Metadata for datasets used in:

**The long shadow of woody encroachment: an integrated approach to modeling grassland songbird habitat**

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**VegetationComposition\_RawData.csv**

Estimates of vegetation composition collected during in May, June, and July on Konza Prairie, 2014-2021. Vegetation data were collected from three (prior to 2017) or 10 randomly-selected locations on each watershed. We used 5 sets of Daubenmire frame measures to determine percent cover of major plant functional groups (at the center of the plot and 5 m from center at the 4 cardinal directions). Description from Konza Data Portal. Missing values = -9. The dataset used in this study is a subset; the full dataset can be accessed here: http://lter.konza.ksu.edu/content/cbs05-estimates-vegetation-structure-and-composition-collected-konza-prairie-watersheds-and

* Point: name of vegetation point
* Type: Type of point (e.g., transect or nest)
* PlotName: name of study unit (i.e. watershed)
* Date: date of observation
* PositionX: UTM Easting
* PositionY: UTM Northing
* VegPlotLocation: location of Daubenmire frame at point (e.g., Center or North)
* %LiveGrass: percent cover of live grass inside Daubenmire frame
* %LiveForb: percent cover of live forbs inside Daubenmire frame
* %Shrub: percent cover of shrubs inside Daubenmire frame
* %DeadGrass: percent cover of dead grass inside Daubenmire frame
* %OtherDead: percent cover of other dead vegetation (e.g., sticks) inside Daubenmire frame
* %Litter: percent cover of litter inside Daubenmire frame
* %Bare: percent cover of bare ground inside Daubenmire frame
* Observer: unique code for technicians

**VegetationComposition2022\_CleanedData.csv**

Estimates of vegetation composition collected during in May, June, and July on Konza Prairie, 2014-2021. Vegetation data were collected from three (prior to 2017) or 10 randomly-selected locations on each watershed. We used 5 sets of Daubenmire frame measures to determine percent cover of major plant functional groups (at the center of the plot and 5 m from center at the 4 cardinal directions). Description from Konza Data Portal. Missing values = -9. The dataset used in this study is a subset; the full dataset can be accessed here: http://lter.konza.ksu.edu/content/cbs05-estimates-vegetation-structure-and-composition-collected-konza-prairie-watersheds-and

* Point: name of vegetation point
* Type: Type of point (e.g., transect or nest)
* PlotName: name of study unit (i.e. watershed)
* Date: date of observation
* PositionX: UTM Easting
* PositionY: UTM Northing
* VegPlotLocation: location of Daubenmire frame at point (e.g., Center or North)
* %LiveGrass: percent cover of live grass inside Daubenmire frame
* %LiveForb: percent cover of live forbs inside Daubenmire frame
* %Shrub: percent cover of shrubs inside Daubenmire frame
* %DeadGrass: percent cover of dead grass inside Daubenmire frame
* %OtherDead: percent cover of other dead vegetation (e.g., sticks) inside Daubenmire frame
* %Litter: percent cover of litter inside Daubenmire frame
* %Bare: percent cover of bare ground inside Daubenmire frame
* Observer: unique code for technicians
* %DeadAndLitter: percent cover of litter and dead grass inside Daubenmire frame
* Gr: grazer identity
* Fire: fire return interval
* Burnyr: was the watershed burned in 2021? (1 = yes, 0 = no)
* Elev: elevation (m) predicted from digital elevation model
* Soil: soil type
* Slope: predicted slope derived from digital elevation model
* Spring: precipitation at the Konza Prairie, March 1 – May 1 (mm)
* BrLagOne: breeding season (May 1 – August 15) precipitation lagged one year at the Konza Prairie (mm)
* BrLagTwo: breeding season (May 1 – August 15) precipitation lagged two years at the Konza Prairie (mm)
* Time: numeric time since onset of study
* Month: numeric month (e.g., 5 = May)
* Year: year (yyyy)
* Mgmt: management regime (ungr1 = ungrazed, 1 year fire return, ungr2 = ungrazed, 2 year fire return; bison1 = bison-grazed, 1 year fire return; bison2 = bison-grazed, 2 year fire return; cattle3 = patch-burn grazed, 3 year fire return)

**VegetationHeight\_RawData.csv**

Estimates of vegetation structure collected during in May, June, and July on Konza Prairie, 2014-2021. Vegetation data were collected from three (prior to 2017) or 10 randomly-selected locations on each watershed. We estimated visual obstruction by placing a Robel Pole in the middle, and 5 m from the middle of the plot in each of the 4 cardinal directions. For each pole placement, we stood 4 m away with eye 1 m above the ground in each of 4 directions, and counting the highest 5-cm segment not completely obscured by vegetation. Missing values = -9. The dataset used in this study is a subset; the full dataset can be accessed here: http://lter.konza.ksu.edu/content/cbs05-estimates-vegetation-structure-and-composition-collected-konza-prairie-watersheds-and

* Point: name of vegetation point
* Type: Type of point (e.g., transect or nest)
* PlotName: name of study unit (i.e. watershed)
* Date: date of observation
* PositionX: UTM Easting
* PositionY: UTM Northing
* CenterRobel-N: Robel pole reading from 5m north of point (dm)
* CenterRobel-E: Robel pole reading from 5m east of point (dm)
* CenterRobel-S: Robel pole reading from 5m south of point (dm)
* CenterRobel-W: Robel pole reading from 5m west of point (dm)
* EdgeRobel-N: Robel pole reading from 5m north of CenterRobel-N point (dm)
* EdgeRobel-E: Robel pole reading from 5m east of CenterRobel-E point (dm)
* EdgeRobel-S: Robel pole reading from 5m south of CenterRobel-S point (dm)
* EdgeRobel-W: Robel pole reading from 5m west of CenterRobel-W point (dm)
* Plot%Shrub: % shrub cover within 5m radius of CenterRobel point
* Plot%Tree: % tree cover within 5m radius of CenterRobel point
* Observer: unique code for technicians

**VegetationHeight2022\_CleanedData.csv**

Estimates of vegetation structure collected during in May, June, and July on Konza Prairie, 2014-2021. Vegetation data were collected from three (prior to 2017) or 10 randomly-selected locations on each watershed. We estimated visual obstruction by placing a Robel Pole in the middle, and 5 m from the middle of the plot in each of the 4 cardinal directions. For each pole placement, we stood 4 m away with eye 1 m above the ground in each of 4 directions, and counting the highest 5-cm segment not completely obscured by vegetation. Missing values = -9. The dataset used in this study is a subset; the full dataset can be accessed here: http://lter.konza.ksu.edu/content/cbs05-estimates-vegetation-structure-and-composition-collected-konza-prairie-watersheds-and

* Point: name of vegetation point
* Plot: name of study unit (i.e. watershed)
* Date: date of observation
* sx: UTM Easting
* sy: UTM Northing
* ht: Robel pole reading (dm)
* obs: observer
* Gr: grazer identity
* Fire: fire return interval
* Burnyr: was the watershed burned in 2021? (1 = yes, 0 = no)
* Elev: elevation (m) predicted from digital elevation model
* Slope: predicted slope derived from digital elevation model
* Soil: soil type
* Spring: precipitation at the Konza Prairie, March 1 – May 1 (mm)
* BrLagOne: breeding season (May 1 – August 15) precipitation lagged one year at the Konza Prairie (mm)
* BrLagTwo: breeding season (May 1 – August 15) precipitation lagged two years at the Konza Prairie (mm)
* Time: numeric time since onset of study
* Month: numeric month (e.g., 5 = May)
* Year: year (yyyy)
* Mgmt: management regime (ungr1 = ungrazed, 1 year fire return, ungr2 = ungrazed, 2 year fire return; bison1 = bison-grazed, 1 year fire return; bison2 = bison-grazed, 2 year fire return; cattle3 = patch-burn grazed, 3 year fire return)

**BurnHistories.csv**

Burn date and area for each study unit, 1972-2020. This is the raw dataset that was downloaded in 2021; it can also be accessed here: http://lter.konza.ksu.edu/content/kfh01-konza-prairie-fire-history.

* Watershed: name of study unit (i.e. watershed)
* Hname: historic watershed name
* Hectares: burning area in hectares
* Acres: burning area in acres
* Date: date of burn
* Type: fire type code (PP = prescribed planned, PU = prescribed unplanned, WP = wildfire planned, WU wildfire unplanned)
* Year: year of burn
* Code: watershed code
* Comments: additional notes

**WatershedCovariates2021.csv**

Management regimes (i.e., fire and grazing) and precipitation for each study unit at the Konza Prairie in 2021.

* Year: year of observation
* Watershed: name of study unit
* Burnyr: was the watershed burned in 2021? (1 = yes, 0 = no)
* Gr: grazing regime (ungr = ungrazed, cattle = cattle grazed, bison = bison-grazed)
* Fire: fire return interval
* Spring: precipitation at the Konza Prairie, March 1 – May 1 (mm)
* BrLagOne: breeding season (May 1 – August 15) precipitation lagged one year at the Konza Prairie (mm)
* BrLagTwo: breeding season (May 1 – August 15) precipitation lagged two years at the Konza Prairie (mm)

**KNZPrecip.csv**

Summarized precipitation amounts at the Konza Prairie headquarters, 1985-2021. The data here are a summarized subset; the raw dataset of daily precipitation can be accessed here: http://lter.konza.ksu.edu/content/apt01-daily-precipitation-amounts-measured-multiple-sites-across-konza-prairie

* Year: year of observation
* Spring: precipitation at the Konza Prairie, March 1 – May 1 (mm)
* BrLagOne: breeding season (May 1 – August 15) precipitation lagged one year at the Konza Prairie (mm)
* BrLagTwo: breeding season (May 1 – August 15) precipitation lagged two years at the Konza Prairie (mm)

**EasternMeadowlarkData.csv**

Mark-resight data for Eastern Meadowlarks at the Konza Prairie, 2019-2021.

* Date: date of observation
* Species: 4 letter species code
* Bands: unique 4 letter color band combination
* Sx: UTM Easting
* Sy: UTM Northing

**Dickcissel\_Data.csv**

Mark-resight data for Dickcissels at the Konza Prairie, 2019-2021.

* Date: date of observation
* Species: 4 letter species code
* Bands: unique 4 letter color band combination
* Sx: UTM Easting
* Sy: UTM Northing

**GrasshopperSparrowData.csv**

Mark-resight data for Grasshopper Sparrows at the Konza Prairie, 2019-2020.

* Date: date of observation
* Species: 4 letter species code
* Bands: unique 4 letter color band combination
* Sx: UTM Easting
* Sy: UTM Northing

**GRSPLocations2021.csv**

Mark-resight data for Grasshopper Sparrows at the Konza Prairie, 2021.

* Date: date of observation
* Species: 4 letter species code
* Bands: unique 4 letter color band combination
* Sx: UTM Easting
* Sy: UTM Northing