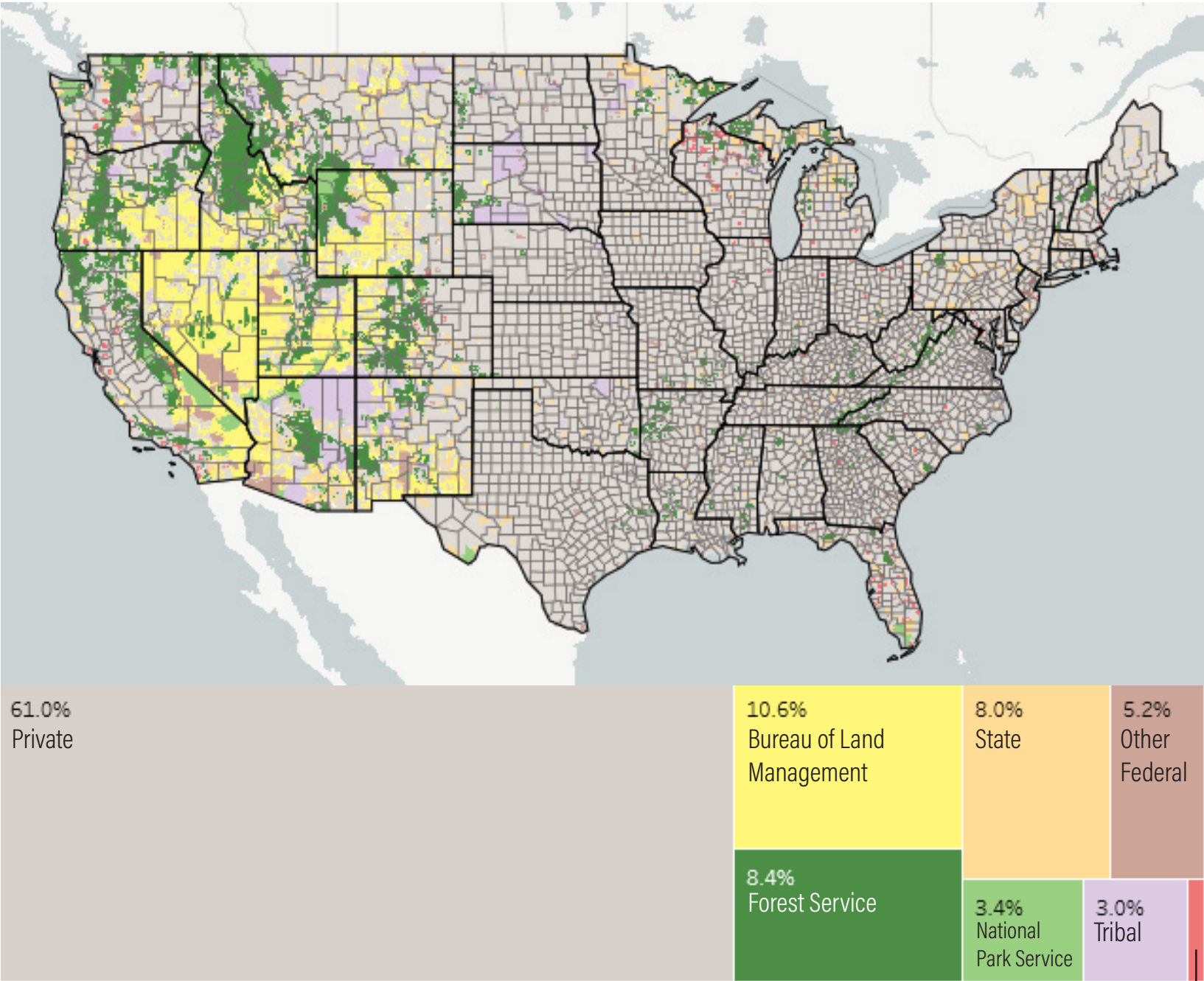
# LAND OWNERSHIP

**Land ownership in the United States is split among the federal government, state governments, tribal entities, and private land-owners.** Especially in the West, these stakeholders often own neighboring plots of land, posing a challenge to landscape-scale restoration programs. This is in part a lasting legacy of the Union Pacific Act of 1862, which was passed by Congress during the construction of the transcontinental railroad. This Act stated that every one square mile section of land along the railroad would be kept as federal government lands and the other sections granted to Union Pacific.<sup>10</sup> The rationale behind this policy was that the railroad adjacent land parcels would increase in value over time, sharing the profits between public and private actors. Overtime, Union Pacific sold many of their lands to timber companies, who had different intentions for the forested region than the public owners. As a result, parcels of land with different

owners and management structures exist adjacent to each other, creating the existing “checkerboard effect” pattern of land ownership. This phenomenon frequently makes restoration initiatives in the U.S. a multi-stakeholder effort involving public and private actors with conflicting interests.

**The policies highlighted in this report are focused on incentives for restoring private lands.** Considering that 60% of U.S. land is privately owned, landowners’ decisions greatly influence the success of restoration policies.<sup>12</sup> Additionally, recent studies have shown that species living on private lands in the U.S. are at the highest risk of habitat loss due to active land degradation.<sup>13</sup> Historically, private landowners have profited from exploiting the resources on their lands; however, properly structured financial incentives could instead enable them to develop the land sustainably.<sup>14</sup>

Figure 2: Land Ownership of the United States<sup>11</sup>



Source: Headwater Economics

City/County

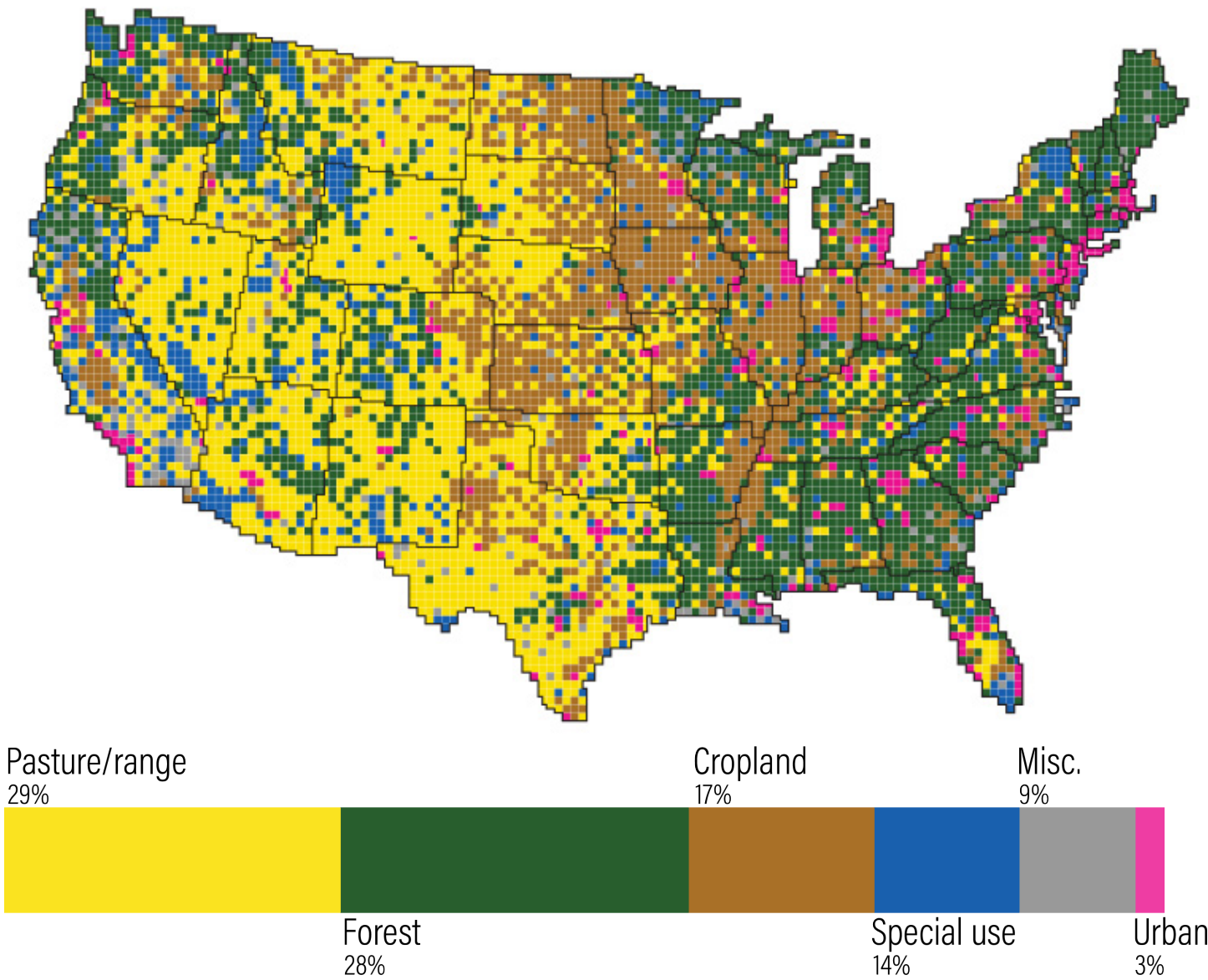
LAND USE

**75% of land in the United States is used for livestock pasture and range, forestry, and agriculture** (Figure 3). By seeking to exploit natural resources, these activities can deplete the productivity of the land, causing land degradation. For example, nitrogen and phosphorus used in industrial fertilizers pollute the surrounding streams and rivers. In determining appropriate restoration activities, the type of land use must be considered. Interventions to restore the land range from forest thinning, to wetland management, to sustainable farming practices.

ENVIRONMENTAL THREATS

**Agriculture, forestry, and other land uses cause an estimated 23% of global greenhouse gas emissions, significantly contributing to climate change.**<sup>15</sup> Climate change exacerbates environmental threats such as extreme weather events, deforestation, and soil erosion, thereby further degrading land. As the impact of climate change continues, these environmental threats are expected to become central to the policymaking process.

Figure 3: Land Use Distribution in the United States



Source: Bloomberg



## METHODOLOGY

## OVERVIEW: **PROJECT GOALS**

In service of the World Resources Institute’s Global Restoration Initiative, the Columbia research team created a database of restoration-focused policies and programs in the United States. The initiative is accelerating the restoration of degraded forests, farms, and natural pastures around the world, with a specific focus on Africa, Asia, and Latin America. To accomplish this goal, WRI

has created a Natural Language Processing tool to automate the identification of relevant restoration incentives in legislation. As a result of this project, WRI will be able to validate their tool for policy identification using legislation from an English-speaking country. In addition, once created, the U.S. policy database can be scaled and adapted for use in other countries.





## LITERATURE REVIEW AND DATA COLLECTION

This project began with a review of primary source policy documents, such as bills and program descriptions, at the federal and state levels. The documents were identified through legislative databases, government websites, and public repositories maintained by non-profit organizations such as the Trust for Public Land. The review used keywords to search for restoration policies, including but not limited to:

- Agroforestry
- Conservation
- Ecosystem services
- Green infrastructure
- Nature-based solutions
- Restoration

This initial survey identified the United States Department of Agriculture (USDA), the U.S. Department of Interi-

or (USDOJ), and the U.S. Environmental Protection Agency (USEPA) as the most active federal departments and agencies regarding national restoration policies.

After reviewing the federal policy landscape, research efforts shifted to examine state-level policies implemented by states' agriculture, natural resources, or environment departments. In total, the restoration policies of 13 states, selected at the discretion of WRI, were examined to gain insight into different approaches to restoration across the U.S. Ultimately, the examination of the national and subnational policy landscape provided a baseline understanding of the incentives, programs, and practices that exist in the U.S., allowing the project scope to be refined to focus on three states (*i.e.*, California, Colorado, and Maryland).

## EXPERT INTERVIEWS

Interviews with subject matter experts helped in identifying some of the most effective, innovative, and well-funded policies and programs in the U.S., and helped in corroborating the policy review. Interviews were conducted with experts working in academia, government, and nonprofits. In addition, WRI facilitated interviewee selection by making connections with in-house restoration and conservation experts and current organizational partners, including the WRI Data Science team

working in parallel to this project on refining the Natural Language Processing framework.

Targeted questions were developed depending on the area of expertise of each interviewee. The questions were framed around understanding restoration policy and economic incentives within the United States, tailored to each individual's expertise. **A full list of consulted individuals is available in the Acknowledgements section.**



## STATE SELECTION

To ensure the inclusion of the most optimal and innovative policy options available, states with progressive policies regarding economic and financial incentives for land restoration were intentionally selected. Based on this criteria, and through consultation with experts, California, Colorado, and Maryland were selected as the focus

states for an in-depth policy analysis. In addition to ongoing restoration work, California, Colorado, and Maryland cover a range of land use types, ecosystems, and land ownership patterns found throughout the country. The policies identified in these states act as a sample of restoration policies across the United States for the purposes of this report.

## POLICY SELECTION

Twenty policies from each of the three states were selected for the policy database. All selected policies met the following criteria:

- Focuses explicitly on restoration
- Provides an economic or financial incentive
- Supports restoration on private lands
- Uses a Nature-based Solution (NbS) for restoration
- Represents one of a key land use type (e.g. agriculture, grassland, forest) in the U.S.


Again, as 60% of U.S. lands are privately owned, policies that incentivize private landowners were prioritized. Additionally, the policies were chosen to reflect **Nature-based Solutions (NbS)** to restoration, as requested by WRI. The number of policies was capped at 60 to accommodate for the time constraints of the project.

## DATABASE DEVELOPMENT

The 60 policies across the three states that contain economic and financial incentives for land restoration were aggregated into a central policy database for organization and analysis. The list of categorical inputs used in the policy database was developed based on frameworks from previous Columbia-WRI reports and a keyword framework used by WRI's data science team. The database includes the following categories:

- Policy Level (State/Federal)
- Policy Title
- Program Title
- Year Implemented
- Active (Yes/No)
- Sub-national jurisdiction
- Policy Instrument
- Primary NbS Outcome
- Primary Environmental Hazard
- Land Use Type
- Primary NbS Activity
- Enforcement Mechanism





## SECTION 1: FEDERAL RESTORATION POLICIES

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### OVERVIEW

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**The federal government drives large-scale restoration policies across the United States, offering a variety of financial incentives for restoration.** The USDA, the USDOJ, and the USEPA and their sub-agencies are key stakeholders in implementing restoration legislation as outlined in the table below.

### OTHER AGENCIES


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While these departments in the table drive federal restoration policies, others also carry out restoration activities, especially in the areas of hazard protection and disaster management. Additional agencies include the Department of Defense, U.S. Federal Emergency Management Agency, U.S. National Park Service, U.S. National Oceanic and Atmospheric Administration, and the Department of Transportation. There may also be additional departments and agencies playing supporting roles in restoration that were not identified by the report.

Table 1: Restoration policies by the federal department.

Department/Agency	Sub-agency	Example of Key Policy/Program
<b>U.S. Department of Agriculture (USDA)</b> <ul style="list-style-type: none"><li>Promotes food security and nutrition in the U.S.</li><li>Mission statement includes conservation and restoration of public and private natural resources.</li></ul>	<b>U.S. Forest Service (USFS)</b> <ul style="list-style-type: none"><li>World's largest forestry research agency.</li><li>Provides funding and training to state and private forestry agencies.<sup>16</sup></li></ul>	<b>Cooperative Forestry Assistance Act of 1978</b> <ul style="list-style-type: none"><li>Established the <b>Forest Legacy Program</b> to protect privately owned lands through land purchases and conservation easements.<sup>17</sup></li></ul>
	<b>National Resource Conservation Service (NRCS)</b> <ul style="list-style-type: none"><li>Implements and coordinates federal policies for conservation at the state level.</li></ul>	<b>Agriculture Improvement Act of 2018 (Farm Bill)</b> <ul style="list-style-type: none"><li>Sweeping agriculture legislation that reauthorized funding for multiple programs for restoration, along with conservation, energy, food aid, and commodity support.</li><li><b>NRCS</b> implements programs reauthorized by the Act that focus on ecosystem restoration and protection, such as <b>Environmental Quality Incentives Program</b>.</li></ul>
	<b>U.S. Farm Agency (USFA)</b> <ul style="list-style-type: none"><li>Supports farmers in producing food and fiber at accessible prices.</li></ul>	<b>Agriculture Improvement Program of 2018 (Farm Bill)</b> <ul style="list-style-type: none"><li><b>USFA</b> implements programs reauthorized by the Act that provide assistance to farmers to restore their land, such as the <b>Conservation Reserve Program</b>.</li></ul>
<b>U.S. Department of the Interior (USDOL)</b> <ul style="list-style-type: none"><li>Protects America's lands and waters for the purposes of conservation and recreation.<sup>18</sup></li></ul>	<b>Bureau for Land Management (BLM)</b> <ul style="list-style-type: none"><li>Manages 245 million acres (10%) of America's lands to maintain their health, productivity, and recreational value.<sup>19</sup></li></ul>	<b>Endangered Species Act of 1973</b> <ul style="list-style-type: none"><li>Legislation to protect endangered species and their ecosystems.<sup>20</sup></li><li><b>BLM</b> supports the implementation of the Act through programs such as the <b>Range Management and Grazing Program</b>.</li></ul>
	<b>U.S. Fish and Wildlife Service (USFWS)</b> <ul style="list-style-type: none"><li>The only federal agency with a mandate exclusively focused on conservation and management of natural resources; namely fish, wildlife, and plants.<sup>21</sup></li></ul>	<b>Endangered Species Act of 1973</b> <ul style="list-style-type: none"><li><b>USFWS</b> supports the implementation of the Act several restoration programs, including the <b>Recovery Land Acquisition Grant Program</b>.</li></ul>
<b>U.S. Environmental Protection Agency (USEPA)</b> <ul style="list-style-type: none"><li>An independent federal agency that protects public health by ensuring the quality of air, land, and water in the U.S.</li></ul>	N/A	<b>Clean Water Act of 1972</b> <ul style="list-style-type: none"><li>This legislation establishes regulations and standards for water quality in the U.S.</li><li>It has launched myriad water quality and watershed restoration programs, such as the <b>Healthy Watersheds Program</b>.<sup>22</sup></li></ul>





## SECTION 2: STATE RESTORATION POLICIES

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### OVERVIEW

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**In addition to implementing federal policies, states shape their own restoration agendas through state-level policies and programs.** In order to understand the range of state-level implementation, this report analyzes the restoration policy landscapes of California, Colorado, and Maryland. These states illustrate different dimensions of the four policy drivers, with varying geographies, land uses, land ownership, and environmental hazards. At the same time, the states share several key characteristics that influenced their selection:

1. A high percentage of private land ownership relative to federal and state ownership.
2. Documented restoration policies and strategies directed at mobilizing private land owners for restoration.
3. Strong state-level financial incentives for restoration, demonstrating funding and commitment to restoration that goes beyond the federal mandates.

This section describes the states’ three approaches to restoration and provides examples of the mix of financial incentives that are applied to solving the issue of land degradation.

CASE STUDY: CALIFORNIA

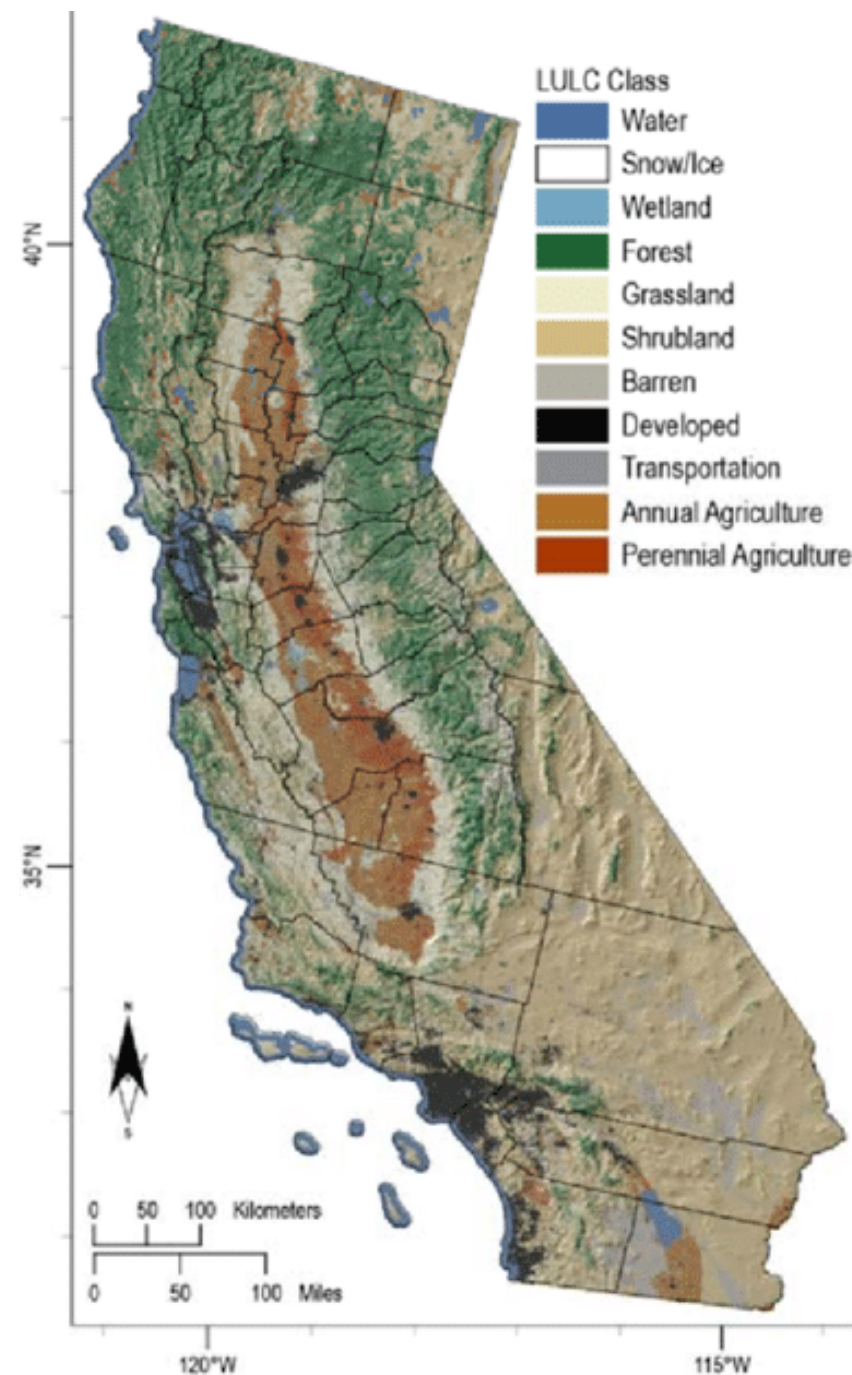


Figure 4: Map of California land cover.  
Source: Tamara S Wilson/Research Gate

California is the third-largest state in the United States in terms of land area and is among the most geographically diverse states. The Sierra Nevada mountains, the fertile farmlands of the Central Valley, the Pacific coastline, and the arid Mojave Desert in the south are some of the major geographic features.

**Land Ownership:**  
Private: 47.5%  
Forest Service: 20.5%  
Bureau of Land Management: 14.9%  
National Park Service: 7.6%  
Other federal: 4.4%  
State: 2.8%  
Local Government: 1.7%  
Tribal: 0.7%

**Land Use (Acres):**  
Grassland: 26,667,000 (26.7%)  
Special use: 24,896,000 (25.0%)  
Forest: 16,991,000 (17.0%)  
Cropland: 9,577,000 (9.6%)  
Urban: 5,299,000 (5.3%)  
Other: 16,269,000 (16.3%)

**Environmental Threats:**  
Wildfires  
Climate Change  
Drought  
Forest Degradation  
Pollution

POLICY LANDSCAPE

Twenty policies incentivizing land restoration across California were identified and analyzed.

**Within the wide array of policy incentives used by California, the most common are technical assistance and cost-sharing at 27% and 19% of incentives, respectively.** Across the 20 assessed land restoration policies, the financial incentives were: cost-sharing, grants, direct payments, easements, credit/guarantee, supplies, fines, and technical assistance. The programs contained within these policies are administered by state actors, and in partnership with the federal government and private landowners. In addition to state-level policies, there are federal policies directing land restoration efforts in California, including those reauthorized by the Agriculture Improvement Act of 2018 (the 2018 Farm Bill). These programs include the Environmental Quality Incentive Program, Conservation Reserve Program, and Wetlands Reserve Program.

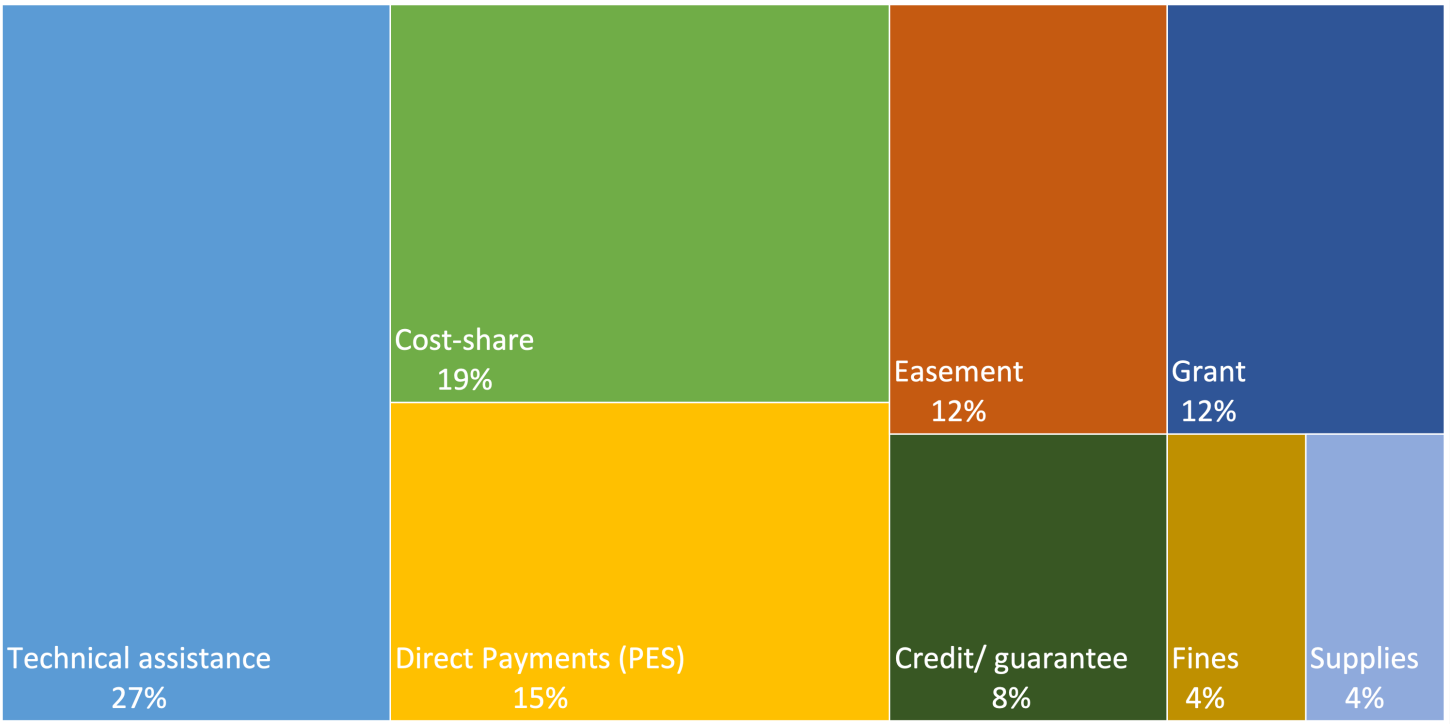


Figure 5: Distribution of key restoration policy instruments for California policies.



**California is a leader among the three states analyzed in its inter-agency collaboration on environmental issues.** As seen in Figure 5, the main actors at the state level are the California Department of Fish and Wildlife, California Department of Forestry and Fire Protection, and the Natural Resources Conservation Service of California. In 2020, Executive Order N-82-20 created the California Biodiversity Collaborative, an initiative led by the California Natural Resources Agency, in consultation with the California Department of Food and Agriculture and the California Environmental Protection Agency. This initiative shares resources and jointly implements the state’s biodiversity initiatives, including many restoration programs.

**Additionally, in 2020, Executive Order EO N-82-20 pledged to conserve 30% of the state’s lands and waters by 2030.**<sup>23</sup> California’s natural and working lands sustain the U.S.’s economy, contribute to the global food supply, and protect the communities from wildfire, floods, droughts, and extreme heat — as well as store and remove carbon from the atmosphere, which counteracts climate change. This Executive Order brings together a focus on achieving climate resilience with enhancing biodiversity and expanding equitable outdoor lands and recreation.

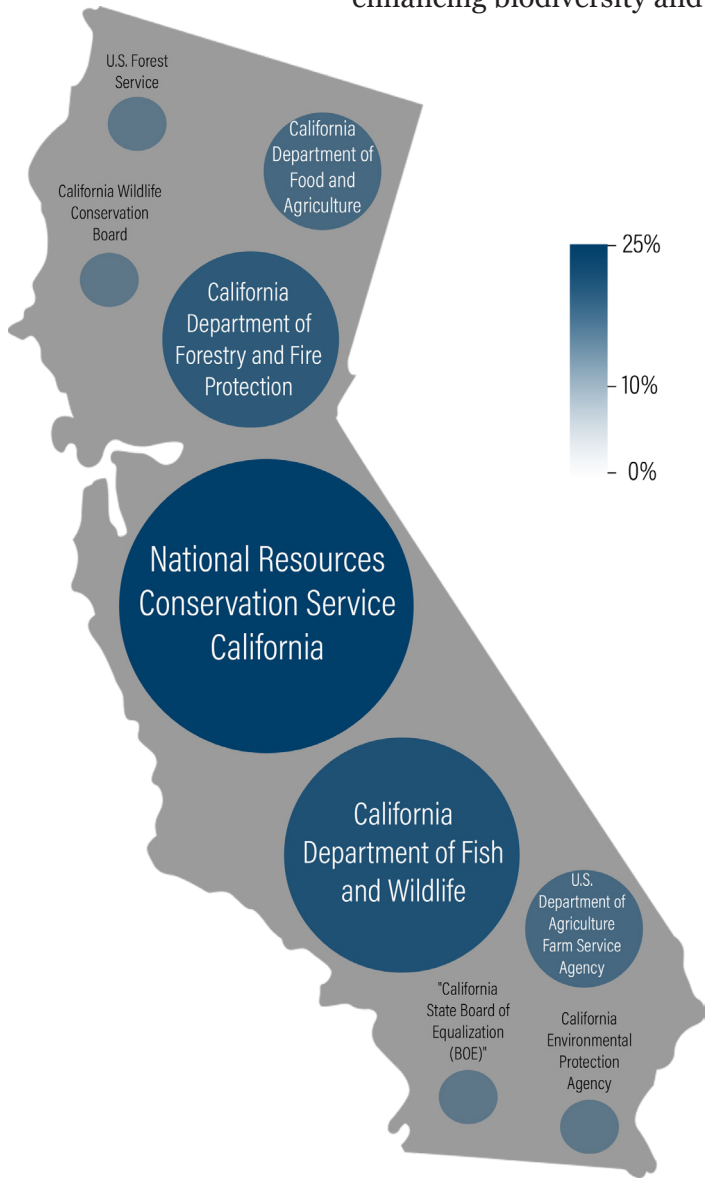
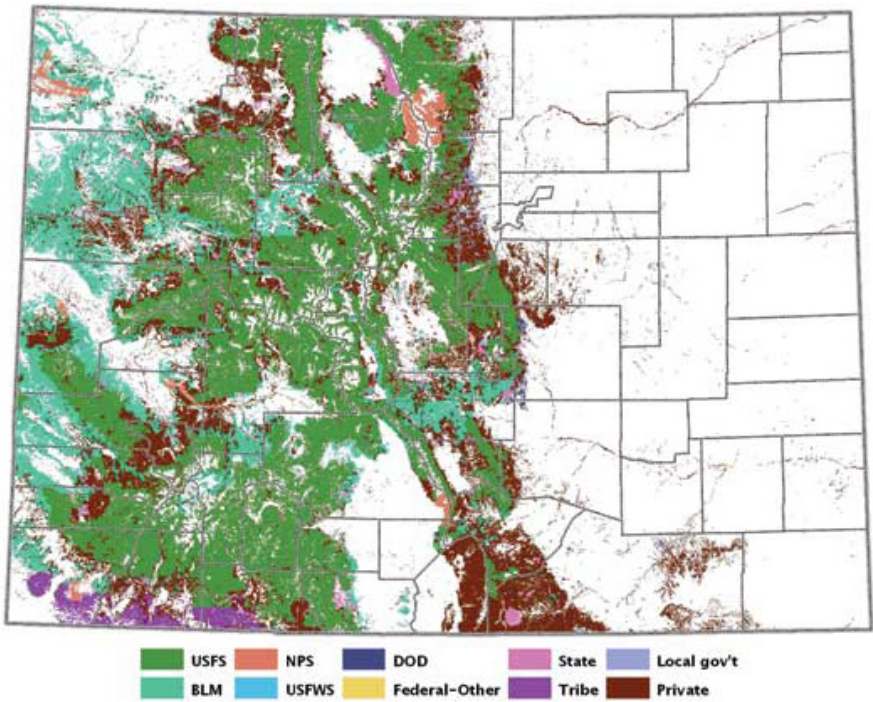


Figure 6: Breakdown of implementing agencies for California policies. Size indicates the number of policies implemented.

Table 2: California Policy Database, federal policies indicated in blue. Full database available in Appendix A.

Policy Title	Program Title	Year Implemented
Wildlife Conservation Law of 1947, Fish and Game Code, Division 2, Chapter 4.	Ecosystem Restoration on Agricultural Lands (ERAL)	1947
CA Revenue and Tax Code 423.5-437 and Revenue Tax Code part 18.5 of Division 2, pamphlet # 43 LDA	Forest Incentive Programs - Property Taxes for California	1977
California Forest Improvement Act of 1978	California Forest Improvement Program	1978
16 U.S. Code § 2103c - Forest Legacy Program	Federal Forest Legacy Program	1990
1990 Farm Bill (Organic Foods Production Act)	CA State Organic Program	1991
1990 Farm Bill (re authorized)	Wetland Reserve Easement (WRE)	1992
Cannella Environmental Farming Act of 1995	CA Healthy Soils Program	1995
Official Policy on Conservation Banks	California Conservation and Mitigation Banks	1995
1996 Farm Bill (reauthorized 2018)	Environmental Quality Incentives Program (EQIP)	1996
Land and Water Conservation Fund Act of 1965	Landowner Incentive Program	2002
California Forest Legacy Program Act of 2007	California Forest Legacy Program	2007
Forest Service Native Plant Materials Policy (FSM 2070)	Lockeford Plant Materials Center (CAPMC)	2008
2008 Farm Bill (reauthorized 2014 and 2018)	Conservation Stewardship Program (CSP)	2009
2008 Farm Bill, amended in 2010 (reauthorized 2014 and 2018)	Emergency Forest Restoration Program (EFRP)	2010
2008 Farm Bill, amended in 2010 (reauthorized 2014 and 2018)	Emergency Conservation Program (ECP)	2010
Assembly Bill 32	CA Cap-and-Trade Program (ARB Emissions Trading Program)	2013
Habitat Restoration and Enhancement Act of 2014	Habitat Restoration and Enhancement Act	2014
2014 Farm Bill (reauthorized 2018)	Regional Conservation Partnership Program (RCPP)	2015
Assembly Bill 32	Forest Health Grants	2016
Assembly Bill 2348	California Winter Rice Habitat Incentive Program	2018

## CASE STUDY: COLORADO



Colorado is the eighth largest state in the U.S. based on land area. The varied landscape and topography supports over 60 ecological systems due to its unique geography and elevational gradient as a result of the Rocky Mountain range, which bisects the state.<sup>24</sup> Various supporting ecosystems include forests, grasslands, wetlands, woodlands, shrublands, and tundra.

Figure 7: Map of Colorado land cover.  
Source: Colorado State Forest Service

### Land Ownership:

Private: 56.9%  
Forest Service: 21.7%  
Bureau of Land Management: 12.5%  
State Government: 4.9%  
Tribal: 1.6%  
National Park Service: 1%  
Local Governments: 0.7%  
Other Federal: 0.6%

### Land Use (Acres):

Grassland: 31,734,000 (47.8%)  
Forest: 15,138,000 (22.8%)  
Cropland: 10,668,000 (16.1%)  
Special use: 7,455,000 (11.2%)  
Urban: 1,012,000 (1.5%)  
Other: 323,000 (0.5%)

### Environmental Threats:

Forest degradation  
Damaged wetlands  
Deforestation  
Pollution runoff  
Wildfires

## POLICY LANDSCAPE

Twenty policies incentivizing land restoration across Colorado were identified and analyzed.

**As seen in Figure 8, the most common policy instrument used in Colorado is technical assistance (37%), which indicates policies providing operational support to landowners.** The other four instruments used the policies include grants, direct payments, easements, and cost-sharing. Figure 9 shows the various agencies responsible for implementing these programs, though agencies often collaborate on restoration efforts. The RESTORE Colorado Initiative is a consortium of non-profit organizations and various state agencies, including the Colorado Department of Natural Resources, Colorado Parks and Wildlife, and the Colorado Water Conservation Board. This partnership funds large-scale wildlife habitat restoration, expansion, and improvement by providing grants for large-scale restoration projects.<sup>25</sup>

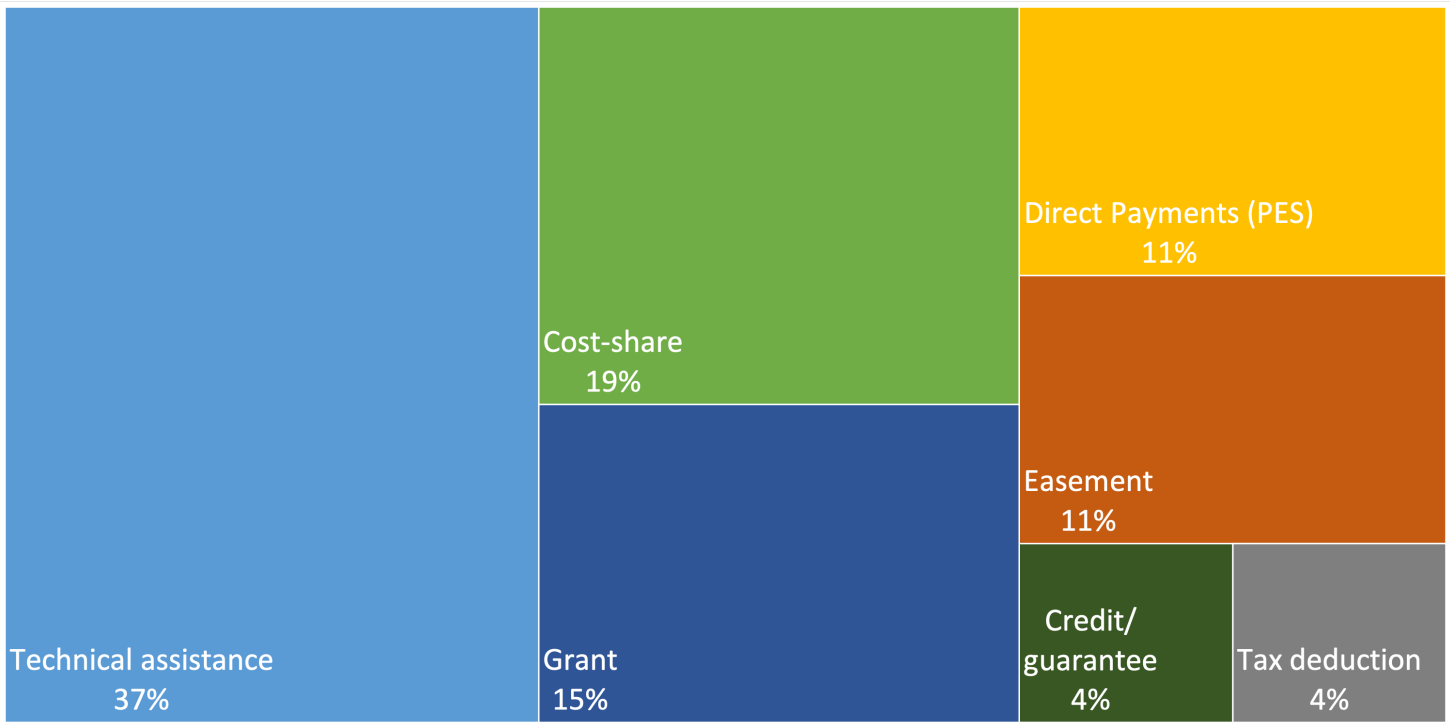


Figure 8: Distribution of key restoration policy instruments for Colorado.



**Federal agencies also play a major role in Colorado’s restoration strategy.** Many restoration programs are funded through the three agencies responsible for managing the 23 million acres of public lands across the state: the U.S. Forest Service, Bureau of Land Management, and the National Parks Service. Federal programs are also often undertaken in collaboration with state authorities and private land-owners. One example is the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill). This legislation initiated several cost-share restoration programs with the Colorado state government that subsidize the cost of restoration and conservation in the state. These programs include the Environmental Quality Incentives Program and the Wildlife Habitat Incentives Program.<sup>26</sup>

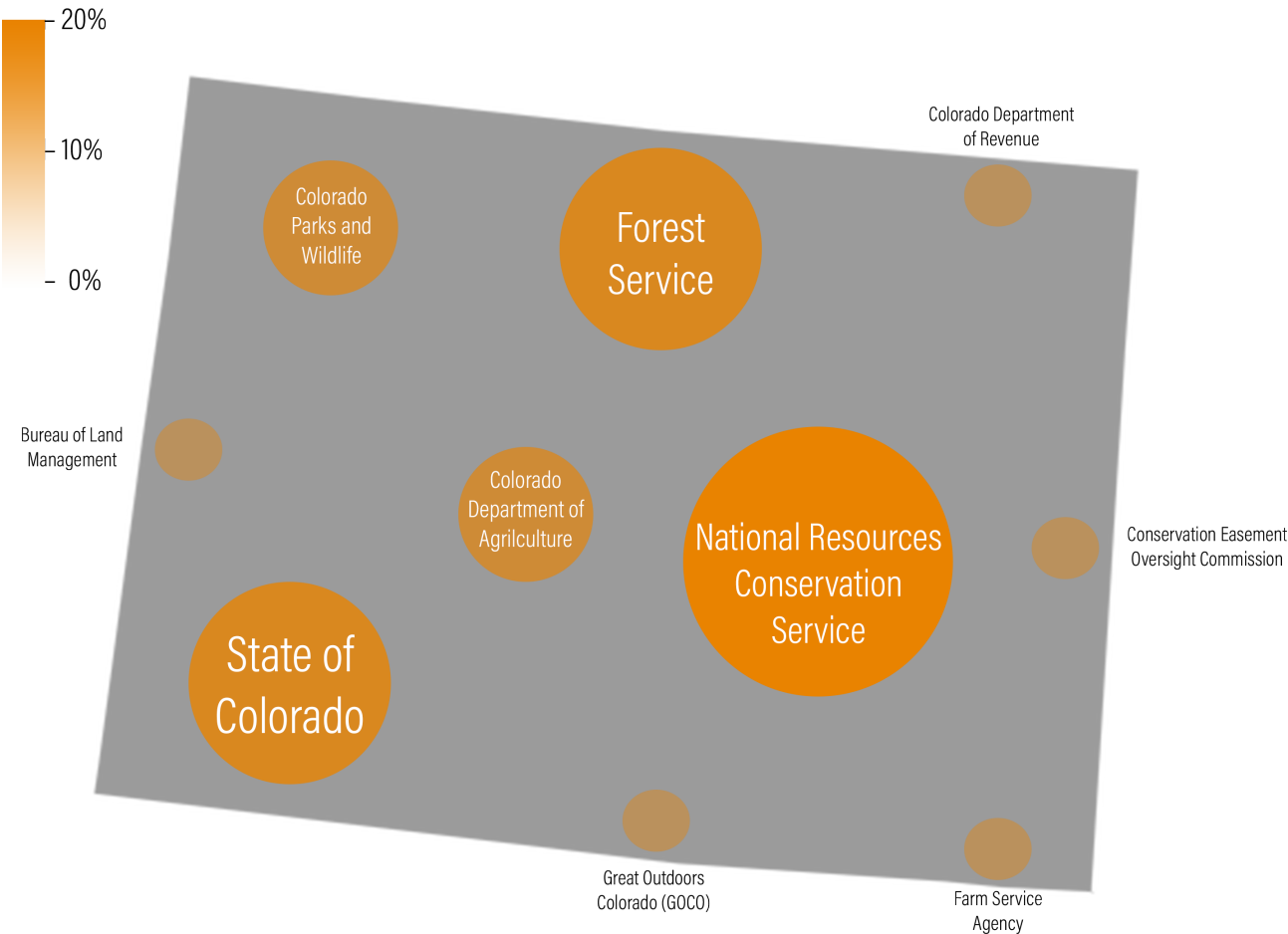
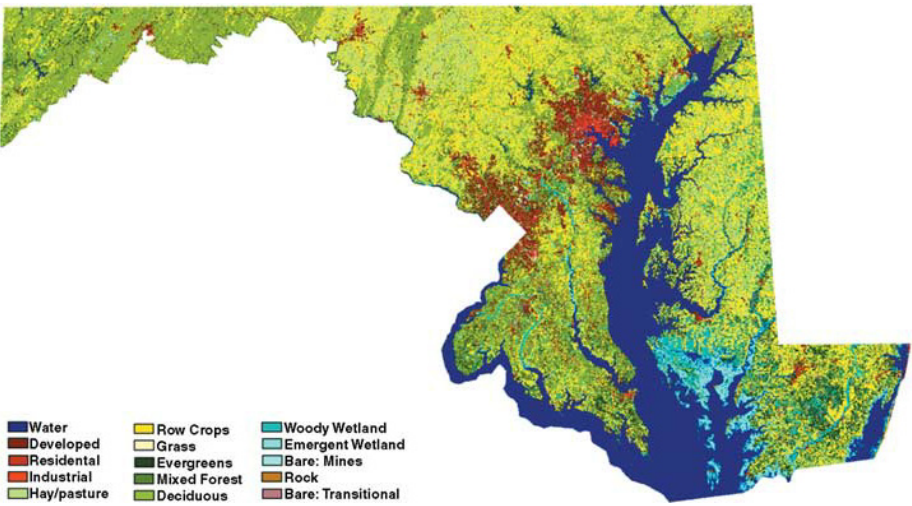


Table 3: Colorado Policy Database, federal policies indicated in blue. Full database available in Appendix A.

Policy Title	Program Title	Year Implemented
Soil Conservation and Domestic Allotment Act of 1936	Conservation Technical Assistance Program	1936
Originally from Flood Control Act of 1950	Emergency Watershed Protection	1950
Colorado Natural Areas Act of 1977	Colorado Natural Areas Program	1977
Cooperative Forestry Assistance Act of 1978	Forest Stewardship Program	1978
Food Security Act of 1985	Conservation Reserve Program (Reauthorized in 2018 Farm Bill)	1985
Cooperative Forestry Assistance Act of 1978	Forest Legacy Program	1990
Article XXVII	Great Outdoors Colorado Program	1992
Weed Free Forage Crop Certification Act of 1997	Certified Weed Free Forage Program	1993
1996 Farm Bill	Environmental Quality Incentives Program	1996
Article XXVII	Wetland Wildlife Conservation Program	1997
HB 99-1155	Colorado Conservation Easement Tax Credit Program	2000
Updated 2002 Farm Bill	Forest Land Enhancement Program	2002
Article XXVII	Colorado Wildlife Habitat Program	2006
SENATE BILL 09-158	Colorado Landowner Incentive Program	2009
Omnibus Public Land Management Act of 2009	Front Range - Collaborative Forest Landscape Restoration Program	2011
HOUSE BILL 13-1012	Wildfire Mitigation Measures Subtraction	2013
Updated 2018 Farm Bill	Agricultural Conservation Easement Program	2014
SENATE BILL 17-050	Forest Restoration & Wildfire Risk Mitigation Grant Program	2017
HB21-1181	Soil Health Initiative	2018
Article XXVII	RESTORE Colorado Program	2020

# CASE STUDY: MARYLAND



Maryland is the ninth smallest state in the U.S. Yet, it contains a variety of landscapes and geographies. The major ecosystems include mountains, forests, and the coastal Chesapeake Bay estuary system.<sup>27</sup>

Figure 10: Map of Maryland land cover.  
Source: Federal Region III National Land Cover (NLCD)

### Land Ownership:

Private: 86.6%  
State: 7.5%  
Local Government: 2.8%  
Other federal: 1.8%  
National Park Service: 1.2%

### Land Use (Acres):

Forest: 2,329,000 (37.5%)  
Cropland: 1,377,000 (22.2%)  
Urban: 1,309,000 (21.1%)  
Special Use: 567,000 (9.1%)  
Grasslands: 447,000 (7.2%)  
Miscellaneous: 183,000 (2.9%)

### Environmental Threats:

Agriculture practices  
Soil degradation  
Coastal erosion  
Pollution runoff  
Deforestation  
Urbanization

# POLICY LANDSCAPE

Twenty policies incentivizing land restoration across Maryland were identified and analyzed.

**Across the analyzed Maryland restoration programs, grants and technical assistance are the most common policy instrument, used in 39% and 36% of policies, respectively.** Figure 11 shows the full distribution of federal and state policy instruments in the state. The National Resources Conservation Service of Maryland implements several key federal programs reauthorized by the Agriculture Improvement Act of 2018 (the 2018 Farm Bill), including the Environmental Quality Incentive Program, the Conservation Reserve Program, and Conservation Reserve Enhancement Program. In addition, the main state level actors implementing these programs, shown in Figure 12, are the Maryland Department of Natural Resources and the Maryland Department of the Environment.

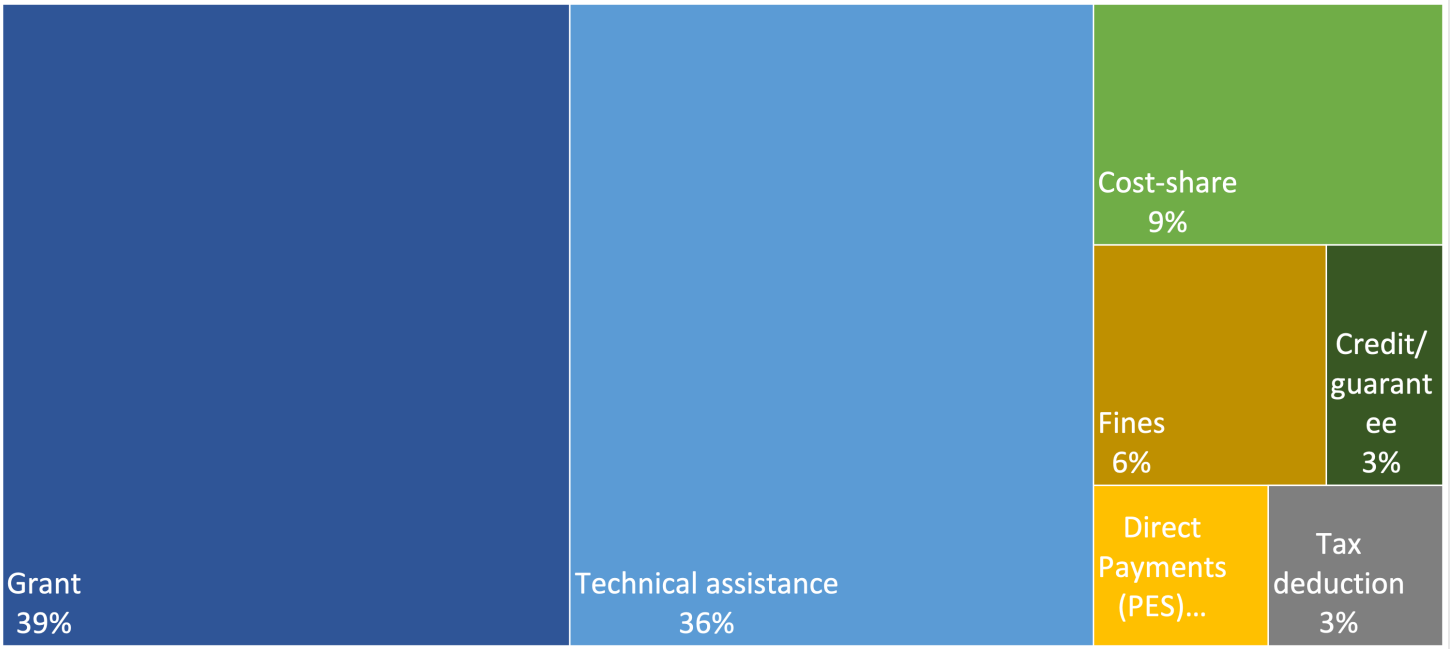


Figure 11: Distribution of of key restoration policy instruments for Maryland

**In February 2021, Maryland introduced the Comprehensive Conservation Finance Act into the State Legislature.** If passed, this policy will require the Maryland Department of Agriculture, the Department of Natural Resources, and the Maryland Environmental Trust to allow participants in their programs to also enter private markets for conservation. This legislation will prohibit restrictions on landowners to buy and sell biodiversity credits, carbon credits, or water quality credits, among other conservation finance instruments, effectively opening up new financial incentives for restoration in the state.<sup>28</sup>

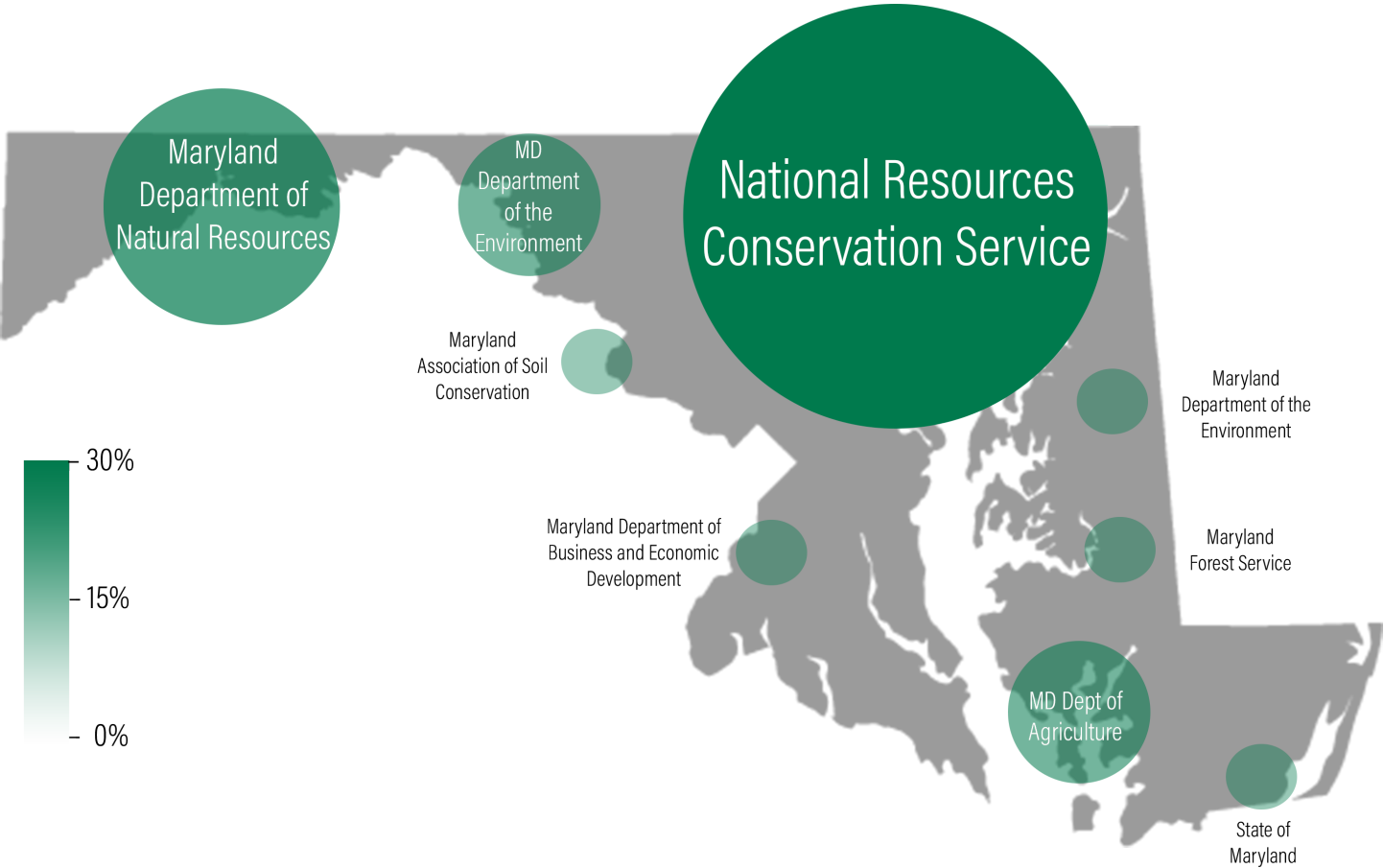


Figure 12: Breakdown of implementing agencies for Maryland policies. Size indicates the number of policies implemented.

Table 4: Maryland Policy Database, federal policies indicated in blue. Full database available in Appendix A.

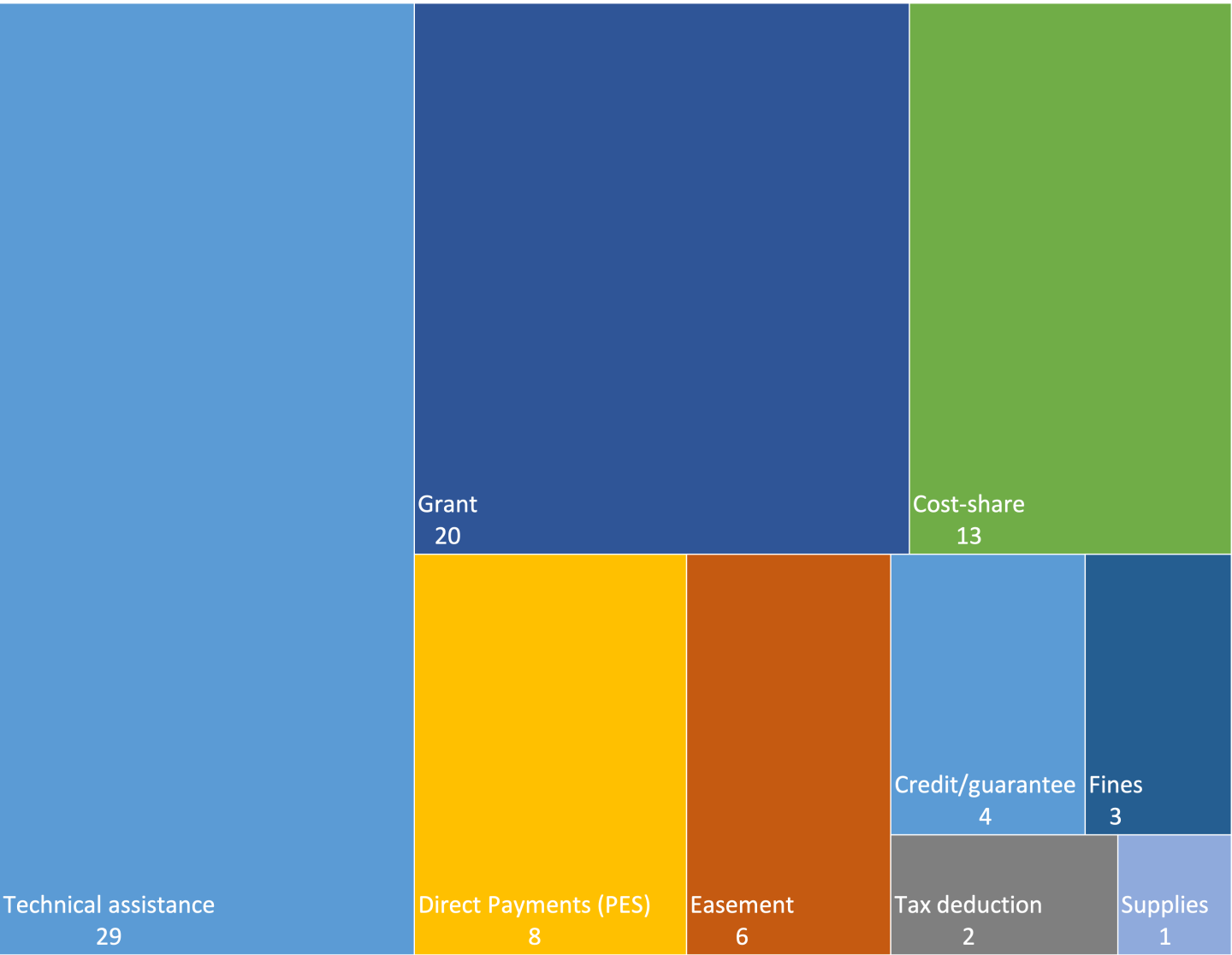
Policy Title	Program Title	Year Implemented
Maryland Nonstructural Shore Erosion Control Act	Shore Erosion Control Program	1968
2003 Healthy Forests Act	Forestry Incentive Program (FIP)	1975
SB 320 Chesapeake Bay Restoration Fund	MD Agricultural Water Quality Cost-Share Program (MACS)	1982
Food Security Act of 1985	Farm and Ranch Lands Protection Program	1985
Farm Security and Rural Investment Act of 2002	Maryland Woodland Incentives Program	1986
Chesapeake Bay Wetlands Policy	Nontidal Wetlands Protection Act	1989
Food, Agriculture, Conservation, and Trade Act of 1990	Forest Stewardship Program (FSP)	1991
Forest Conservation Act	Forest Conservation Act Program	1991
Federal Agriculture and Improvement Act 1996	Environmental Quality Incentive Program (EQIP),	1996
Federal Agriculture and Improvement Act	Flood Risk Reduction Program	1996
Food Security Act 1985	Maryland Conservation Reserve Enhancement Program	1997
Food Security Act 1985	Conservation Reserve Program (CRP)	1997
Maryland Voluntary Cleanup and Revitalization Program Act	Voluntary Cleanup Program (VCP)	1997
Brownfields Redevelopment Reform Act	Brownfields Redevelopment Initiative Program (BRIP)	2004
HB 679 - The Uniform Environmental Covenants Act (UECA)	Environmental Covenants Program	2005
Federal Agriculture and Improvement Act	Wildlife Habitat Incentives Program (WHIP)	2008
Farm Security and Rural Investment Act of 2002	Maryland Nutrient Trading Program	2010
Resiliency through Restoration Initiative	Community Resilience Grant program	2017
Federal Crop Insurance Act	The Agricultural Management Assistance (AMA)	2018
Resiliency through Restoration Initiative	Conservation Buffer Initiative	2020



# SECTION 3: TRENDS IN AGGREGATED POLICIES ACROSS STATES

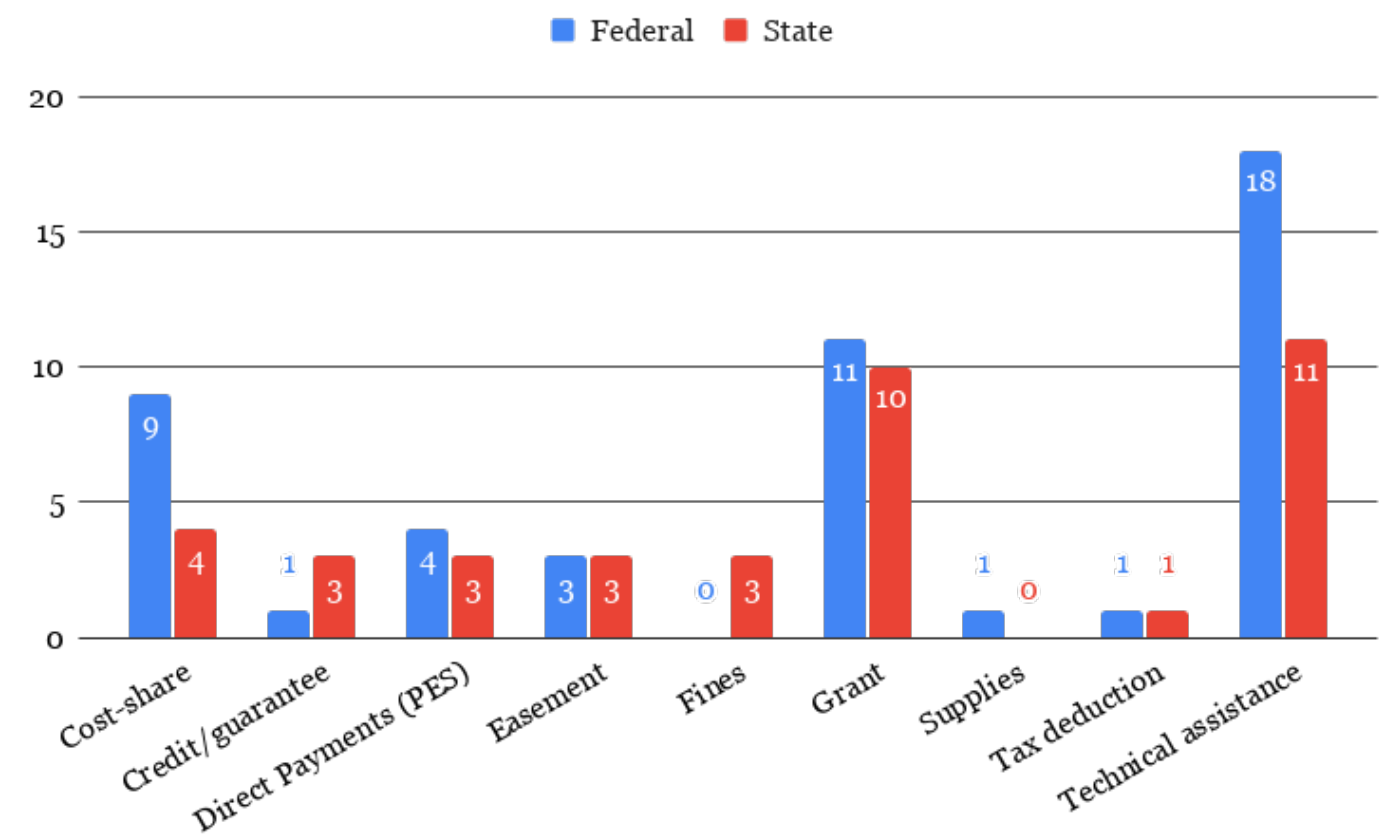
This section analyzes the aggregated policy data from California, Colorado, and Maryland. 86 policy instruments were implemented across 60 policies in these states. Some trends emerge from the data, such as the predominance of technical assistance and grants, and the flexibility of policy instruments to be used to achieve a variety of NbS outcomes.

Figure 13: Policy Instruments Across All States (n=86)



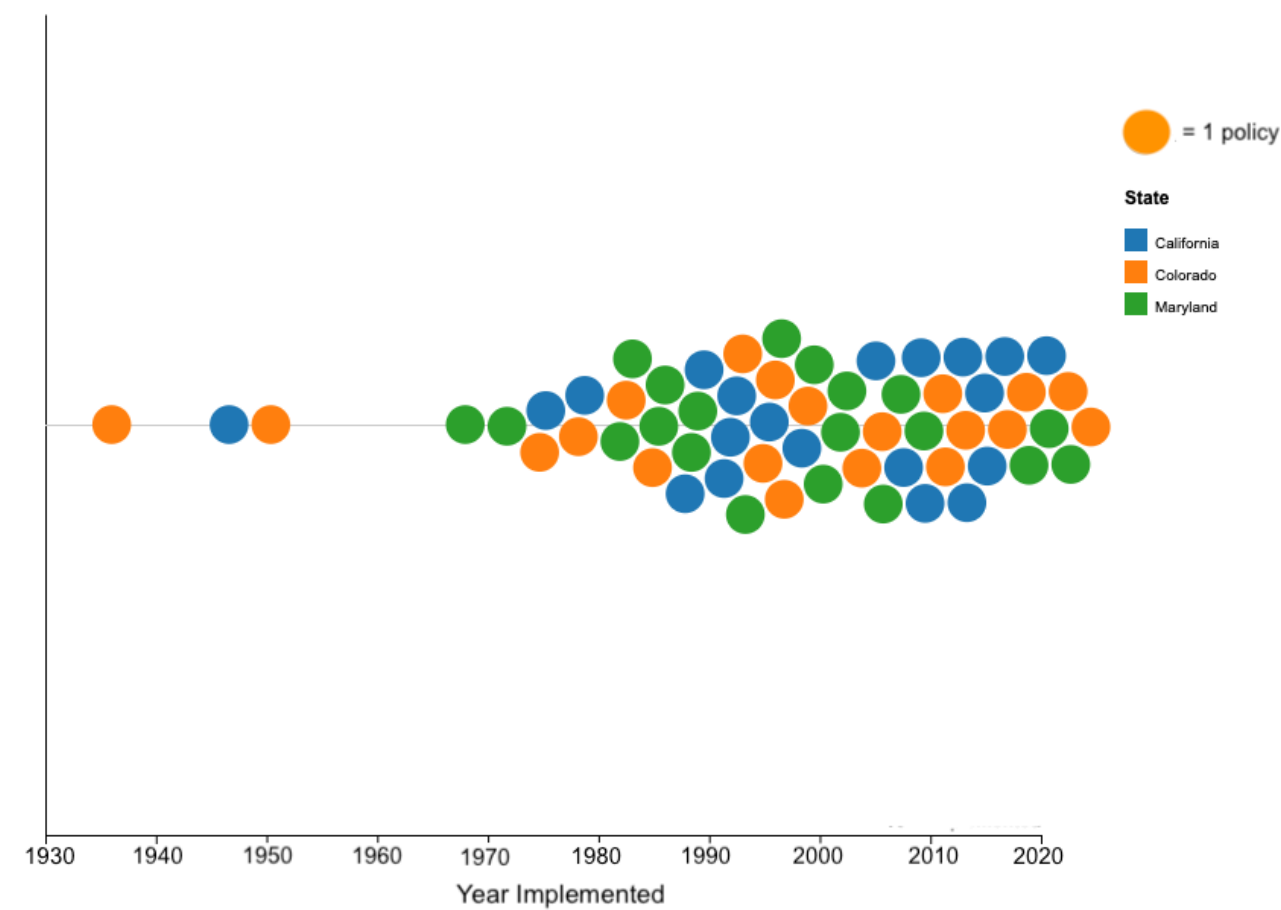
- Key Points:**
- Multiple policies include more than one financial or economic incentive for restoration.
  - Technical Assistance and Grants were the two most used policy instruments in aggregate, with a total count of 29 and 20, respectively.
  - Market-based policies such as credits and guarantees are still not widely implemented, with a total count of 4.

Figure 14: Distribution of Federal and State Policies by Type of Financial Instrument (n=86)



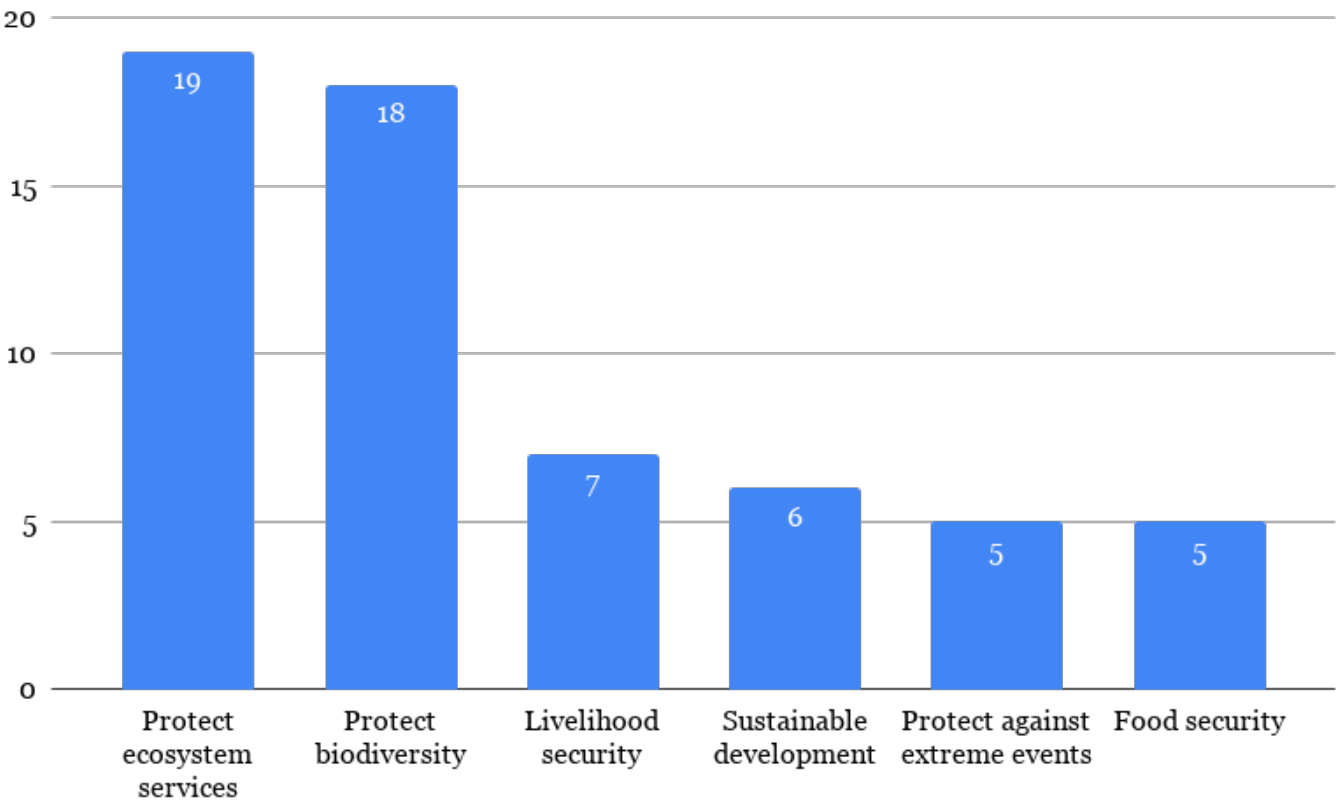
- Key Points:**
- Federal policies employed more financial incentives, with a count of 48 across 30 policies, compared to state policies, which used 38 incentives across 30 policies.
  - Federal policies employed more technical assistance and cost share instruments when compared to state policies. Otherwise, the distribution of instruments for both state and federal policies was approximately the same.
  - In the sample, fines were only used to enforce policies at the state level.

Figure 15: Policy Implementation Over Time (n=60)



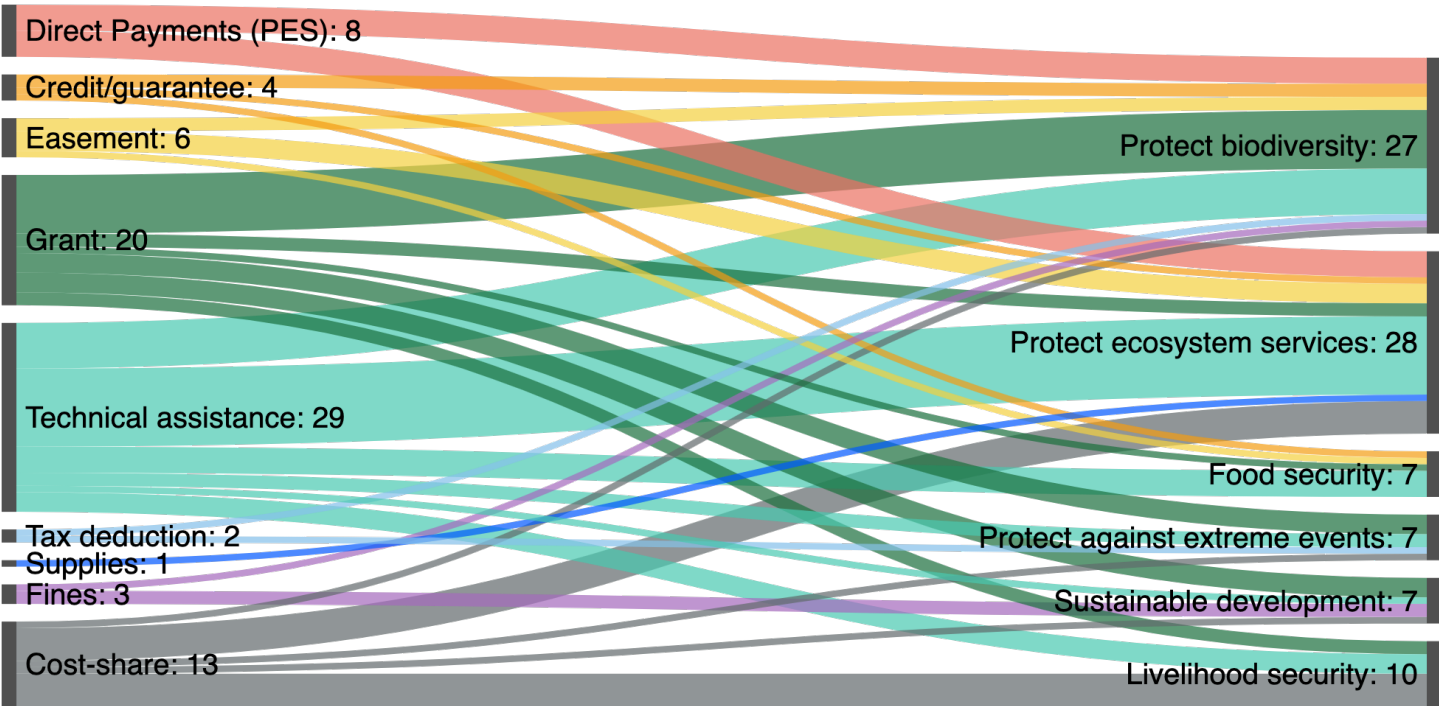
- Key Points:**
- As time has progressed, states have added increasing numbers of policies with a restoration and conservation focus.
  - The number of new policies added per decade has remained steady since the 1990s.
  - Each state implemented the most programs during the 1990s and 2010s
    - Maryland: 7 in the 90s and 4 in the 2010s.
    - Colorado: 4 in the 90s and 4 in the 2010s.
    - California: 6 in the 90s and 7 in the 2010s

Figure 16: NbS Outcomes Across All States (n=60)



- Key Points:**
- The most common intended NbS outcomes of policies were Protecting Ecosystem Services (19 policies) and Protecting Biodiversity (18 policies).
  - Food security, Livelihoods, and Sustainable Development were the intended NbS outcomes of only 18 policies.
  - Protecting Against Extreme Events was the NbS outcome of 5 policies.

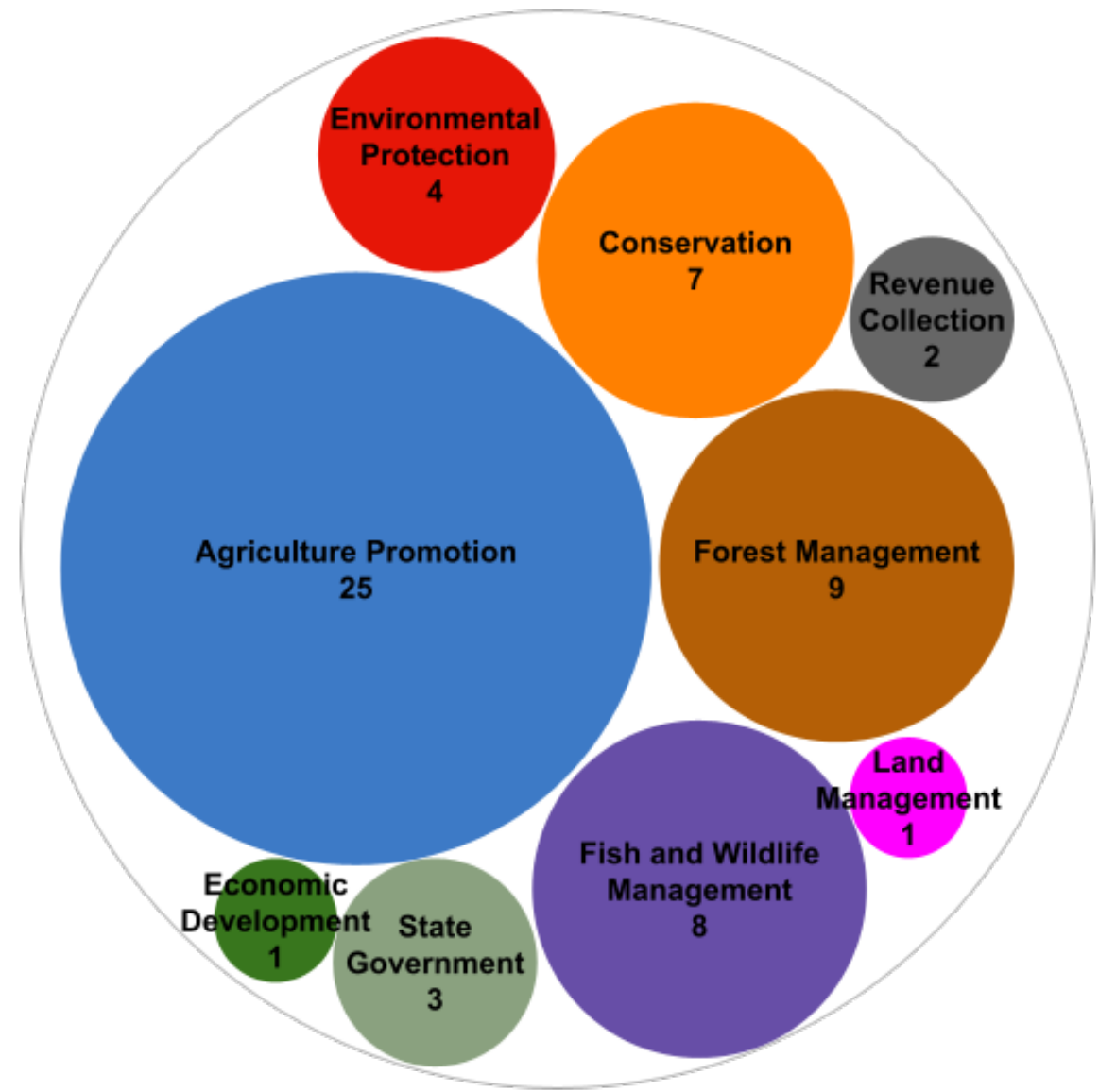
Figure 17: Correlation of Policy Instruments to Primary NBS Outcomes (n=86)



- Key Points:**
- Financial incentives can be used to achieve a diverse range of NbS outcomes.
  - Technical Assistance and Grants were used to achieve every type of NbS outcome analyzed.

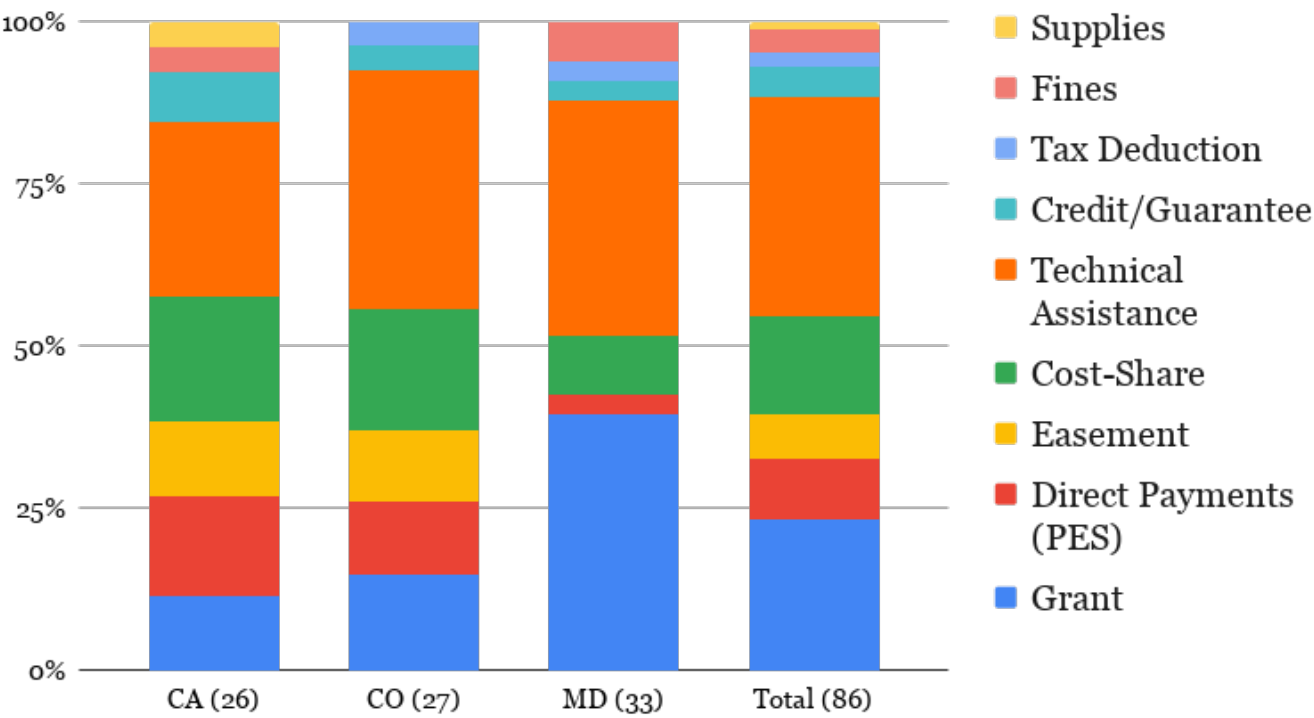


Figure 18: Distribution of Policies by Mandate of Implementing Government Bodies (n=60)



- Key Points:**
- 42% of policies were implemented by agencies and departments that have Agriculture Promotion as their primary mandate.
  - Other leading governing bodies implementing restoration policies had Forest Management, Fish and Wildlife Management, and Conservation as their primary mandates.
  - Maryland is the only state that had the Department of Business and Economic Development implementing a restoration program.

Figure 19: Distribution of Policy Incentives (n=60)



- Key Points:**
- The policy landscape in California and Colorado appears similar while Maryland relies upon mostly two main mechanisms: grants and technical assistance.
  - This is possibly due to the significantly higher portion of land owned by private entities in Maryland (~90%) compared to the other two states (~50%).
  - The impact of differences in land ownership on incentives could be a productive subject of further research to assess this observed trend.

## DISCUSSION AND CRITICAL CONSIDERATIONS

## DISCUSSION

**This report illustrates preliminary themes and trends that emerge from California, Colorado, and Maryland's restoration policies.** It provides WRI with a broad analysis of restoration policies that are active in the U.S. A comprehensive analysis of the policies in each state will require additional research into each state's political economy, policy landscape, and restoration programs.

**The data analysis did not determine if one state's approach is more effective than others.** In order to draw these types of conclusions, an analysis of factors such as policies' cost-effectiveness, feasibility and breadth of impact would need to be conducted (See Rapid Policy Analysis, Appendix C). However, three themes emerged from the research that could contribute to the success or failure of a state when implementing restoration policies:

- 1. Funding:** Restoration is a costly activity and states that injected funding into these programs also have higher incomes relative to other states. In terms of Gross Domestic Product per capita, California was ranked 5th, Maryland was 11th, and Colorado was 13th in the U.S..<sup>27</sup>
- 2. Land Ownership:** The land ownership distribution within the state determines how much state policies can influence restoration. The three states in the analysis all have high percentages of private land ownership, which can be influenced through state policies. However, the deployment of financial incentives for restoration could take a different form in other states, where federal land ownership can be as high as 80%.
- 3. Politics:** The three states in the report are considered to be politically progressive states. California, Colorado, and Maryland have consistently voted for Democratic candidates in national elections in recent years. The current Democratic Biden-Harris administration has declared the climate crisis to be a major focus, signaling that these states may have public support for implementing an environmental agenda.



# CRITICAL CONSIDERATIONS

There are several factors that influenced the production of this report and that should be carefully considered in its reading and interpretation:

1.

**Project Scope:** The timeline of the project limited the scope to three representative states and a portion of existing federal and state policies. Each state database should be seen as a sample rather than an exhaustive list. The policy database also focuses primarily on active policies; however, a future effort could consider the full history of land restoration policies in the United States to monitor their evolution over time.

2.

**Data Accessibility and Availability:** Restoration policies are implemented by diverse federal and state institutions, meaning that finding the policies required visiting numerous individual databases and government websites. There is no comprehensive database in existence that contains an exhaustive list of relevant policies. Additionally, there was inconsistent availability of primary source documents, especially for older policies, posing a challenge.

3.

**Policy and Program Structure:** In the United States, policies pertaining to restoration are often implemented at the state level as programs without explicit acknowledgement of the authorizing policy. Additionally, programs can be a product of a single piece of legislation, or the result of policies that are regularly amended and altered. As a result, it can be a challenge to trace a policy instrument to the law or policy it originates from.

4.

**Keywords and Terminology:** There are many keywords relevant to restoration legislation, which can be a challenge when locating relevant policies. In addition, there is limited consistency in the phrasing of keywords between different states, governmental actors, and state and federal agencies, and language evolves over time. As such, policies from different eras articulate the need for a nature-based approach to restoration in different ways. For example, many of the policies called for “conservation” rather than “restoration,” which is a relatively newer term.

5.

**Importance of Interviews:** Interviewing federal employees and restoration professionals working in the private sector and academia was an effective way to understand the current scope of restoration efforts in the United States. Many of these experts referred us to additional agencies conducting restoration work and explained the importance of keywords used in NbS legislation. Overall, the interviews provided the necessary background information and insight into policies that guided that scope of the project.



# RECOMMENDATIONS AND NEXT STEPS FOR WRI

## 1. Expand Research to Additional States and Agencies

California, Colorado, and Maryland were selected for their varied policy landscapes and unique incentives for private landowners for land restoration; however, in future work, other states should be analyzed to develop a complete picture of restoration policies across the United States. By expanding this analysis framework to other states, WRI will better understand the cross-state policy relationships. These relationships include the evolution of nature-based solutions, the most common financial incentives, and a broader list of innovative policy measures, as other states likely employ notable approaches to incentivize land restoration. There are also many other factors relevant to restoration measures, such as the political background of a state and the state’s economy. It is important to consider that certain incentives could be more likely to be approved or disapproved within the context of the political and economic landscape and leadership of a state at a given point in time.

## 2. Assess Disincentives to Land Restoration

An understanding of existing disincentives toward land restoration is critical in contextualizing the role that incentives play in the overall policy landscape. The timeline of this project inhibited the inclusion of disincentives into the analysis; however, this area of policy should be prioritized as a next step. Disincentives to restoration will likely be found in historically extractive industries, such as mining, conventional agriculture, logging, and energy production. As with incentives, the scale of disincentives is expected to vary between states, depending on their priorities. Our expectation is that states with prevalent restoration policies will have fewer competing policies that disincentivize restoration and vice versa.due to the politicization of such environmental issues. The analysis of disincentives is necessary to evaluate this hypothesis.

## 3. Evaluate the Policy Impact

One challenge for this report was assessing the impact of policies from different levels of government, with different amounts of funding, with different scales of restoration, and for different states throughout the U.S. Another logical continuation of this project would be to evaluate the success of restoration policies and financial incentives within their state contexts. Additionally, it would be interesting to obtain and analyze long-term data of restoration projects in order to examine effectiveness over time.

Rapid policy analysis is a tool that helps to rank the policies based on their effectiveness and impact. Though not regularly yet regularly used for environmental policies, this method of policy analysis is common within the medical and transportation fields. A rapid policy analysis works to compare the impact of policies from varied scales, and assign a ranking for effectiveness. Combined with the policy database, a rapid policy analysis will help to identify if the most successful mechanisms for restoration are being used widely throughout the country. With the innovative nature of the financial and economic incentives for restoration, the rapid policy analysis would enable WRI to prioritize policies in their ongoing work in other countries.

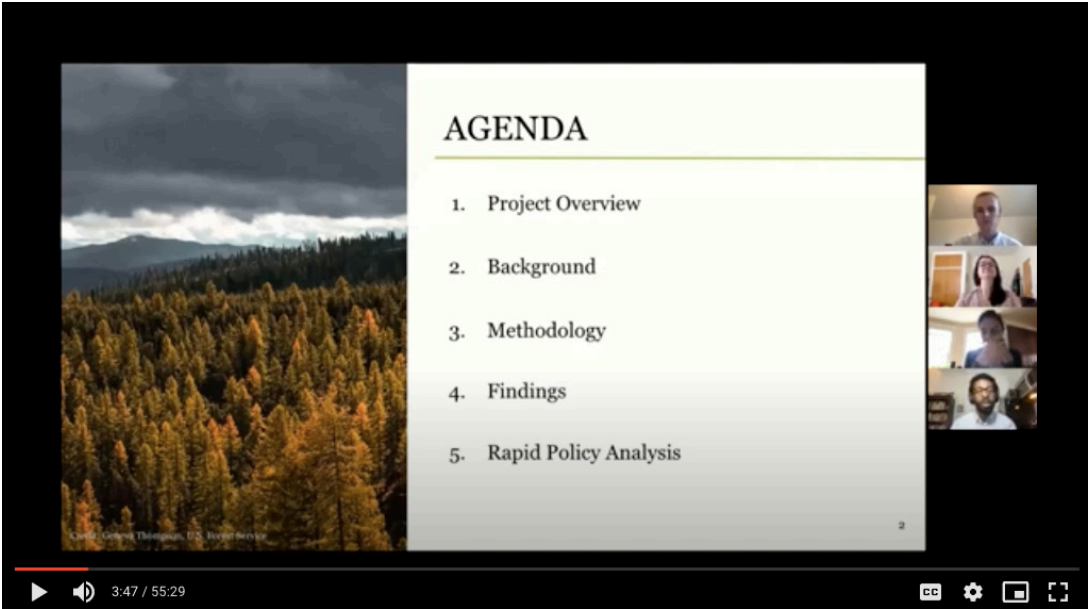
A proposed framework for conducting a rapid policy analysis for land restoration policies was created in tandem with this report. Though not used to analyze the existing policy database, this tool can be a starting point for identifying the most effective policy mechanisms for land restoration (Refer to Appendix C).

# CONCLUSION

This report and the corresponding policy database analyzes existing incentives for nature-based solutions to land degradation throughout the United States, and provides the World Resources Institute with a knowledge base to further examine incentives for restoration that could be replicable in other regions and countries. Acting as a sample of policy instruments, the current database indicates that further research is needed to gain a complete understanding of the U.S. policy landscape regarding nature-based solutions. The existing database can be expanded upon as more policies are identified and new states are included. In addition the policies that have been identified will act as a measure of accuracy for policies flagged through WRI’s automated Natural Language Processing framework. Ultimately, the hope is that this research will aid in furthering the movement to restore degraded lands in the U.S. and around the globe through its identification of common financial incentives for land restoration that may be scaled and replicated through subsequent work.

### Client Briefing

Click [here](#) to watch or scan the QR code below



### Midterm Briefing

Click [here](#) to watch or scan the QR code below



### Final Briefing

Click [here](#) to watch or scan the QR code below

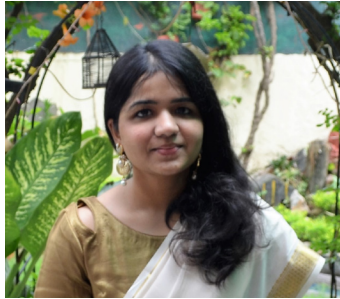


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## TEAM BIOS



**Mahak Agrawal** is a medical candidate turned urban planner, exploring innovative, implementable, impactful solutions for pressing urban-regional challenges in her diverse works. Presently, she is studying environmental science and policy at Columbia University as a Shardashish Interschool Fellow and SIPA Environmental Fellow. In different capacities, Mahak has worked with the Intergovernmental Panel on Climate Change, Town and Country Planning Organization-Government of India, Institute of Transport Economics, Oslo. In 2019, she founded Spatial Perspectives as an initiative that uses the power of digital storytelling and open data to dismantle myths and faulty perspectives associated with spaces around the world. In her spare time, Mahak creates sustainable artwork to tell tales of environmental crisis.



**Rashika Choudhary** has a Bachelor of Science degree in Biological Sciences from the University of California, Riverside and a certificate in Recycling and Resource Management from Santa Monica College. She has experience working on projects pertaining to environmental justice and sustainability issues through the lens of society, business, and policy. In 2019, Rashika assisted in piloting the Climate Action Leadership Program (CALP) to bridge the gap between science and policy through effective communication, leadership, and education for high school students in Southern California. She is also a Climate Reality Leader dedicated to intersectional environmentalism. At Columbia, Rashika is the President of the MPA-ESP Class of 2021 and is working to make lasting changes for future cohorts—specifically in diversity and inclusion (DEI) and antiracism in academia. Her academic coursework includes climate science and mitigation, policy analysis, and social campaigns.



**Owen Flood** is the Manager for the 2021 Spring Workshop. He has a Bachelor of Science degree in Environmental Science and Policy from the University of Maryland, College Park, with a concentration in Global Environmental Change, where he did a capstone project on flood mitigation mapping and strategies in vulnerable communities in Maryland. He has worked for WSP in Baltimore on projects dealing with climate change resilience, environmental planning, and water resource management. He also has experience in field research and interviews based on conservation. His skills include facilitation of group dialogue, research, data collection, and leadership. At Columbia, his academic focus includes data science, foreign policy, and climate science.



In the MPA-ESP program, **Hayley Herzog** is especially interested in the intersection of climate change science and policy. She earned her Bachelor's degree in Environmental Earth Science from Washington University in St. Louis. In 2018, Hayley worked as a field organizer for a U.S. Senate campaign where she oversaw volunteers and interns. Hayley then worked for the Trustees of Reservations, a Massachusetts conservation nonprofit, where she worked at an art museum and in land stewardship. Hayley has also interned at the National Geospatial-Intelligence Agency where she analyzed GIS data. At Columbia, she is a teaching assistant for a graduate course on the science of sustainable water management.



**Anna Nikolova** is the Deputy Manager for the 2021 Spring Workshop. She has a professional background in international development, impact investment, and social enterprise. She started her career as a Program Analyst at the U.S. Agency for International Development in Washington, DC, where she coordinated public-private partnerships with large global companies such as Intel. From 2017-2018, she was an Investment Fellow at Unitus Ventures, an impact-driven venture capital firm in India and worked in Indian social enterprises and non-profits until 2020. Anna's academic focus in the MPA ESP program is corporate sustainability. She is excited for the opportunity to identify economic and financial incentives for public-private partnerships for restoration. Her core skills are project management, writing, and policy analysis.



**Tunde Olatunji** has a background as a policy researcher, focused primarily on international development and poverty reduction. He has had experiences in both qualitative and quantitative methods and believes that policy should be grounded in strong, empirical research whenever possible. Through his most recent experience with the World Bank as a research consultant he developed skills in report writing, distillation of research, and presenting research findings to clients. In the environmental space, his interests are primarily in climate adaptation measures in parts of the world where climate impacts are most acute and where support is most needed.



After studying Economics at Bucknell University, **Drew Poling** spent three years with the New York Public Interest Research Group (NYPIRG), an environmental non-profit organization in New York state. At NYPIRG, Drew worked as an Outreach Director for the Long Island and New York City offices, managing and training staff members in community engagement. Additionally, Drew spent a year directing NYPIRG's activism-focused internship program at the College of Staten Island, teaching student interns and volunteers through skill-building workshops and events for six different campaigns. As a current finalist for the Presidential Management Fellows program, Drew's MPA-ESP coursework focuses on energy policy and climate mitigation.



**Rebecca Purba** is a communications specialist, with over 3 years of experience working at the intersection of UN, business, and government. Her expertise includes social media, writing, copyediting, graphic design, and project management. During her time at the United Nations Global Compact, she was exposed to the works of the World Resources Institute and collaborated with them on several campaigns such as the *Ambition Loop* and *Business Ambition for 1.5°C — Our Only Future* campaign through the Science Based Targets initiative. These works inspired her to focus her communications career in environment and development. After finishing her master's in Environmental Science and Policy at Columbia University she hopes to continue working in the sustainability and business spheres.



APPENDIX A: FULL POLICY DATABASE WITH ALL THE STATES

CALIFORNIA

State	Policy Level	Policy Title	Program Title	Year Implemented	Active	Sub-national jurisdiction	Policy Instrument 1	Policy Instrument 2	Primary NbS Outcome	Primary Environmental Hazard	Land Use Type 1	Land Use Type 2	Primary NbS Activity	Enforcement mechanism	Link to policy
California	Federal	Forest Service Native Plant Materials Policy (FSM 2070)	Lockeford Plant Materials Center (CAPMC)	2008	Yes	National Resources Conservation Service California	Supplies	Technical assistance	Protect ecosystem services	Soil erosion	Agriculture	Wetlands	Sustainable land use	No	<a href="https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/NativePlantMaterialsPolicy_Sept2012.pdf">https://www.fs.fed.us/wildflowers/Native_Plant_Materials/documents/NativePlantMaterialsPolicy_Sept2012.pdf</a>
California	Federal	2014 Farm Bill (reauthorized 2018)	Regional Conservation Partnership Program (RCPP)	2015	Yes	National Resources Conservation Service California	Cost-share	None	Protect ecosystem services	Biodiversity loss	Agriculture	Forest	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/farmbill/rcpp/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/farmbill/rcpp/</a>
California	Federal	1996 Farm Bill (reauthorized 2018)	Environmental Quality Incentives Program (EQIP)	1996	Yes	National Resources Conservation Service California	Direct Payments (PES)	Technical assistance	Protect ecosystem services	Water quality	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/financial/eqip/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/financial/eqip/</a>
California	Federal	2008 Farm Bill (reauthorized 2014 and 2018)	Conservation Stewardship Program (CSP)	2009	Yes	National Resources Conservation Service California	Direct Payments (PES)	None	Protect ecosystem services	Soil erosion	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/financial/csp/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/financial/csp/</a>
California	State	Cannella Environmental Farming Act of 1995	CA Healthy Soils Program	1995	Yes	California Department of Food and Agriculture	Grant	None	Protect ecosystem services	Soil erosion	Agriculture	None	Sustainable agricultural practices	No	<a href="https://www.cdfa.ca.gov/oefi/healthysoils/IncentivesProgram.html">https://www.cdfa.ca.gov/oefi/healthysoils/IncentivesProgram.html</a>
California	Federal	1990 Farm Bill (Organic Foods Production Act)	CA State Organic Program	1991	Yes	California Department of Food and Agriculture	Cost-share	None	Livelihood security	Soil erosion	Agriculture	None	Sustainable agricultural practices	No	<a href="https://www.cdfa.ca.gov/is/organicprogram/costshare.html">https://www.cdfa.ca.gov/is/organicprogram/costshare.html</a>
California	Federal	2008 Farm Bill, amended in 2010 (reauthorized 2014 and 2018)	Emergency Conservation Program (ECP)	2010	Yes	U.S. Department of Agriculture Farm Service Agency	Cost-share	None	Livelihood security	Drought	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Fact-Sheets/emergency-conservation-program-ecp-fact_sheet.pdf">https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Fact-Sheets/emergency-conservation-program-ecp-fact_sheet.pdf</a>
California	State	Assembly Bill 2348	California Winter Rice Habitat Incentive Program	2018	Yes	California Department of Fish and Wildlife	Direct Payments (PES)	None	Protect biodiversity	Biodiversity loss	Agriculture	None	Sustainable agricultural practices	No	<a href="https://wildlife.ca.gov/Lands/CWHP/Private-Lands-Programs#:~:text=The%20California%20Winter%20Rice%20Habitat%20Incentive%20Program%20(CWRHIP)%20provides%20economic,Wildlife's%20(CDFW)%20Comprehensive%20Wetland%20Habitat">https://wildlife.ca.gov/Lands/CWHP/Private-Lands-Programs#:~:text=The%20California%20Winter%20Rice%20Habitat%20Incentive%20Program%20(CWRHIP)%20provides%20economic,Wildlife's%20(CDFW)%20Comprehensive%20Wetland%20Habitat</a>
California	State	Wildlife Conservation Law of 1947, Fish and Game Code, Division 2, Chapter 4.	Ecosystem Restoration on Agricultural Lands (ERAL)	1947	Yes	California Wildlife Conservation Board	Grant	None	Protect biodiversity	Biodiversity loss	Agriculture	Wetlands	Habitat/species conservation	No	<a href="https://wcb.ca.gov/Programs/Agricultural-Lands">https://wcb.ca.gov/Programs/Agricultural-Lands</a>
California	State	Assembly Bill 32	CA Cap-and-Trade Program (ARB Emissions Trading Program)	2013	Yes	California Environmental Protection Agency	Credit/guarantee	None	Protect ecosystem services	Deforestation	Forest	Urban/built	Forest management	No	<a href="https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/guidance/cap_trade_overview.pdf">https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/guidance/cap_trade_overview.pdf</a>
California	State	Assembly Bill 32	Forest Health Grants	2016	Yes	California Department of Forestry and Fire Protection	Grant	None	Protect against extreme events	Wildfire	Forest	None	Forest management	No	<a href="https://www.fire.ca.gov/grants/forest-health-grants/">https://www.fire.ca.gov/grants/forest-health-grants/</a>
California	State	California Forest Legacy Program Act of 2007	California Forest Legacy Program	2007	Yes	California Department of Forestry and Fire Protection	Easement	Technical assistance	Protect ecosystem services	Deforestation	Forest	None	Forest management	No	<a href="https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&amp;division=10.5.&amp;title=&amp;part=&amp;chapter=2.&amp;article=">https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&amp;division=10.5.&amp;title=&amp;part=&amp;chapter=2.&amp;article=</a>
California	Federal	16 U.S. Code § 2103c - Forest Legacy Program	Federal Forest Legacy Program	1990	Yes	U.S. Forest Service	Easement	None	Protect ecosystem services	Deforestation	Forest	None	Forest management	No	<a href="https://www.law.cornell.edu/uscode/text/16/2103c">https://www.law.cornell.edu/uscode/text/16/2103c</a>
California	State	California Forest Improvement Act of 1978	California Forest Improvement Program	1978	Yes	California Department of Forestry and Fire Protection	Cost-share	Technical assistance	Sustainable development	Wildfire	Forest	None	Forest management	No	<a href="https://www.placer.ca.gov/DocumentCenter/View/496/Forest-Improvement-Program-PDF">https://www.placer.ca.gov/DocumentCenter/View/496/Forest-Improvement-Program-PDF</a>
California	State	CA Revenue and Tax Code 423.5-437 and Revenue Tax Code part 18.5 of Division 2, pamphlet # 43 LDA	Forest Incentive Programs - Property Taxes for California	1977	Yes	California State Board of Equalization (BOE)	Fines	None	Sustainable development	Deforestation	Forest	None	Forest management	Yes	<a href="https://www.srs.fs.usda.gov/econ/data/forestincentives/summary-california.htm">https://www.srs.fs.usda.gov/econ/data/forestincentives/summary-california.htm</a>
California	Federal	2008 Farm Bill, amended in 2010 (reauthorized 2014 and 2018)	Emergency Forest Restoration Program (EFRP)	2010	Yes	U.S. Department of Agriculture Farm Service Agency	Cost-share	None	Livelihood security	Wildfire	Forest	None	Reforestation	No	<a href="https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Fact-Sheets/emergency_forest_restoration_program-fact_sheet.pdf">https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Fact-Sheets/emergency_forest_restoration_program-fact_sheet.pdf</a>
California	State	Official Policy on Conservation Banks	California Conservation and Mitigation Banks	1995	Yes	California Department of Fish and Wildlife	Credit/guarantee	None	Protect biodiversity	Biodiversity loss	Forest	Wetlands	Forest management	No	<a href="https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=FGC&amp;division=2.&amp;title=&amp;part=&amp;chapter=7.9.&amp;article=">https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=FGC&amp;division=2.&amp;title=&amp;part=&amp;chapter=7.9.&amp;article=</a>
California	State	Habitat Restoration and Enhancement Act of 2014	Habitat Restoration and Enhancement Act	2014	Yes	California Department of Fish and Wildlife	Technical assistance	None	Protect biodiversity	Biodiversity loss	Wetlands	Other	Wetland management	No	<a href="http://leginfo.ca.gov/pub/13-14/bill/asm/ab_2151-2200/ab_2193_bill_20140926_chaptered.htm">http://leginfo.ca.gov/pub/13-14/bill/asm/ab_2151-2200/ab_2193_bill_20140926_chaptered.htm</a>
California	Federal	Land and Water Conservation Fund Act of 1965	Landowner Incentive Program	2002	Yes	California Department of Fish and Wildlife	Direct Payments (PES)	Technical assistance	Protect biodiversity	Biodiversity loss	Wetlands	Grassland/range	Habitat/species conservation	No	<a href="https://wildlife.ca.gov/Lands/CWHP/Private-Lands-Programs/Landowner-Incentive-Program">https://wildlife.ca.gov/Lands/CWHP/Private-Lands-Programs/Landowner-Incentive-Program</a>
California	Federal	1990 Farm Bill (re authorized)	Wetland Reserve Easement (WRE)	1992	Yes	National Resources Conservation Service California	Easement	Technical assistance	Protect ecosystem services	Biodiversity loss	Wetlands	Agriculture	Wetland management	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/easements/acep/?cid=stelprdb1253509">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/easements/acep/?cid=stelprdb1253509</a>

# APPENDIX A: FULL POLICY DATABASE WITH ALL THE STATES

## COLORADO

State	Policy Level	Policy Title	Program Title	Year Implemented	Active	Sub-national jurisdiction	Policy Instrument 1	Policy Instrument 2	Primary NbS Outcome	Primary Environmental Hazard	Land Use Type 1	Land Use Type 2	Primary NbS Activity	Enforcement mechanism	Link to policy
Colorado	State	HB21-1181	Soil Health Initiative	2018	Yes	Colorado Department of Agriculture	Technical assistance	None	Protect ecosystem services	Soil erosion	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://ag.colorado.gov/conservation/soil-health">https://ag.colorado.gov/conservation/soil-health</a> , <a href="https://leg.colorado.gov/bills/hb21-1181">https://leg.colorado.gov/bills/hb21-1181</a>
Colorado	Federal	Updated 2018 Farm Bill	Agricultural Conservation Easement Program	2014	Yes	National Resources Conservation Service Colorado	Easement	Technical assistance	Food security	Soil erosion	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/easements/acep/?cid=nrcseprd1451447">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/easements/acep/?cid=nrcseprd1451447</a> , <a href="https://www.federalregister.gov/documents/2021/02/04/2021-02268/agricultural-conservation-easement-program">https://www.federalregister.gov/documents/2021/02/04/2021-02268/agricultural-conservation-easement-program</a>
Colorado	Federal	Soil Conservation and Domestic Allotment Act of 1936	Conservation Technical Assistance Program	1936	Yes	National Resources Conservation Service Colorado	Technical assistance	None	Food security	Soil erosion	Agriculture	Grassland/range	Sustainable land use	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/technical/cp/cta/?cid=nrcs144p2_062773">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/technical/cp/cta/?cid=nrcs144p2_062773</a> , <a href="https://fas.org/sgp/crs/misc/R40763.pdf">https://fas.org/sgp/crs/misc/R40763.pdf</a>
Colorado	State	Weed Free Forage Crop Certification Act of 1997	Certified Weed Free Forage Program	1993	Yes	Colorado Department of Agriculture	Technical assistance	None	Food security	Biodiversity loss	Agriculture	None	Sustainable agricultural practices	No	<a href="https://drive.google.com/file/d/0Bxn6NtpJWc9JNmx1QnJGRGYzNVE/view">https://drive.google.com/file/d/0Bxn6NtpJWc9JNmx1QnJGRGYzNVE/view</a> , <a href="https://cpw.state.co.us/aboutus/Pages/Weed-FreeForageProgram.aspx">https://cpw.state.co.us/aboutus/Pages/Weed-FreeForageProgram.aspx</a>
Colorado	Federal	Food Security Act of 1985	Conservation Reserve Program (Reauthorized in 2018 Farm Bill)	1985	Yes	Farm Service Agency	Direct Payments (PES)	Cost-share	Protect biodiversity	Biodiversity loss	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/Fact-Sheets/2019/conservation-reserve_program-fact_sheet.pdf">https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/Fact-Sheets/2019/conservation-reserve_program-fact_sheet.pdf</a>
Colorado	Federal	1996 Farm Bill	Environmental Quality Incentives Program	1996	Yes	National Resources Conservation Service Colorado	Technical assistance	Cost-share	Protect ecosystem services	Water quality	Agriculture	Grassland/range	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/financial/eqip/?cid=nrcseprd1361683">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/financial/eqip/?cid=nrcseprd1361683</a> , <a href="https://sustainableagriculture.net/publications/grassrootsguide/conservation-environment/environmental-quality-incentives-program/">https://sustainableagriculture.net/publications/grassrootsguide/conservation-environment/environmental-quality-incentives-program/</a>
Colorado	State	SENATE BILL 17-050	Forest Restoration & Wildfire Risk Mitigation Grant Program	2017	Yes	State of Colorado	Grant	None	Protect against extreme events	Wildfire	Forest	None	Forest management	No	<a href="https://leg.colorado.gov/sites/default/files/documents/2017A/bills/2017a_050_enr.pdf">https://leg.colorado.gov/sites/default/files/documents/2017A/bills/2017a_050_enr.pdf</a>
Colorado	Federal	Cooperative Forestry Assistance Act of 1978	Forest Stewardship Program	1978	Yes	U.S. Forest Service	Technical assistance	None	Protect ecosystem services	Deforestation	Forest	None	Reforestation	No	<a href="https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf">https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf</a>
Colorado	Federal	Cooperative Forestry Assistance Act of 1978	Forest Legacy Program	1990	Yes	U.S. Forest Service	Direct Payments (PES)	None	Protect ecosystem services	Deforestation	Forest	None	Forest management	Yes	<a href="https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/15541-forest-service-legacy-program-508.pdf">https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/15541-forest-service-legacy-program-508.pdf</a>
Colorado	Federal	Omnibus Public Land Management Act of 2009	Front Range - Collaborative Forest Landscape Restoration Program	2011	Yes	U.S. Forest Service	Technical assistance	None	Protect ecosystem services	Deforestation	Forest	None	Forest management	No	<a href="https://cfri.colostate.edu/projects/fr-cflrp/">https://cfri.colostate.edu/projects/fr-cflrp/</a> , <a href="https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd525431.pdf">https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd525431.pdf</a>
Colorado	Federal	Updated 2002 Farm Bill	Forest Land Enhancement Program	2002	No	U.S. Forest Service	Cost-share	Technical assistance	Protect ecosystem services	Deforestation	Forest	None	Forest management	No	<a href="https://www.timbertax.org/getstarted/costshare/programs/flep/">https://www.timbertax.org/getstarted/costshare/programs/flep/</a> , <a href="https://www.epa.gov/sites/production/files/2015-10/documents/app_e.pdf">https://www.epa.gov/sites/production/files/2015-10/documents/app_e.pdf</a>
Colorado	State	Article XXVII	Great Outdoors Colorado Program	1992	Yes	State of Colorado	Grant	Cost-share	Protect ecosystem services	Biodiversity loss	Multi-use	None	Sustainable land use	No	<a href="https://goco.org/sites/default/files/ARTICLE-XXVII-GOCO-Amendment_0.pdf">https://goco.org/sites/default/files/ARTICLE-XXVII-GOCO-Amendment_0.pdf</a>
Colorado	State	Article XXVII	Colorado Wildlife Habitat Program	2006	Yes	Colorado Parks and Wildlife	Easement	None	Protect biodiversity	Deforestation	Multi-use	None	Habitat/species conservation	No	<a href="https://cpw.state.co.us/Documents/LandWater/COWildlifeHabitatProtectionProgram/2020-CWHP-RFP_FactSheet.pdf">https://cpw.state.co.us/Documents/LandWater/COWildlifeHabitatProtectionProgram/2020-CWHP-RFP_FactSheet.pdf</a>
Colorado	State	Colorado Natural Areas Act of 1977	Colorado Natural Areas Program	1977	Yes	State of Colorado	Technical assistance	None	Protect ecosystem services	Biodiversity loss	Multi-use	None	Sustainable land use	Yes	<a href="https://cpw.state.co.us/Documents/CNAP/CNAP-Act-of-1977.pdf">https://cpw.state.co.us/Documents/CNAP/CNAP-Act-of-1977.pdf</a> , <a href="https://cpw.state.co.us/aboutus/Pages/CNAP-About.aspx">https://cpw.state.co.us/aboutus/Pages/CNAP-About.aspx</a>
Colorado	Federal	Originally from Flood Control Act of 1950	Emergency Watershed Protection Program	1950	Yes	National Resources Conservation Service Colorado	Technical assistance	Cost-share	Protect against extreme events	Flooding	Multi-use	None	Sustainable land use	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/financial/ewp/?cid=stelprdb1193198">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/programs/financial/ewp/?cid=stelprdb1193198</a> , <a href="https://www.federalregister.gov/documents/2003/11/19/03-28793/emergency-watershed-protection-program">https://www.federalregister.gov/documents/2003/11/19/03-28793/emergency-watershed-protection-program</a>
Colorado	Federal	SENATE BILL 09-158	Colorado Landowner Incentive Program	2009	Yes	Bureau of Land Management	Grant	None	Protect biodiversity	Biodiversity loss	Multi-use	None	Habitat/species conservation	No	<a href="https://www.fws.gov/wsfrprograms/subpages/grantprograms/lip/lip.htm">https://www.fws.gov/wsfrprograms/subpages/grantprograms/lip/lip.htm</a> , <a href="http://seas.umich.edu/ecomgt/swap/PDFs/LIP.pdf">http://seas.umich.edu/ecomgt/swap/PDFs/LIP.pdf</a>
Colorado	State	Article XXVII	Wetland Wildlife Conservation Program	1997	Yes	Colorado Parks and Wildlife	Direct Payments (PES)	None	Protect biodiversity	Biodiversity loss	Wetlands	Forest	Wetland management	No	<a href="https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/CP-WWetlandsProgram.pdf">https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/CP-WWetlandsProgram.pdf</a>
Colorado	State	Article XXVII	RESTORE Colorado Program	2020	Yes	Great Outdoors Colorado (GOCO)	Grant	None	Protect biodiversity	Biodiversity loss	Wetlands	Grassland/range	Habitat/species conservation	No	<a href="https://goco.org/news/goco-and-funding-partners-award-27m-11-projects-inaugural-round-restore-grant-program">https://goco.org/news/goco-and-funding-partners-award-27m-11-projects-inaugural-round-restore-grant-program</a> , <a href="https://goco.org/grants/apply/restore-colorado">https://goco.org/grants/apply/restore-colorado</a>
Colorado	State	HOUSE BILL 13-1012	Wildfire Mitigation Measures Subtraction	2013	Yes	Colorado Department of Revenue	Tax deduction	None	Protect against extreme events	Wildfire	Forest	None	Forest management	No	<a href="http://www.leg.state.co.us/CLICS/CLICS2013A/csl.nsf/fsbillcont3/1384C4AC0C3740D287257A8E0073CB66?Open&amp;file=1012_enr.pdf">http://www.leg.state.co.us/CLICS/CLICS2013A/csl.nsf/fsbillcont3/1384C4AC0C3740D287257A8E0073CB66?Open&amp;file=1012_enr.pdf</a> , <a href="https://www.colorado.gov/pacific/sites/default/files/Income65.pdf">https://www.colorado.gov/pacific/sites/default/files/Income65.pdf</a>
Colorado	State	HB 99-1155	Colorado Conservation Easement Tax Credit Program	2000	Yes	Conservation Easement Oversight Commission	Credit/guarantee	Easement	Protect biodiversity	Biodiversity loss	Multi-use	None	Sustainable land use	No	<a href="https://leg.colorado.gov/sites/default/files/conservation_easement_program_ip_memo_6052017.pdf">https://leg.colorado.gov/sites/default/files/conservation_easement_program_ip_memo_6052017.pdf</a> , <a href="https://leg.colorado.gov/sites/default/files/images/olls/2003a_sl_137.pdf">https://leg.colorado.gov/sites/default/files/images/olls/2003a_sl_137.pdf</a>

APPENDIX A: FULL POLICY DATABASE WITH ALL THE STATES

MARYLAND

State	Policy Level	Policy Title	Program Title	Year Implemented	Active	Sub-national jurisdiction	Policy Instrument 1	Policy Instrument 2	Primary NbS Outcome	Primary Environmental Hazard	Land Use Type 1	Land Use Type 2	Primary NbS Activity	Enforcement mechanism	Link to policy
Maryland	Federal	Farm Security and Rural Investment Act of 2002	Maryland Nutrient Trading Program	2010	Yes	Maryland Department of Agriculture	Credit/guarantee	None	Food security	Biodiversity loss	Agriculture	None	Sustainable agricultural practices	No	<a href="https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Documents/Webinars/May/Nutrient_Trading_and_Ecosystem_Markets.pdf">https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Documents/Webinars/May/Nutrient_Trading_and_Ecosystem_Markets.pdf</a>
Maryland	State	Maryland Voluntary Cleanup and Revitalization Program Act	Voluntary Cleanup Program(VCP)	1997	Yes	Maryland Department of the Environment	Grant	None	Sustainable development	Wildfire	Agriculture	Forest	Sustainable land use	No	<a href="https://dnr.maryland.gov/forests/Documents/textupdate13.pdf">https://dnr.maryland.gov/forests/Documents/textupdate13.pdf</a>
Maryland	Federal	Resiliency through Restoration Initiative	Community Resilience Grant program	2017	Yes	Maryland Department of Natural Resources	Grant	None	Livelihood security	Soil erosion	Agriculture	Wetlands	Wetland management	No	<a href="https://dnr.maryland.gov/ccs/Pages/Resiliency-through-Restoration.aspx">https://dnr.maryland.gov/ccs/Pages/Resiliency-through-Restoration.aspx</a>
Maryland	Federal	Federal Crop Insurance Act	The Agricultural Management Assistance (AMA)	2018	Yes	Maryland Association of Soil Conservation	Technical assistance	Grant	Livelihood security	Soil erosion	Agriculture	None	Sustainable agricultural practices	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ama/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ama/</a>
Maryland	Federal	Food Security Act 1985	Conservation Reserve Program (CRP)	1997	Yes	National Resources Conservation Service Maryland	Grant	None	Sustainable development	Deforestation	Agriculture	None	Forest management	No	<a href="https://www.mdsg.umd.edu/wra/programs/conservation-reserve-program-crp">https://www.mdsg.umd.edu/wra/programs/conservation-reserve-program-crp</a>
Maryland	Federal	Federal Agriculture and Improvement Act 1996	Environmental Quality Incentive Program (EQIP),	1996	Yes	National Resources Conservation Service Maryland	Cost-share	Technical assistance	Livelihood security	Soil erosion	Agriculture	None	Sustainable agricultural practices	No	<a href="https://www.mdsg.umd.edu/wra/programs/environmental-quality-incentives-program-eqip">https://www.mdsg.umd.edu/wra/programs/environmental-quality-incentives-program-eqip</a>
Maryland	Federal	Food Security Act of 1985	Farm and Ranch Lands Protection Program	1985	Yes	National Resources Conservation Service Maryland	Technical assistance	Grant	Food security	Soil erosion	Agriculture	None	Sustainable land use	Yes	<a href="https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_014911.pdf">https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_014911.pdf</a>
Maryland	Federal	Federal Agriculture and Improvement Act	Flood Risk Reduction Program	1996	Yes	National Resources Conservation Service Maryland	Grant	Technical assistance	Protect against extreme events	Flooding	Agriculture	Wetlands	Wetland management	No	<a href="https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1297&amp;context=iowaagreview">https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1297&amp;context=iowaagreview</a>
Maryland	State	SB 320 Chesapeake Bay Restoration Fund	MD Agricultural Water Quality Cost-Share Program (MACS)	1982	Yes	Maryland Department of Agriculture	Cost-share	Technical assistance	Livelihood security	Water quality	Agriculture	Wetlands	Sustainable agricultural practices	Yes	<a href="https://mda.maryland.gov/resource_conservation/pages/macs.aspx">https://mda.maryland.gov/resource_conservation/pages/macs.aspx</a>
Maryland	Federal	Food Security Act 1985	Maryland Conservation Reserve Enhancement Program	1997	Yes	Maryland Department of Agriculture	Grant	Technical assistance	Protect biodiversity	Biodiversity loss	Forest	Wetlands	Agroforestry	Yes	<a href="https://mda.maryland.gov/resource_conservation/Pages/crep.aspx">https://mda.maryland.gov/resource_conservation/Pages/crep.aspx</a>
Maryland	State	Forest Conservation Act	Forest Conservation Act Program	1991	Yes	Maryland Department of Natural Resources	Fines	None	Protect biodiversity	Deforestation	Forest	None	Forest management	Yes	<a href="https://dnr.maryland.gov/forests/Pages/programapps/FCA-Requirements.aspx">https://dnr.maryland.gov/forests/Pages/programapps/FCA-Requirements.aspx</a>
Maryland	Federal	Federal Agriculture and Improvement Act	Wildlife Habitat Incentives Program (WHIP)	2008	No	National Resources Conservation Service Maryland	Grant	Tax deduction	Protect biodiversity	Biodiversity loss	Forest	Wetlands	Habitat/species conservation	No	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs141p2_024540">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs141p2_024540</a>
Maryland	State	Farm Security and Rural Investment Act of 2002	Maryland Woodland Incentives Program	1986	Yes	Maryland Department of Natural Resources	Grant	Technical assistance	Protect biodiversity	Deforestation	Forest	None	Reforestation	No	<a href="https://www.mdsg.umd.edu/wra/programs/woodland-incentive-program">https://www.mdsg.umd.edu/wra/programs/woodland-incentive-program</a>
Maryland	Federal	Food, Agriculture, Conservation, and Trade Act of 1990	Forest Stewardship Program (FSP)	1991	Yes	Maryland Forest Service	Technical assistance	Grant	Protect biodiversity	Deforestation	Forest	None	Reforestation	No	<a href="https://www.fs.usda.gov/managing-land/forest-stewardship/program">https://www.fs.usda.gov/managing-land/forest-stewardship/program</a>
Maryland	Federal	2003 Healthy Forests Act	Forestry Incentive Program (FIP)	1975	No	National Resources Conservation Service Maryland	Grant	Technical assistance	Protect biodiversity	Deforestation	Forest	None	Reforestation	No	<a href="https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_002103.pdf">https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_002103.pdf</a>
Maryland	State	HB 679 - The Uniform Environmental Covenants Act (UECA)	Environmental Covenants Program	2005	Yes	Maryland Department of the Environment	Fines	None	Sustainable development	Biodiversity loss	Urban/built	Forest	Sustainable land use	Yes	<a href="https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Maryland%20UECA%20Fact%20Sheet(5).pdf">https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Maryland%20UECA%20Fact%20Sheet(5).pdf</a>
Maryland	State	Brownfields Redevelopment Reform Act	Brownfields Redevelopment Initiative Program (BRIP)	2004	Yes	Maryland Department of Business and Economic Development	Grant	None	Sustainable development	Biodiversity loss	Urban/built	None	Sustainable land use	No	<a href="https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Brownfields%20Redevelopment%20Reform%20Act%20Rev%202LRP.pdf">https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Brownfields%20Redevelopment%20Reform%20Act%20Rev%202LRP.pdf</a>
Maryland	State	Resiliency through Restoration Initiative	Conservation Buffer Initiative	2020	Yes	Maryland Department of Natural Resources	Technical assistance	Direct Payments (PES)	Protect ecosystem services	Water quality	Wetlands	None	Agroforestry	No	<a href="https://mda.maryland.gov/resource_conservation/Pages/conservation-buffer-initiative.aspx#:~:text=Introducing%20Maryland's%20new%20Conservation%20Buffer,streams%20and%20the%20Chesapeake%20Bay.">https://mda.maryland.gov/resource_conservation/Pages/conservation-buffer-initiative.aspx#:~:text=Introducing%20Maryland's%20new%20Conservation%20Buffer,streams%20and%20the%20Chesapeake%20Bay.</a>
Maryland	State	Maryland Nonstructural Shore Erosion Control Act	Shore Erosion Control Program	1968	Yes	Maryland Department of Natural Resources	Cost-share	Technical assistance	Protect ecosystem services	Coastal Erosion	Wetlands	None	Wetland management	No	<a href="https://digitalcommons.odu.edu/cgi/viewcontent.cgi?article=1004&amp;context=hraforum_24">https://digitalcommons.odu.edu/cgi/viewcontent.cgi?article=1004&amp;context=hraforum_24</a>
Maryland	State	Chesapeake Bay Wetlands Policy	Nontidal Wetlands Protection Act	1989	Yes	Maryland Department of the Environment	Grant	Technical assistance	Protect biodiversity	Coastal Erosion	Wetlands	None	Wetland management	No	<a href="https://mde.state.md.us/programs/Water/WetlandsandWaterways/DocumentsandInformation/Documents/www.mde.state.md.us/assets/document/WetlandsWaterways/protection.pdf">https://mde.state.md.us/programs/Water/WetlandsandWaterways/DocumentsandInformation/Documents/www.mde.state.md.us/assets/document/WetlandsWaterways/protection.pdf</a>



APPENDIX B: RAPID POLICY ANALYSIS

Policy Name	enter name here		enter name here		enter name here		enter name here	
Restoration Score (out of 100)								
Policy Implementation Score (out of 100)								
Restoration Assessment	Check if Yes		Check if Yes		Check if Yes		Check if Yes	
Is the Policy Currently Active?								
Does the policy implement one or more of the following instruments?		which ones?		which ones?		which ones?		which ones?
Cost-share								
Direct Payments (PES)								
Subsidy								
Tax deduction								
Easement								
Grant								
Credit/guarantee								
Technical assistance								
Supplies								
Fines								
Does the policy address one or more of the following environmental hazards?		which ones?		which ones?		which ones?		which ones?
Coastal Erosion								
Deforestation								
Drought								
Flooding								
Water availability								
Water quality								
Wildfire								
Soil erosion								
Biodiversity loss								
Does the policy implement one or more of the following activities?		which ones?		which ones?		which ones?		which ones?
Forest management								
Reforestation								
Agroforestry								
Sustainable land use								
Sustainable agricultural practices								
Wetland management								
Grassland management								
Habitat/species conservation								
Does the policy have an enforcement mechanism?								
Policy Implementation Assessment	Select a number between 1-10		Select a number between 1-10		Select a number between 1-10		Select a number between 1-10	
On a scale of 1-10, how impactful are the effects of this policy?								
On a scale of 1-10, how significant are the benefits compared to the costs?								
On a scale of 1-10, how equitably are the benefits of the policy distributed?								
On a scale of 1-10, how socially acceptable is this policy?								
On a scale of 1-10, how feasible are the policy's activities?								
On a scale of 1-10, how certain are the effects of the policy to happen?								

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