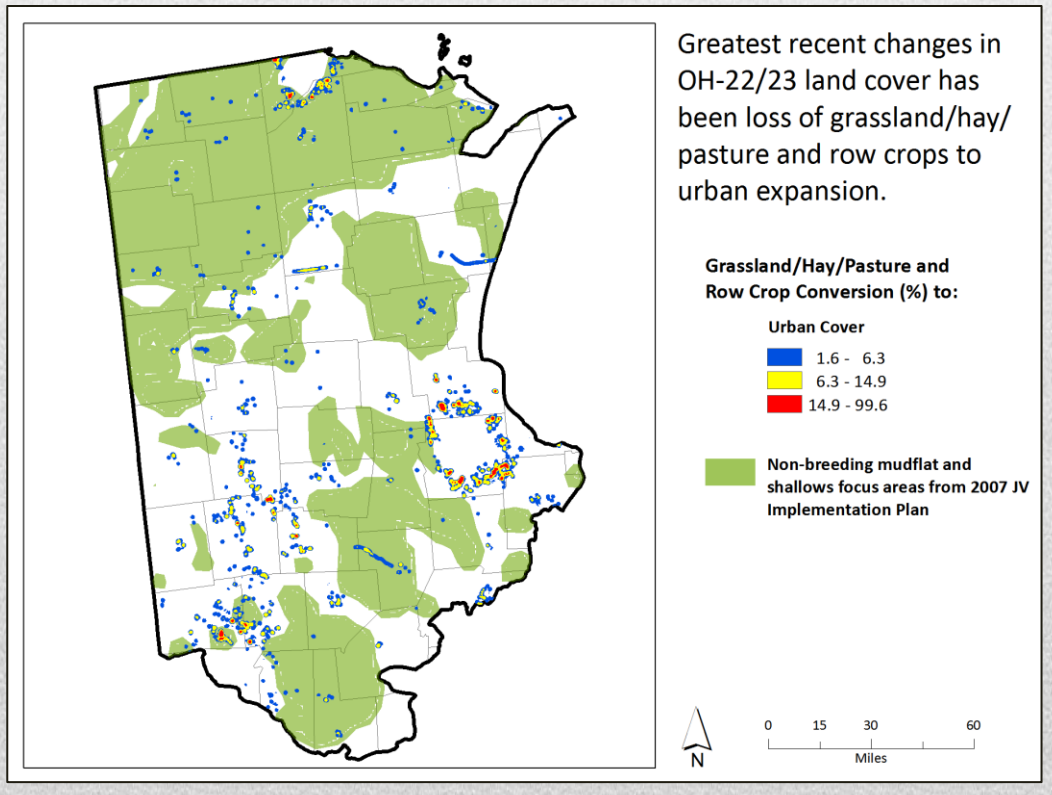
UPPER MISSISSIPPI RIVER & GREAT LAKES REGION
JOINT VENTURE
Delivering bird conservation through partnerships

Ohio BCR 22/23 – 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 Ohio BCR 22 and 23 (OH-22/23) "State x Bird Conservation Regions." 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 OH-22/23 assessment for more details.**



Primary cover-types

OH-22/23 consists of extensive urban cover (14%), upland forest (11%), and grassland/hay/pasture (8%), but its primary cover type is cultivated cropland (64%). Urban land (+42,000 ac) expanded in recent years, whereas acreage of row crops (-27,000 ac) and upland forest (-10,000 ac) declined. Gains in urban cover came primarily from land previously in agriculture and this change was largely associated with metropolitan areas.

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 to 2006) in Ohio Bird Conservation Regions 22 and 23. 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. Wetland and open water availability are based on the recently completed NWI (not NLCD).

Habitat/cover types	Conservation objective	Cover type availability	Short-term land cover trend (%)
Woodand and openland			
Deciduous forest	16,302	1,411,699	-0.7
Evergreen forest	0	26,062	-0.5
Shrubland	669,370	12,173	-2.3
Other forest	0	30,933	-0.5
Grassland	537,472	133,627	-0.6
Savanna	988,000	n/a	n/a
Marsh, mudflat, and open water			
Emergent wetland	78,600[a]	57,654	0.0
Woody wetland	14,345[b]	119,023	0.6
Dry mudflat	44,225	8,321,751[c]	-0.3
Open water	30,109	126,591	0.2

[a] Includes habitat objectives for multiple focal species combined: deep water marsh, shallow semi-permanent marsh, wet meadow 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 focal species combined: marsh with associated shrub/forest and forested wetlands.

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

Management Implications

Woodland:

- Forest cover is abundant but forest fragmentation results in lower productivity of some breeding focal species. Species dependent on mature forests have a substantial habitat base, whereas shrub and early-growth forest birds have been in population declines reflective of habitat shortfalls.
- Maintaining quality forest bird migration pathways, especially adjacent western Lake Erie and along rivers, should be considered a priority in management planning.

Openland:

- Grassland availability is only 25% of the estimated area needed to meet breeding grassland bird objectives, and the area of savanna (mixed wooded openland) could not be determined with NLCD spatial data.
- Future grassland abundance will be largely related to private land management (e.g., CRP), and high commodity prices may result in some conversion of grassland to row crops.
- Cultivated cropland and urban cover dominate the OH-22/23 landscape, and current JV population and habitat objectives for grassland / openland birds are probably beyond achievement with current economic and land use trends.

Marsh, mudflat, and open water:

- The current areas of open water, woody wetland, and dry mudflat appear adequate to meet habitat objectives for JV focal species, but emergent marsh area is below objective.
- "Dry mudflat" availability is represented by the area of row crop, which provides value to some species during the spring migration period; the quality of all potential wetland bird habitats could not be assessed using available spatial data and most are unprotected.
- Expansion of invasive plants (e.g., *Phragmites australis*) and human disturbance can reduce habitat quality for wetland birds, especially in Lake Erie coastal marshes and open water areas.
- Partners should continue to expand restoration and protection of marsh and wet meadow providing high quality bird habitat while seeking and implementing effective control of invasive plants.

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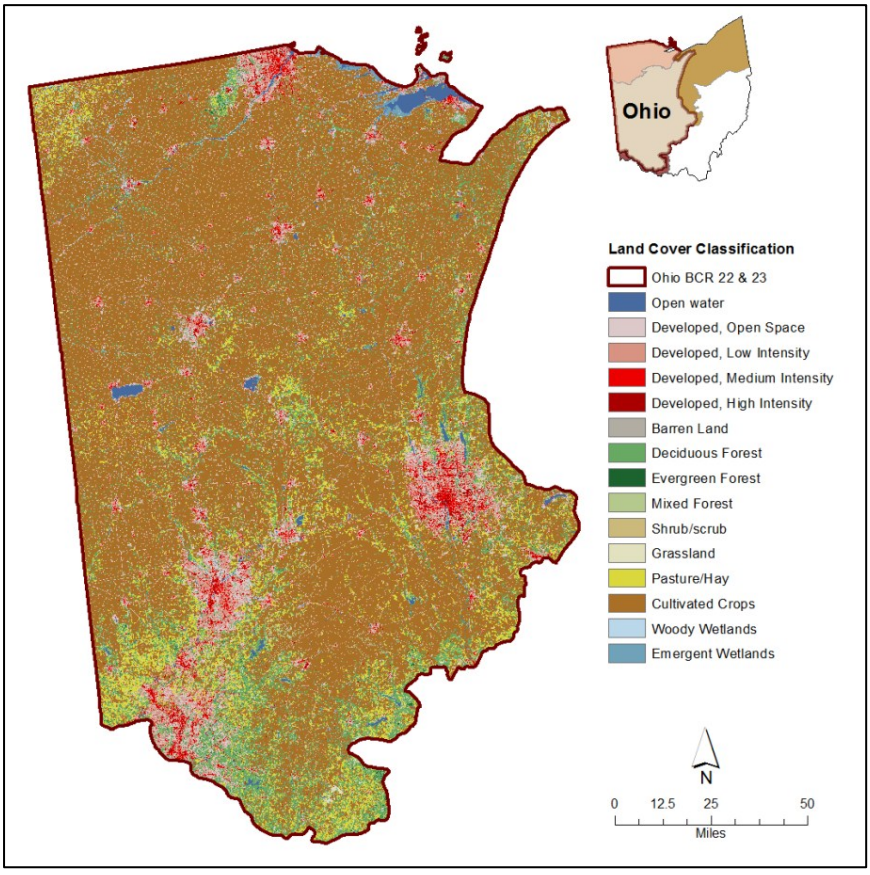
State by BCR Assessment

Ohio 22/23– Eastern Tallgrass Prairie and Prairie Hardwood Transition

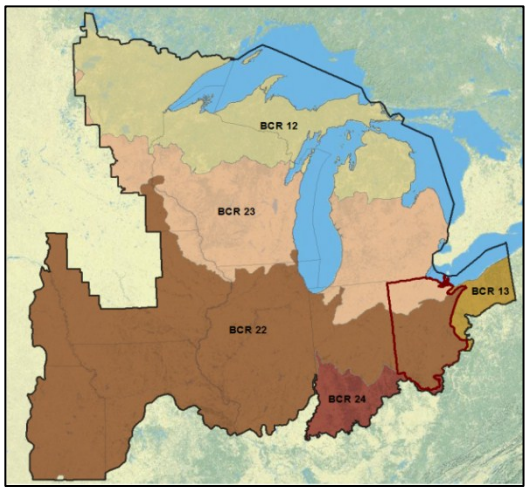
This document was developed to serve as a "stepped-down" version of the 2007 Joint Venture (JV) Implementation Plan with focus on Ohio BCRs 22 and 23, the Eastern Tallgrass Prairie and Prairie Hardwood Transition portions of Ohio. It includes lists of bird species used for JV regional planning (i.e., focal species) that represent land cover types, or bird habitat associations, important to bird guilds occurring in OH-22/23. 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 high 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 under protection, primary modes of recent cover type conversion, and general management implications for OH-22/23 bird conservation partners.



JV 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 OH-22/23 (species within guilds may be more common than focal species, see 2007 JV Plan).

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



Bird Conservation Regions (BCR's) 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., OH-22/23). 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 OH-22/23 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) and National Wetland Inventory (NWI) 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 and NWI are useful for indicating current land use and patterns of change, and they are 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 Implementation Plan were developed using population information and 2001 NLCD. Although NLCD categories were often more general than JV habitat categories, NLCD (supplemented with NWI) 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 OH-22/23 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. General land cover types (acres) and percent change between 2001 and 2006 in Ohio BCRs 22 and 23 based on NLCD. Note: The correct classification rate of NLCD is 80 to 85%; misclassification often occurs between pasture and grassland categories and forested wetlands and upland forest categories.

	Year			Acres
Cover Type	2001	2006	% change	gained/lost
Open Water	172,372	172,768	0.2	396
Urban	1,831,503	1,873,492	2.3	41,989
Barren	15,507	17,179	10.8	1,673
Upland Forest	1,481,179	1,471,102	-0.7	-10,078
Shrub/Scrub	12,455	12,173	-2.3	-281
Grassland/Hay/Pasture	1,064,418	1,057,316	-0.7	-7,102
Grassland	134,373	133,627	-0.6	-746
Row Crops	8,348,593	8,321,751	-0.3	-26,842
Wetlands	102,203	102,448	0.2	245
Emergent Wetlands	59,580	59,577	0.0	-3
Woody Wetlands	42,622	42,871	0.6	249
Total	13,028,229	13,028,229		

OH-22/23 is dominated by open lands, with large amounts of grassland, hay, and pasture, but its primary cover type is cultivated cropland (Table 1).[1] Row crop coverage declined between 2001 and 2006, accounting for a 27,000-acre loss. Likewise, upland forest declined by 10,000 acres. Conversely, urban cover increased by 42,000 acres, roughly the combined area of Ohio cities Springfield, Marion, Lima, and Findlay. Gains in urban cover came primarily from land previously in row crop (Figure 1, Table 2) representing permanent habitat loss for some bird species. Most of this conversion was associated with expanding cities (Figure 2). Areas of open water, shrub/scrub, and emergent and woody wetlands were relatively stable between 2001 and 2006.

[1] To evaluate landscape change, we compared satellite imagery (NLCD) of OH-22/23 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.

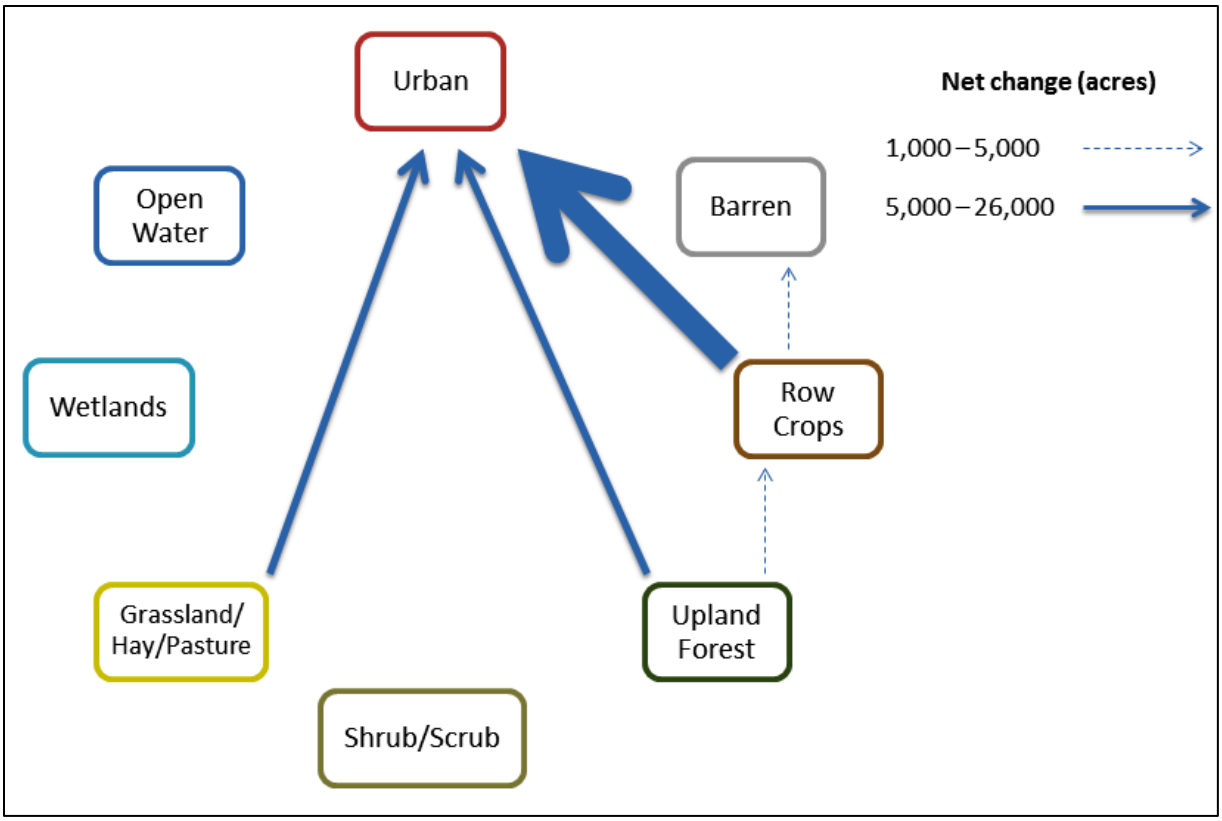


Figure 1. Net change of general land cover types (>1,000 acres converted) in Ohio BCRs 22 and 23 between 2001 and 2006 (NLCD). Arrows point in the direction of change between two cover types and line thickness increases in proportion to amount of net change. "Wetlands" include woody and emergent herbaceous wetland, whereas "upland forest" represents upland (non-wetland) forest cover.

Table 2. Conversion (acres) of primary land cover types in Ohio BCRs 22 and 23 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, an estimated 504 acres of open water converted to wetland and 171 acres of wetland converted to open water, for a net change among these two cover types of +333 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	Upland Forest	Shrub/Scrub	Grassland/ Hay/Pasture	Row Crops	Wetlands
2001	Open Water	170,950	205	82	77	0	4	268	504
	Urban	0	1,828,509	0	0	0	0	0	0
	Barren	390	225	14,722	0	0	17	12	115
	Upland Forest	97	7,641	111	1,468,078	79	951	1,768	35
	Shrub/Scrub	0	157	0	19	12,062	124	73	0
	Grassland/Hay/Pasture	87	7,672	284	220	9	1,054,334	12	59
	Row Crops	791	25,761	1,950	302	4	109	8,305,893	136
	Wetlands	171	261	3	0	0	49	121	101,430

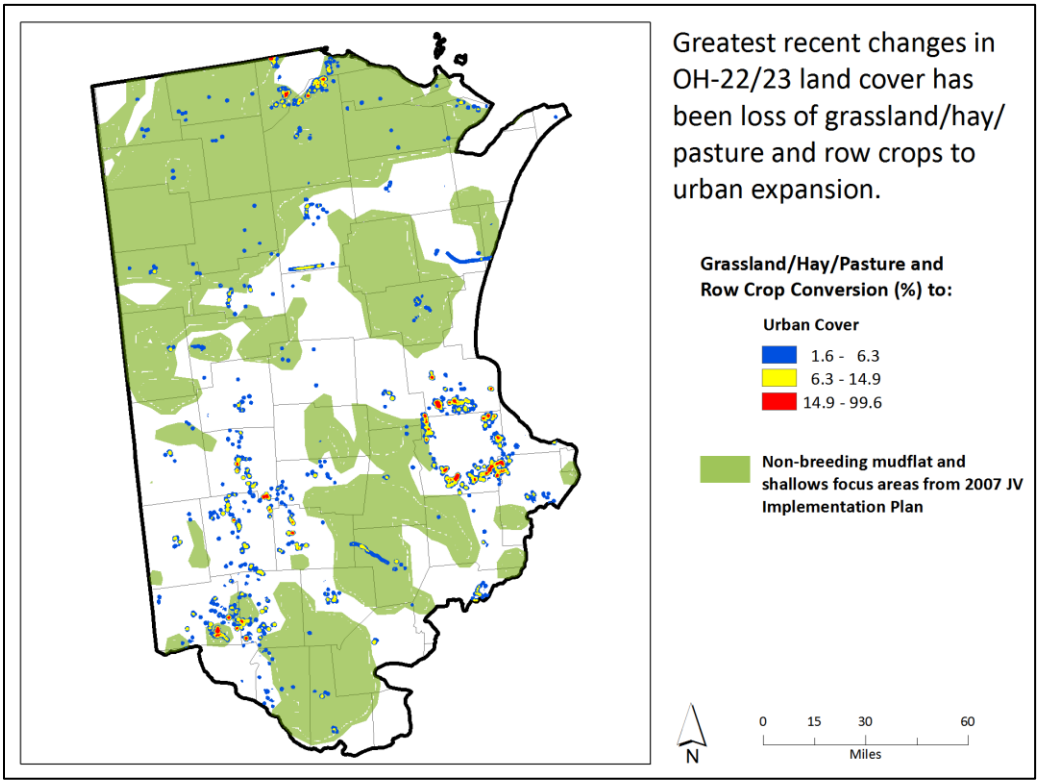


Figure 2. Conversion (percent total area converted within 1 km circular radius) from grassland/hay/pasture and row crop cover to urban cover in Ohio BCRs 22 and 23, 2001 to 2006 (NLCD). Green areas reflect areas with greater conservation emphasis for bird species dependent on mudflat and shallows during migration periods (2007 JV Implementation Plan).

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 the amount 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 only for 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.

Objectives presented here represent the total of OH-22/23 in the 2007 JV Plan. The area of cover types potentially providing bird habitat was estimated using the National Wetland Inventory for wetlands and National Land Cover Database (NLCD 2006) for upland / openland. 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 OH-22/23 protected land configuration and ownership composition (Figure 3). In December 2013, 282,000 acres were enrolled in the Conservation Reserve Program (CRP) in Ohio with roughly 99,400 acres scheduled to expire by 2018. We

were unable to partition total CRP acreage to the BCR-22/23 portion of Ohio or assess the land cover composition of CRP lands due to privacy protections in the U.S. Farm Bill.

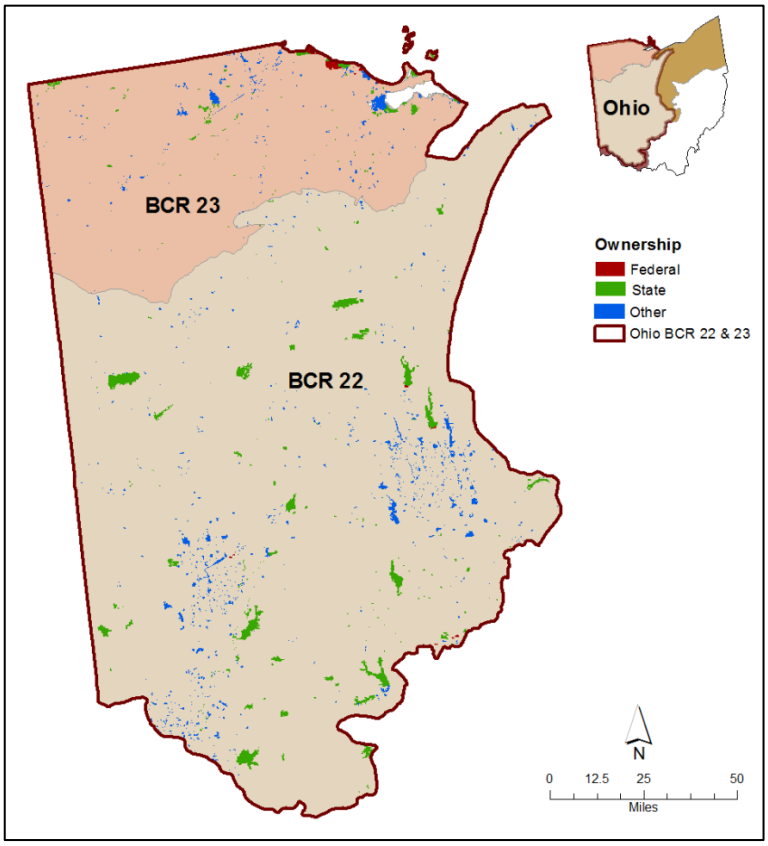


Figure 3. Location of federal, state, and other conservation lands in Ohio Bird Conservation Regions 22 and 23. "Other" ownership category includes private land with temporary and permanent easements, conservancy land, and county, township and city owned land. Total land area conserved (excluding CRP) is 385,272 acres, including about 155,400 woodland/grassland acres and 132,900 acres of marsh wetland, agriculture, and open water.

Woodland and Openland

The estimated amount of woodland and openland/grassland needed in a high quality habitat condition to maintain current landbird populations, plus achieve population goals (via habitat restoration), is 2.2 million acres (Table 3). This represents 17% of the total area in OH-22/23 and considerably more than what is currently protected (Table 3). About 45% of this upland bird habitat objective is needed to maintain and increase landbird populations occurring in savanna (mixed wooded openland) based on calculations presented in the 2007 JV Plan.

Landbird cover types and focal species	
Deciduous forest	Wood Thrush, Louisiana Waterthrush, Kentucky Warbler
Forest generalist	Chimney Swift
Forested wetland	Prothonotary Warbler
Shrubland	American Woodcock, Willow Flycatcher, Blue-winged Warbler, Yellow-breasted Chat
Grassland	Upland Sandpiper, Henslow's Sparrow, Eastern Meadowlark
Savanna	Red-headed Woodpecker

Woodland.—Objectives developed for deciduous forest, forested wetland, shrubland, and other mixed forest were all driven by the needs of breeding landbirds. OH-22/23 encompasses about 1,587,000 woodland acres, of which 125,500 acres are protected (Table 3). Forest cover is well above objective levels and especially abundant along river floodplains and hilly areas, but forest fragmentation is a concern because it can limit habitat quality for breeding forest birds. For example, some JV focal species require large (>5,000 ac) forest tracts for high productivity and survival. Because OH-22/23 woodland is largely fragmented, forest-track size and configuration may limit survival and productivity of edge-sensitive species.

Habitat objectives for shrubland birds (669,000 acres) were substantially higher than the estimated area of shrubland available in OH-22/23 (Table 3). However, shrubland cover types are poorly mapped and estimates based on remote sensing (i.e., NLCD) are not sufficient for 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.

Openland.—The grassland-bird guild used for JV planning requires an estimated 537,500 acres of high quality habitat in OH-22/23, and the region contains an estimated 133,600 acres of grassland plus 923,700 acres of pasture/hay (Table 3). The amount of grassland appears inadequate to meet objectives. In addition, changes in agricultural practices (i.e., early hay mowing), recent intensive conversion (grassland, pasture, and hay to row crops), and fragmentation of large grasslands have likely been detrimental to breeding grassland birds.

Savanna (mixed wooded openland) objectives (988,000 acres; Table 3) are based on the breeding habitat requirements of birds occupying savanna (e.g., Red-headed Woodpecker). This cover type is not mapped by NLCD and assessing the landscape's capacity for supporting current and future populations of savanna birds is not possible with these spatial data. In addition, the savanna area objective will likely be reduced substantially in future JV planning based on new information.

Table 3. Upland bird habitat maintenance and restoration objectives (acres) by primary woodland and openland cover types and the estimated amount of each currently on the landscape in Ohio BCRs 22 and 23. 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), except forested wetland which was determined using National Wetland Inventory. 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
Woodland							
Deciduous forest	8,151	8,151	1,411,699	6,178	58,097	44,879	109,154
Evergreen forest	0	0	26,062	106	2,832	2,187	5,125
Forested wetland	494	247	106,601	381	6,254	220	6,855
Shrub/scrub	271,700	397,670	12,173	77	677	235	989
Other forest	0	0	30,933	79	2,637	677	3,393
Grassland/openland							
Grassland	268,736	268,736	133,627	237	2,157	3,138	5,532
Pasture/hay[b]	--	--	923,689	909	7,865	15,605	24,379
Savanna	494,000	494,000	na[c]	na	na	na	na
Total	1,043,081	1,168,804	2,643,037	7,967	80,519	66,941	155,427

[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 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 habitat needed in OH-22/23 to maintain current populations of birds dependent on marsh, mudflat/shallows, and open water is about 123,000 acres (Table 4)[2]. This area, plus an additional 44,000 acres of restored high quality wetland, 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. The overall conservation objective 167,000 acres represents about 1.3% of the area in OH-22/23.

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	Piping Plover, Sanderling

Marsh.—Habitat objectives were developed in the JV Plan for breeding wetland bird groups dependent on four marsh categories and totaling 89,100 acres: wet meadow with open water and shallow semi-permanent marsh / hemi-marsh (72,500 ac), deep-water marsh (3,000 ac), and marsh with associated shrub or forest (13,600 ac). However, some wetland categories were combined for this analysis (Table 4) due to resolution limitations of NWI and NLCD spatial data. Results suggest a total 70,100 acres of marsh/shrub wetlands are available, of which 22% are protected (Table 4). Thus, JV conservation objectives for marsh cover types, driven largely by the needs of non-breeding waterfowl, are greater than the area of marsh/shrub wetland currently available.

Although semi-permanent marsh available during the breeding season can also accommodate shallow-marsh birds during the non-breeding period, the deep water marsh objective (3,000 ac) for OH-22/23 is primarily important during the non-breeding period (Table 4). We were unable to determine the quality of existing marsh for migrating wetland birds based on NWI spatial data. Moreover, NWI and NLCD wetland data were not in full agreement; local-scale planning for wetland protection / restoration in OH-22/23 should use these spatial data cautiously.

Mudflat and Shallows.—Objectives for wet mudflat, shallow (<2 in), and moderate-depth (2-8 in) open wetland communities were based on the energetic needs of migrating shorebirds and waterfowl. These objectives total about 3,100 acres of high quality wet mudflat and shallow-water habitat for wetland birds (Table 4). However, assessments of these cover types are difficult using remotely sensed data and are not adequately identified by NWI. These cover types are also dynamic and conditions can change daily and seasonally making one-time static assessments (i.e., NWI) poor estimators of cover type availability. The area of dry mudflat, which is represented by row crop in NLCD (i.e., spring agricultural fields provide value to some shorebirds), includes 71,400 acres of protected land; 22,300 acres of state and federal lands are apparently in agriculture (Table 4).

Open Water and Beach.—Objectives for extensive open-water areas are based on the habitat needs of migrating and wintering diving ducks. This group requires an estimated 30,100 acres of high quality foraging and resting habitat when populations are at goal levels. Whereas the region has abundant open water locations (Table 4), low food availability and human disturbance may negatively influence use of some open-water areas.

[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 quality habitat needed in OH-22/23 to maintain current populations of birds dependent on shallow semi-permanent marsh is 62,229 acres, as the non-breeding objective (62,229 ac) is greater than the breeding objective (56,637 ac) (See Table 4).

Some species of shorebirds and terns depend on beach. Beach objectives total about 80 acres. Beach cover appears adequate to meet objectives and is found largely along Lake Erie and river corridors.

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 Ohio BCRs 22 and 23. 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 Wetland Inventory; National Land Cover Database (2006) was used for dry mudflat and beach. 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 area on landscape	Conservation status (protected)			
	B	N	B	N		Federal	State	Other	Total
Marsh									
Deep-water marsh	12	3,018	7	0	1,102	54	148	0	202
Shallow semi-permanent marsh[a]	56,637	62,229	10,243	4,199	56,552[b]	4,851	8,273	64	13,188
Marsh with shrub/ forest	11,337	0	2,267	0	12,422	173	1,710	25	1,908
Mudflat and shallows									
Wet mudflat/ shallows[c]	0	2,428	0	675	na[d]	na	na	na	na
Dry mudflat[e]	18,142	136	26,083	79	8,321,751	1,025	21,298	49,070	71,393
Open water and beach									
Extensive open water	0	25,648	0	4,461	216,207[f]	3,566	42,277	106	45,949
Beach	5	20	0	54	17,152[f]	54	166	82	302
Total	86,133	93,479	38,600	9,468	8,625,186	9,723	73,872	49,347	132,942

[a]Bird habitat objectives for "shallow semi-permanent marsh" also include objectives set for "wet meadow with areas of open water" in the 2007 JV Plan.

[b]Cover type area for "shallow semi-permanent marsh" includes emergent marsh within palustrian, lacustrine, and riverine categories in NWI.

[c]Bird habitat objectives for "wet mudflat/shallows" category incorporates objectives for "wet mudflat," "shallow water depth (<2 in)" and "moderate water depth (2-8 in)" open flats in the 2007 JV Plan.

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

[e]Dry mudflat/agriculture was a bird habitat category used in the 2007 JV Plan, and "row crop" (NLCD) as the cover type measured on the landscape.

[f]Cover type area for "extensive open water" represents lacustrine, riverine, and unconsolidated bottom and shore categories (NWI) whereas "beach" is the area of sand/gravel/bedrock with little vegetation (NLCD).

Management Implications

OH-22/23 is dominated by agriculture, but portions remain ecologically diverse and important to birds. The region is unique for its value to migrating shorebirds, breeding and migrating waterbirds, and breeding, migrating, and wintering waterfowl. Although migrating forest birds traverse OH-22/23 in great abundance, non-breeding landbird habitat objectives were not developed for the 2007 JV Implementation Plan. The non-breeding period of the life cycle for landbirds will be addressed when the JV Plan is next updated. Slight declines in forest cover occurred in recent years in OH-22/23; however, considerable amounts of forest cover are protected in public ownership. Maintaining quality forest bird migration corridors, especially adjacent Lake Erie and along rivers, should be considered a priority in management planning.

The amount of available grassland is far below the estimated need to meet habitat objectives for JV grassland focal species. Grassland/hay/pasture area declined modestly between 2001 and 2006, and only a small portion

of existing grassland is protected under conservation ownership. Moreover, grassland quality for bird habitat could not be assessed with remotely sensed data, and many areas are poor quality due to plant species composition (e.g., tall fescue, *Sericea lespedeza*). The future of grassland bird habitat will be largely dependent on private land management and programs like CRP. There are opportunities to promote grasslands in a working landscape through methods other than taking land out of production. For example, the value of pasture and hay cover for grassland birds may be increased through management practices (e.g., timing and or intensity of grazing/mowing) maintaining both ecological and economic benefits. Although current high commodity prices are resulting in conversion of grassland and shrub to agriculture, managers should plan for future grassland conservation activity when commodity/land prices decline as often occurs in economic cycles.

Because a significant area of state and federally owned lands are mapped as cultivated cropland (22,300 acres), managers should seek opportunity to convert areas back to native cover, particularly grassland, when conditions are suitable. In addition, connecting "permanent" openings such as grasslands associated with right-of-ways (e.g., highways and utility corridors), perpetual grassland/pasture easements, and large marsh complexes can result in greater management efficiency by providing larger openland areas/unit cost.

The 2007 JV Implementation Plan includes substantial habitat objectives for savanna bird species dependent on mixed-wooded openland in OH-22/23. We could not assess the abundance or quality of this cover type given the spatial data available, but savanna area is likely far below objective levels despite habitat management in the Oak Openings region of northwest OH-22/23. The JV objective for this cover type will likely be reduced substantially in the future due to new information. In the meantime, OH-22/23 partners should continue to investigate ways to evaluate habitat objectives and conservation targeting for savanna birds.

In general, the current areas of open water and dry mudflat appear adequate to meet habitat objectives for JV focal species, whereas the area of various marsh cover types is below objectives developed in the JV Plan. The area of wet mudflat and shallows providing forage to migrating wetland birds could not be determined using existing spatial data. Where capacity exists, management may be necessary to assure mudflat is available during shorebird migration periods. 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). Row crop fields have the potential to serve as habitat for some spring migrating shorebirds, although expanding row crop cover for bird conservation is not recommended in this region. OH-22/23 partners should continue expanding restoration and protection of marsh, wet meadow, and wet mudflat providing quality wetland-bird habitat, while implementing effective inventory and control of invasive plants such as Phragmites and hybrid cattail that can reduce bird habitat quality. Open water area seems adequate for foraging waterfowl during the non-breeding period, but some locations may have limited value due to water quality and human disturbance.

Finally, conversion of row crop to grassland, savanna, marsh, and other native-plant communities can serve purposes beyond bird habitat restoration. For example, OH-22/23 is a contributor to hypoxia in the Gulf of Mexico due to nutrient loading of river systems in this agriculturally dominated landscape. Targeting both bird habitat conservation and reduced nutrient loading of Ohio River tributaries should be a priority where possible.

Recommended citation: Kahler, B.M., R.L. Pierce, and G.J. Soulliere. 2014. State X BCR Assessment: Ohio 22/23 – Eastern Tallgrass Prairie and Prairie Hardwood Transition. Upper Mississippi River and Great Lakes Region Joint Venture, U.S. Fish and Wildlife Service, Bloomington, MN, USA.

This assessment document and JV Implementation Plan available at: www.UpperMissGreatLakesJV.org (*Last revised 22 July 2014).*