

KICK THE DUST OFF: A PRO-CATTLE AMENDMENT TO COLORADO’S DUST BLOWING ACT OF 1954

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INTRODUCTION

In 1935, on the eastern plains of Colorado, children gleefully played tag on their family homestead. Farm dogs rolled around in the grass while barn cats basked in the sunshine. Meanwhile, anxious parents sat inside around the kitchen table, wishing for rain to save the land from the five-year-long drought ravaging the great plains of the United States.¹ The rain never came.

What came instead was a one-thousand-foot cloud of thick, black dust that some observers would later describe as a “black blizzard.”² The dust swirled and lingered across parts of Colorado, New Mexico, Texas, Kansas, and Oklahoma, achieving the peak of its damage in 1935 through 1936.³ This period, called the 1930s Dust Bowl,⁴ significantly threatened animal and human health.⁵ Human land management, harsh droughts, and poor soil conditions were the main causes.⁶

Concerned with the risks that dust posed to human welfare, the Colorado Legislature created the Dust Blowing Act of 1954 (Dust Act).⁷ Unfortunately, the Dust Act undermines its own power by omitting important land management techniques—namely integration of livestock—from its required list of activities that prevent soil erosion. The Dust Act should impose a duty upon cattle-owners to integrate their cattle into their current land use in accordance with regenerative agricultural practices to prevent harmful topsoil erosion. This Article proposes amending the Dust Act to require landowners and occupiers who own cattle to integrate their cattle into their land management practices in accordance with regenerative agricultural principles. Requiring cattle integration will enhance the Dust Act’s goal of protecting human welfare, while transforming the Act into environmentally protective legislation.

Part I discusses the role of agriculture in climate change. Part II considers misconceptions that cattle are inherently harmful animals, and Part III asserts that agriculture can be a climate change solution. Part IV

1. See R. DOUGLAS HUNT, *THE DUST BOWL: AN AGRICULTURAL AND SOCIAL HISTORY* 1 (Nelson-Hall Chic. 1984 reprt.) (1981) (describing how dust replaced the rain that rural citizens hoped for in 1935).

2. *Id.* at 1–2.

3. *Id.* at 2–3.

4. See generally *id.* at 3, 84–86 (noting how dust storms occurred from 1930 until 1940).

5. See *id.* at 103–04 (describing the damage dust caused to pastures used to raise cattle); see also Jeffrey B. Basara et al., *Drought and Associated Impacts in the Great Plains of the United States—A Review*, 4 INT’L J. GEOSCIENCES 72, 76–77 (2013) (explaining the harmful impacts of the Dust Bowl on agricultural crops and human lungs).

6. See HUNT, *supra* note 1, at 17 (“[T]he composition of the soil, the severity of the climate, and the settlement of man were responsible for the creation of the Dust Bowl.”).

7. See *infra* Part IV.A.

provides an overview of the Dust Act and interprets the relevant sections of the Act and its application in case law. Part V discusses the proposed amendment to the Act that requires cattle owners to integrate their cattle into the land to prevent soil erosion and the implications of this amendment.

I. AGRICULTURE AS A PROMISING CLIMATE CHANGE SOLUTION

Agriculture and climate change share a complex relationship. This Part evaluates this relationship and asserts that properly managing cattle through regenerative agriculture will draw carbon dioxide back into the ground, offsetting the effects of climate change. This Part also details the threats of climate change and how conventional agriculture enhances those threats.

Greenhouse gas (GHG) emissions are heating the Earth's atmosphere and damaging its ecosystems and resources.⁸ Climate scientists contend that if humanity does not significantly reduce GHG emissions—namely carbon dioxide, methane, and nitrous oxide—catastrophe will ruin the planet.⁹ After GHGs raise the earth's temperature by 1.5 degrees Celsius compared to pre-industrial temperature,¹⁰ extreme drought, flooding, biodiversity loss, increased heat-related illness, more frequent spread of diseases, and greater risk of species extinction are likely.¹¹ Carbon dioxide exacerbates climate change, comprising 82% of the United States' domestic GHG emissions.¹² This domestic carbon dioxide creation constitutes 15% of human-caused carbon dioxide globally¹³ and comprises most of the United States' contribution to global climate change.¹⁴ Increasing amounts of carbon dioxide in the atmosphere is the greatest cause of climate change.¹⁵

8. Alexia Brunet Marks, *(Carbon) Farming Our Way Out of Climate Change*, 97 DENV. L. REV. 497, 499–500 (2020) (stating that damage from climate change includes a reduction in arable land that decreases how much food farmers can produce; weakened land, water, and soil quality; increased price instability; more frequent political conflicts; and significant threats to human health—like extending allergy season).

9. *Id.*

10. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5 C vii (Valérie Masson-Delmotte et al. eds., 2018) (noting that the pre-industrial time period is 1850–1900).

11. *Id.* at 177–81.

12. NICOLETTE HAHN NIMAN, DEFENDING BEEF: THE ECOLOGICAL AND NUTRITIONAL CASE FOR MEAT 9 (Benjamin Watson & Laura Jorstad eds., 2021).

13. *Id.*

14. *Id.* (“[Carbon dioxide’s] warming effect, lasts hundreds of thousands of years. Essentially, CO₂’s warming effect lasts forever.”).

15. *Id.* at 10.

Agriculture within the United States emits GHGs, including harmful carbon dioxide.¹⁶ In the United States, agriculture is the most common type of land use,¹⁷ constituting 9% of domestic GHG emissions and 25% of global GHG emissions.¹⁸ Combined, this means limiting GHG emissions from farms is essential for limiting the impacts of climate change. Conventional agricultural practices specifically create GHG emissions because its defining practices, such as plowing and stationary grazing, erode soil and release GHGs.¹⁹ Furthermore, conventional agricultural practices strip soil of its important organic carbon content, reducing the ability of soil to function, and releasing that carbon into the atmosphere.²⁰ Unhealthy soils create carbon; healthy soils store carbon.²¹

Because good agricultural practices have the ability to sequester a significant amount of atmospheric carbon dioxide, agriculture is an optimal sector to combat climate change within.²² The carbon cycle demonstrates agriculture's potential to sequester carbon from the atmosphere and into the soil.²³ The well-known concept of photosynthesis, where plants use sunshine to grow, is a cornerstone of the carbon cycle.²⁴ For plants to photosynthesize

16. *Id.* at 9, 12, 20 (describing that 14% of domestic agricultural GHG emissions are carbon dioxide, 40% of domestic agricultural GHG emissions are methane, and that nitrous oxide composes 5% of United States GHG emissions with 73% of that nitrous oxide attributed to agriculture).

17. DANIEL P. BIGELOW & ALLISON BORCHERS, U.S. DEP'T OF AGRIC., MAJOR USES OF LAND IN THE UNITED STATES, 2012, (2017) (stating that grassland pasture and rangeland constitute nearly one third of total United States land use, followed closely by forest land use).

18. Marks, *supra* note 8, at 501.

19. Moises Velasquez-Manoff, *Can Dirt Save the Earth?*, N.Y. TIMES MAG. (Apr. 18, 2018), <https://www.nytimes.com/2018/04/18/magazine/dirt-save-earth-carbon-farming-climate-change.html>.

20. JOHN A. STANTURF ET AL., SOILS ARE FUNDAMENTAL TO LANDSCAPE RESTORATION, SOILS AND LANDSCAPE RESTORATION 22–24 (John A. Stanturf & Mac A. Callahan Jr. eds., 2020).

21. See NIMAN, *supra* note 12, at 34–39. Fungi underneath the soil create a sticky carbon-based protein called glomalin. Glomalin attaches to the roots of plants and provides nutrients to the plants from the soil, while providing the carbon from the plants to the soil. Clumps of soil held together by glomalin stabilize the carbon within the soil and so the carbon stays in the soil for a long time. The soil clumps of glomalin help filter water, retain water, and feed carbon to important organisms within the soil. *Id.*

22. See, e.g., *id.* at 36 (stating that “the greatest opportunities for carbon sequestration lie in grazing areas”); JUDITH D. SCHWARTZ, COWS SAVE THE PLANET AND OTHER IMPROBABLE WAYS OF RESTORING SOIL HEALTH TO HEAL THE EARTH 16 (Laura Jorstad ed., 2013) (explaining the importance of changing agricultural practices to sequester carbon dioxide and quoting a colleague stating “[w]orldwide, if the organic matter—which is about 58 percent carbon—in all the land that we currently farm and graze were increased 1.6 percent to a foot in depth, atmospheric CO₂ levels would be at pre-industrial levels.”); see also Velasquez-Manoff, *supra* note 19 (describing how reducing emissions alone is insufficient to mitigate climate change, and rather that people must address land use and soil health).

23. SCHWARTZ, *supra* note 22, at 22 (“When we look at the carbon cycle in the context of soil, this is what we see: . . . we’ve got more carbon in the soil, we’ve got fertile ground for plants, more photosynthesis, and a positive feedback loop that takes carbon dioxide out of the air . . .”).

24. *Id.* at 11 (quoting soil ecologist Christine Jones saying “[t]he process that actually removes CO₂ from atmospheric circulation is photosynthesis”).

something, those plants combine absorbed solar energy with carbon dioxide and water to create material such as food, biomass, and fuel.²⁵ In other words, plants draw down atmospheric carbon dioxide into the soil. Healthy soils contain more carbon, which facilitates plant growth, increases photosynthesis, and sequesters more carbon dioxide.²⁶ It follows that land use impacts the carbon cycle's ability to sequester carbon. Agriculture already dominates land use in the United States, so shifting conventional agriculture to prioritize soil health and capitalize on the carbon cycle has enormous potential.

Without changing conventional agricultural practices, two outcomes are likely. First, tilling, deforestation, improper livestock management, pesticide use, and other conventional practices will degrade soil.²⁷ This means that carbon escapes from the ground and continues polluting the atmosphere.²⁸ Second, unhealthy soils are more erodible than healthy soils.²⁹ Harmful agricultural practices make soil loose and sandy, allowing water to wash and wind to blow the soil away.³⁰ Instead, soil should contain carbon to balance its texture, retain water, and prevent wind erosion.³¹

As the harms of conventional agriculture on GHG emissions worsen, efforts are shifting towards expanding better land-management regimes to draw atmospheric GHGs, specifically carbon, back into the soil.³² Scientists call the process of drawing carbon down into the soil “carbon sequestration” and are dedicating attention to preserving the relationship between soil and the atmosphere.³³ Carbon is the key component of soil health.³⁴ Specifically, “[c]arbon is what lends fertility to soil and sustains plant and microbial life.”³⁵ This means that carbon sequestration that occurs through better land

25. *Id.* at 22.

26. *Id.*

27. Marks, *supra* note 8, at 501, 507.

28. *Id.* at 503.

29. Shannon Avery Hughes, *Global Sustainable Farming and the “SoCo” Soil Conservation Project*, 45 DENV. J. INT’L L. & POL’Y 431, 439–40 (2017) (“[S]oil is subject to a series of degradation processes linked to agriculture such as: erosion due to water, wind, and tillage; compaction; declining organic carbon and biodiversity; salinization; and contamination by heavy metals and pesticides, or excess nitrates and phosphates.”).

30. *Id.*

31. STANTURF ET AL., *supra* note 20, at 8.

32. Velasquez-Manoff, *supra* note 19.

33. *Id.*

34. See generally SCHWARTZ, *supra* note 22, at 11–13, 15–16 (describing how carbon that is stored within soil helps that soil to retain water, distribute nutrients, survive dangerous weather events, and reduce the effects of global climate change).

35. *Id.* at 11.

management significantly benefits soil health.³⁶ Soil can take carbon out of the atmosphere by bringing that carbon back into the soil where it belongs.³⁷

Agriculture is a powerful climate change solution because “[s]oils are the second largest reservoir of carbon.”³⁸ Carbon sequestration is the most impactful contribution agriculture can make to combatting climate change.³⁹ Increasing the carbon content of soil accounts for “89% of [GHG] mitigation potential.”⁴⁰ Agriculture has created GHG emissions and caused environmental damage throughout time.⁴¹ It is time to capitalize on agriculture’s equally undeniable capacity for regeneration.

II. “IT’S NOT THE COW, IT’S THE HOW”

This Part explores three public misconceptions of cattle. First, people perceive cattle as one of the main sources of methane emissions—one of the three major greenhouse gases (GHGs).⁴² Second, people think cattle constitute the largest amount of GHG emissions from the entire agricultural sector.⁴³ Third, people assert that cattle cause overgrazing.⁴⁴ This Part explains why these three ideas are incorrect while debunking the narrative that cattle are inherently harmful to the environment and concludes by explaining how cattle are environmentally beneficial and critical to soil health and carbon sequestration.

Over time, cattle have had a significant role in human lives and history. Data suggest that humans first domesticated cattle in 5800 B.C., with some evidence suggesting that cattle domestication occurred even 500 years before.⁴⁵ Today, cattle feed billions of people and generate substantial

36. *Id.*

37. *Id.* at 11–13.

38. Marks, *supra* note 8, at 503 (quoting Charlotte Streck & Austina Gay, *The Role of Soils in International Climate Change Policy*, INT’L. Y.B. SOIL L. & POL’Y, 105, 105–107 (2016); Harald Ginzky et al. eds., 2016 (noting that oceans are the largest carbon reservoir)).

39. NIMAN, *supra* note 12, at 30–31.

40. *Id.* at 31.

41. See Velasquez-Manoff, *supra* note 19 (describing how tilling causes erosion and clear-cutting causes emissions); see also J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L. Q. 263, 277–78 (2000) (explaining how transforming natural landscapes into agricultural landscapes causes soil erosion).

42. NIMAN, *supra* note 12, at 12–13.

43. Marks, *supra* note 8, at 501–02.

44. NIMAN, *supra* note 12, at 108–09.

45. Dexter Perkins, Jr., *Fauna of Çatal Hüyük: Evidence for Early Cattle Domestication in Anatolia*, 164 SCI. 177, 177 (1969).

economic movement annually.⁴⁶ Despite the prominent impact of cattle on human existence, the public often perceives cattle in a negative light.⁴⁷

A. Myth: Cattle Burps Create Methane and Warm the Planet

The first misconception, that cattle are the lead cause of methane emissions, is based on the notion that cattle burps release methane and pollute the planet.⁴⁸ Specifically, people believe that cattle's unique digestive process inherently causes cattle to emit more methane than all modes of transportation in the world combined.⁴⁹ This common incorrect thought is harmful and must be debunked.

Beginning with cattle digestion, cattle process carbon dioxide in tandem with the carbon cycle itself because of their unique digestive systems.⁵⁰ Plants photosynthesize which create carbohydrates that only cattle are capable of consuming by fermenting the material in one chamber of their four-chambered stomachs, called the rumen.⁵¹ Cattle break down these carbohydrates and emit methane which is then converted into carbon dioxide through other complex scientific processes.⁵² This carbon is old; it is "the same carbon that was in the air prior to being consumed by an animal. It is recycled carbon."⁵³ The important takeaway is that cattle are not creating new emissions but instead move emissions through ecosystems in the same circular fashion as the carbon cycle.⁵⁴ As a result, these methane emissions

46. See generally, *Cattle & Beef Statistics & Info.*, USDA: ECON. RES. SERV., <https://www.ers.usda.gov/topics/animal-products/cattle-beef/statistics-information> (last updated Jan. 8, 2025) (reporting that the U.S. produced 27.9 billion pounds of beef which equals 51.9 billion dollars of production value in 2021).

47. See generally, Debra L. Donahue, *Livestock Production, Climate Change, and Human Health: Closing the Awareness Gap*, 45 ENV'T L. REP. 11112, 11113 (2015) (calling for the removal of all cattle from public lands); Todd M. Olinger, *Public Rangeland Reform: New Prospects for Collaboration and Local Control Using the Resource Advisory Councils*, 69 U. COLO. L. REV. 633, 641 (1998) (arguing that cattle cause overgrazing which "harms bio-diversity, competes with wildlife, erodes soils, degrades riparian areas, and reduces water quality").

48. See NIMAN, *supra* note 12, at 18 ("As a by-product of this unique digestive process [of cattle], methane is burped (mostly), breathed out (somewhat), and farted (a little) . . .").

49. Marks, *supra* note 8, at 502.

50. See NIMAN, *supra* note 12, at 16–18 (explaining how other elements of nature circulate carbon through ecosystems, so cattle-related methane emissions do not "actually [add] carbon to the earth's ecosystem").

51. *Id.* at 18 ("The digestive process involves fermentation in a chamber called a *rumen*, which is why cattle are called *ruminants* This capacity transforms the globe's vast grasslands into an invaluable component of the human food system.").

52. *Id.* at 17.

53. *Id.*

54. DIANA RODGERS & ROBB WOLF, *SACRED COW: THE CASE FOR (BETTER) MEAT* 135 (Claire Schulz ed., 2020) (explaining the role of cattle in the carbon cycle, stating "the methane emitted

from cattle are not harmful.⁵⁵ The idea that cow burps warm the planet is incorrect.

B. Myth: Cattle Create the Most GHGs in the Agricultural Sector

The second misconception about cattle is that methane emissions from cattle's digestive processes are the largest contributor to GHG emissions from agriculture.⁵⁶ This idea is also incorrect. Rather, this exaggerated impact of cattle on GHG creation comes from an incorrect statement that cattle emit so much methane that it constitutes more methane than the world's transportation.⁵⁷ People derive this misconception from a 2006 report by the Food and Agriculture Organization of the United Nations (FAO).⁵⁸ Scientists created this report, called "Livestock's Long Shadow," and analyzed the environmental impacts of animal agriculture, specifically cattle.⁵⁹ The report, however, contained significant research flaws and scientists have since reduced the report's projected impacts of GHG emissions from cattle.⁶⁰ The scientists responsible for the report have even admitted that their methods of assessment were unfair and they exaggerated the results.⁶¹ The FAO report and statements derived from it are not dependable because of the report's "striking methodological error."⁶²

Contrary to the FAO's erroneous conclusion, transportation, alongside the energy sector, actually does constitute the United States' largest source of GHG emissions, not cattle digestion.⁶³ Indeed, the Environmental Protection Agency (EPA) proclaimed that cattle used for beef comprise of merely 2% of the GHG emissions.⁶⁴ Another FAO report written alongside the International Atomic Energy Agency, entitled "Belching Ruminants, a Minor Player in Atmospheric Methane," supports the EPA's assertion.⁶⁵ That

from cattle are part of the natural, or 'biogenic,' carbon cycle, whereas fossil fuels are not. Fossil fuels come from 'ancient' carbon that has been locked underground for millions of years, and when it is extracted, it's adding new carbon to the atmosphere . . .").

55. *Id.*

56. Marks, *supra* note 8, at 501–02.

57. See RODGERS & WOLF, *supra* note 54, at 139–42 (demonstrating how methane outputs from cattle are exaggerated using visual aids).

58. *Id.* at 139.

59. FOOD & AGRIC. ORG. OF U.N. & LIVESTOCK, ENV'T AND DEV. INITIATIVE, LIVESTOCK'S LONG SHADOW 4–5, 15 (2006).

60. RODGERS & WOLF, *supra* note 54, at 139.

61. *Id.*

62. *Id.* ("There's a lot more going on here than cow burps.").

63. *Id.* at 141 ("The largest source of GHG emissions in the US comes from energy and transportation.").

64. *Id.*

65. *Id.* at 136.

report explained how other sources of methane besides cattle contribute significantly to global methane emissions, and “the role of [cattle] in greenhouse gases may be less significant than originally thought.”⁶⁶ Cattle do not create the most agricultural GHGs.

C. Myth: Cattle Cause Overgrazing

The third misconception about cattle is that cattle cause overgrazing.⁶⁷ This misconception supposes that cattle inherently overgraze the land which causes desertification and loss of soil to erosion.⁶⁸ Likewise, people think that cattle degrade ecosystems in the Western United States and other areas with ample rangeland.⁶⁹ Livestock’s impact on land is currently so overblown that people sometimes call for the removal of all animals from the land.⁷⁰

Cattle grazing receives an unfair and incorrect blame for overgrazing.⁷¹ Cattle grazing is important because around 40% of the earth’s land is grassland, which constitutes 70% of land used for agriculture in the world.⁷² Cattle have unique digestive systems which make them one of the only animals that can eat these grasses.⁷³ The ability of cattle to graze grassland makes grass “the base layer of the global food system.”⁷⁴ Cattle can turn a common resource that humans cannot consume into nutrient-dense meat that humans can eat.⁷⁵

Grazing cattle also impose significant benefits upon the environment—more than modern plows ever could.⁷⁶ Cattle’s hooves break up and shove seeds deep into the soil, functioning as natural plows.⁷⁷ Unlike a plow, cattle grazing also prompts soil regeneration because when cattle graze, the grasses move through their digestive tract and are excreted back onto the land as

66. *Id.* at 137.

67. NIMAN, *supra* note 12, at 108.

68. *Id.*

69. See Robert H. Smith, *Livestock Production: The Unsustainable Environmental and Economic Effects of an Industry Out of Control*, 4 BUFF. ENV’T. L. J. 45, 58–59 (1996) (stating, erroneously, that cattle graze in areas where desertification is the most severe).

70. Donahue, *supra* note 47, at 11125 (arguing for the removal of livestock from public lands).

71. NIMAN, *supra* note 12, at 109 (noting that crop cultivation is the biggest culprit of human-caused degradation).

72. *Id.* at 59.

73. *Id.*

74. *Id.* at 60.

75. *Id.* (describing that cattle change grasses and shrubs into food for humans, otherwise humans could not use those resources).

76. *Id.* at 61.

77. *Id.* at 62.

nutrient-dense fertilizer, which prompts more grass growth.⁷⁸ Healthy grassland ecosystems require the presence of cattle.⁷⁹

Overall, cattle must graze to survive; however, the conventional methods of cattle grazing cause environmental damage—not the cattle inherently.⁸⁰ When completed properly, cattle grazing restores grassland and other ecosystems.⁸¹ Without cattle grazing, “grass just grows, oxidizes . . . , and eventually dies.”⁸² Part III describes how to optimize cattle grazing and environmental protection.

III. REGENERATIVE AGRICULTURE: THE PRO-CATTLE APPROACH TO CLIMATE CHANGE

Regenerative agriculture⁸³ is an agricultural framework that prioritizes soil health.⁸⁴ While regenerative agriculture lacks a universal definition, it is directed by principles including strengthening bonds between humans and ecosystems, reducing synthetic additives like pesticides, and nourishing communities.⁸⁵ The guiding philosophy of regenerative agriculture is “farming and ranching in a style that nourishes people and the earth, with specific practices varying from grower to grower and from region to region.”⁸⁶

78. *Id.*

79. See RODGERS & WOLF, *supra* note 54, at 120–21 (explaining how cattle grazing is essential for providing nutrients to soils and helping those soils retain water).

80. NIMAN, *supra* note 12, at 110 (quoting Professor David Montgomery, stating “[g]ood management can improve agricultural soils just as surely as bad management can destroy them[.]”).

81. See Velasquez-Manoff, *supra* note 19 (“If done right . . . grazing could be restorative.”).

82. RODGERS & WOLF, *supra* note 54, at 119.

83. *Regenerative Agriculture 101*, NAT. RES. DEF. COUNCIL (Nov. 29, 2021), <https://www.nrdc.org/stories/regenerative-agriculture-101>. This Article acknowledges that while regenerative agriculture may be a new buzzword, Native Americans and Indigenous peoples have been farming in harmony with the land for millennia. Indigenous peoples are some of the earth’s first stewards and regenerative agriculture reflects the “dawning realization among more people that an Indigenous approach to agriculture can help restore ecologies, fight climate change, rebuild relationships, spark economic development, and bring joy.” *Id.*

84. Joe Fassler, *Regenerative Agriculture Needs a Reckoning*, COUNTER (May 3, 2021, 6:25 AM), <https://thecounter.org/regenerative-agriculture-racial-equity-climate-change-carbon-farming-environmental-issues/> (arguing that regenerative agriculture should expand its focus beyond soil health).

85. See *Regenerative Agriculture 101*, *supra* note 83 (“There’s no strict rule book, but the holistic principles behind the dynamic system of regenerative agriculture are meant to restore soil and ecosystem health, address inequity, and leave our land, waters, and climate in better shape for future generations.”).

86. *Id.*

Certain practices and goals also constitute regenerative agriculture.⁸⁷ A literature review of definitions of regenerative agriculture revealed that experts often defined regenerative agricultures' practices as minimizing tillage and synthetic inputs, cover cropping, increasing plant biodiversity, composting, and integrating livestock into the land.⁸⁸ Common goals of regenerative agriculture include improving the health of ecosystems, increasing biodiversity, expanding profitability of farming, sequestering more atmospheric carbon, and enhancing soil health.⁸⁹ Overall, regenerative agriculture typically involves improving the health of soils and integrating livestock into the land.⁹⁰

Cattle are a fundamental component of regenerative agriculture, making proper cattle management part of the climate change solution.⁹¹ Integrating cattle into the land improves the capacity of that soil to sequester atmospheric carbon.⁹² Cattle benefit the land by pushing beneficial materials into complex grassland root systems with their hooves,⁹³ transporting nutrients with their feces, and increasing soil biodiversity which makes land more resilient to climate change.⁹⁴ Integrating cattle into the land contains immense potential for combatting climate change because “[g]rasslands need [cattle] to be healthy.”⁹⁵

Traditional agricultural practices relating to cattle cause environmental harms.⁹⁶ Soil restoration is needed to reduce harmful GHG emissions, specifically carbon.⁹⁷ Because conventional agriculture harms soil and creates harmful GHG emissions, the agriculture industry should further

87. See Peter Newton et al., *What Is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes*, 4 FRONTIERS IN SUSTAINABLE FOOD SYS. 1, 5 (2020) (describing the “processes” and “outcomes” experts frequently used to define regenerative agriculture).

88. *Id.*

89. *Id.*

90. Fassler, *supra* note 84.

91. See generally Velasquez-Manoff, *supra* note 19 (stating that proper cattle management makes cattle grazing “restorative”).

92. Marks, *supra* note 8, at 509.

93. *Id.*

94. See RODGERS & WOLF, *supra* note 54, at 119 (explaining how cattle spread nutrients and increase biodiversity throughout soil).

95. *Id.*

96. See Ruhl, *supra* note 41, at 274 (noting how farming causes “(1) habitat loss and degradation; (2) soil erosion; (3) water resources depletion; (4) soil salinization; (5) chemical releases; (6) animal waste disposal; (7) water pollution; and (8) air pollution.”).

97. See Marks, *supra* note 8, at 501 (“Soil erosion caused by agriculture management practices continue to threaten the Earth”).

efforts to restore and stabilize soil.⁹⁸ Focusing on soil to remedy agriculture's environmental impact provides a realistic method of combatting climate change.

IV. COLORADO'S DUST BLOWING ACT OF 1954

The 1954 Dust Act (Dust Act) is an existing piece of legislation that requires property owners in Colorado to conduct certain actions in compliance with an enumerated list to prevent soil erosion.⁹⁹ The list of required activities is specific and omits any agricultural or livestock requirements.¹⁰⁰ Because livestock, namely cattle, constitute a significant amount of Colorado's land use, property owners have the opportunity to use their livestock to prevent soil erosion.¹⁰¹ To comply with the Act's purpose, property owners possessing cattle should use their cattle in accordance with regenerative agriculture to prevent blowing dust. The Colorado legislature should amend the Dust Act to place a duty on property owners to integrate their cattle into the land and manage the cattle how regenerative agriculture suggests one should.

This Part interprets two components of the Dust Act's statutory language. Subpart A analyzes the Dust Act's legislative declaration and concludes that the Colorado Legislature intended for the Dust Act to protect the health of Coloradans, not the environment. Subpart B examines the Dust Act's duties section and discusses the list of activities it currently requires property owners and occupiers to complete to prevent soil erosion. Subpart C discusses the few instances where Colorado courts interpreted and applied the Dust Act, focusing on two Colorado decisions.

A. The Legislative Declaration Demonstrates that the Dust Act Is a Human Welfare Law, Not an Environmental Law

Despite the Colorado Legislature intending for the Act to control statewide erosion,¹⁰² the Act has no teeth. This Part interprets the statutory

98. See SCHWARTZ, *supra* note 22, at 7 (explaining how essential soil restoration is for slowing climate change).

99. See generally COLO. REV. STAT. § 35-72-102(1) (2023).

100. *Id.*

101. Colo. Cattlemen's Ass'n, *The Colorado Beef Industry*, https://docs.google.com/document/d/1dKp9b-OB1v1K6uLYNsFotAnVp_bSxY0uVNXUmYgcBNo/edit (last visited Apr. 21, 2025). Colorado raises roughly 2.85 million cattle annually and earns \$5.14 billion for Colorado's economy from general livestock production. *Id.*

102. See COLO. REV. STAT. § 35-72-101 (2023). The Act states:

language of the Act, to understand the Act's aims and how it fails to maximize its potential to protect soil.

This analysis begins by honoring the “cardinal rule” of statutory interpretation—analyzing the plain language of the statute.¹⁰³ The Act's plain meaning is clear, barring several scientific terms that are discernable in context. Because the Act's language is understandable, consulting extrinsic sources is not necessary; however, this Part explores the relevant historical context of the Act anyway.

Legislative declarations are a component of many statutory schemes that help reveal the “intent of the [legislative body] and the problems it was attempting to address.”¹⁰⁴ Combined with the historical context surrounding the statute's enactment, legislative declarations highlight a legislature's intentions and goals.¹⁰⁵ The Dust Act's legislative declaration creates the base for understanding its goals.¹⁰⁶ In relevant part, the legislative declaration proclaims that eroding soil and its resulting damage to property and natural resources are “a menace to the safety of the citizens of the state.”¹⁰⁷ To remediate the harm of soil erosion, the legislative declaration asserts that it is in “the interest of the people of this state to allow recovery of damages for such negligent conduct.”¹⁰⁸ The legislative declaration raises three relevant points: (1) the Act's local and human focus; (2) the Act's available cause of action; and (3) the Act's concern with Coloradan welfare. This Article now addresses these points in order.

First, the Colorado Legislature narrowed the Dust Act's scope to human welfare in Colorado. Under the guidance of the Dust Act's plain language, the word “state” refers specifically and exclusively to the state of Colorado. Therefore, any of the Dust Act's intentions are geographically restricted to Colorado. Further, the legislative declaration also refers to the “safety of the citizens” of Colorado.¹⁰⁹ By specifying “citizens,” the Colorado Legislature

To deter actions which are harmful to property and natural resources and to further the ability of persons injured by negligent conduct associated with blowing soil to have legal recourse, it is determined to be in the interest of the people of this state to allow recovery of damages. . . .

Id.

103. See *Cowen v. People*, 431 P.3d 215, 218 (Colo. 2018) (quoting *FDIC v. Meyer*, 510 U.S. 471, 476 (1994)) (“In the absence of . . . a definition, we construe a statutory term in accordance with its ordinary or natural meaning.”).

104. *Hotsenpiller v. Morris*, 488 P.3d 219, 224 (Colo. App. 2017).

105. *Id.* (“Indeed, ‘[o]ften the best guides to legislative intent are the context in which the statutory provisions appear and any accompanying statements of legislative policy, such as a legislative declaration.’”) (quoting *St. Vrain Valley Sch. Dist. RE-1J v. A.R.L.*, 325 P.3d 1014, 1019 (Colo. 2014)).

106. § 35-72-101.

107. *Id.*

108. *Id.*

109. *Id.* (emphasis added).

explicitly prioritizes people and implicitly excludes the environment from its purview. The Dust Act, therefore, is geographically and topically limited to human citizens of Colorado.

Second, the Dust Act creates a civil cause of action in negligence. Other subsections of the Dust Act elaborate on procedure and qualifications for the cause of action,¹¹⁰ but the legislative declaration notifies Colorado residents that the cause of action exists. The legislative declaration pronounces that people who experience damage in violation of the Dust Act can sue the party causing the damage for negligence.¹¹¹ The plain language stating how the cause of action is in “the interest of the people of this state” reiterates the Dust Act’s human-centered focus.¹¹² Referencing the interest of the *people* of Colorado also emphasizes the intended goal of the Dust Act—to protect human safety in Colorado through soil management. The cause of action, therefore, becomes the mechanism through which the Dust Act aims to enforce this goal.

Third, and most importantly, unwavering concern about human safety drives the Dust Act. The legislative declaration acknowledges the harm dust causes to property and natural resources, calling it “injurious,” but describes dust as a “*menace* to the safety” of Coloradans.¹¹³ The shift in tone from the measured description of the threat dust poses to property and natural resources to the bold use of “menace” to describe the threat to human safety reveals greater emphasis on protecting human welfare. Further, the plain meaning of “menace” is rarely lighthearted or tempered; it is aggressive, strong, and matter-of-fact. Differentiating the risk to humans as a “menace” begs readers to give more attention and care to the risk to humans. The Dust Act, therefore, is inherently more human-focused.

Overall, the historical context in which the Colorado Legislature created the Dust Act reiterates its human-centered focus. Two events are notable—the Dust Bowl and Colorado’s creation of conservation districts.¹¹⁴ The Dust Bowl occurred throughout the 1930s, exacerbating widespread drought, soil erosion, and causing many families to abandon their farms.¹¹⁵ The Dust Bowl

110. See COLO. REV. STAT. § 35-72-102(4)–(5) (2023).

111. *Raleigh v. Performance Plumbing & Heating, Inc.*, 130 P.3d 1011, 1015 (Colo. 2006) (explaining that to sue for negligence, a plaintiff must show: (1) that the defendant owed a legal duty to the plaintiff; (2) that the defendant breached their duty; (3) that the plaintiff experienced harm; and (4) that the defendant’s conduct caused the plaintiff’s harm).

112. § 35-72-101.

113. *Id.*

114. *76 Colorado Conservative Districts: Conservative Districts in Colorado*, COLO. ASS’N OF CONSERVATION DISTS., <https://www.coloradoacd.org/conservation-districts-fact-sheets.html> (last visited Apr. 21, 2025).

115. See *supra*, notes 1–7 and accompanying text.

inflicted environmental damage, caused human health problems, and was a source of trauma for many individuals residing in the midwestern United States at the time.¹¹⁶ Dust defined the 1930s for many midwestern states, including Colorado.¹¹⁷ Conversely, in 1937, Colorado began creating conservation districts, local jurisdictions aimed at targeting regional environmental topics in direct response to the Dust Bowl.¹¹⁸ The conservation districts target and address local environmental concerns, including soil erosion.¹¹⁹ The historical context leading up to the Dust Act demonstrates that the Colorado Legislature's primary concerns were to rehabilitate and protect human welfare.

B. The Duties Section Demonstrates that the Dust Act Requires Small-Scale Land Management to Prevent Soil Erosion, Not Bold Action

The second component of statutory interpretation examines the duties the Dust Act imposes upon Colorado landowners and occupiers.¹²⁰ The “Duty of landowner – liability for damage” section (*duties section*) of the Dust Act specifically requires landowners and occupiers to mitigate soil erosion:

[B]y planting perennial grasses, shrubs, or trees or annual or biennial crops and by treatment consisting of listing, chiseling, and similar practices at such times and in such manner as will prevent or minimize erosion of the soil and soil blowing . . . [and] leaving stubble residue on top of the soil.¹²¹

Conversely, the Dust Act creates a cause of action for property owners and occupiers who experience property damage to their “crops, grasslands, fences, fencerows, irrigation canals, ditches, or livestock, proximately caused by the failure of any owner or occupier of other land to discharge his duty to prevent soil blowing from land he owns or occupies”¹²² These duties

116. *Id.*

117. Warigia M. Bowman, *Dustbowl Waters: Doctrinal and Legislative Solutions to Save the Ogallala Aquifer Before Both Time and Water Run Out*, 91 U.COLO.L.REV. 1081, 1084 (2020) (noting how the “epicenter of the 1930s Dust Bowl” occurred in states placed on top of the Ogallala Aquifer).

118. *Conservation Districts Fact Sheet supra* note 114.

119. *Id.*

120. See COLO. REV. STAT. § 35-72-102 (2023) (listing the activities and tasks Colorado landowners and occupiers must complete to comply with the Dust Act).

121. *Id.* § 35-72-102(1).

122. *Id.* § 35-72-102(2).

create the substance of the Dust Act because it makes the statute operative by creating liability for landowners and occupiers.

The Dust Act's duties section raises two important ideas: (1) the enumerated list of duties is human-centered and reasonably achievable; and (2) people may sue for damage to livestock but are not required to manage their livestock to prevent soil erosion.¹²³ Beginning with the first idea, the duties focus on fast and easy-to-do human activities—like planting trees. Furthermore, the listed activities reflect the agrarian perspectives common among western lawmakers in the 1950s because of its focus on agricultural and rangeland actions.¹²⁴ The listed activities are also reasonably achievable because most people can plant grass or cover open land with little financial burden and with relative ease. Therefore, the focus of the duties section is on human action that average people can reasonably achieve.

The second notable feature of the duties section is its use for people to sue if their livestock are damaged while not requiring people to properly manage those livestock to help prevent soil erosion.¹²⁵ Property owners and occupiers can sue others for damaging their livestock but do not have an affirmative duty to manage their own livestock to prevent soil erosion, which weakens the Dust Act's effectiveness.¹²⁶ Further, omitting livestock management from the list of tasks people must take to prevent soil erosion is ironic because mismanaged livestock cause disruptive soil erosion.¹²⁷ This discrepancy creates a large hole in the effectiveness of the Dust Act as a human-centered Act because it fails to address a significant contributor to soil erosion. Consequently, the Dust Act only partially addresses soil erosion and amending the Dust Act can increase its efficacy.

C. Application of Colorado's Dust Blowing Act

Colorado courts have applied the Dust Act in two notable instances. First, the Colorado Supreme Court decided *Oberst v. Mays* in 1961.¹²⁸ In this case, the court applied the legislative declaration section to a farmer who received an "Order to Perform Soil Treatment to Prevent Soil Erosion" from his county clerk.¹²⁹ The county clerk issued the order against the farmer

123. See *id.* § 35-72-102.

124. *Id.*

125. See *supra* note 123.

126. *Id.*

127. See RODGERS & WOLF, *supra* note 54, at 119–20 (explaining how grasslands die without cattle on the land, or when cattle graze too intensely).

128. See generally 148 Colo. 285 (1961).

129. *Id.* at 287.

because of excessive dust blowing from the farmer's property.¹³⁰ The county clerk then issued a certificate of purchase for the property.¹³¹ A property rights dispute followed.¹³² The court ultimately issued a summary abatement on the farmer's property with the express goal to protect the "health and well-being of the citizens of the state."¹³³

While the Dust Act functioned as an auxiliary topic in *Oberst*, the case further informs the purpose and intention behind the Dust Act. The court explained that "an emergency existed" regarding the farmer's soil erosion problem.¹³⁴ To make the point that the farmer's land caused enough concern to warrant the order, the court cited the Dust Act's legislative declaration to call soil erosion a "menace."¹³⁵ Because the court articulated the threat soil erosion poses to Colorado's citizens and reaffirmed the summary abatement in response, the court confirmed the Dust Act's focus on protecting humans rather than operating as environmental legislation. Additionally, *Oberst* demonstrates the power the Dust Act holds when it is enforced. The court decided that violating the Dust Act is significant enough to skip a trial and rapidly address the problem.¹³⁶

Next, nearly two decades later in *Haas v. Lavin*, farmer Haas sued farmer Lavin under the Dust Act when Lavin caused dust to enter Haas's property because of his negligent farm management.¹³⁷ Specifically, Lavin's tilling caused eroded soil to blow onto Haas's property.¹³⁸ The 10th Circuit Court of Appeals affirmed a Colorado court's jury verdict granting Haas damages for Lavin's mismanagement of his farm.¹³⁹

Haas is a particularly notable application of the Dust Act because of the facts prompting the court to hold that Lavin's farm management violated the Dust Act. The court considered evidence including: that more dust blew from Lavin's property than neighboring properties; that Lavin planted cover crops too late into the season; that too many weeds littered Lavin's land and reduced water retention; and that Lavin tilled the land too excessively.¹⁴⁰ The court determined that Lavin's land use damaged Haas's land in violation of

130. *Id.*

131. *Id.*

132. *Id.* at 288.

133. *Id.* at 290–91 (quoting COLO. REV. STAT. § 35-72-101 (2023)).

134. *Id.* at 290.

135. *Id.*

136. *Id.* at 291.

137. 625 F.2d 1384, 1385 (10th Cir.1980).

138. *Id.*

139. *Id.* at 1391.

140. *Id.* at 1387–88.

the Dust Act, making Lavin liable for negligence.¹⁴¹ Ultimately, *Haas* is significant because it illustrates some factors and the severity necessary for soil erosion to violate the Dust Act.¹⁴²

Both *Oberst* and *Haas* demonstrate the current scope of the Dust Act because each case highlights a different component of the Act. *Oberst* reiterates the threat soil erosion poses to human welfare because the court issued a summary abatement in response to the threat of soil erosion.¹⁴³ *Haas* indicates how severe soil erosion must be to trigger the Dust Act's cause of action, demonstrating that Colorado courts consider factors, such as excessive tilling—sufficient to trigger the Dust Act.¹⁴⁴

V. A PRO-CATTLE AMENDMENT TO THE DUST ACT

When the Colorado Legislature created the Dust Blowing Act of 1954 (Dust Act) it focused on remedying human health during the aftermath of the 1930s Dust Bowl.¹⁴⁵ Driven by fear of another Dust-Bowl-type event, the legislature focused on short-term, easily achievable, and immediately effective steps to prevent soil erosion.¹⁴⁶ Notably, most advanced soil science did not exist until several decades later, so the legislature had a more limited perspective.¹⁴⁷ Today, the soil instability continues, placing Colorado in a precarious environmental position—much like the 1930s Dust Bowl.¹⁴⁸ As Colorado potentially approaches another Dust-Bowl-type event,¹⁴⁹ one key difference places Colorado in a stronger position this time around: knowledge.

The Colorado Legislature can now access a wealth of scientific knowledge describing relevant topics such as the carbon cycle, photosynthesis, and carbon sequestration. Based on this knowledge, the Dust Act is evidently no longer sufficient to protect human health. The Colorado

141. *Id.* at 1388–89 (explaining how Lavin violated his duty to “prevent or minimize erosion of the soil and dust blowing”).

142. *See id.* at 1387–88 (describing the evidence the jury considered in concluding that Lavin violated his duty to prevent soil erosion on his land).

143. *Oberst v. Mays*, 148 Colo. 285, 291 (1961).

144. *Haas v. Lavin*, 625 F.2d 1384, 1385, 1387–88 (10th Cir. 1980).

145. *See supra* Part IV.A.

146. *See supra* Part IV.B.

147. Eric C. Brevik et al., *Selected Highlights in American Soil Science History from the 1980s to the Mid-2010s*, 146 CATENA 128, 134–141 (2016) (describing the expansion of soil science technology and renewed interest in soil science across the 2010s).

148. Joseph Romm, *The Next Dust Bowl*, 478 NATURE 450, 451 (2011) (explaining that dust bowl conditions will likely span across the Midwest and Western United States, including Colorado).

149. *See id.* at 450 (predicting “[a]ridity comparable to the 1930s Dust Bowl” to soon occur within the United States as a consequence of climate change).

Legislature should amend the Dust Act to require property owners and occupiers who possess livestock—specifically cattle—to manage those cattle in accordance with regenerative agricultural principles.

The remainder of this Article explains the necessary changes to the Dust Act to shift the current livestock management practices in Colorado while achieving stronger soil erosion prevention. Subpart A presents and describes three changes that comprise an amendment to the Dust Act. Subpart B explains how these three changes help the Dust Act optimize its environmental protection and achieve its purpose of protecting human welfare.

A. Proposed Amendment to the Dust Act

To help the Dust Act prevent soil erosion and strengthen its capacity for environmental protection, the Colorado Legislature should amend the Dust Act in three ways. First, the Colorado Legislature should add a clause to its duties section requiring livestock management that comports with regenerative agriculture. Second, the Colorado Legislature should also define regenerative agriculture in its definitions section.¹⁵⁰ Third, the Colorado Legislature should issue an “effective date” for when property owners and occupiers must comply with the amendment.¹⁵¹

1. Strengthening the Duties Section

The Dust Act’s duties section provides a list of actions that landowners and occupiers in Colorado must complete to prevent dust from blowing.¹⁵² Because proper cattle management can prevent soil erosion and benefit the environment, the Dust Act’s duties section undermines its own efficacy by omitting cattle management.¹⁵³ The Dust Act can accomplish better erosion control and environmental protection by adding one crucial clause at the end: “*and managing livestock in accordance with regenerative agriculture principles.*”¹⁵⁴

150. COLO. REV. STAT. § 35-1-102 (2023).

151. *Effective Date*, BLACK’S LAW DICTIONARY (11th ed. 2019) (defining effective date as “[t]he date on which a statute, contract, insurance policy, or other such instrument becomes enforceable or otherwise takes effect”).

152. See *supra* Part IV.B.

153. See Marks, *supra* note 8, at 509 (explaining how integrating cattle into natural landscapes improves the health of the land); RODGERS & WOLF, *supra* note 54, at 119. (emphasizing how important cattle are for grassland ecosystems).

154. With this amendment, the statutory language requires “planting perennial grasses, shrubs, or trees or annual or biennial crops and by treatment consisting of listing, chiseling, and similar practices at

The Colorado Legislature should require owners and occupiers to use livestock according to regenerative agriculture. Regenerative agriculture incorporates cattle into the land, mirroring the restorative relationship that grasslands and grazing animals should share.¹⁵⁵ When cattle ranchers properly raise cattle within their natural landscape, those cattle restore grasslands and significantly reduce soil erosion.¹⁵⁶ Cattle are “[a]t the heart of this regenerative [agriculture] system”¹⁵⁷ Instances of successful cattle integration in Colorado have already restored the land.¹⁵⁸ The Colorado Legislature should capitalize off this momentum and reap the erosion-control benefits of requiring cattle management guided by regenerative agriculture.

2. Defining Regenerative Agriculture

No universal definition of regenerative agriculture exists.¹⁵⁹ Without uniformity, inconsistent definitions of regenerative agriculture confuse people, undermine the term’s value, and create an obstacle for researchers, policymakers, and farmers trying to make it more widespread.¹⁶⁰ Using a definition that is still broad enough to permit regional changes and specialization will maximize the benefits of regenerative agriculture.¹⁶¹ The Colorado Legislature should define regenerative agriculture in the Dust Act’s definitions section¹⁶² as:

*Regionally specific¹⁶³ holistic farming and ranching aimed at restoring ecosystems and human relationships with the land.*¹⁶⁴

such times and in such manner as will prevent or minimize erosion of the soil and soil blowing . . . leaving stubble residue on top of the soil and managing livestock in accordance with regenerative agriculture principles.” See *supra* note 121.

155. Velasquez-Manoff, *supra* note 19.

156. See generally Loretta Sorenson, *Colorado Cattle Stomp Shows The Benefit Of Healing Hooves*, BEEF (May 7, 2014), <https://www.beefmagazine.com/pasture-range/colorado-cattle-stomp-shows-benefit-healing-hooves> (providing a case study of successful cattle integration into a natural landscape).

157. NIMAN, *supra* note 12, at 246.

158. Sorenson, *supra* note 156 (describing a successful research experiment that demonstrates the restorative benefits of integrating cattle into a damaged rangeland in Colorado’s Crystal River Valley).

159. See *supra* Part III.

160. Newton et al., *supra* note 87 at 2.

161. Alexandra Spring, *Big Ag, Antitrust & Climate Change: The Environmental Impacts of Constrained Economic Choice*, 23 VT. J. ENV’T. L. 266, 270–72 (2022) (explaining that farming practices must differ between Zimbabwe and North Dakota because both regions have different climates).

162. COLO. REV. STAT. § 35-1-102 (2023).

163. See Spring, *supra* note 161, at 272 (explaining how regenerative agriculture tailors agricultural practices to the specific needs of that regional environment).

164. *Regenerative Agriculture* 101, *supra* note 83 (describing regenerative agriculture as “farming and ranching in a style that nourishes people and the earth, with specific practices varying from

Four principles comprise regenerative agriculture: (1) increasing soil health to draw carbon from the atmosphere; (2) managing grazing animals to strengthen ecosystem health; (3) rotating and using crop varieties to increase biodiversity; and (4) reducing mechanized tilling and chemical inputs to help plant roots and prevent soil erosion.¹⁶⁵ Regenerative agriculture requires farmers and ranchers to integrate practices from all four principles into their land management.

The definitions section should also provide non-exhaustive lists of land management practices that comply with each principle of regenerative agriculture. Lists of examples will guide landowners and occupiers as they change their land management because people can reference those lists. The Colorado Legislature should consult experts, such as the Colorado Department of Agriculture, to create and modify the list of practices. For now, because the second principle of managing grazing animals to strengthen ecosystem health is this Article's priority, it should be defined as:

(2) managing grazing animals to strengthen ecosystem health: grazing animals, including cattle, shall be integrated into one's land rather than retained inside feedlots or indoor spaces. Relevant practices include rotationally grazing the animals,¹⁶⁶ using grazing animals to break the ground and cut vegetation,¹⁶⁷ converting cropland into grassland wherever possible,¹⁶⁸ and feeding livestock using grass-based diets.¹⁶⁹ Grazing animals must reside within a landowner or occupier's natural landscape.

The Colorado Legislature should maintain its discretion regarding which practices it lists as examples of each principle. Agency and expert opinions

grower to grower and from region to region . . . the holistic principles behind the dynamic system of regenerative agriculture are meant to restore soil and ecosystem health").

165. REGENERATIVE AGRICULTURE INITIATIVE & THE CARBON UNDERGROUND, WHAT IS REGENERATIVE AGRICULTURE? 2 (2017) (explaining how minimizing tilling is common in regenerative agriculture).

166. NIMAN, *supra* note 12, at 39 (describing Dr. Christine Jones's research finding that rotationally grazing animals, meaning those using "short pulses of grazing with high densities of animals" create healthy topsoil that defends against soil erosion).

167. *Id.* at 61 (stating "grazing animals have a far more potent effect on plants and soils than a lawn mower ever could").

168. *Id.* at 63–64 (noting how cropland erodes more easily than grassland and that cattle encourage plant growth and biodiversity when they graze grassland vegetation).

169. *Id.* at 30–31. Greater cultivation of grasslands stabilizes soil and mitigate soil erosion. The U.K. Soil Association noted that "[g]rass-fed livestock has a critical role to play in minimizing carbon emissions from farming . . ." *Id.*

should guide the Colorado Legislature as it amends the Dust Act's definitions section. Critically, legislators should remember that integrating grazing animals into the land—especially incorporating cattle into grasslands—restores soil and substantially mitigates soil erosion.¹⁷⁰ The definition of regenerative agriculture that this Article provides allows for regional specialization, which will maximize the Amendment's capacity to mitigate soil erosion.

3. Stating an Effective Date

To optimize the Dust Act's ability to mitigate soil erosion and its capacity for environmental protection, the Colorado Legislature should add an effective date to the statute. Effective dates provide a specified time for when compliance with an amendment is required. Effective dates are important because meaningful changes often cannot occur rapidly. In this case, landowners and occupiers should change how they manage their land—specifically how they manage their cattle. To maximize the Dust Act's potential benefit, the amendments should require compliance from all landowners and occupiers in Colorado by a reasonable and measurable date. While the environmental benefits of proper cattle management will occur quickly,¹⁷¹ the steps required to achieve those benefits may not.

Because the effective date should provide enough time for landowners and occupiers to enact the required changes, the Colorado Legislature should provide Colorado citizens with five years to change their cattle management. Other Colorado statutes provide an outline for how the Colorado Legislature should structure the Dust Act's effective date provision.¹⁷² Combining this structure with the five-year effective date, the effective date clause should state:

The effective date is January 1, 2028, and marks the date that Colorado landowners and occupiers must be in compliance with the 2023 amendments.

170. *Id.* at 62.

171. *Id.* at 51 (explaining that proper cattle management, specifically cattle integration and grazing within the natural landscape, can sequester one third of global atmospheric carbon and reduce the effects of climate change).

172. COLO. REV. STAT. § 14-10-133 (2024) (providing the effective date for a provision under the Uniform Dissolution of Marriage Act). The effective date marks the day the provision becomes applicable and states “[t]his article shall take effect January 1, 1972, and shall apply only to actions affected by this article which are commenced on or after such date; all such actions commenced prior to said date shall be governed by the laws then in effect.” *Id.*

The 2028 effective date provides sufficient time for Colorado landowners and occupiers who own cattle to independently integrate those cattle into their landscapes and implement other regenerative agriculture practices because Colorado provides helpful resources. Notably, Colorado is championing multiple soil restoration and conservation projects that make a five-year effective date feasible.¹⁷³ For example, the Colorado Department of Agriculture’s “Saving Tomorrow’s Agricultural Resources” (STAR) program rates farmers and ranchers to help discern how healthy their soils are and encourages practices that align with regenerative agriculture.¹⁷⁴ The STAR program explicitly declares “livestock integration” and grazing lands as one of its five principles of healthy soil.¹⁷⁵ Colorado’s burgeoning soil programs demonstrate statewide commitment to soil health. The soil programs indicate statewide eagerness to achieve the benefits of the Dust Act’s amendment and to help landowners and occupiers comply with the required changes.

B. The Amendment Makes the Dust Act Environmentally Protective Rather than Environmentally Neutral

When the Colorado Legislature created the Dust Act in 1954, it prioritized human welfare over environmental protection.¹⁷⁶ Amending the Dust Act to require regenerative-agricultural livestock management enhances its ability to achieve human welfare alongside accomplishing new and important environmental protections.

Requiring regenerative-agricultural livestock management alongside the other activities listed in the duties section strengthens the Dust Act’s protection of human welfare because it continues to prevent dust from blowing.¹⁷⁷ Proper livestock management maximizes rangeland health, increases water retention and the strength of soils, and continues mitigating soil erosion. Shifting livestock management from a paradigm that creates soil erosion to a regenerative paradigm that prevents soil erosion keeps more dust

173. See generally *Colorado Soil Health Program*, COLO. DEP’T. OF AGRIC., <https://ag.colorado.gov/soil-health> (last visited Apr. 21, 2025) (describing the Colorado Department of Agriculture’s Saving Tomorrow’s Agricultural Resources (STAR) and Star Plus programs, its Soil Health Advisory Committee, and its Conservation District program).

174. *National STAR Program*, COLO. DEP’T. OF AGRIC., <https://ag.colorado.gov/conservation/soil-health-program/national-star-program> (last visited Apr. 21, 2025).

175. *Id.*

176. See *supra* Part IV.A.

177. See *id.*

in the ground and out of the air.¹⁷⁸ Dust that is not in the air is less likely to enter human lungs.¹⁷⁹ Because regenerative-agricultural livestock management keeps dust out of human lungs, the Amendment achieves the Dust Act's primary goal of preventing the "menace" to society:¹⁸⁰ blowing dust.

Despite the Colorado Legislature's lack of emphasis on environmental protection when it created the Dust Act, the Amendment makes the Dust Act more environmentally protective because its cattle integration enhances land restoration. Regenerative-agricultural livestock management mitigates soil erosion—the Dust Act's explicit goal—while restoring soils and increasing soil's capacity to sequester carbon and prevent climate change.¹⁸¹ The amendment's potential environmental benefits are especially important because livestock management comprises roughly 70% of global agricultural activity.¹⁸² In states like Colorado, where land with livestock is common,¹⁸³ requiring owners to manage livestock properly will reduce soil erosion and regenerate the land.¹⁸⁴ Amending the Dust Act to require regenerative-agricultural livestock management will add environmental protection to the Act's list of accomplishments.

CONCLUSION

The 1930s Dust Bowl wreaked havoc on Colorado and its neighboring states.¹⁸⁵ To protect its constituents, the Colorado Legislature created the Dust Blowing Act of 1954 (Dust Act) to prevent soil erosion.¹⁸⁶ Soil erosion continues because the Dust Act does not address the harm of conventional agricultural practices. To protect its citizens, restore the planet, and prevent another Dust-Bowl-type event, the Colorado Legislature should amend the

178. *See supra* Part I.

179. *See* Alexander Yang et al., *Global Premature Mortality by Dust and Pollution PM_{2.5} Estimated from Aerosol Reanalysis of Modern-era Retrospective Analysis for Research and Applications, Version 2*, 10 FRONTIERS IN ENV'T SCI. 1, 2 (2022) (explaining how particulate matter, including dust occurring in dust storms, can cause significant respiratory issues such as lung cancer).

180. *See supra* note 102.

181. *See supra* Part IV.

182. Hannah H. E. Van Zanten et al., *Defining a Land Boundary for Sustainable Livestock Consumption*, GLOB. CHANGE BIOL., Apr. 2018, at 4186.

183. Nat. Dep't. of Statistics Serv., *2022 Census of Agriculture State Profile Colorado*, U.S. DEP'T. OF AGRIC. (2022), https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Colorado/cp99008.pdf (explaining that Colorado contains 2,658,012 head of cattle and calves alone).

184. *See* RODGERS & WOLF, *supra* note 54, at 119–21 (reiterating the benefits of proper cattle management).

185. *See supra*, notes 1–7 and accompanying text.

186. *See supra* Part IV.A.

Dust Act. The amendment would impose a duty upon cattle owners to integrate their cattle into their current land use in accordance with regenerative agricultural practices to prevent harmful topsoil erosion.

To create this essential duty, the Colorado Legislature should amend the Dust Act in three ways. The Colorado Legislature should add a clause into the Dust Act's existing duties section and require Colorado cattle owners to integrate their cattle into the land in alignment with regenerative agriculture.¹⁸⁷ Despite the expansiveness of the term, the Dust Act should also provide a clear definition of regenerative agriculture to achieve uniformity and maximize the Dust Act's benefits.¹⁸⁸ Finally, this amendment should become effective in 2028, providing Coloradans with ample time to make required changes.¹⁸⁹ This will help kick the dust off, or rather, kick the dust into the ground, once and for all.

187. *See supra* Part V.A.1.

188. *See supra* Part V.A.2.

189. *See supra* Part V.A.3.