

Contact:
Ben Larson
Agriculture Program
Manager
larsonb@nwf.org
(p) 202-797-6869

Land Use Change and Biofuels

Biofuels policy may be driving direct and indirect loss of wildlife habitat.

The world has a limited amount of cropland, but demands for it are increasing. Traditional demands for food, forage, and fiber are increasing, largely due to improving standards of living.¹ In addition, driven by government incentives and mandates, the growing biofuels industry is using increasing amounts of cropland for the production of biofuel feedstocks, primarily corn, soy, and palm oil. In the US, about 25% of corn acres are used for ethanol.² Replacing traditional crop production with biofuel feedstock production often leads farmers to bring new lands into production, and all too often these new croplands come from land that used to be forests, grasslands, and wetlands. Whether 'direct' or 'indirect' (see descriptions below), land use change has dire consequences for wildlife habitat and climate change.

Direct Land Use Change

Direct land use change occurs when forests, grasslands or wetlands are converted to grow biofuels feedstocks. Unfortunately, high crop prices since passage of the Renewable Fuel Standard (RFS) have led to widespread conversion of previously untilled land. Although discounted by the ethanol industry, evidence of the conversion of native grasslands and other untilled lands comes from a range of sources, including USDA data showing that between 2011 and 2012, almost 400,000 of previously uncultivated lands were brought into production for the first time—much of it in states with ethanol plants,³ remote sensing, which reveals concentrations of grassland conversions in the Western Corn Belt,⁴ and farmer interviews.⁵ Ecologically, it is devastating to lose what remains of our native grasslands—not to mention wetlands and forests. Less than two percent of tallgrass prairies remain. These remaining prairies should be saved for the biodiversity, history, and beauty they contain—and for the wildlife habitat, carbon sequestration, and water quality they provide. Further, when converted to croplands, grasslands, wetlands, and forests release significant amounts of carbon, reducing or nullifying a biofuel's GHG advantages.



Photo (left): Native grasslands are threatened by land use change (right) Corn fields surrounding wetlands. (both by Jim Ringelman, Ducks Unlimited).

Indirect Land Use Change (ILUC)

Indirect land use change occurs when the demand for biofuel feedstocks leads to expanded planting into lands where other crops had been grown, leading to a domino effect of conversion of new lands to grow those displaced crops. For example, if land that was used to grow wheat is converted to grow corn for ethanol, then somewhere else, grassland may be converted to cropland to replace the wheat. This Indirect Land Use Change (ILUC) magnifies the threat of biofuels expansion on biodiversity and is a mark against the sustainability of biofuels.

Clearing new land results in tremendous greenhouse gas emissions, released when soil carbon is oxidized and trees or vegetation is burned. In fact, land use change accounts for 20% of global greenhouse gas emissions.

Policies like the RFS may encourage ILUC by driving demand for biofuel feedstocks. Many studies have attempted to model the increased emissions from ILUC in different policy scenarios. For example, one study found that corn ethanol doubles greenhouse gas (GHG) emissions over 30 years and increases emissions for 167 years.⁶

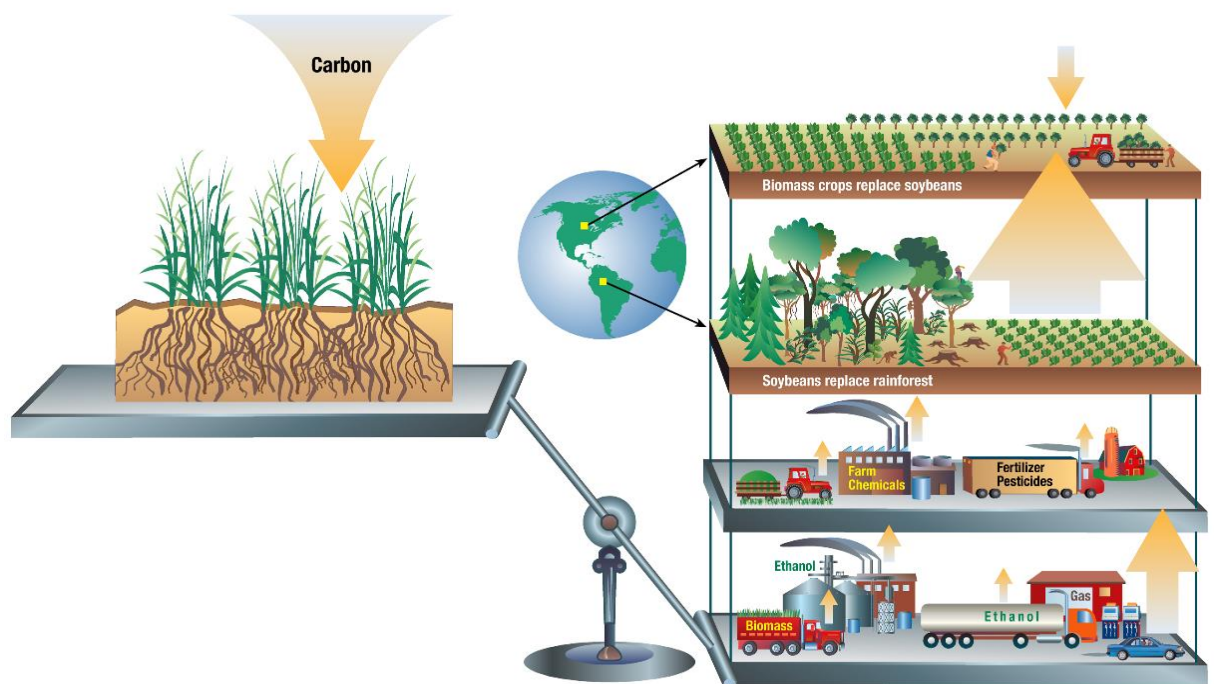


Figure 1: Land use change emissions may tip the scale against the use of some bioenergy crops, which contribute to global warming rather than helping to solve the problem.

¹Union of Concerned Scientists. 2013. [Climate Friendly Land Use: Paths and Policies Toward a Less-Wasteful Planet](#).
²Mumm, et al, 2014. "Land usage attributed to corn ethanol production in the United States." *Biotechnology for Biofuels*. 7:61.
³USDA. 2013. [Farm Service Agency](#). New breakings data.
⁴Wright and Wimberly. 2013. [Recent Land Use Change in the Western Corn Belt Threatens Grasslands and Wetlands](#). Proceedings of the National Academies of Science.
⁵USDA, Economic Research Service. 2011. [The Ethanol Decade: An Expansion of US Corn Production, 2000-2009](#).
⁶Searchinger *et al*, 2008. *Science*. "Use of US Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change."