2021 PLOWPRINT

Earlier this summer, the Intergovernmental Panel on Climate Change (IPCC) released a dire warning in its Climate Change 2021 Report: if natural ecosystems that store and sequester vast amounts of carbon continue to be destroyed, and the rate at which we are burning fossil fuels isn't immediately reversed, there will be a cataclysmic rise in global temperatures and extreme weather events. The U.N. Secretary General called the findings a "code red for humanity."

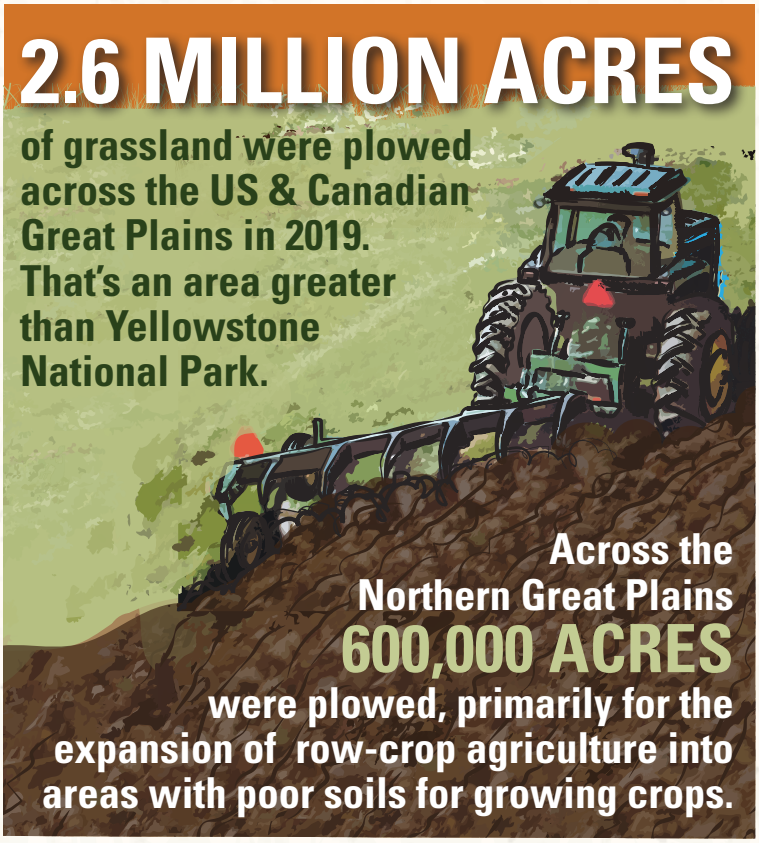
The IPCC report cites global deforestation as one of the leading causes of carbon dioxide emissions. Like forests, grasslands also play a critical role as carbon storing ecosystems. Because grasslands sequester and store most of their carbon in the soil, as intense fire events increase, the role of grasslands as a safeguard against carbon loss will be vital. Grasslands also provide critical habitat for plant and animal life, livelihoods for rural communities, clean water, and fresh air.

In a concerning trend, World Wildlife Fund's 2021 Plowprint Report has revealed that, for the second year in a row, grassland plow-up across the Great Plains has continued to accelerate. The 2021 report, which utilizes the USDA's annual Cropland Data Layer and the Canadian Annual Crop Inventory from two years prior to its release date, finds that **from 2018-2019 an estimated 2.6 million acres of grassland were plowed-up**, primarily to make way for row crop agriculture. This is an area larger than Yellowstone National Park. Within the Northern Great Plains (NGP), the Great Plains' most intact region, **nearly 600 thousand acres were plowed up during this same period.** Nearly 70% of new conversion across the Great Plains was for three crops: corn (25%), soy (22%) and wheat (21%). In the NGP, wheat accounted for most of the new conversion (42%) followed by corn (10%) and soy (10%).

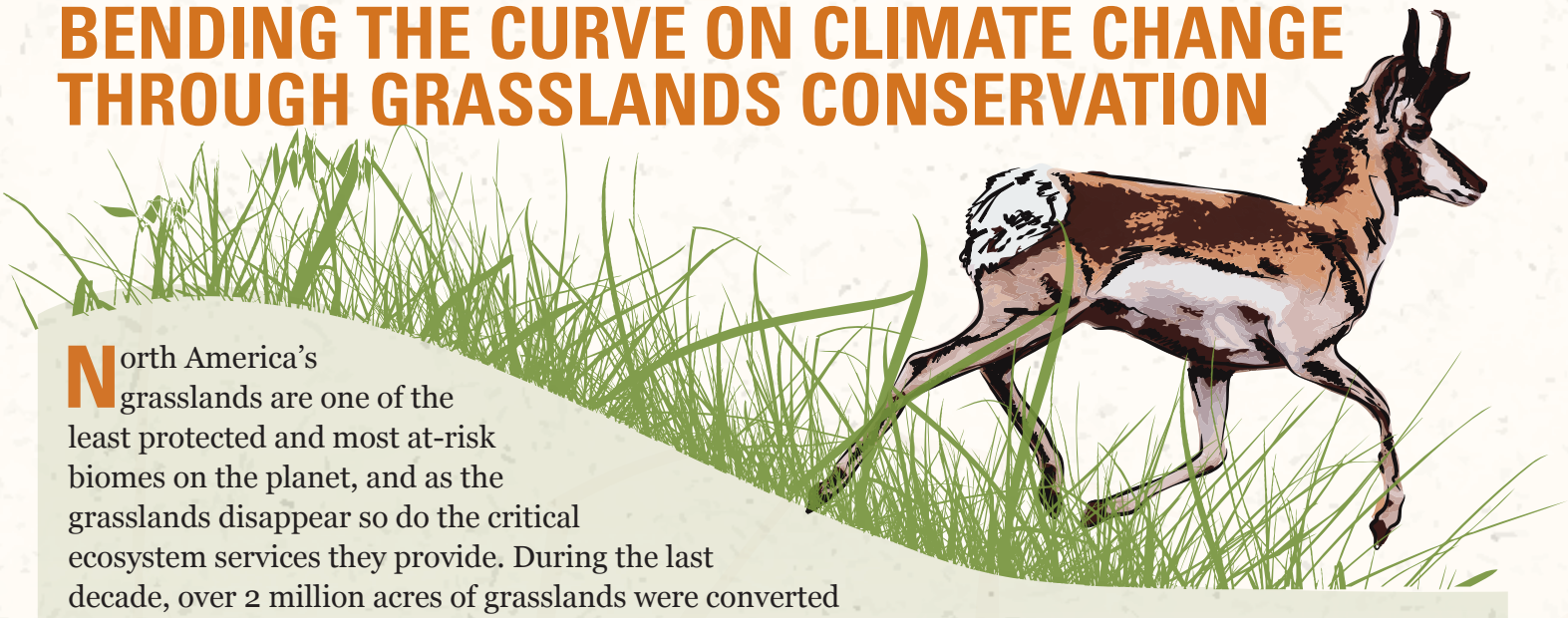
To hold the projected rise in temperatures below 1.5° C, the IPCC urges a 50% cut in the world's current emissions. And while curbing the current rate of deforestation and forest restoration are critically important steps, grasslands conservation and restoration, especially in the United States, must also be part of the solution.

When grasslands are tilled, soil organic carbon stocks are immediately reduced by 30% on average, releasing vast amount of carbon into the atmosphere. As abandoned croplands are restored, recovery of carbon stocks to levels comparable to the soil found in native prairies may take 350 years, though up to 50% recovery has been observed in the first few decades[1]. Therefore, the optimal solution is to avoid conversion in the first place, particularly if we are to successfully meet the suggested IPCC emissions targets within the necessary timeline that's needed to slow the process of climate change before the end of the century.

This year, in response to concerns over continuing grasslands loss and ways that it impacts biodiversity and people, several North American initiatives including the Central Grasslands Roadmap, NRCS Great Plains Framework, JV8 Conservation Initiative, and a growing coalition of support for a North American Grasslands Conservation Act are underway. With the right level of support and engagement, they could make real progress toward preserving what remains of North America's intact grasslands and improve and restore those which were previously degraded or plowed. In the pages that follow, readers will find more information on these initiatives, as well as other ways in which policy makers, governmental agencies, corporations, Native nations, ranchers, NGOs, and many other stakeholders can work together to conserve North America's grasslands.



BENDING THE CURVE ON CLIMATE CHANGE THROUGH GRASSLANDS CONSERVATION



North America's grasslands are one of the least protected and most at-risk biomes on the planet, and as the grasslands disappear so do the critical ecosystem services they provide. During the last decade, over 2 million acres of grasslands were converted to croplands each year across the US and Canadian Great Plains, rates comparable to the clearing of the Brazilian Amazon.

	TOTAL PLOWPRINT		ANNUAL EXPANSION		INTACT	
	NGP	Great Plains*	NGP	Great Plains*	NGP	Great Plains*
2019	43,710,849	243,556,118	586,000	2,565,000	130,587,000	380,223,000
2018	43,022,000	239,847,000	549,100	2,147,000	131,253,000	384,079,000
2017	42,473,000	237,701,000	475,700	2,036,000	131,802,000	386,226,000
2016	41,997,000	235,665,000	552,600	2,234,000	132,278,000	388,261,000
2015	41,444,000	233,431,000	759,800	2,932,000	132,830,000	390,495,000

*Plowprint Rates from 2019 (the year this report analyzes) compared to prior years. A cropland expansion of nearly 2.6 million acres occurred across the Great Plains in 2019 alone.

Impacts of Climate Change on Agriculture and the Role of Grassland Conservation

Grassland conservation is one of the critical solutions that must be acted upon to slow climate change. The agricultural industry has an opportunity to play a critical role in ensuring this solution's success. Climate change adversely impacts agriculture on a continental scale. Greater annual and seasonal climatic variability, rising average temperatures, and changing precipitation patterns will all increase the risks associated with producing crops and livestock. Grassland conversion exacerbates these impacts by adding additional greenhouse gases to the atmosphere, removing critical carbon sinks, and planting vast areas with monocultural crops which makes food systems less resilient. As the effects of climate change are felt across the globe and food demands increase to meet projected population growth, food security will be further challenged. Intact grasslands can help buffer the effects of climate change and reduce its potential associated risks.

How Do We Protect Grasslands? Opportunities for Success

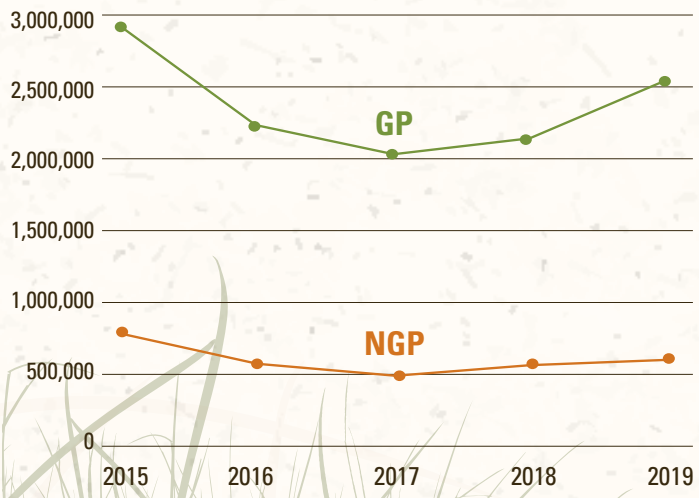
CROP INSURANCE

Crop insurance is a valuable tool that helps protect farmers against the uncertainties of food production. Weather, disease, and pests can all impact yield, and safeguards are necessary to ensure a resilient food supply. Unfortunately, there is a downside as well. Insurance subsidies may incentivize some farmers to take greater risks in areas that are unsuitable for growing crops rather than seeking ways for increasing productivity on previously plowed ground[2]. One program that seeks to directly reduce the negative impacts of crop insurance is Sodsaver, which lowers crop insurance subsidies for the first four years on cropland converted from native prairie. However, this protection applies only to six states—Iowa, Minnesota, Montana, Nebraska, and the Dakotas—that surround the prairie pothole region. In recent years there has been an effort to expand Sodsaver nationwide. If expanded, it could help afford much-needed protection to the grasslands that remain throughout the U.S.

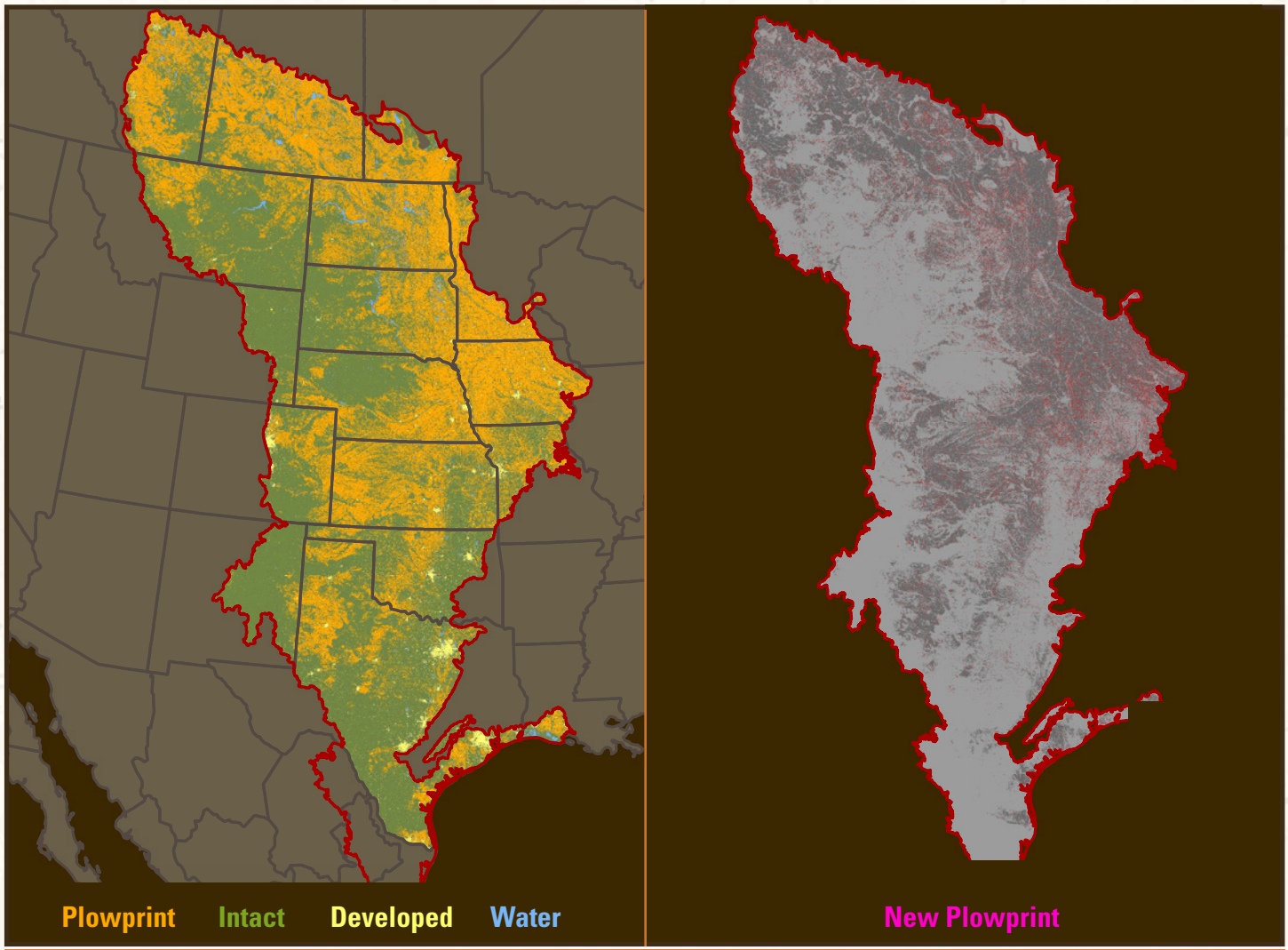
RENEWABLE FUEL STANDARDS

The goal of the Renewable Fuel Standard program is to reduce greenhouse gas emissions while expanding the US's renewable fuels sector and reduce the nation's reliance on imported oil. And while it is true that biofuel production holds potential as a viable renewable fuel source, a 2021 IHS Markit report suggests that changes in policy to boost ethanol demand are the biggest threat to grassland acres being converted to crops. Recent industry claims of a reduced carbon intensity of corn ethanol incorrectly model an increase in carbon sequestration when grasslands are converted to croplands—findings that are not scientifically supported by the research community at large and set a dangerous precedent for continued grassland conversion and carbon emissions when used in policy making decisions[3]. Alternatively, designing renewable fuels and associated policies that discourage the conversion of grasslands to row crops and instead incentivize the planting of diverse perennial grasslands and cellulosic feedstocks on existing cropland may encourage restoration of grasslands on marginal and environmentally sensitive lands, leading to both climate and biodiversity benefits[4].

ANNUAL ACRES OF GRASSLANDS CONVERTED



INTACT GRASSLANDS, PLOWPRINT, AND NEW PLOWPRINT IN 2019



Map: © WWF-US / Sarah Olimb

A scalable, online version of the US and Canadian Plowprint map is available at www.plowprint.org

Map of intact grasslands, Plowprint (lands that were already crops or have been planted to crops beginning in 2009) and the new addition to the Plowprint in 2018 (lands that were plowed in 2018 and verified in 2019) in the Great Plains. Because the Plowprint has a spatial resolution of 30 meters, the new Plowprint pixels are challenging to see at the scale of the Great Plains. Thus, WWF aggregated the smaller pixels to 300 meters, maintaining "new Plowprint" status if any pixel within the grouping held that designation. This allowed the pixels to be more visible at the Great Plains scale and reflect the hotspots of new conversion.

NORTH AMERICAN GRASSLANDS CONSERVATION ACT

Grassland conservation policy is urgently needed. Enacting a North American Grasslands Conservation Act, modeled after the popular and effective North American Wetlands Conservation Act, would kickstart the voluntary protection and restoration of grasslands. The goals of such an effort could be: 1) Prevent additional conversion of native grasslands and loss of sagebrush shrub-steppe and to sustain these systems as working lands by creating a flexible, voluntary, and innovative program; 2) Improve grassland and rangeland health and management; 3) Support ranchers and grasslands stewards from Native nations; 4) Improve biodiversity and habitat for grassland and sagebrush birds, pollinators, and other wildlife; 5) Increase carbon sequestration; and 6) Provide increased recreational and hunter access opportunities, strictly at the discretion of private landowners.

CENTRAL GRASSLANDS ROADMAP

The Central Grasslands Roadmap is a collaborative effort to increase the conservation of North America's Central Grasslands. By bringing together eight diverse sectors—Indigenous communities and nations, province and state-level agencies, industry, private landowners/managers/ producers, academia, non-governmental organizations, foundations, and federal governments of the U.S., Canada, and Mexico—the Roadmap identifies common principles and collaborative priorities for the many people and organizations living, working on, and influencing the Central Grasslands.

PARTNERING WITH NATIVE NATIONS

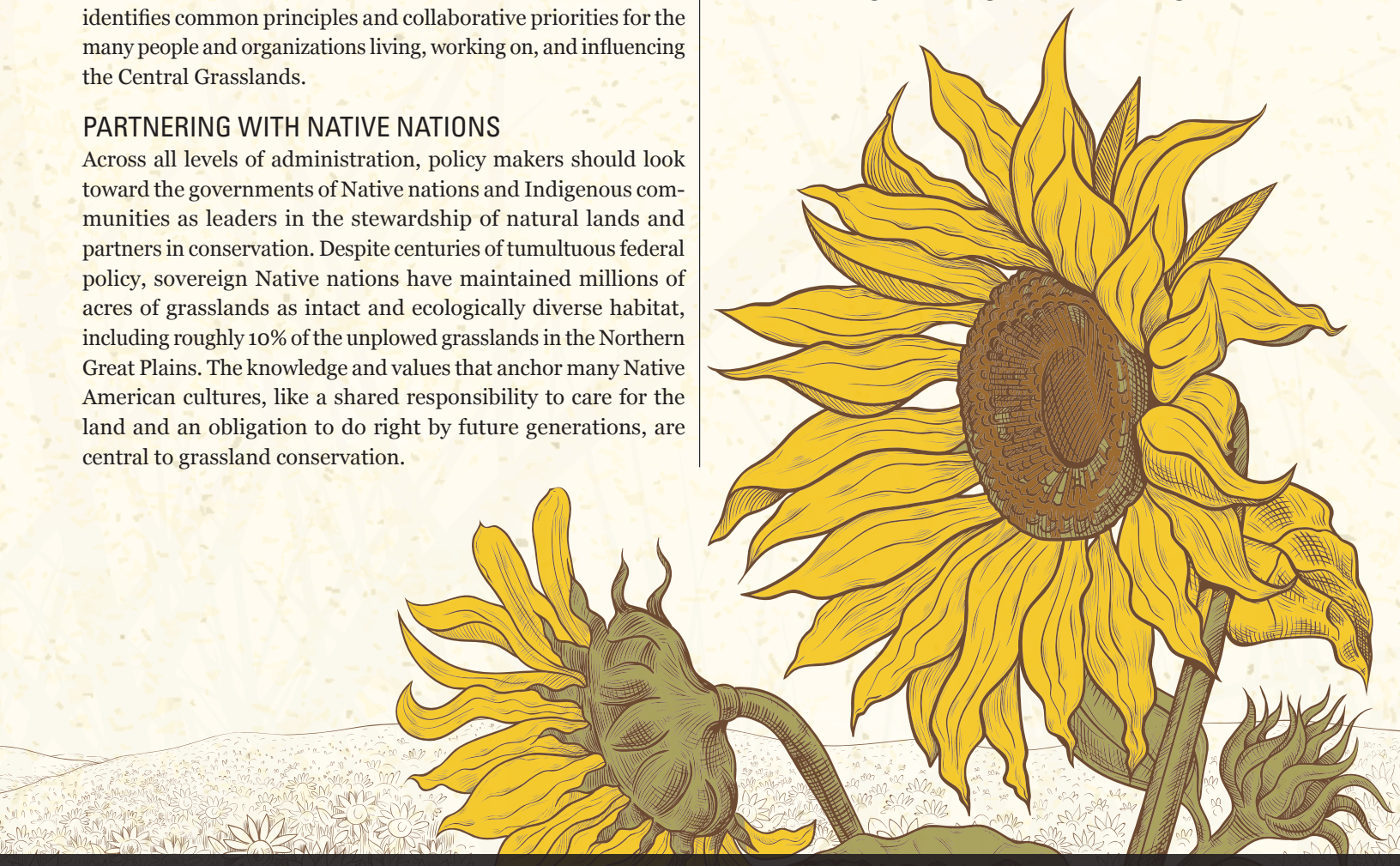
Across all levels of administration, policy makers should look toward the governments of Native nations and Indigenous communities as leaders in the stewardship of natural lands and partners in conservation. Despite centuries of tumultuous federal policy, sovereign Native nations have maintained millions of acres of grasslands as intact and ecologically diverse habitat, including roughly 10% of the unplowed grasslands in the Northern Great Plains. The knowledge and values that anchor many Native American cultures, like a shared responsibility to care for the land and an obligation to do right by future generations, are central to grassland conservation.

INCENTIVIZING GRASS-BASED ECONOMIES

Livestock grazing is currently the primary economic industry on privately owned grasslands that are at risk of conversion. Well managed grazing lands not only provide a revenue stream while maintaining intact grasslands, but they also support carbon storage, increase water infiltration, reduce erosion and nutrient runoff, and provide valuable habitat for wildlife[5]. More payments for ecosystem services from healthy grasslands could directly increase the profitability of livestock operations. Payments for services such as carbon sequestration markets have been gaining in popularity, though they are often geared towards croplands where more immediate gains are achievable.

SUPPLY CHAIN ENGAGEMENT

Corporate agricultural supply chains have an important role to play in conserving grasslands and meeting their sustainability targets. These can be achieved through investments in improved ecological, economic, and social outcomes on remaining grasslands and promoting conversion-free supply chains. The Science Based Targets Initiative offers one way to reduce emissions and lead the way to a zero-carbon economy, boost innovation, and drive sustainable growth. Companies should examine their supply chains to understand how they are implicated in grassland conversion and incorporate land use change into their corporate inventories and greenhouse gas reduction strategies.



[1] (Rosenzweig et al. 2016), [2] (Classen et al. 2011; Coble and Barnett, 2013; Lark et al. 2020), [3] (Spawn-Lee et al., 2021), [4] (Robertson et al., 2017), [5] (Flynn et al., 2017; Pogue et al., 2018; Teague et al., 2016)