

GREEN INFRASTRUCTURE VISION

Green Infrastructure Vision User Guide

2015



Chicago Metropolitan
Agency for Planning

Green Infrastructure Vision User Guide Contents

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What is the Green Infrastructure Vision?

The Green Infrastructure Vision (GIV) is a spatial dataset representing the Chicago Wilderness Biodiversity Recovery Plan developed through a collaborative and consensus-based process. The GIV characterizes green infrastructure resources to support conservation and restoration decisions in the region.

The GIV contains a variety of spatial information about type and quality of ecosystems that make up the regional green infrastructure network. This User Guide provides an overview of how to use and analyze the GIV data.

Data Package Components

| Layer Name | Description |
|---|--|
| CarbonStorage_DollarValue.lyr | Layer file that shows the dollar per acre per year of carbon storage value of the GIV. Includes carbon that is stored above ground in vegetation and below ground in soil. |
| FloodControl_DollarValue.lyr | Layer file that shows the dollar per acre per year of flood control value of the GIV. |
| FloraFauna_RelativeValue.lyr | Layer file that shows the relative value of native flora and fauna of the GIV. |
| GroundwaterRecharge_DollarValue.lyr | Layer file that shows the dollar per acre per year of groundwater recharge value of the GIV. |
| LandscapeTypes_Core.lyr | Layer file that shows the core landscape types for woodlands/forests, prairie/grassland/savanna, wetlands, and lakes/streams in the GIV. |
| SelectedServices_AggregateDollarValue.lyr | Layer file that shows the aggregate dollar per acre per year of carbon storage, flood control, groundwater recharge, and water purification value in the GIV. |
| WaterPurification_DollarValue.lyr | Layer file that shows the dollar per acre per year of water purification value of the GIV. |

| Underlying Datasets | Description |
|-----------------------------------|--|
| GIV 2.2 Hub Layers | Feature dataset with three feature classes for three GIV Hub Layers. Hub Layer 1 contains GIV ecological networks. Hub Layer 2 contains all protected lands. Hub Layer 3 is a combination of Hub Layers 1 and 2 and stream buffers. See GIV 2.2 documents for more detail. |
| Landscape Type Grids | Raster data for all of the layers within each landscape type that provides underlying data for the LandscapeTypes_Core.lyr. |
| GIV2_3EcosystemServiceValues Grid | Raster data of ecosystem service values that provide underlying data for all the ecosystem service layers. |

Landscape Types

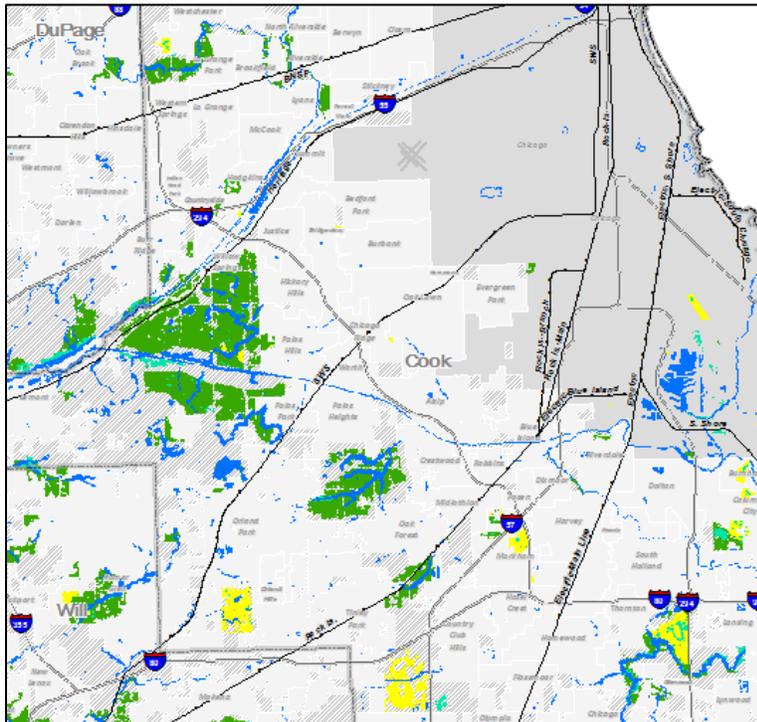
Areas within the GIV are classified into four general landscape types: woodlands/forests, prairie/grassland/savanna, wetlands, and streams/lakes. The documentation for this classification can be found in the [GIV 2.2 materials](#). The composite layers of each landscape type include different ecosystem sizes and qualities that can be used to identify areas for conservation and potential restoration.

Mapping Landscape Types

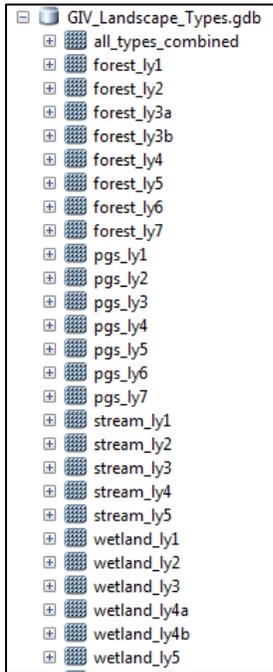
All of the core landscapes can be mapped with the LandscapeTypes_Core.lyr file under the Layer File folder.

- Layer_Files
 - CarbonStorage_DollarValue.lyr
 - FloodControl_DollarValue.lyr
 - FloraFauna_RelativeValue.lyr
 - GroundwaterRecharge_DollarValue.lyr
 - LandscapeTypes_Core.lyr**
 - SelectedServices_AggregateDollarValue.lyr
 - WaterPurification_DollarValue.lyr

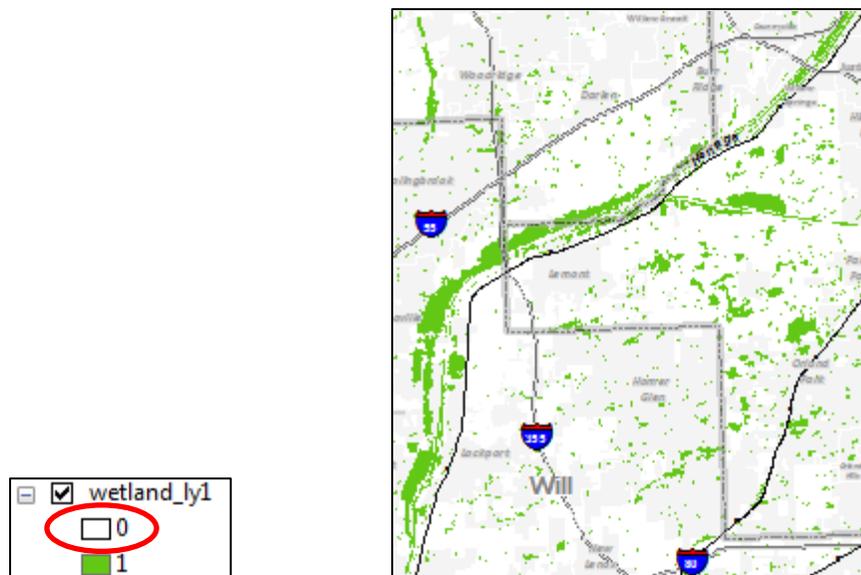
- Core Landscapes
 - Selected Landscape Types
 - Core lakes and streams (stream layer 3)
 - Core wetlands (wetland 4a, 4b, 5)
 - Core prairies/savannas (pgs 1,2)
 - Core woodland/forest (forest 3a, 3b, 4)



The underlying data for the LandscapeTypes_Core.lyr comes from the “all_types_combined” grid stored in the GIV_Landscape_Type geodatabase. The geodatabase also includes grids for each individual landscape layer, which are described in the [reference list](#) in the following section.



These individual grids can be used to map specific landscape layers. For example, add Wetland Layer 1 (all wetlands) to the map to show the location of wetlands that are part of the GIV. Change the symbology for “0” to a hollow fill (circled below) so that the map only shows areas that are designated within Wetland Layer 1.



Landscape Layer Reference List

The list below section explains the organization of the landscape grids and serves as a reference for the GIV_Landscape_Types geodatabase. Note that the layers within each landscape type are not mutually exclusive. The layer categories are not uniform across landscape types, but generally indicate the following information:

- **Size.** Some layers contain large, unfragmented ecosystems and smaller ecosystems. The woodlands/forests and wetlands layers differentiate between patches that are over and under 50 acres.
- **Quality.** The factors of ecosystem quality include presence of rare, threatened, or endangered species, protected area designations; and human-disturbed areas. The highest quality ecosystems make up the core layers for each landscape type. Lower quality landscapes outside of the core layers may cover areas that contain other land uses.
- **Corridors.** Most landscape types include corridor layers that indicate the most suitable terrestrial wildlife connections between core areas. Corridors were identified through an analysis of unobstructed pathways for terrestrial animals.

Woodlands/Forests

Name/Alias: Forest_ly1 (Woodland/Forest Patches > 50 acres)

Description: Woodlands/forest patches over 50 acres

Data Source(s): Morphological Spatial Pattern Analysis (MSPA) provided by US EPA, based on 2006 National Land Cover Dataset (NLCD).

Name/Alias: Forest_ly2 (Woodland/Forest Patches < 50 acres)

Description: Woodlands/forest patches less than 50 acres

Data Source(s): MSPA provided by US EPA, based on 2006 NLCD.

Name/Alias: Forest_ly3a (Woodlands/Forest Layer 3a)

Description: Forest_ly1 combined with high-quality subset of Forest_ly2 (high quality forested lands and/or known habitat of rare, threatened, or endangered species)

Data Source(s): IL Natural Areas Inventory; IL Natural Heritage Database; IL Nature Preserves Commission; Audubon important bird areas; City of Chicago nature & wildlife sites.

Name/Alias: Forest_ly3b (Woodlands/Forest Layer 3b)

Description: High-quality subset of Forest_ly1 (includes high quality forested lands and/or known habitat of rare, threatened, or endangered species)

Data Source(s): IL Natural Areas Inventory; IL Natural Heritage Database; IL Nature Preserves Commission; Audubon important bird areas; City of Chicago nature & wildlife sites.

Name/Alias: Forest_ly4 (Core Woodlands/Forest)

Description: Forest_ly1 located inside pre-settlement forest boundary combined with high-quality subset of Forest_ly2.

Data Source(s): McHenry County oak woodlands remnants (2005 only); IL Natural History Survey pre-settlement vegetation.

Name/Alias: Forest_ly5 (Woodlands/Forest Sites)

Description: Forest_ly2 with no high-quality designations and forest_ly1 located outside pre-settlement forest boundary

Data Source(s): McHenry County oak woodlands remnants (2005 only); IL Natural History Survey pre-settlement vegetation.

Name/Alias: Forest_ly6 (Pre-settlement Woodlands/Forest)

Description: Pre-settlement forest areas with human-disturbed areas removed.

Data Source(s): 2006 NLCD; 2005 CMAP Land Use Inventory; ESRI Roads.

Name/Alias: Forest_ly7 (Woodland/Forest Corridor)

Description: Functional woodlands/forest corridors identified via a Terrestrial Movement Analysis.

Data Source(s): See Appendix E of [June 2012 GIV report](#) for procedures/inputs.

Prairie/Grassland/Savanna

Name/Alias: Pgs_ly1 (Core Prairie)

Description: Known prairie/grassland sites; no minimum size threshold

Data Source(s): 2006 NLCD; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas; Midewin National Tallgrass Prairie prairie/grassland sites; City of Chicago nature & wildlife sites.

Name/Alias: Pgs_ly2 (Core Savanna)

Description: Known savanna sites; no minimum size threshold.

Data Source(s): 2006 NLCD; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas; Midewin National Tallgrass Prairie savanna sites; City of Chicago nature & wildlife sites.

Name/Alias: Pgs_ly3 (Grassland Blocks)

Description: Existing grassland sites combined with grassland/herbaceous areas > 50 acres that fall outside of pre-settlement forest area boundary

Data Source(s): 2006 NLCD; IL Natural Heritage Survey's landscapes of ecological importance, IL Natural History Survey pre-settlement vegetation.

Name/Alias: Pgs_ly4 (Pre-Settlement Prairie/Grassland)

Description: Undeveloped pre-settlement prairie vegetation areas.

Data Source(s): 2006 NLCD; IL Natural History Survey pre-settlement vegetation.

Name/Alias: Pgs_ly5 (Pre-Settlement Savanna)

Description: Undeveloped pre-settlement savanna.

Data Source(s): 2006 NLCD; IL Natural History Survey pre-settlement vegetation.

Name/Alias: Pgs_ly6 (Combined Prairie/Grassland Cores)

Description: Pgs_ly1 combined with Pgs_ly3.

Data Source(s): 2006 NLCD; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas; Midewin National Tallgrass Prairie PGS sites; City of Chicago nature & wildlife sites.

Name/Alias: Pgs_ly7 (Prairie/Grassland Corridor)

Description: Functional prairie/grassland corridors identified via iterative Terrestrial Movement Analysis.

Data Source(s): See Appendix E of [June 2012 GIV report](#) for procedures/inputs.

Wetlands

Name/Alias: Wetland_ly1 (All Wetlands)

Description: All wetlands from land cover and wetlands datasets; no minimum size threshold

Data Source(s): Ducks Unlimited enhanced National Wetland Inventory (NWI) dataset; Advanced Identification (ADID) wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory.

Name/Alias: Wetland_ly2 (Wetland Patches > 50 acres)

Description: Wetlands over 50 acres, with human-disturbed areas removed.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”, ESRI Roads.

Name/Alias: Wetland_ly3 (Wetland Patches < 50 acres)

Description: Wetlands under 50 acres, with human-disturbed areas removed.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”, ESRI Roads.

Name/Alias: Wetland_ly4a (Wetland Layer 4a)

Description: Known high quality locations of wetlands or occurrences of wetland dependent species extracted from wetland_ly3.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”; ESRI Roads; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas.

Name/Alias: Wetland_ly4b (Wetland Layer 4b)

Description: Known high quality locations of wetlands or occurrences of wetland dependent species extracted from wetland_ly2 and wetland_ly3.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”; ESRI Roads; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas.

Name/Alias: Wetland_ly5 (Core Wetlands)

Description: Wetland_ly2 combined with wetland_ly4a.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”; ESRI Roads; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas.

Name/Alias: Wetland_ly6 (Wetland Sites)

Description: Wetland_ly3 minus wetland_ly4a and wetland_ly4b.

Data Source(s): Ducks Unlimited enhanced NWI dataset; ADID wetland data for McHenry County, Kane County, and Lake County; Kane County Fens Study; CMAP 2005 Land Use Inventory; National Hydrography Dataset “Plus”; ESRI Roads; IL Natural Areas Inventory; IL Nature Preserves Commission; Chicago Wilderness Biodiversity Recovery Plan; Audubon important bird areas.

Name/Alias: Wetland_ly7 (Wetland Complexes)

Description: Areas with favorable wetland conditions that are potential restoration and enhancement opportunities for future site scale investigation.

Data Source(s): IL Natural History Survey pre-settlement vegetation; Chicago Wilderness Wetlands Task Force data; SSURGO hydric soils data; NLCD 2006; ESRI Roads.

Name/Alias: Wetland_ly8 (Wetland Corridors)

Description: Functional wetland corridors identified via iterative Terrestrial Movement Analysis.

Data Source(s): See Appendix E of [June 2012 GIV report](#) for procedures/inputs.

Streams and Lakes

Name/Alias: Stream_ly1 (NHDPlus Buffer)

Description: 90-meter buffer of waterbodies and flowlines with human-made streams, canals, and ditches removed

Data Source(s): National Hydrography Dataset “Plus.”

Name/Alias: Stream_ly2 (Undeveloped NHDPlus Buffer)

Description: Stream_ly1 with human-disturbed areas removed.

Data Source(s): National Hydrography Dataset “Plus”; NLCD 2006; ESRI Roads.

Name/Alias: Stream_ly3 (Core Lakes and Streams)

Description: Stream_ly2 combined with known high quality and priority locations of streams/lakes or occurrences of stream/lake dependent species.

Data Source(s): National Hydrography Dataset “Plus”; NLCD 2006; ESRI Roads; National Hydrography Dataset “Plus”; IL Natural Areas Inventory; IL Natural Heritage Database; IL Nature Preserves Commission; Audubon important bird areas; Chicago Wilderness Wetlands Task Force data, IL Biologically Significant Streams, Alliance for the Great Lakes ravine data.

Name/Alias: Stream_ly4 (Freshwater Systems)

Description: Stream_ly3 combined with floodplains, groundwater protection areas, pre-settlement water areas, and ravines

Data Source(s): National Hydrography Dataset “Plus”; NLCD 2006; ESRI Roads; National Hydrography Dataset “Plus”; IL Natural Areas Inventory; IL Natural Heritage Database; IL Nature Preserves Commission; Audubon important bird areas; Chicago Wilderness Wetlands Task Force data; IL Biologically Significant Streams; Alliance for the Great Lakes ravine data; DFIRM floodplains (Cook, DuPage, Kane, McHenry); FEMA Q3 floodplains (Will, Lake, Kendall); IL Natural History Survey; Illinois EPA Phase 2 wellhead protection areas.

Name/Alias: Stream_ly5 (Freshwater Systems)

Description: Stream_ly4 with human-disturbed areas removed.

Data Source(s): National Hydrography Dataset “Plus”; NLCD 2006; ESRI Roads; National Hydrography Dataset “Plus”; IL Natural Areas Inventory; IL Natural Heritage Database; IL Nature Preserves Commission; Audubon important bird areas; Chicago Wilderness Wetlands Task Force data; IL Biologically Significant Streams; Alliance for the Great Lakes ravine data; DFIRM floodplains (Cook, DuPage, Kane, McHenry); FEMA Q3 floodplains (Will, Lake, Kendall); IL Natural History Survey; Illinois EPA Phase 2 wellhead protection areas.

Ecosystem Services

The GIV also provides information about the ecological functionality of landscapes in the region. A [valuation study of the GIV's ecosystem services](#) that summarizes findings and documents methodology can be found on CMAP's [Data Sharing Hub](#). This study provides monetary valuations for four services (flood control, water purification, groundwater recharge, and carbon sequestration) and relative valuations for biodiversity of native flora and fauna.

The GIV data package includes a GIS-based summary tool that allows users to quickly estimate the potential ecosystem service values and landscape type acreage within any user-defined study area. Note that the tool **requires ArcGIS 10.1 or later** to run, as it employs the arcpy data access module. The tool will run at all license levels, and does not require any extensions. A walkthrough is presented below.

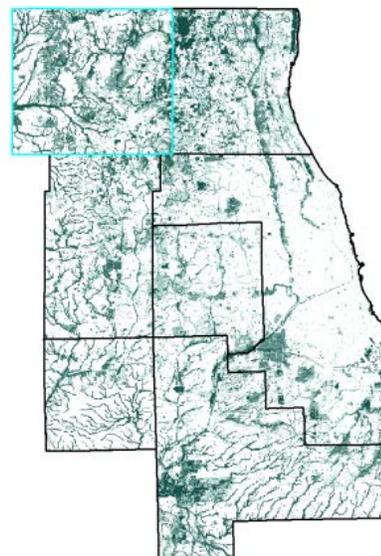
Using the Ecosystem Service Summary Tool

1. Add the “LandscapeTypes_Core.lyr” and “SelectedServices_AggregateDollarValue.lyr” files within the “Layer_Files” folder to a new or existing ArcMap session.

| Name | Type |
|---|-------|
| CarbonStorage_DollarValue.lyr | Layer |
| FloodControl_DollarValue.lyr | Layer |
| FloraFauna_RelativeValue.lyr | Layer |
| GroundwaterRecharge_DollarValue.lyr | Layer |
| LandscapeTypes_Core.lyr | Layer |
| SelectedServices_AggregateDollarValue.lyr | Layer |
| WaterPurification_DollarValue.lyr | Layer |

Note: relative pathways to the source data will break if you re-structure the folders, change file locations, or rename the layer files or source data. If a layer's source needs to be repaired, point it back to the source datasets. LandscapeTypes should point to the “all_types_combined” grid, while SelectedServices should point to the “GIV2_3_EcosystemServiceValues” grid.

2. Add any shapefile or feature class containing a study area of interest. Examples include counties, municipalities, watersheds, or legislative districts. Select a single feature. McHenry County is selected below.



3. Open the GIV Summary Tool, either via the ArcCatalog or ArcToolbox.

ArcCatalog

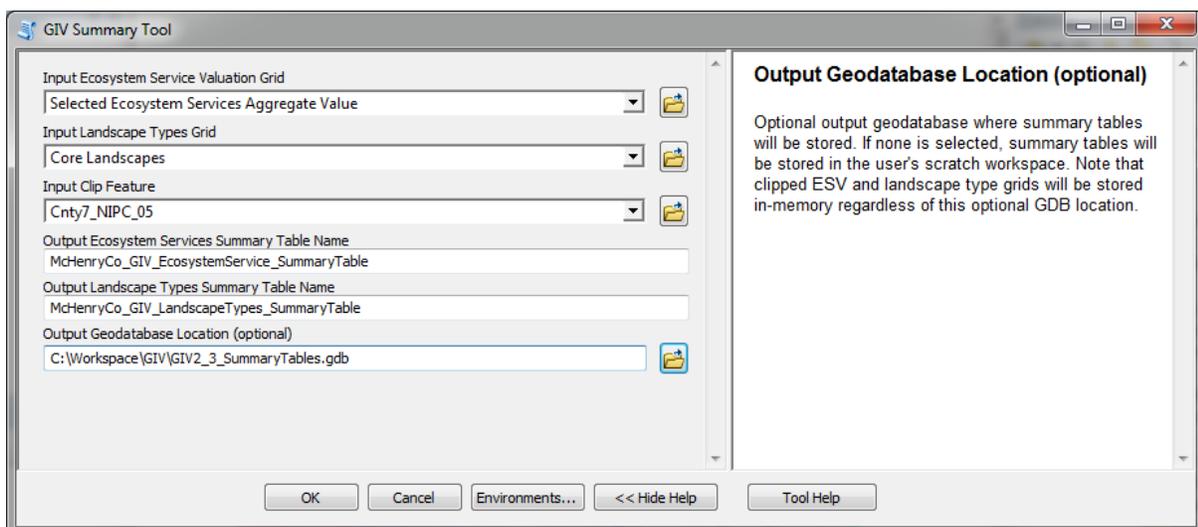
- a. Click this icon  within the Standard toolbar.
- b. Within the ArcCatalog window, create a folder connection to the GIV 2.3 location by clicking this icon  and navigating to the appropriate folder.
- c. Double click the script to open the GIV Summary Tool.



ArcToolbox

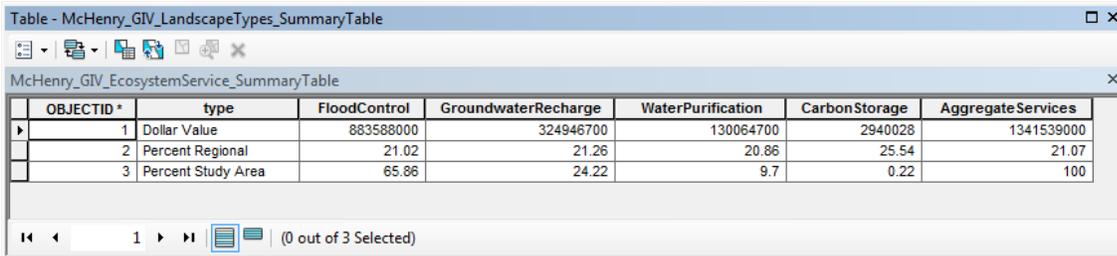
- a. Click this icon  within the Standard toolbar.
 - b. Right click “ArcToolbox” within the window that appears and select “Add Toolbox.” Navigate to the GIV data folder and select “GIV_Summary_Tool.tbx.”
 - c. Expand the newly added toolbox and double-click the script to open the GIV Summary Tool.
4. Select the layer from Step 2 as the Input Clip Feature. Edit the output table names and output geodatabase location as desired, and click Okay.

Note: the output geodatabase is an optional parameter defining where summary tables will be stored. If none is selected, summary tables will be stored in the user’s scratch workspace. Note that clipped ESV and landscape type grids will be stored in-memory regardless of this optional GDB location; users can employ the “Clip Raster” tool if clipped grids are desired.



- Click this icon  under Table of Contents to enter “List By Source” view. Two tables will appear within the default scratch GDB (typically C:\users\name\Documents\ArcGIS\Default.gdb).

Ecosystem Service Summary Table

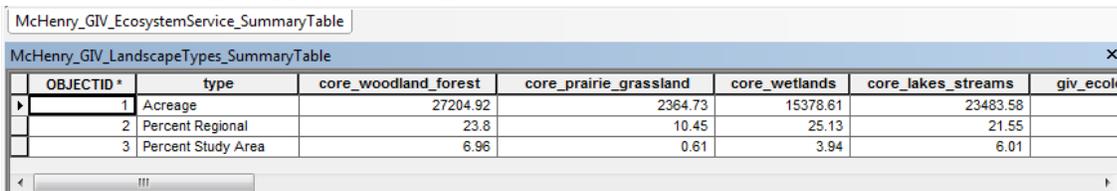


| OBJECTID * | type | FloodControl | GroundwaterRecharge | WaterPurification | CarbonStorage | AggregateServices |
|------------|--------------------|--------------|---------------------|-------------------|---------------|-------------------|
| 1 | Dollar Value | 883588000 | 324946700 | 130064700 | 2940028 | 1341539000 |
| 2 | Percent Regional | 21.02 | 21.26 | 20.86 | 25.54 | 21.07 |
| 3 | Percent Study Area | 65.86 | 24.22 | 9.7 | 0.22 | 100 |

The ecosystem service summary table provides the dollar amount of each ecosystem service for the clipped geography. It also indicates the percent that the study area contributes to the total regional value of each ecosystem services. For instance, in this example, the GIV in McHenry County contributes to 21.02% of the region’s flood control value. This data is most useful for large geographies, such as counties, forest preserve districts, or watersheds. The table also shows the percent contribution of each ecosystem service for the study area. For instance, flood control makes up 65.86% of the aggregate ecosystem services valued in McHenry County.

It is important to note that the ecosystem service valuation is based on the GIV, which is developed from the Chicago Wilderness Biodiversity Recovery Plan. Any valuation estimates generated **do not** represent the dollar value of existing conditions; rather they represent a combination of existing and potential conditions. Calculating values for just the core layers is the recommended way to estimate current conditions.

Landscape Type Summary Table



| OBJECTID * | type | core_woodland_forest | core_prairie_grassland | core_wetlands | core_lakes_streams | giv_ecok |
|------------|--------------------|----------------------|------------------------|---------------|--------------------|----------|
| 1 | Acreage | 27204.92 | 2364.73 | 15378.61 | 23483.58 | |
| 2 | Percent Regional | 23.8 | 10.45 | 25.13 | 21.55 | |
| 3 | Percent Study Area | 6.96 | 0.61 | 3.94 | 6.01 | |

The landscape summary table shows the acreage and percentage of each landscape layer in the study area. For example, this table shows that there are 27,204 acres of core woodlands/forests in McHenry County, which makes up 6.96% of the total area of the County.

Ecosystem Services by Landscape Type

Users can cross-reference the landscape acreage summary above with the following tables to estimate each landscape layer's ecosystem service value. The layers are listed in order of highest to lowest economic benefit. Some landscape types were not estimated to contribute any economic benefit to ecosystem services due to quality, size, isolation, or other factors. These are listed as areas for potential restoration.

Flood Control by Landscape Type

| GIV Layer | GIS Model Reference | Economic Benefit (2014\$/acre/year) |
|--|--------------------------------|--|
| [Lakes] from Core lakes and streams | Steams/Lakes Layer 3 | \$37,000 |
| Core wetland designated areas | Wetland Layers 4a & 4b | \$22,000 |
| Core wetlands | Wetland Layer 5 | \$22,000 |
| Wetland sites | Wetland Layer 6 | \$22,000 |
| Wetland corridors | Wetland Layer 8 | \$22,000 |
| Core prairies | PGS Layer 1 | \$16,000 |
| Core savannas | PGS Layer 2 | \$16,000 |
| [Streams] from Core lakes and streams | Steams/Lakes Layer 3 | \$6,500 |
| Undeveloped NHD+ stream buffer | Streams/Lakes Layer 2 | \$6,500 |
| Undeveloped freshwater systems | Stream/Lakes Layer 5 | \$6,500 |
| Core woodland/forest designated areas | Woodland/Forest Layers 3a & 3b | \$1,603 |
| Core woodland/forest | Woodland/Forest Layer 4 | \$1,603 |
| Woodlands sites | Woodland/Forest Layer 5 | \$1,603 |
| Woodland/forest corridors | Woodland/Forest Layer 7 | \$1,603 |
| Areas for Potential Restoration | | |
| Pre-settlement woodland/forest | Woodland/Forest Layer 6 | |
| Grassland blocks | PGS Layer 3 | -- |
| Pre-settlement prairie/grassland | PGS Layer 4 | -- |
| Pre-settlement savanna | PGS Layer 5 | -- |
| Prairie/grassland corridors | PGS Layer 7 | -- |
| Wetland complexes | Wetland Layer 7 | -- |
| NHD+ raster buffer | Streams/Lakes Layer 1 | -- |
| Freshwater Systems | Streams/Lakes layer 4 | -- |

Water Purification by Landscape Type

| GIV Layer | GIS Model Reference | Economic Benefit (2014\$/acre/year) |
|--|--------------------------------|--|
| Core wetland designated areas | Wetland Layers 4a & 4b | \$4,350 |
| Core wetlands | Wetland Layer 5 | \$4,350 |
| Wetland corridors | Wetland Layer 8 | \$4,350 |
| Core woodland/forest designated areas | Woodland/Forest Layers 3a & 3b | \$1,300 |
| Core woodland/forest | Woodland/Forest Layer 4 | \$1,300 |
| Woodland/forest corridors | Woodland/Forest Layer 7 | \$1,300 |
| Woodlands sites | Woodland/Forest Layer 5 | \$1,300 |
| Core prairies | PGS Layer 1 | \$57 |
| Core savannas | PGS Layer 2 | \$57 |
| Areas for Potential Restoration | | |
| Pre-settlement woodland/forest | Woodland/Forest Layer 6 | -- |
| Prairie/grassland corridors | PGS Layer 7 | -- |
| Grassland blocks | PGS Layer 3 | -- |
| Pre-settlement prairie/grassland | PGS Layer 4 | -- |
| Pre-settlement savanna | PGS Layer 5 | -- |
| Wetland complexes | Wetland Layer 7 | -- |
| NHD+ raster buffer | Streams/Lakes Layer 1 | -- |
| Undeveloped NHD+ stream buffer | Streams/Lakes Layer 2 | -- |
| Freshwater Systems | Streams/Lakes layer 4 | -- |
| Undeveloped freshwater systems | Stream/Lakes Layer 5 | -- |

Groundwater Recharge by Landscape Type

| GIV Layer | GIS Model Reference | Economic Benefit (2014\$/acre/year) |
|---------------------------------------|--------------------------------|--|
| [Floodplains] | Multiple GIV layers | \$4,806 |
| [Streams] from Core lakes and streams | Streams/Lakes Layer 3 | \$4,806 |
| Core wetland designated areas | Wetland Layers 4a & 4b | \$660 |
| Core wetlands | Wetland Layer 5 | \$660 |
| Wetland corridors | Wetland Layer 8 | \$660 |
| [Lakes] from Core lakes and streams | Streams/Lakes Layer 3 | \$566 |
| Core prairies | PGS Layer 1 | \$269 |
| Core savannas | PGS Layer 2 | \$269 |
| Core woodland/forest designated areas | Woodland/Forest Layers 3a & 3b | \$269 |
| Core woodland/forest | Woodland/Forest Layer 4 | \$269 |
| Woodlands sites | Woodland/Forest Layer 5 | \$269 |
| Woodland/forest corridors | Woodland/Forest Layer 7 | \$269 |
| Areas for Potential Restoration | | |
| Pre-settlement woodland/forest | Woodland/Forest Layer 6 | -- |
| Grassland blocks | PGS Layer 3 | -- |
| Pre-settlement prairie/grassland | PGS Layer 4 | -- |
| Pre-settlement savanna | PGS Layer 5 | -- |
| Prairie/grassland corridors | PGS Layer 7 | -- |
| Wetland complexes | Wetland Layer 7 | -- |
| NHD+ raster buffer | Streams/Lakes Layer 1 | -- |
| Freshwater Systems | Streams/Lakes layer 4 | -- |

Carbon Sequestration Valuation

Estimating ecosystem value for carbon sequestration is calculated through the following equation:

$$\text{Carbon storage value per grid cell} = (C_{\text{above}} + C_{\text{below}}) * \$2/\text{tonne}/\text{year}$$

C_{above} = Aboveground carbon storage (dry weight biomass * 0.5) from the [National Biomass and Carbon Dataset](#)

C_{below} = Belowground carbon storage from [Gridded Soil Survey Geographic \(gSSURGO\) Database](#)

Considerations for Using GIV Data

Users should [review final report and literature review](#) for greater detail about the methodology and underlying data used to generate these values. Users should keep in mind the following considerations when using this data in reports, planning documents, and analysis.

- 1. The data does not represent existing “on-the-ground” conditions.** All GIV data is based on the Chicago Wilderness Biodiversity Recovery Plan, so any areas covered by the GIV (or valuation estimate generated by the Ecosystem Service Summary Tool) **do not** represent existing conditions; they represent a combination of existing and potential conditions.
- 2. The data is not recommended for site-scale analysis.** Cell resolution for the GIV is 30 meters. This tool is recommended for larger geographic units such as municipalities, counties, forest preserve districts, or watersheds. Those who wish to use it for site-scale analysis should also conduct field work or ground verification.
- 3. The economic values are rough estimates.** Users should always round when presenting the dollar values. All of valuation outputs should be treated as estimates rather than precise figures.
- 4. The economic valuations only cover four services primarily within GIV areas.** This study only estimates monetary valuations for four ecosystem services out of many. The aggregate layer is not a total figure for all ecosystem benefits, but only a summation of the four considered here (carbon storage, flood control, groundwater recharge, and water purification. The ecosystem service valuation is not a full inventory of the region’s vegetation and natural areas. It generally covers areas defined within the GIV.

Citation for ecosystem service valuation data:

GIV 2.3 Ecosystem Service Valuation. The Conservation Fund, 2014. Using ArcGIS Version 10.2. Redlands, CA: Esri. 2014.

For more information, please contact:

The Conservation Fund

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