



2016

PLOWPRINT

REPORT

FACTS & FIGURES

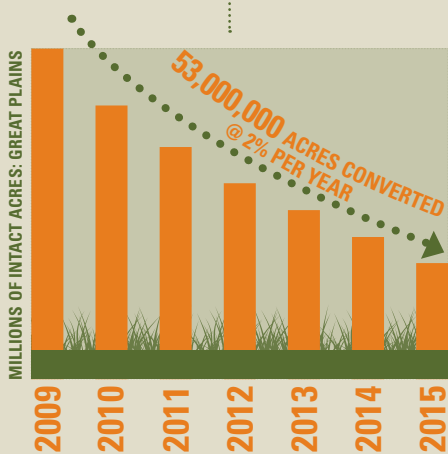


BIG PICTURE

53,000,000:

Number of acres of grasslands converted across the Great Plains since 2009.

2% ANNUAL RATE OF LOSS BETWEEN 2009-2015



THIS EQUALS:

13% OF 419 MILLION INTACT ACRES LOST

THAT'S THE SIZE OF KANSAS!

Temperate grassland ecosystems are the least protected biomes on the planet¹. Worldwide, these important habitats are being lost at an alarming rate due to a number of factors that include the production of food and fuel for a growing human population. Their decline is having a significant impact on ecosystem services that include carbon sequestration, water infiltration, and soil conservation.

The Mississippi River Basin and Great Plains encompass the majority of the historic extent of temperate grasslands in North America's breadbasket and define the study region in this report. Over the past few centuries the majority of the tallgrass prairie in the eastern portion of the region has vanished to make room for annually planted crops. The central and western portions of the region—the Great Plains—have seen less conversion overall, but still only half of their grasslands remains intact. **Since 2009, 53 million acres of grassland—an area the size of Kansas—have been converted to cropland across the Great Plains alone. That represents almost 13% of the 419 million acres that remained intact in 2009.** The average annual rate of loss of grasslands was 2% between 2009 and 2015, leaving 366 million acres intact.

The purpose of the plowprint² is to track annual grassland conversion to cropland across the Mississippi River Basin and Great Plains region, and to provide a way to measure the loss of this important habitat type, against which annual changes can be compared. This report tracks changes at the sub-regional scale, as well as in the context of the broader geography, and highlights key elements of change each year. The focus of this report is on changes in grassland conversion from 2014-2015, based on data from the USDA National Agricultural Statistics Service Cropland Data Layer and the Agriculture and Agri-Food Canada Annual Crop Inventory. For this analysis, cropland is defined as any annually planted agricultural commodity (e.g., corn, soybeans, wheat, etc.) or fallow agricultural land.

¹ Hoekstra, J.M., et al. 2005. Confronting a biome crisis: global disparities of habitat loss and protection *Ecology Letters* 8:23-29. ² Gage, A.M., Olimb, S.K., Nelson, J. *In press*. Plowprint: tracking cumulative cropland expansion to target grassland conservation. *Great Plains Research*.

PLOWPRINT REPORT CARD

ACRES of GRASSLANDS LOST TO CONVERSION: 2014-2015

RANK

1	Great Plains: 3,686,960 Acres (1.00% Annual Loss)
2	Mississippi River Basin: 2,999,120 Acres (0.63% Annual Loss)
3	Plains and Prairie Potholes Landscape Conservation Cooperative: 2,032,540 Acres (1.37% Annual Loss)
4	Prairie Habitat Joint Venture: 1,082,160 Acres (2.78% Annual Loss)
5	WWF's Northern Great Plains Focal Region: 966,230 (0.75% Annual Loss)
6	Prairie Pothole Joint Venture: 875,090 Acres (2.21% Annual Loss)
7	Northern Great Plains Joint Venture 299,440 Acres (0.38% Annual Loss)

REFER TO MAP, NEXT PAGE: THE GREAT PLAINS:
Grasslands Conversion from 2014-2015

COMPARATIVE ANNUAL RATES OF LOSS, 2011-2015:

GEOGRAPHY	% LOSS			
	2011-2012	2012-2013	2013-2014	2014-2015
Great Plains	2.16%	1.10%	1.08%	1.00%
Mississippi River Basin	1.27%	0.75%	0.68%	0.63%
Plains and Prairie Potholes Landscape Conservation Cooperative	2.55%	1.60%	1.89%	1.37%
Prairie Habitat Joint Venture	6.95%	3.08%	3.63%	2.78%
WWF's Northern Great Plains Focal Region	1.19%	0.77%	1.06%	0.75%
Prairie Pothole Joint Venture	2.54%	2.84%	3.08%	2.21%
Northern Great Plains Joint Venture	0.41%	0.32%	0.56%	0.38%

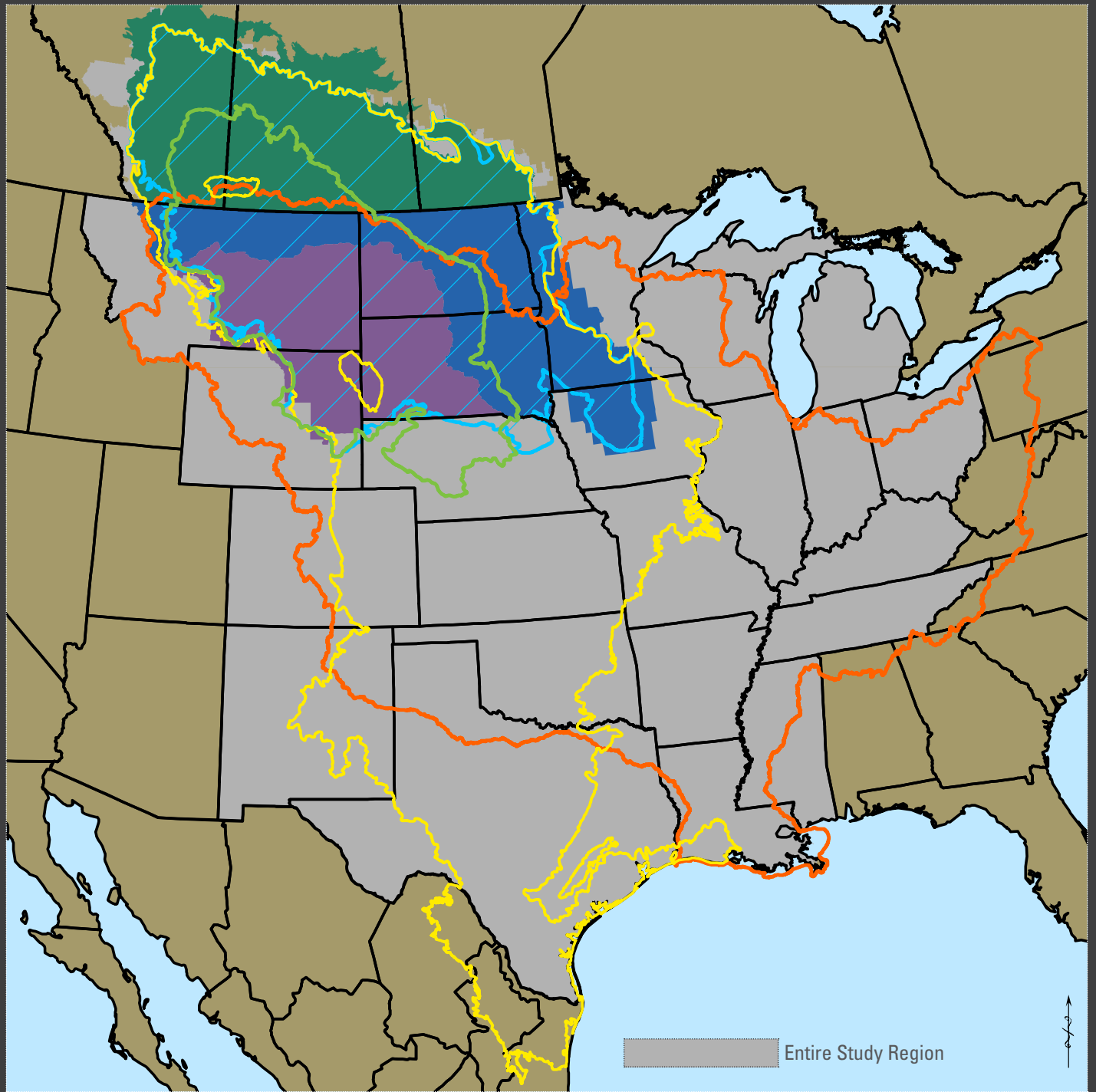
PERCENTAGE OF NEWLY CONVERTED ACRES¹ PLANTED TO THESE CROPS IN 2015

GEOGRAPHY	ALFALFA		CORN		CANOLA		SOY		WHEAT	
	Acres	% PP ²	Acres	% PP	Acres	% PP	Acres	% PP	Acres	% PP
Great Plains	5,293,190	10.0%	4,298,050	8.1%	2,120,950	4.0%	3,785,090	7.1%	9,150,630	17.2%
Mississippi River Basin	3,142,240	7.2%	7,701,570	17.6%	67,220	0.2%	6,638,840	15.1%	5,218,160	11.9%
Plains and Prairie Potholes Landscape Conservation Cooperative	4,239,370	14.6%	1,728,540	5.9%	2,112,740	7.3%	2,039,690	7.0%	5,682,800	19.5%
Prairie Habitat Joint Venture	3,808,460	19.9%	69,080	0.4%	2,405,240	12.6%	225,970	1.2%	3,637,610	19.0%
WWF's Northern Great Plains Focal Region	1,577,230	14.4%	585,580	5.4%	169,190	1.5%	351,650	3.2%	2,711,350	24.8%
Prairie Pothole Joint Venture	603,140	6.2%	1,674,350	17.1%	99,350	1.0%	1,988,410	20.3%	1,577,980	16.1%
Northern Great Plains Joint Venture	486,370	14.1%	187,690	5.4%	21,950	0.6%	29,470	0.9%	920,780	26.7%

¹Converted since 2009, ²%PP = % of Plowprint

THE GREAT PLAINS:

GRASSLANDS CONVERSION FROM 2014-2015



0.38%	0.63%	0.75%	1.00%	1.37%	2.21%	2.78%
Northern Great Plains Joint Venture	Mississippi River Basin	WWF's Northern Great Plains Focal Region	Great Plains (CEC)	Plains & Prairie Potholes LCC	Prairie Pothole Joint Venture	Prairie Habitat Joint Venture

Refer to **Plowprint Report Card** (Proceeding Page) for Acreage Converted Per Geography

PLOWPRINT AT-A-GLANCE

GEOGRAPHIES THAT HAD THE HIGHEST RATES OF CONVERSION:

- Similar to previous years, the highest rates of loss occurred in the Prairie Potholes Region and specifically in the Canadian portion of that region. The rate of loss in this region is about twice that of the larger study region.
- The Northern Great Plains Joint Venture and the central portion of World Wildlife Fund's Northern Great Plains Focal Region experienced the lowest rates of loss this year, at about 0.4%.

NGP CONVERSION HOTSPOTS THAT OVERLAP WITH IMPORTANT GRASSLAND BIRD HABITAT:

- The counties with the highest amounts of conversion from 2014-2015 (all >18,000 acres) overlapping with areas of important grassland bird habitat were: White Valley Rural Municipality, SK; Montana: Blaine County, Phillips County, Valley County, and Garfield County.
- Five NGP counties with high amounts of conversion in key grassland bird habitat are located around the Charles M. Russell National Wildlife Refuge in north-central Montana and Grasslands National Park near the U.S.-Canadian border in southern Saskatchewan.

CURRENT PLOWPRINT COMPOSITION:

- Approximately 80% of the plowprint was in active cropland/fallow land in 2015.
- About 13% was in grassland/shrubland/wetland and about 4% is in alfalfa/hay land. WWF considers the lands that are in these categories to be "restored" lands, simply meaning that they provide some level of habitat that is better than active cropland for some species.

% INTACT BY FOCAL GEOGRAPHIES:

- Approximately 54% of the Great Plains was still intact as of 2015, while the three joint venture geographies were, on average, 46% intact.
- About 70% of the Northern Great Plains was intact.

SOME GEOGRAPHIES HAD EXPANDED PERENNIAL / RESTORED HABITAT:

- When restored lands are included in overall habitat available for species, some geographies actually gained habitat from 2014-2015. The Prairie Habitat Joint Venture, the portion of Montana that is contained within the Northern Great Plains Joint Venture, the Canadian portion of the Plains and Prairie Potholes Landscape Conservation Cooperative, and the central portion of the WWF's Northern Great Plains focal region all gained more grassland through restoration and planting than was newly converted.

DEFINITIONS: CONVERTED LANDS, RESTORED LANDS

- **Converted Lands:** Pixels (=56m²) that have changed from grassland/wetland/shrubland to any annually planted agricultural commodity (alfalfa excluded because it is perennial); converted since 2008 in the U.S. and 2009 in Canada.
- **Restored Habitat:** Pixels that were converted to cropland and then restored or reverted back to a non-crop land-cover type, such as grassland, wetland, shrubland, hayland, pasture, forest or alfalfa.

KEY COMMODITIES DRIVING LOSS



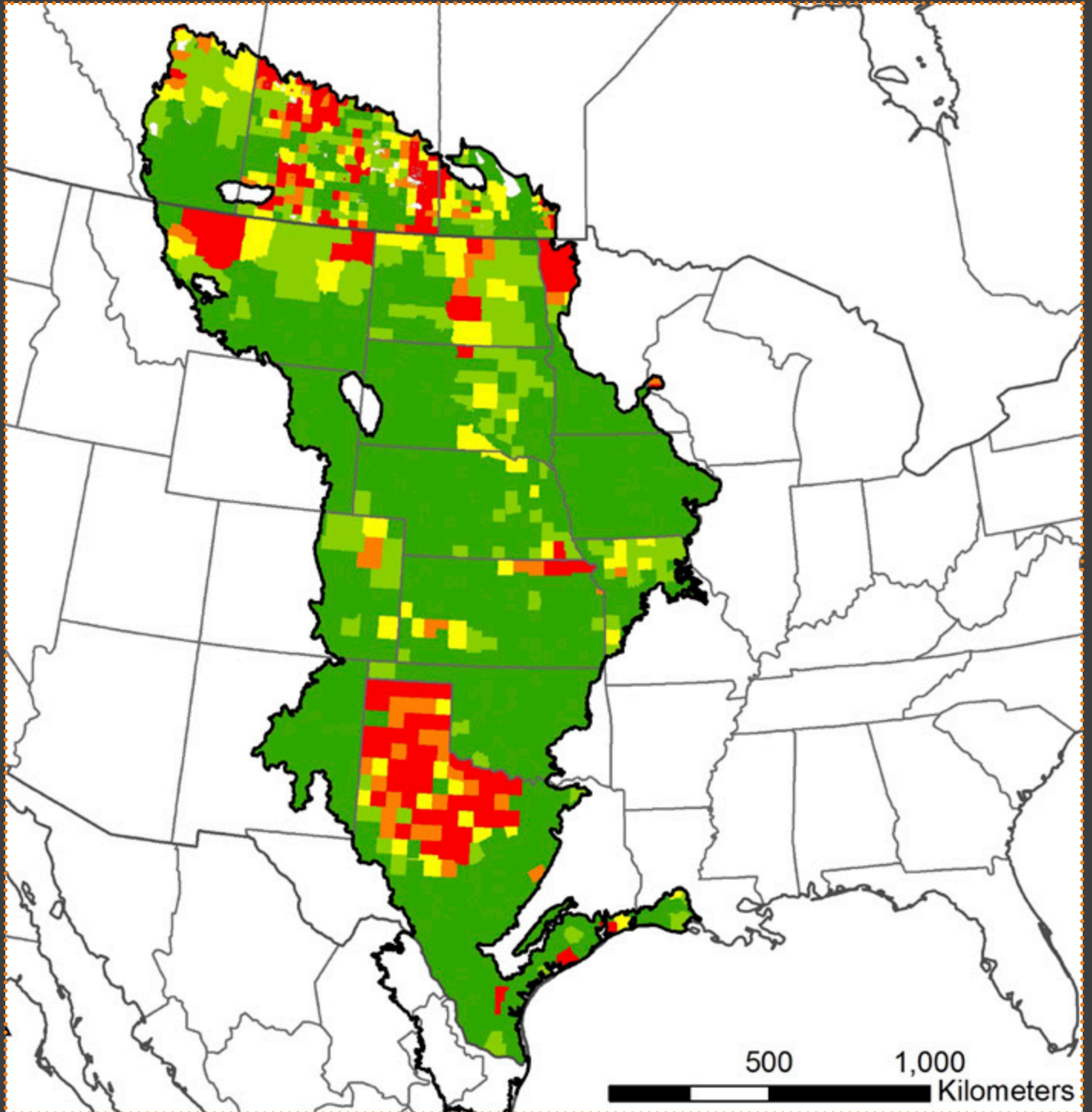
CORN SOY WHEAT

IN 2014 THE
NORTHERN GREAT
PLAINS
LOST
MORE
ACRES
TO CONVERSION
THAN THE BRAZILIAN
AMAZON
(1.4 MILLION LOST)

366 MILLION
INTACT ACRES
REMAIN
IN THE GREAT PLAINS

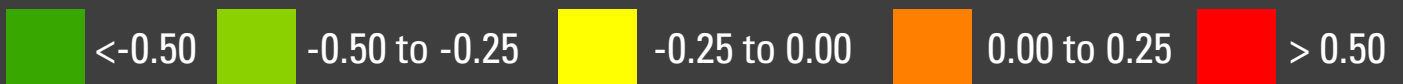
AREAS OF GREATEST GRASSLAND CONVERSION:

Compared to the average conversion rate across the Great Plains from 2014-2015, counties in red experienced the highest rates of conversion while counties in dark green experienced the lowest rates.



Average Conversion Rate: 1.74% of County Area

Deviation from Average Rate (%)



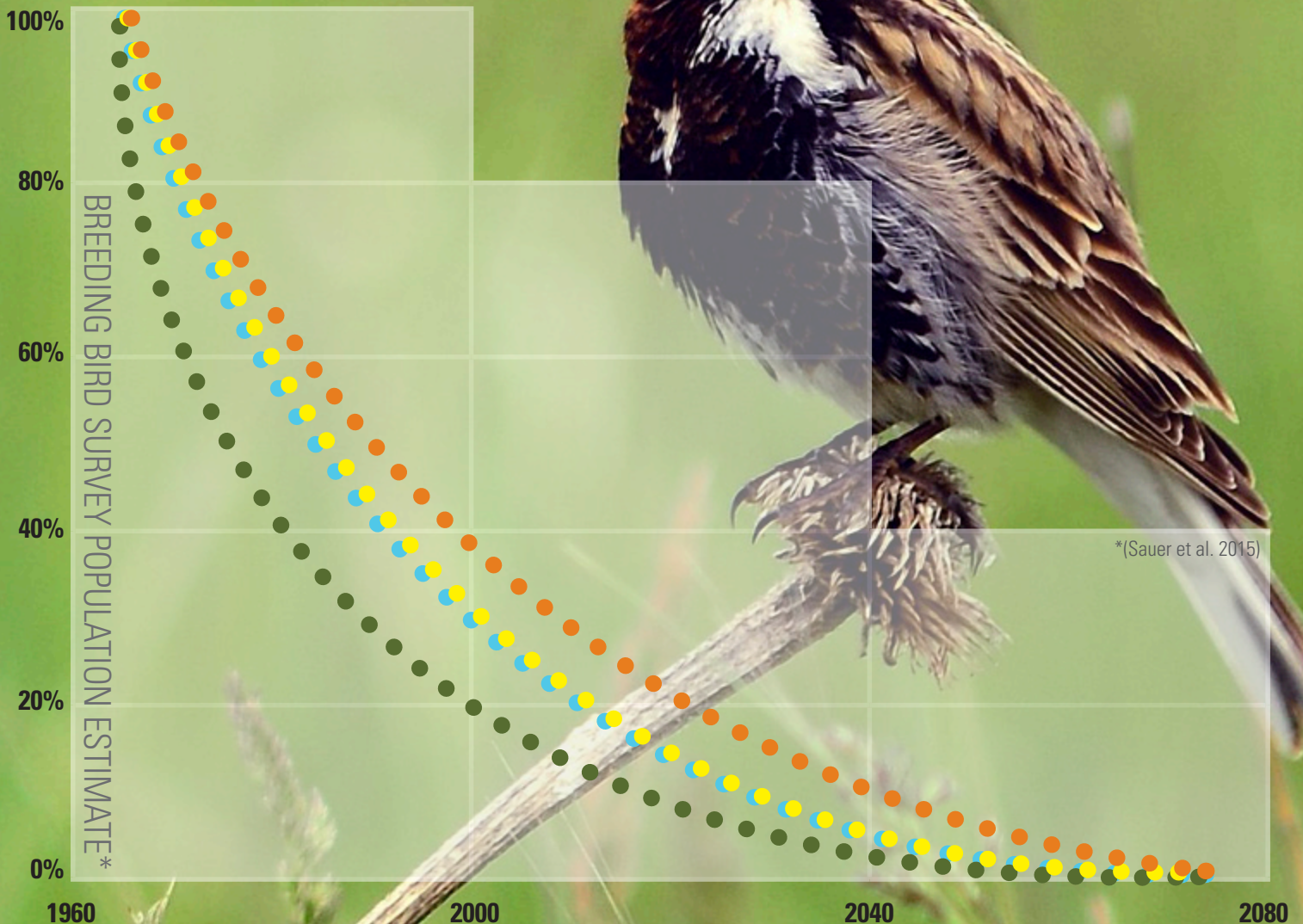
GRASSLAND BIRDS IN DECLINE

Birds are highly sensitive to landscape changes which makes them excellent indicators of overall ecosystem health. **Grassland birds, as a group, have experienced the steepest decline of all North American birds.** Six of these species exist nowhere else in the world and depend on grasslands in the Great Plains for nesting and foraging. All grassland bird species nest on the ground, making them vulnerable to predation and only 30-50% of nests are successful. As a result, these birds rely on a sea of grass to hide their young. Since the 1960s, populations of four key species have

declined as much as 80% (see graph below). The loss of intact grasslands throughout the region has played a major role in their decline, so working in partnership with private landowners, such as ranchers, who are also striving to keep the grass healthy is a natural fit for conservation. Throughout the Great Plains, people appreciate birds for many different reasons and look to them as signals for seasonal changes, as game species, agents of insect control, and for their beautiful songs, coloration, and behavior.

Most Affected Species:

- **McCown's Longspur, -6.2% per year**
- **Chestnut-collared Longspur, -4.4% per year**
- **Lark Bunting, -4.1% per year**
- **Sprague's Pipit, -3.5% per year**





WORLD WILDLIFE FUND
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