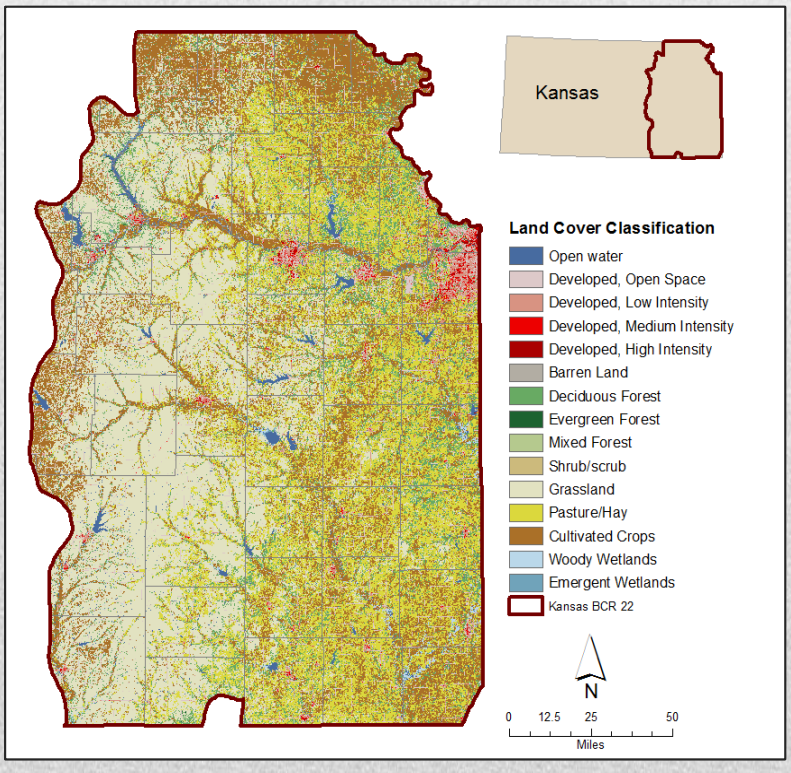
UPPER MISSISSIPPI RIVER & GREAT LAKES REGION
JOINT VENTURE
Delivering bird conservation through partnerships

Kansas BCR 22 – Assessment Summary

Bird conservation Joint Ventures (JVs) were established to help achieve continental bird population goals by designing and managing landscapes with high value to birds at regional, state, and local scales. JVs develop Implementation Plans where "focal species" are used to represent guilds and biological models are employed to translate population objectives into habitat objectives. This summary includes highlights from a JV assessment of bird habitat objectives and landscape trends in the Kansas BCR 22 (KS-22) "State x Bird Conservation Region." Objectives in the 2007 JV Implementation Plan were developed using spatial data from 2001, and JV partners have reported significant conservation accomplishments since objectives were established. However, trends in landscape cover types suggest mixed results in maintaining and increasing those land covers associated with key bird habitats. We provide general landscape trends based on the National Land Cover Database (2001 to 2006), comparisons between JV bird habitat objectives and cover type availability, and broad implications of those land-cover trends to bird habitat conservation. **Please see the complete KS-22 assessment for more details.**



Primary cover-types

KS-22 consists of extensive row crops (21%), upland forest (9%), and urban cover (7%), but its primary cover type is grassland and pasture (60%). Urban land expanded (+20,700 ac) in recent years, whereas total acreage of row crops (-16,700 ac), upland forest (-13,900 ac), and grassland/pasture (-10,500 ac) declined.

Comparison (acres) of Joint Venture bird habitat objectives (maintenance and restoration combined, from 2007 JV Plan) and estimated cover type availability (NLCD 2006) and trend (NLCD 2001 and 2006) in Kansas Bird Conservation Region 22. Note: Bird "conservation objectives" represent quality habitats (high recruitment/high survival) for JV focal species whereas "cover type availability" reflects landscape cover types, but not necessarily quality habitats.

Habitat/cover types	Conservation objective	Cover type availability	Short-term land cover trend (%)
Openland and woodland			
Grassland	2,272,400	5,575,833	0.0
Savanna	3,293,498	n/a	n/a
Deciduous forest	13,338	1,458,839	-0.9
Evergreen forest	0	7,099	-1.5
Shrubland	31,383	12,515	-3.8
Other forest	0	40,654	0.2
Marsh, mudflat, and open water			
Emergent wetland	94,492[a]	28,905	64.2
Woody wetland	18,659[b]	177,265	-0.6
Dry mudflat	55,706	3,440,074[c]	-0.5
Open water	14,094	274,268	3.7

[a] Includes habitat objectives for multiple emergent wetland focal species combined: deep water marsh, shallow semi-permanent marsh, wet meadows with open water, wet mudflat/moist-soil plants, shallow water depth (<2 in), and moderate water depth (2-8 in) subcategories.

[b] Includes habitat objectives for multiple woody wetland focal species combined: marsh with shrub forest and forested wetlands.

[c] Area of row crops, which can provide some value to dry mudflat bird species.

Management Implications

Openland:

- Current JV population and habitat objectives for grassland / openland birds are likely achievable in KS-22 based on the area of openland cover types available, but much of the grassland area may be providing low quality bird habitat under current management practices.
- Quality habitat for grassland birds depends largely on private land management, particularly grazing intensity and timing, burning regime, and land conversion due to recent high commodity prices resulting in less grassland, more row crops, and a higher degree of fragmentation.

Woodland:

- Upland forest and woody wetland cover is greater than needed to meet current JV bird habitat objectives; however forest fragmentation may result in lower productivity of some breeding focal species.
- The area of available shrubland appears to be substantially lower than habitat objectives for shrubland birds and restoration of this cover type remains a priority.

Marsh, mudflat, and open water:

- Current area of open water and mudflat appear adequate to meet habitat objectives for JV focal species whereas emergent marsh is not adequate. The quality of these potential wetland-bird habitats could not be assessed using available spatial data, and most are unprotected.
- Although open water appears sufficient, water quality and associated waterfowl forage (e.g., aquatic plants, invertebrates) is a concern in many areas, especially large rivers.
- Gains in emergent wetlands and open water between 2001 and 2006 were likely temporary, resulting from higher water levels in the Missouri River, Tuttle Creek Reservoir, and Kansas River systems.
- Partners should continue to expand protection and restoration of emergent marsh and wet meadow and provide food-energy resources (e.g., moist-soil plants) where this practice is suitable and efficient.

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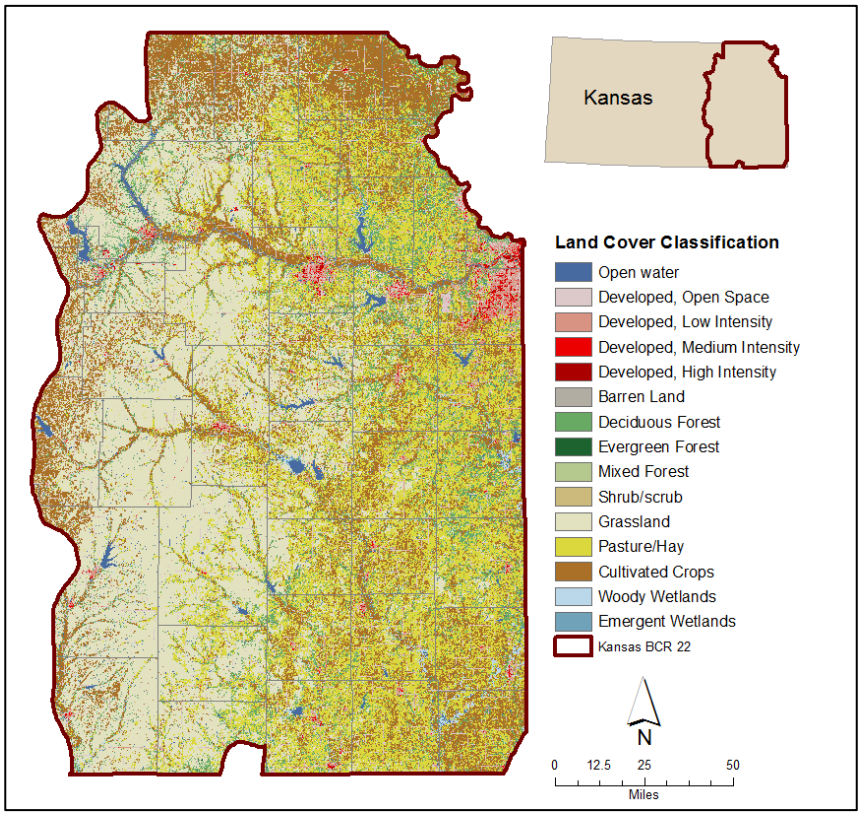
State by BCR Assessment

Kansas 22 – Eastern Tallgrass Prairie

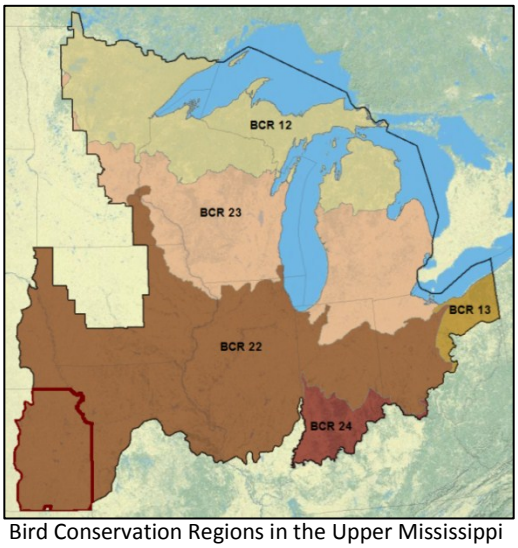
This document was developed to serve as a "stepped-down" version of the 2007 Joint Venture (JV) Implementation Plan with focus on Kansas BCR 22, the Eastern Tallgrass Prairie portion of Kansas. It includes lists of bird species used for JV regional planning (i.e., focal species) that represent land cover types, or bird habitat associations, important to bird guilds occurring in KS-22. Bird habitat (cover type) objectives are presented for maintenance/protection and restoration/enhancement based on the 2007 JV Plan.

Spatial data were not available to assess each bird habitat type identified in the JV Plan, but recent trends in broad land cover categories believed to be important to JV focal species are provided. Land cover trend analyses are based on quantities (acres) calculated from the 2001 and 2006 National Land Cover Database (NLCD). Although area estimates do not translate into quality bird habitats, significant increases or decreases in specific cover types likely result in similar population trends for species associated with those cover types. Also included in this assessment are the amount and location of land currently protected, primary modes of recent cover type conversion, and general management implications for KS-22 bird conservation partners.



Focal species were selected to facilitate planning and monitoring when developing the 2007 Implementation Plan. Population and habitat objectives for landbirds and waterbirds included the breeding period only, whereas objectives generated for waterfowl and shorebirds also included the non-breeding period (migration/winter). The following JV focal species represent bird guilds requiring specific cover types found in KS-22 (species within guild may be more common than focal species, see 2007 JV Plan).

Landbird	Shorebird
Greater Prairie-Chicken	American Golden-Plover
Whip-poor-will	Killdeer
Chimney Swift	Upland Sandpiper
Red-headed Woodpecker	Sanderling
Willow Flycatcher	Dunlin
Wood Thrush	Short-billed Dowitcher
Prothonotary Warbler	American Woodcock
Louisiana Waterthrush	Wilson's Phalarope
Kentucky Warbler	**Waterfowl**
Henslow's Sparrow	Tundra Swan
Eastern Meadowlark	Wood Duck
	American Black Duck
Waterbird	Mallard
Black-crowned Night-Heron	Blue-winged Teal
King Rail	Canvasback
Black Tern	Lesser Scaup



Bird Conservation Regions in the Upper Mississippi River and Great Lakes JV region.

Introduction

A primary goal of bird habitat Joint Ventures is to achieve continental bird population targets by designing landscapes with greater value to birds and employing conservation actions at regional, state, and smaller scales. To contribute to this goal, the UMRGLR JV developed an all-bird Implementation Plan in 2007, which included explicit regional bird population and habitat conservation objectives. These objectives were created by sequentially stepping-down continental population goals to the JV region, Bird Conservation Regions (BCRs), and the intersections of states and BCRs (e.g., KS-22). This "top-down" planning process relied on accurate population estimates and biological models to determine the amount of high quality habitat area needed to achieve bird population goals. A key assumption of the planning process was that population goals could be achieved with current and potential bird habitat cover types available on the landscape. JV planners also assumed existing bird habitats would remain available through time, but given the dynamic nature of some landscapes, this is not always the case.

Compared to the 2007 JV Implementation Plan, this complementary document includes updated and refined information to help guide KS-22 managers in decision making for bird habitat conservation. Its primary purpose was to use existing spatial data to evaluate the suitability of established focal species habitat objectives by comparing them with the area of cover type associated with that species (i.e., capacity of the landscape to support the objectives). Spatial data used in this analysis were the National Land Cover Database (NLCD); however, these data are imperfect. Classification accuracy is 80-85% but lower for some cover types such as grassland, shrubland, and pasture/hay. In addition, these spatial data do not necessarily identify "high quality" bird habitats, where focal species abundance, survival, and reproduction are relatively high. Despite these inadequacies, NLCD is useful for indicating current land use and patterns of change, and is sufficient to identify gross disparities between the JV's bird habitat objectives and available land covers. Updated cover type

information, coupled with new bird research and monitoring data and JV partner priorities, will be used to improve future versions of the JV Implementation Plan.

Land Cover Change

Bird habitat objectives and decision-support maps in the 2007 JV Plan were developed using population information and 2001 NLCD. Although NLCD categories were often more general than JV habitat categories, NLCD provided a source of spatial data for the whole JV region. However, smaller-scale landscape conditions, trends in land cover, or how these conditions might correspond with JV objectives were not considered. Landscapes are not static, which inevitably has a strong bearing on the attainability of bird habitat objectives. As such, this assessment aims to provide a better understanding of land cover conditions in KS-22 and to illustrate how the landscape has changed since development of the 2007 JV Plan. Periodic assessment of landscape conditions allows us to identify land cover trajectories and provides a means to continually reevaluate the feasibility of achieving bird population and habitat objectives. Furthermore, knowledge of whether we are gaining or losing priority bird habitats and where on the landscape this change is occurring provides managers an additional tool to assist in focusing on-the-ground conservation efforts.

Table 1. Broad land cover types (acres) and percent change between 2001 and 2006 in Kansas BCR 22 based on NLCD. Note: The correct classification rate of NLCD is approximately 80 to 85%. Categories most often misclassified are pasture and grassland; forested wetlands are likely underrepresented.

	Year			
Cover Type	2001	2006	% change	Acres gained/lost
Open Water	264,472	274,268	3.7	9,797
Urban	1,074,011	1,094,237	1.9	20,226
Barren	13,096	14,369	9.7	1,273
Upland Forest	1,522,891	1,509,016	-0.9	-13,875
Shrub/Scrub	13,008	12,515	-3.8	-493
Grassland/Hay/Pasture	9,783,712	9,773,205	-0.1	-10,507
Grassland	5,577,790	5,575,833	0.0	-1,957
Row Crops	3,456,775	3,440,074	-0.5	-16,702
Wetlands	195,890	206,170	5.2	10,280
Emergent Wetlands	17,602	28,905	64.2	11,303
Woody Wetlands	178,289	177,265	-0.6	-1,023
Total	22,097,536	22,105,859		

Large amounts of row crop, urban cover, and upland forest occur in KS-22, with moderate interspersion, but the most dominant cover is grassland and pasture (Table 1).[1] Upland and wetland forest declined slightly between 2001 and 2006, accounting for a 14,900 acre loss. Grassland and pasture also declined, by 10,500 acres. Conversely, urban cover increased by 20,200 acres, an area roughly the size of the city of Lawrence. Gains in urban cover came primarily from land previously in row crops and grassland/hay/pasture and thus represent permanent habitat loss (Figure 1, Table 2). Gains in emergent wetland and open water between 2001 and 2006

[1] To evaluate landscape change, we compared satellite imagery (NLCD) of KS-22 between 2001 and 2006. We used ArcGIS to determine whether a given pixel (30 x 30 m resolution) changed from one cover type to another. We collapsed cover types into eight distinct categories: open water, urban, barren, upland forest, shrub/scrub, grassland/hay/pasture, row crops, and wetlands. Although coarse, these broad cover types provide a good indication of landscape composition and a means for prioritizing finer scale analyses.

suggest active conservation activity (e.g., conversion from row crop), but some aquatic coverage may have been temporary, resulting from higher water in the Missouri River, Tuttle Creek Reservoir, and Kansas River systems.

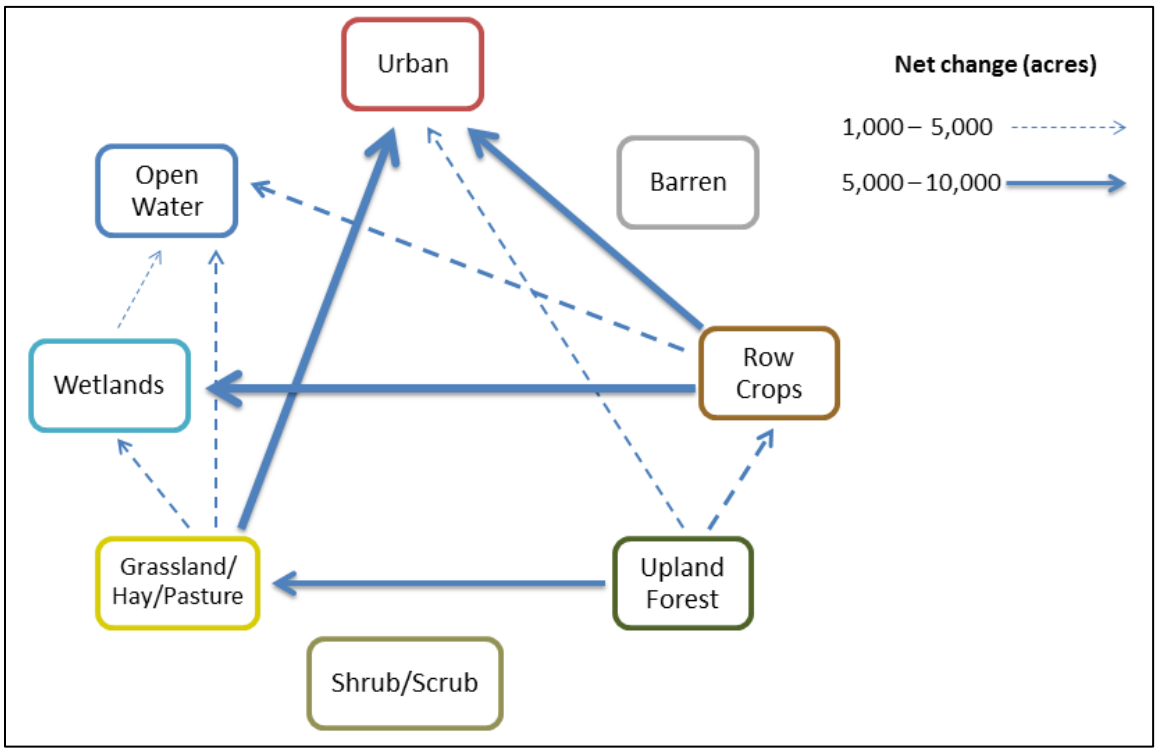


Figure 1. Net change of general land cover types (>1,000 acres converted) in Kansas BCR 22 between 2001 and 2006 (NLCD). Arrows point in the direction of change between two cover types and line thickness increases in proportion to amount of net change. "Wetlands" include woody and emergent herbaceous wetland, whereas "upland forest" represents upland (non-wetland) forest cover.

Table 2. Conversion (acres) of primary land cover types in Kansas BCR 22 between 2001 and 2006. Grey cells represent the acreage in which no change occurred, whereas remaining cells represent the area of 2001 cover types (vertical axis) coverted to other cover types by 2006 (horizontal axis). For example, between 2001 and 2006, 121 acres of open water converted to wetland and 2,155 acres of wetland converted to open water, for a net change of -2,034 wetland acres (also see Figure 1). Note: The correct classification rate of NLCD is 80 to 85%; misclassification often occurs between pasture and grassland categories and forested wetland and upland forest categories.

Land Cover Type		2006							
		Open Water	Urban	Barren	Forest	Shrub/Scrub	Grassland/ Hay/Pasture	Row Crops	Wetlands
2001	Open Water	262,250	90	617	187	0	427	348	121
	Urban	3	1,072,251	0	0	0	0	0	2
	Barren	450	94	11,890	48	0	344	204	45
	Forest	914	2,558	416	1,504,002	4	7,288	4,520	701
	Shrub/Scrub	75	67	5	4	12,457	235	121	23
	Grassland/Hay/Pasture	3,295	9,441	753	1,859	35	9,748,059	1,068	3,207
	Row Crops	4,678	7,726	310	446	0	233	3,428,130	9,602
	Wetlands	2,155	221	354	4	0	642	61	192,133

Bird Habitat Objectives and Cover Type Availability

JV bird habitat conservation objectives fall under two categories: "maintain and protect" (hereafter maintenance) and "restore and enhance" (hereafter restoration). Maintenance objectives reflect estimated area of habitat needed to maintain current bird populations, whereas restoration objectives were generated based on population deficits (deficit = population goal - current population) and reflect area of new habitat needed to achieve population goals. For each category, there are breeding and non-breeding bird habitat objectives. Breeding objectives were established for all four bird groups – waterfowl, waterbirds, shorebirds, and landbirds – whereas non-breeding (migration and wintering) objectives were developed for only shorebirds and waterfowl. Breeding habitat was calculated based on cover-type area needed for successful reproduction and non-breeding habitat was based on food-energy needs critical to survival.

The area of cover types potentially providing bird habitat was estimated using the National Land Cover Database (NLCD 2006). Location and ownership of public lands was also assessed. Spatial data from the Protected Areas Database (PAD), the Conservation and Recreation Lands Database (CARL), and the National Conservation Easement Database were pooled to display KS-22 protected land configuration and ownership composition (Figure 2). In December 2013, 2.29 million acres were enrolled in the Conservation Reserve Program (CRP) in Kansas with roughly 475,000 acres scheduled to expire by 2018. We were unable to partition CRP acreage to KS-22 or assess the land cover composition of CRP lands due to privacy protections in the U.S. Farm Bill.

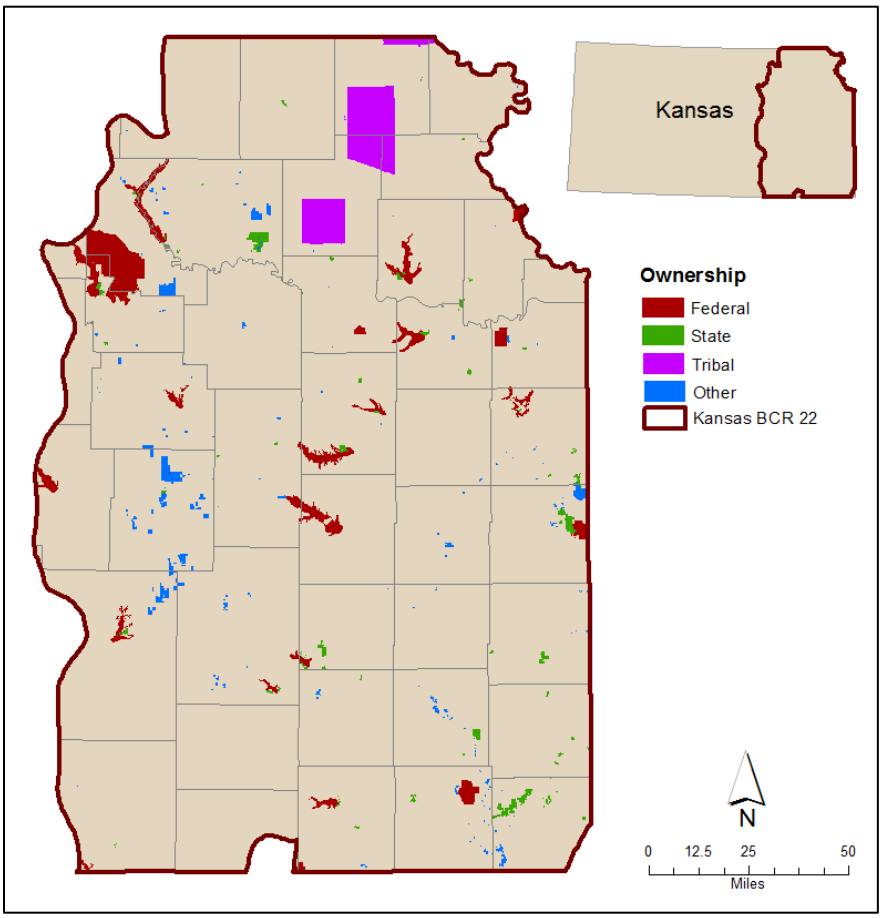


Figure 2. Location of federal, state, or other conservation lands in Kansas Bird Conservation Region 22. "Other" ownership category includes private land with temporary and permanent easements, conservancy land, and county, township, and city owned land. Total land area conserved (excluding CRP lands) is 726,100 acres, including 460,700 acres of openland and woodland and 313,000 acres of open water, agriculture, and marsh wetland.

Openland and Woodland

Upland cover types and focal species	
Grassland	Upland Sandpiper, Greater Prairie-Chicken, Henslow's Sparrow, Eastern Meadowlark
Savanna	Red-headed Woodpecker
Deciduous forest	Whip-poor-will, Wood Thrush, Louisiana Waterthrush, Kentucky Warbler
Forest generalist	Chimney Swift
Forested wetland	Prothonotary Warbler
Shrubland	Willow Flycatcher

Bird habitat objectives for cover types in KS-22 are greatest for grassland and savanna (mixed wooded openland). The estimated amount of grassland and savanna (mixed wooded openland) needed in a high quality habitat condition to maintain current landbird populations is 2,816,000 acres (Table 3). This represents 13% of the total area of KS-22 and more than what is currently under federal, state, or other protection even when including CRP lands (Table 3). Moreover, the JV Plan calls for similar restoration objectives for these openlands communities based on breeding population goals stepped down from the continental landbird plan.

Openland.—Grassland communities can be poorly mapped by NLCD, but their dominance in KS-22, particularly the impressive Flint Hills region, improves our confidence in using these data for this region. The grassland-bird guild used for planning requires 2,272,000 acres to achieve goal populations, and the region contains an estimated 5.6 million acres of grassland plus nearly 4.2 million acres of pasture (Table 3). Although the amount of grassland appears adequate, changes in agricultural practices (e.g., elevated grazing pressure, timing of spring burning), ongoing conversion of grassland / pasture to urban, and fragmentation of large grasslands due to activities such as energy development have been detrimental to breeding grassland birds. Savanna objectives (3,293,000 acres for maintenance and restoration combined; Table 3) are based on the breeding habitat requirements of birds occupying savannas (e.g., Red-headed Woodpecker). This cover type is not mapped by NLCD so it is difficult to assess the landscape's capacity for supporting current and future populations of savanna birds. In addition, the savanna objective will be substantially reduced in future JV landbird plans due to new information.

Woodland.—Objectives developed for deciduous forest and forested wetland were driven by the needs of breeding landbirds. KS-22 encompasses about 1,696,000 acres of woodland, of which 115,000 acres are protected (Table 3). Forest cover in KS-22 ranges from more extensive in the east to almost non-existent in the west, following a gradient of precipitation from relatively high to low, respectively. Wooded areas in the west portion of KS-22 are located primarily along rivers and streams.

The availability of both upland deciduous forest and forested wetland was substantially greater than estimated forest bird habitat needs for the region (Table 3). However, habitat quality features such as intact forest tracts and sparse understory are important to breeding success of some forest birds. In addition, forest fragmentation may be a concern in some eastern areas because it can limit habitat quality of breeding forest birds.

Habitat objectives for shrubland birds (31,400 acres) were substantially lower than the estimated area of shubland available in KS-22 (Table 3). However, shrubland cover types are poorly mapped and estimates based on remote sensing (i.e., NLCD) are not sufficient for accurate assessment. Local managers should consult the USDA Forest Service Forest Inventory and Analysis (FIA) program for county-level measures of this somewhat dynamic cover type.

Migration and wintering habitat objectives for landbirds were not developed for the 2007 JV Implementation Plan, but the non-breeding period for landbirds will be addressed when the JV Plan is next updated. Of particular conservation importance will be migration habitat for grassland and forest birds traversing KS-22.

Table 3. Upland bird habitat maintenance and restoration objectives (acres) by primary openland and woodland cover types and the estimated amount of each currently on the landscape in Kansas BCR 22. Objectives are from the 2007 JV Implementation Plan and represent estimated area of high quality habitat required to meet the needs of JV focal species during the breeding period. Cover types were measured using the National Land Cover Database (2006). Conservation status (protected land) and ownership was determined using the Protected Areas Database, Conservation and Recreation Lands Database, and National Conservation Easement Database.

Bird habitat categories	Habitat objective[a]		Land cover				
	Maintenance	Restoration	Cover type area on landscape	Conservation status (protected)			
				Federal	State	Other	Total
Openland							
Grassland	1,136,200	1,136,200	5,575,833	99,976	17,080	86,927	203,983
Pasture/hay[b]	--	--	4,197,372	28,434	8,790	104,520	141,744
Savanna	1,646,749	1,646,749	na[c]	na	na	na	na
Woodland							
Deciduous forest	8,892	4,446	1,458,839	45,801	12,469	26,117	84,387
Evergreen forest	0	0	7,099	680	225	12	917
Forested wetland	3,952	1,976	177,265	13,880	11,387	1,918	27,185
Shrub/scrub	20,510	10,873	12,515	353	180	437	970
Other forest	0	0	40,654	946	269	331	1,546
Total	2,816,303	2,800,244	11,469,577	190,070	50,400	220,262	460,732

[a]Upland bird habitat objectives are for the breeding period only; non-breeding habitat objectives were not calculated for landbirds (see 2007 JV Implementation Plan for more detail).

[b]Bird habitat objectives were not established for this primary NLCD cover type providing some openland value.

[c]na indicates cover type area could not be estimated due to resolution limitations of spatial data.

Marsh, Mudflat, and Open Water

The estimated area of high quality bird habitat needed in marsh wetland, mudflats, and open water to maintain current bird populations is about 141,000 acres (Table 4)[2]. This area, plus an additional 40,000 acres of restored, high quality wetland cover types is predicted to achieve a landscape design adequate (i.e., provide carrying capacity) to meet JV goal populations for breeding and non-breeding wetland birds in KS-22.

Wetland and open water cover types and focal species	
Deep water marsh	Tundra Swan, American Black Duck, Black Tern
Wet meadow w/ open water	Blue-winged Teal
Semi-permanent/hemi-marsh	American Black Duck, Mallard, King Rail
Marsh with shrub/forest	Wood Duck, Black-crowned Night-Heron
Wet mudflat/moist soil plants	Blue-winged Teal, Dunlin
Shallow water (<5 cm)	Short-billed Dowitcher
Moderate water (5-20 cm)	Wilson's Phalarope
Dry mudlfat	American Golden-Plover, Killdeer
Open water	Canvasback, Lesser Scaup
Beach	Sanderling

Marsh.—Habitat objectives for birds dependent on marsh wetlands were divided into shallow semi-permanent marsh / hemi-marsh, deep-water marsh, and marsh with associated shrub or forest. The JV Plan calls for high quality wetland-bird habitat totaling 89,800 acres of shallow semi-permanent marsh (includes 5,800 acres for wet meadow with open water) and 12,700 acres of marsh with associated shrub/forest (Table 4) during the breeding period. Objectives for shallow semi-permanent marsh and deep water marsh were higher during the

[2] Acreage totals for habitat objectives in this section represent cumulative total of highest values between breeding and non-breeding habitat objectives for each cover type. For example, the estimated area of high quality habitat needed in KS-22 to maintain current populations of birds dependent on dry mudflat is 22,852 acres, as the breeding objective (22,852 ac) is greater than the non-breeding objective (173 ac) (See Table 4).

non-breeding period and totaled 92,300 acres. Based on available spatial data, there were a total of 29,000 acres of emergent marsh in KS-22 and 57% are protected (Table 4). This area is only about 30% of the JV goal, and we were unable to determine the quality of these communities for waterfowl and other wetland birds based on spatial information.

Mudflat and Shallows.—Objectives for wet mudflat, shallow-depth (<2 in), and moderate-depth (2-8 in) open wetland communities were based primarily on the energetic needs of migrating waterfowl and shorebirds. These objectives total about 3,900 acres of wet mudflat and shallow-water providing high quality (food energy) bird habitat (Table 4). However, assessments of these cover types are difficult using remotely sensed data. These cover types are also dynamic, especially along major rivers, where conditions can change daily and seasonally making one-time static assessments poor estimators of cover type availability. The area of dry mudflat (i.e. row crop) protected totals 112,400 acres and is primarily in tribal ownership based on conservation lands spatial data.

Open Water and Beach.—Open-water bird habitat objectives are based on the needs of migrating and wintering diving ducks. This group requires an estimated 14,100 acres of high quality foraging and resting habitat. Whereas the region's open-water abundance is greater than JV objectives (Table 4), some of the large river areas with lower water quality may lack adequate forage for this bird group. Regarding beach in KS-22, there are species of shorebirds and terns dependent on this cover type. Beach habitat objectives total about 100 acres and beach is relatively abundant (Table 4), but concentrated primarily along the Kansas River corridor.

Table 4. Wetland bird habitat maintenance and restoration objectives (acres) for marsh, mudflat, and open water and the estimated amount of each cover type currently on the landscape in Kansas BCR 22. Objectives are from the 2007 JV Implementation Plan and represent estimated area of high quality habitat required to meet the needs of JV focal species and planning guilds during both breeding (B) and non-breeding (N) periods. Cover types were measured using National Landcover Data (2006). Conservation status (protected land) and ownership was determined using the Protected Areas Database, Conservation and Recreation Lands Database, and National Conservation Easement Database.

Bird habitat categories	Habitat objective				Land cover				
	Maintenance		Restoration		Cover type	Conservation status (protected)			
	B	N	B	N	area on	Federal	State	Other	Total
Marsh									
Deep-water marsh	17	4,725	7	0	na[a]	na	na	na	na
Shallow semi-permanent marsh[b]	8,331	87,544	2,216	627	28,905[c]	7,127	519	8,713	16,359
Marsh with shrub/ forest	10,609	86	2,122	79	na	na	na	na	na
Mudflat and shallows									
Wet mudflat/ shallows[d]	0	3,057	0	852	na	na	na	na	na
Dry mudflat[e]	22,852	173	32,853	101	3,440,074	16,205	4,112	92,086	112,403
Open water and beach[f]									
Extensive open water	0	12,145	0	1,949	274,268	78,631	6,879	97,905	183,415
Beach	0	27	0	69	14,368[f]	474	183	133	790
Total	41,810	107,758	37,198	3,678	3,714,342	102,437	11,693	198,837	312,967

[a]na indicates cover type are could not be estimated due to resolution limitations of spatial data.
[b]Bird habitat objectives for "shallow semi-permanent marsh" also include objectives for "wet meadow with areas of open water" in the 2007 JV
[c]Cover type area for "shallow semi-permanent marsh" includes herbaceous wetlands in NLCD.
[d]Bird habitat objectives for "wet mudflat/shallows" category incorporates objectives for "wet mudflat," "shallow (<2 in)," and "moderate water depth (2-8 in)" open flats in the 2007 JV Plan.
[e]Dry mudflat/agriculture was a bird habitat category in the 2007 JV Plan and row crop (NLCD) is the cover type measured on the landscape.
[f]"Beach" is sand/gravel/bedrock with little vegetation (NLCD).

Management Implications

KS-22 is a diverse bird conservation area, with a gradient from substantial forest cover and higher precipitation in the east to expansive drier prairie in the west. Within the JV region, KS-22 stands out for its high value to both breeding and non-breeding openland birds. The Kansas Flint Hills region is the largest remaining native tallgrass prairie in the United States and retains some of the highest breeding grassland bird abundances. Grassland and savanna bird objectives were not developed for the non-breeding period in the 2007 JV Implementation Plan, and this period of the annual cycle deserves emphasis in future JV planning. The KS-22 region is also important for migrating shorebirds, marsh birds, and some waterfowl.

In general, the current area of grassland appears adequate to meet habitat objectives for JV focal species; however, the quality of these potential bird-habitat areas could not be assessed with remotely sensed data and only a small portion of the existing grassland is protected under conservation ownership or easement. Although grassland cover was stable between 2001 and 2006, populations of several grassland bird species have declined. An increasing area of grassland is poor quality for birds due to plant species composition (e.g., tall fescue) and agricultural use trends (e.g., un-prescribed cattle stocking rates). Permanent protection (public ownership) of vast grassland and savanna tracts is unfeasible, thus natural resource managers should continue seeking opportunities to promote bird conservation on private lands. Whereas the high intensity and frequency of spring burning has been identified as a concern for prairie birds breeding in the Flint Hills, lack of burning and associated brush encroachment has negatively influenced grassland birds in eastern KS-22. Moderation in the west and intensification of burning in the east is necessary for prairie burns that emulate natural cycles resulting in sustainable native grass systems. Managers may have a greater impact for grassland birds by working with ranchers and the broader agricultural community, finding a balance between short-term and long-term economic viability via healthy native-grass prairies.

Breeding birds dependent on upland and wetland forests appear to have adequate cover, although the linear nature of the riparian forests in the region may result in lower productivity of some breeding forest birds. KS-22 partners should consider expanding protection of unfragmented riverine forests for breeding birds as these areas also serve as landbird migration corridors. The existing area of shrubland appears to be substantially lower than habitat objectives for shrubland birds. Although this cover type is poorly mapped with available spatial data, populations of species dependent on shrub and young-growth forest are generally declining in the JV region and should be considered in forest management planning.

The current areas of open water and mudflat appear generally adequate to meet habitat objectives for JV focal species. However, the area of wet mudflat and shallows providing forage to migrating wetland birds could not be determined using existing spatial data. NLCD spatial data were also inadequate to assess emergent wetland types (hemi-marsh vs. wet meadow), quality (high vs. low reproduction / survival), and timing of availability (recently wet vs. wet when image was taken). Gains in emergent wetland area and open water between 2001 and 2006 are encouraging, but some were likely temporary due to high precipitation, and the amount of emergent wetland in KS-22 remains well below JV objectives. KS-22 partners should continue to expand protection and restoration of emergent marsh and wet meadow providing quality wetland-bird habitat, especially during the migration period.

Recommended citation: Kahler, B.M., R.L. Pierce, and G.J. Soulliere. 2014. State X BCR Assessment: Kansas 22 – Eastern Tallgrass Prairie. Upper Mississippi River and Great Lakes Region Joint Venture, U.S. Fish and Wildlife Service, Bloomington, MN, USA.

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