# LINK Analysis: Potential Species Richness for a Selected Group of Important Grassland Birds in the State Of Minnesota

GRASSLAND BIRDS USED IN LINK QUERY:

Dickcissel
Field Sparrow
Grasshopper Sparrow
Greater Prairie-Chicken
Henslow's sparrow
Le Conte's Sparrow
Northern Harrier
Sharp-tailed Grouse
Short-eared Owl
Swainson's Hawk
Upland Sandpiper

SOURCE LAYER:

National Land Cover Dataset (1992)

ZONAL LAYER:

Counties

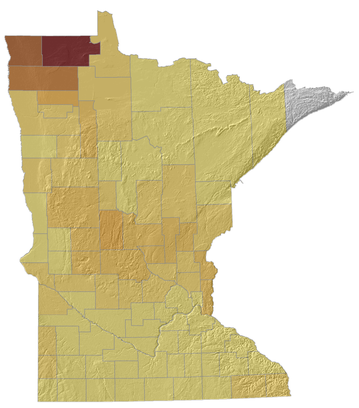
RANGE USED:

Breeding Bird Survey (BBS)

Potential Species Richness (PSR) values may range from 0 to the number of species queried (11).

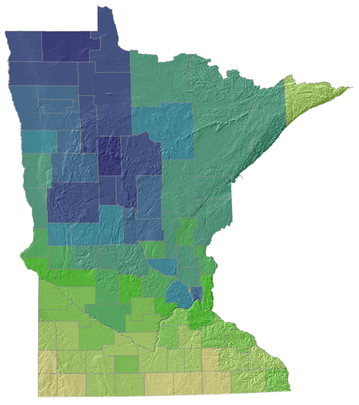
0.25 - 1.05
1.06 - 1.77
1.78 - 2.04
2.05 - 2.34
2.35 - 2.58
2.59 - 2.74
2.75 - 2.93
2.94 - 3.17
3.18 - 3.49
3.50 - 3.91

Potential Species Richness By County (Mean)



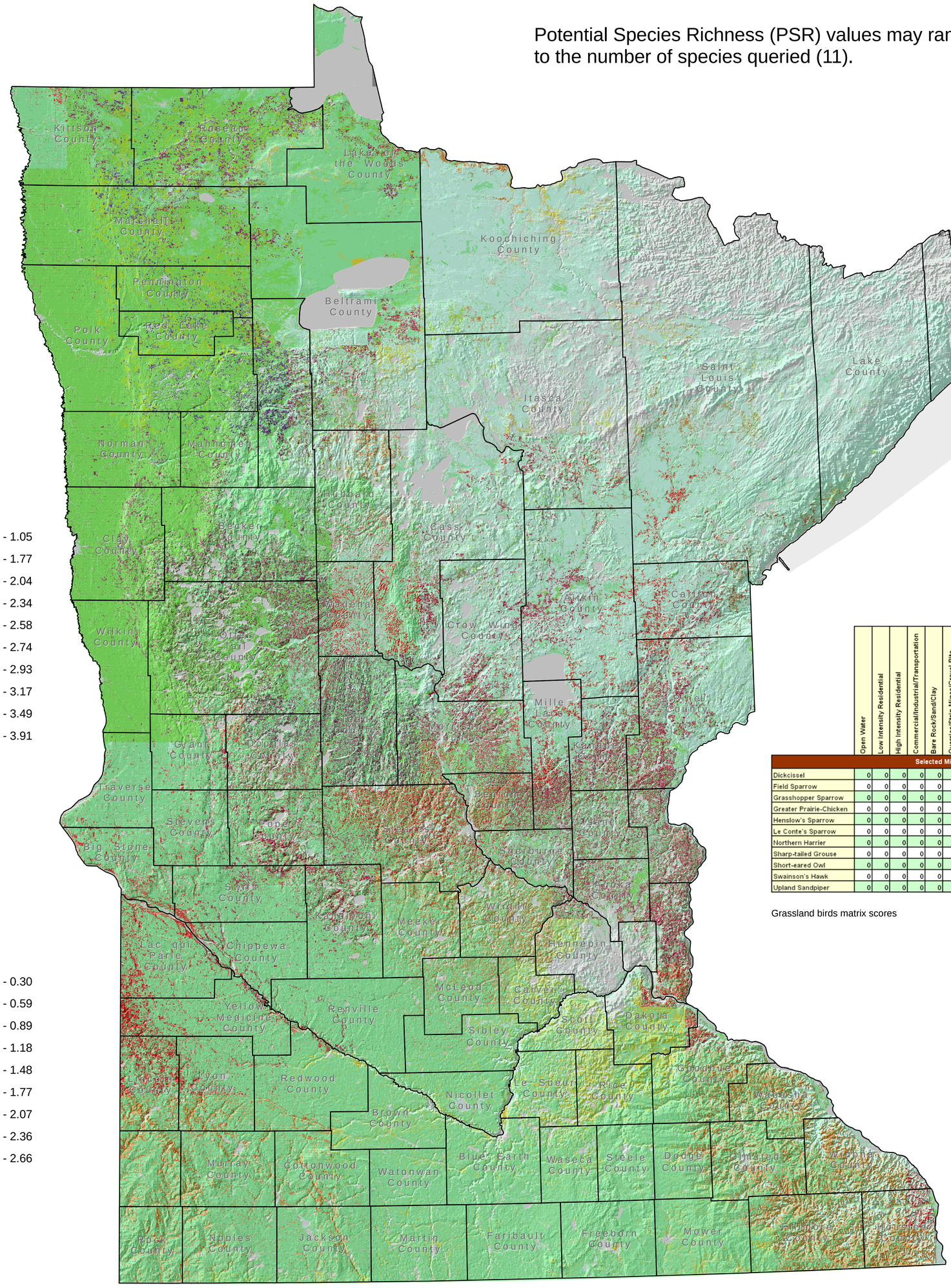
0.00
0.01 - 0.30
0.31 - 0.59
0.60 - 0.89
0.90 - 1.18
1.19 - 1.48
1.49 - 1.77
1.78 - 2.07
2.08 - 2.36
2.37 - 2.66

Potential Species Occurrence By County (Mean)



0.07 - 0.12
0.13 - 0.16
0.17 - 0.20
0.21 - 0.24
0.25 - 0.28
0.29 - 0.32
0.33 - 0.36
0.37 - 0.40
0.41 - 0.45
0.46 - 0.49

Simpson's Diversity Index By County (Mean)




| Selected Minnesota Grassland Birds | Open Water | Low Intensity Residential | High Intensity Residential | Commercial/Industrial/Transportation | Bare Rock/Sand/Clay | Quarries/Strip Mines/Gravel Pits | Transitional | Deciduous Forest | Evergreen Forest | Mixed Forest | Shrubland | Grasslands/Herbaceous | Pasture/Hay | Row Crops | Small Grains | Urban/Recreational Grasses | Woody Wetlands | Emergent Herbaceous Wetlands |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dickcissel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 80 | 20 | 0 | 0 | 0 | 0 | 0 |
| Field Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 20 | 0 | 20 | 100 | 40 | 40 | 0 | 0 | 0 | 0 | 0 |
| Grasshopper Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 80 | 0 | 20 | 20 | 0 | 0 |
| Greater Prairie-Chicken | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 20 | 100 | 100 | 0 | 40 | 0 | 0 | 0 |
| Henslow's Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 100 | 40 | 0 | 0 | 0 | 0 | 40 |
| Le Conte's Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 40 | 0 | 0 | 0 | 0 | 100 |
| Northern Harrier | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 40 | 100 | 100 | 0 | 0 | 0 | 40 | 80 |
| Sharp-tailed Grouse | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 20 | 40 | 100 | 60 | 100 | 0 | 100 | 0 | 0 | 0 |
| Short-eared Owl | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 0 | 0 | 0 | 20 | 100 | 100 | 20 | 20 | 0 | 20 | 60 |
| Swainson's Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 100 | 100 | 0 | 0 | 0 | 0 | 0 |
| Upland Sandpiper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 100 | 40 | 0 | 40 | 0 | 0 |

Grassland birds matrix scores

Potential Species Richness

0
1
2
3
4
5
6
7
8
9
10

LINK is a set of Environmental Systems Research Institute (ESRI, Redlands, California) ArcGIS tools designed to map species-habitat patterns across a landscape. LINK uses species-habitat matrices to model potential species habitat and landscape diversity. Three main data sources are needed to run LINK: a species-habitat matrix, source maps such as land cover, and a zonal layer used to average model output scores such as counties, watersheds, or other management units.

LINK relates the values contained in the species-habitat matrix to the source maps generating several indices of potential habitat including: potential species richness (PSR), mean potential species occurrence (PSO) and habitat diversity as measured by the Simpson's Diversity Index (SDI.) PSR is described as the potential total number of the queried species that may be found in a given area. Mean PSO is described as the average matrix score for all the queried species. The SDI measures the diversity of habitats and is influenced by the number of habitat types and how they relate to each other.

An extension was developed to the LINK tool that incorporates bird species ranges into models of habitat suitability; in this way, species are modeled only for those areas within their range. This range limitation emphasizes that the LINK tool models potential rather than occupied habitat. As part of this extension, we incorporated ranges of all birds in the Western Hemisphere as provided in the collection of digital distribution maps by NatureServe.

http://www.umesc.er.usgs.gov/management/dss/bird_conservation_tools_link.html

Map Date: February 2007

USGS
science for a changing world