

Land and Water Legacy Program – Conservation Plan

Washington County Water Consortium

Wednesday, May 5th, 2010 – Amy Carolan and Jessica Thiel

2006 Referendum

- In favor of authorizing Washington County to issue general obligation bonds in one or more issues in an amount not to exceed \$20,000,000 to acquire and improve land and interests in land, for the purpose of improving water quality of rivers, lakes and streams; protecting drinking water sources; purchasing parkland; preserving wetlands and woodlands; and protecting land along water bodies from development, with spending reviewed by a citizen's advisory committee and subject to an annual audit.

2006 Referendum

- Washington County received 33 proposals in response to its first RFP from interested property owners.
- It became apparent that a method for prioritizing land acquisition (and interests in land) would be needed.

Washington County Conservation Plan

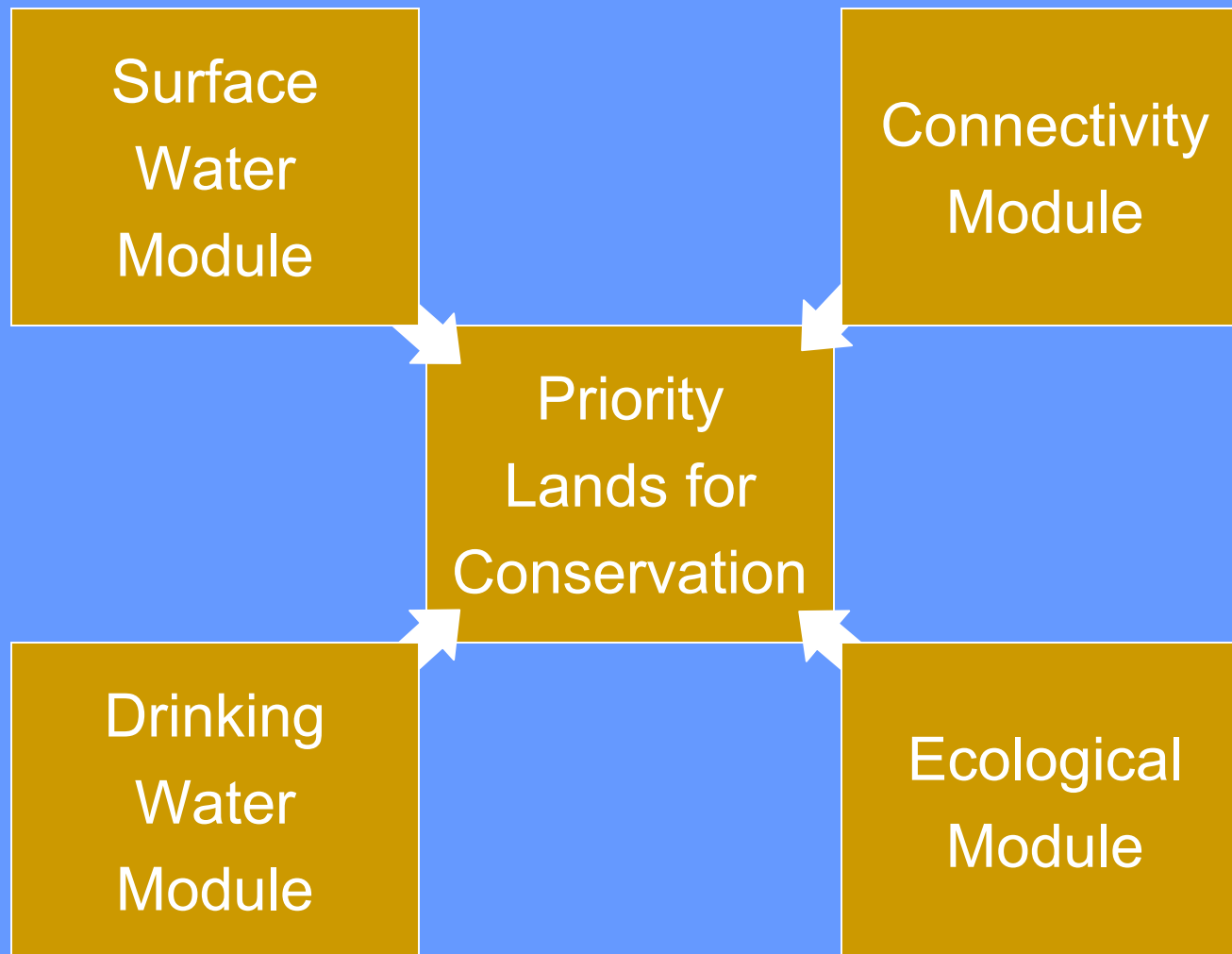
- In 2008, Washington County received a grant from the Minnesota DNRs Community Conservation Assistance Program to develop a plan for prioritizing land acquisition
- Goals of the County Conservation Plan
 - Provide focus areas for future RFPs
 - Determine areas for proactive outreach
 - Have data for use in evaluating RFPs
 - Have a map of high priority areas for land protection, that creates a functioning, interconnected system of natural areas.



Conservation Plan Contributors

- St. Croix Research Station
- Ramsey Washington Metro Watershed District
- MSCWMO
- County Parks and Open Space Commission
- Valley Branch WD
- Brown's Creek WD
- Car-Mar St. Croix WD
- MnDNR
- Washington County Parks
- Washington County Public Health and Environment
- WCD
- Trust for Public Land
- Rice Creek WD
- Nature Conservancy
- Minnesota Land Trust
- Friends of the Mississippi River
- South Wash. WD

The four modules



Surface Water Module

Unique Water Resources: wetland plant communities listed by the MnDNR in the NHIS database

Tributary Wetlands: wetlands within or intersecting the 100M buffer of a lake, stream, river or major DNR wetland

DFIRMS: land mapped on a DFRIM and classified as A, AE, or 500 yr. flood hazard

Surface
Water
Module

100M buffer: undeveloped land found within 100M of a lake, stream, river or major DNR wetlands

Highly erodible lands: lands classified as HEL in the Wash. Co. soil survey, slopes typically greater than 12%

Surface water module - points

<u>Criteria</u>	<u>Possible Points</u>	<u>Points Assignment to 10M x 10M cells</u>
Identified water resource 100M* buffer	0, 2 - 3 points	0 – not present 2 – maintained lands (20000s MLCCS) 3 – natural communities (>20000s MLCCS)
Digital Flood Insurance Rate Maps DFIRMS	0 or 1 point	0 – not present 1 – if classified as Flood zone, A, AE, or 0.2 PCT annual chance flood hazard.
Tributary Wetlands	0, 2 - 3 points	0 – not present 2 – maintained lands (20000s MLCCS) 3 - natural communities (>20000s MLCCS)
Unique Water Resources	0 or 3 points	0 – not present 3 – if present
Highly Erodible Lands	0, 1 - 2	0 – not present 1 - maintained lands (20000s MLCCS) 2 – natural communities (>20000s MLCCS)
	Total	0 – 12 points possible

Drinking water module

Upland Depressional Areas:

depressional areas with at least 2' of topographic change capable of collecting and infiltrating water. Areas are non-wetland.

Areas of High Infiltration Potential:

Areas classified as those with high infiltration potential. Data set developed through the Wash. Co. groundwater studies.

Drinking
Water
Module

DWSMA Vulnerability Areas: Assessment of the likelihood for a potential contaminate source within the drinking water supply management area to contaminate a public water supply based on several factors such as geologic sensitivity.

Drinking water module - points

<u>Criteria</u>	<u>Possible Points</u>	<u>Points Assignment to 10M x 10M cells</u>
Upland depressional area	0 or 1 point	0 – not present in cell 1 – depressional area present
Areas of high infiltration potential	0 or 1 point	0 – not considered an area with high infiltration potential 1 – considered an area with high infiltration potential based on county groundwater studies
DWSMA* Vulnerability Areas	0 – 3 points	0 – not in a DWSMA 1 – Low and Very Low Vulnerability Ranking 2 – Moderate Vulnerability Ranking 3 – High and Very High Vulnerability Ranking
	Total	0 – 5 points possible

Ecological Module

- Based on the existing Regionally Significant Ecological Areas Model (RSEA, MnDNR)
- 8 part GIS based model



Ecological Module

- Major evaluations and changes
 - Forests and woodlands
 - Evaluates areas coded 30000 and 40000 excluding altered/disturbed, **includes lowland forest**
 - Minimum of 24 hectares
 - Identified core forest core areas
 - Buffer in 120m
 - Adjacent forests/woodlands at least 150M wide were included
 - Identified woodlands and forests were evaluated based on size, shape, adjacent landuse, cover, connectivity, and species diversity



Ecological Module

- Major evaluations and changes
 - Grasslands
 - Identifies “tall grasslands” and “dry tall grasslands” based on MLCCS coding
 - Minimum size tall grasslands – 16 hectares w/ 60m width
 - Minimum size for dry tall grasslands – 6 hectares w/ minimum of 90 m width
 - Removed maintained grasslands for Wash. Co. 20000s



Ecological Module

- Major evaluations and changes
 - Wetlands
 - Wetland complexes – 3 or more wetlands
 - Evaluated wetlands at least **1 hectare in size**
 - 2 hectares in original RSEA
 - connected by natural vegetation
 - Isolated wetlands at least 10 hectares, 3 cover types (H20 + 2)
 - Small wetlands at least **one hectare**
 - Adjacent to forests or within 200m of a large wetland
 - 90 m ring must be 95% natural



Ecological Module

- Evaluates natural community quality
 - MLCCS 34X – A through C

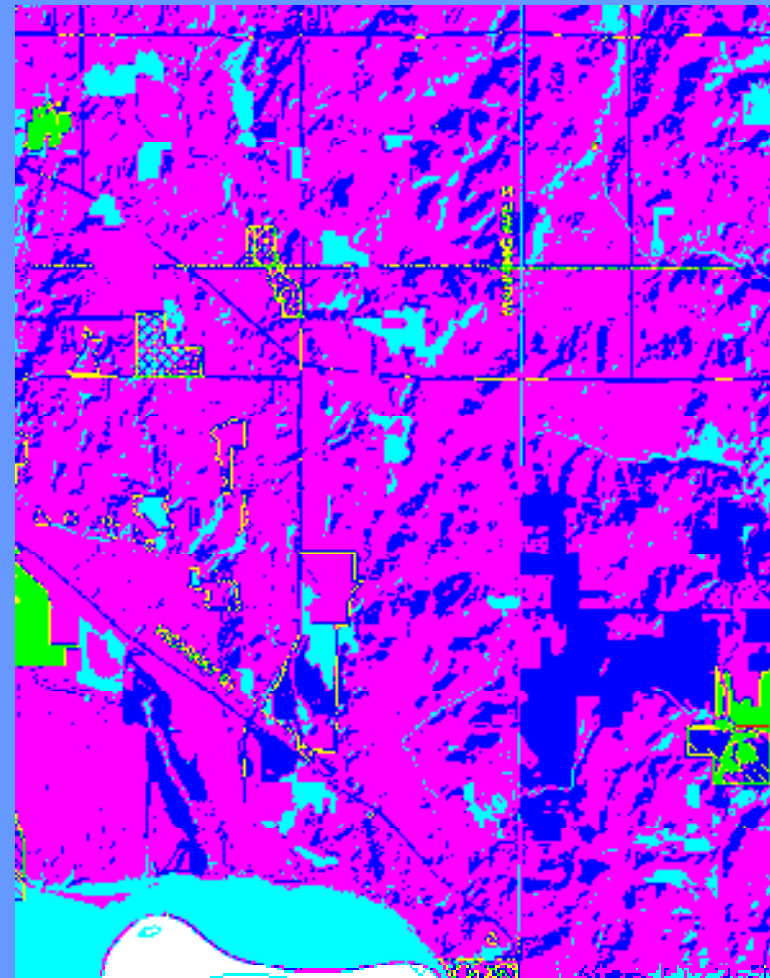


Ecological module - points

<u>Criteria</u>	<u>Possible Points</u>	<u>Points Assignment to 10M x 10M cells</u>
Ecologically Significant Areas in the County	0 – 13	0 – not present in cell 1 – 2 – Low significance 2 – 5 – Moderate significance 5 – 13 – High significance
	Total	0 – 13 points

Connectivity Model

- GIS model identifies land located between identified ecological patches. Using a cost-distance analysis the shortest and smallest route between patches is selected.
- The model first searches for natural lands to create connections, then allows agricultural lands if necessary to complete the connector.
- Developed lands are not considered.



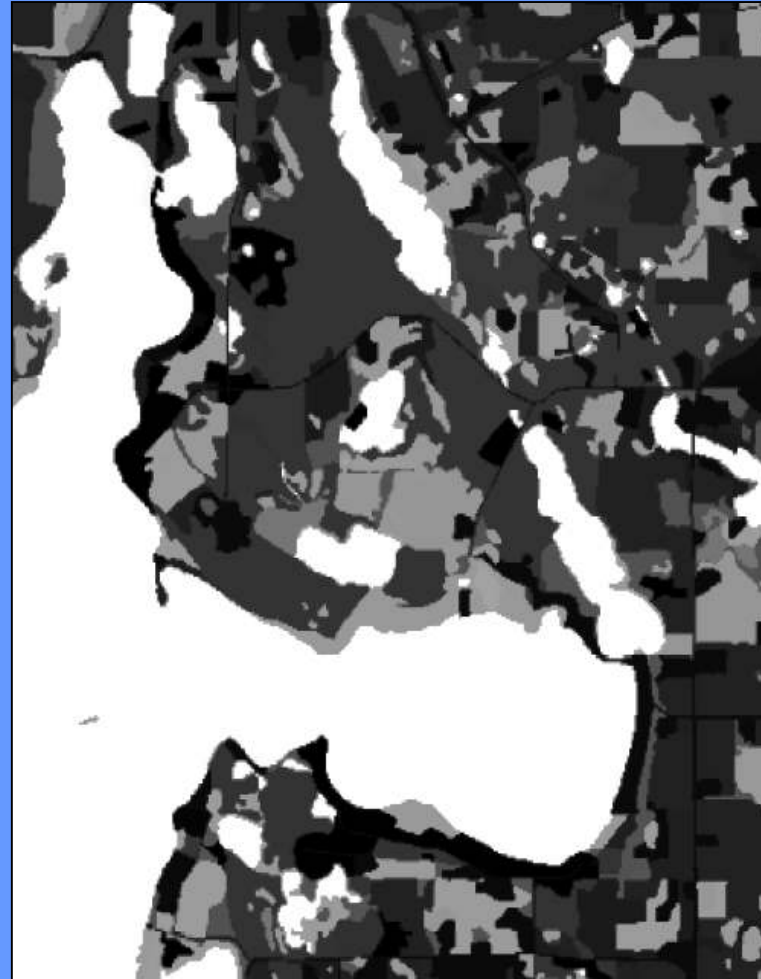
Connectivity Module

<u>Criteria</u>	<u>Possible Points</u>	<u>Points Assignment to 10M x 10M cells</u>
Connect Identified Ecological Patches	0 or 1	0 – not present in cell 1 – connector present
	Total	1

County wide grid – the base layer



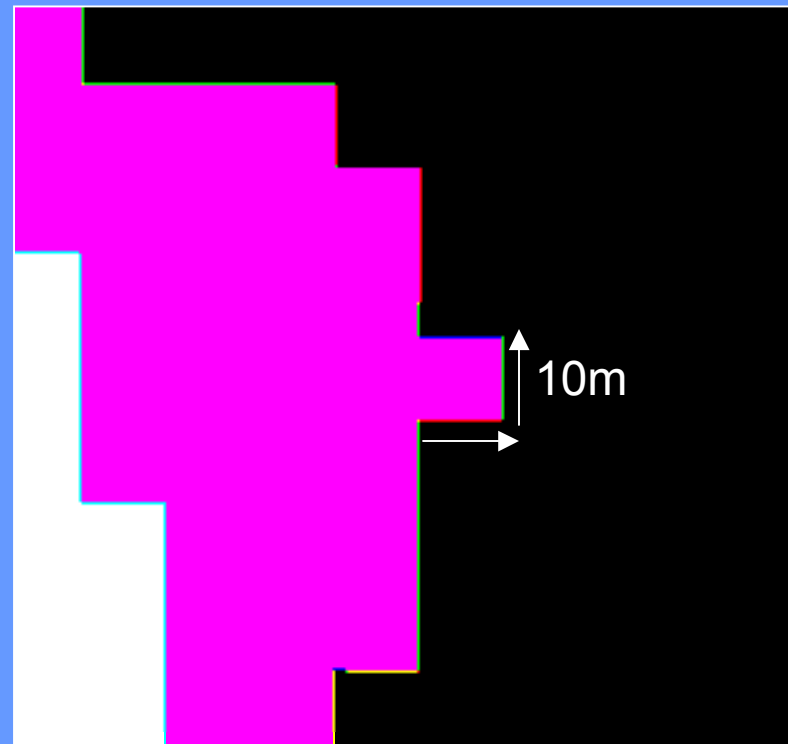
Polygons



Raster based grid

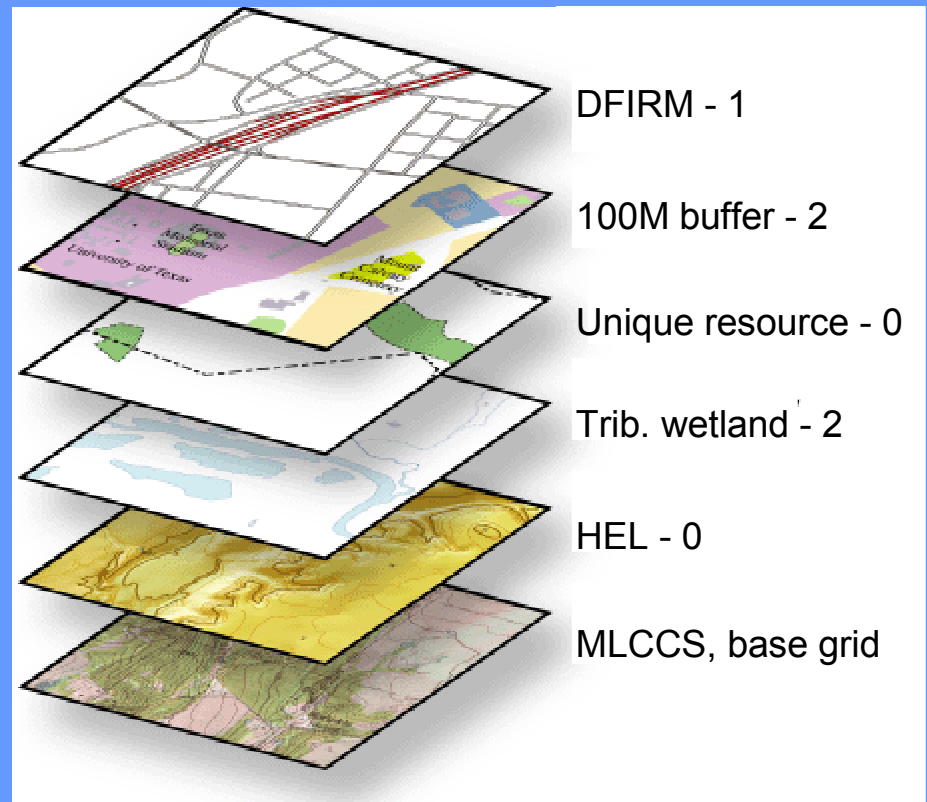
County wide grid – the base layer

- Cells within the grid are 10m x 10m
- Each cell is scored during the modeling process – based on the criteria and points set for each of the modules



Modeling process

- Model Builder
- Surface Water, Drinking Water, Ecological, and connectivity:
 - Points values are summed for each cell
 - ArcGIS generates a histogram
 - User can define breaks
 - Ranking from high, medium, low



Total = 5, high ranked

on
JM_Buffer

ArcToolbox

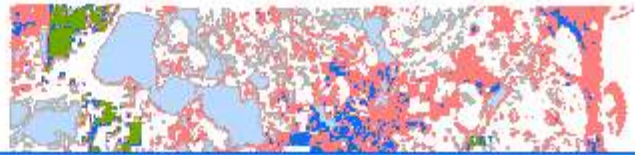
- 3D Analyst Tools
- Analysis Tools
- Cartography Tools
- connectivity
- Conversion Tools
- Coverage Tools
- Data Interoperability Tools
- Data Management
- Drinking
- Final
- Geocoding
- Geostats
- Linear Referencing
- Network Analyst
- Sampling
- Spatial Analyst
- Spatial Statistics
- Surface

Layer Properties

General

Show: Classification

Stretch



Classification

Classification Method: **Natural Breaks (Jenks)**

Classes: **4**

Data Exclusion:

Columns: **100** Show Std. Dev. Show Mean

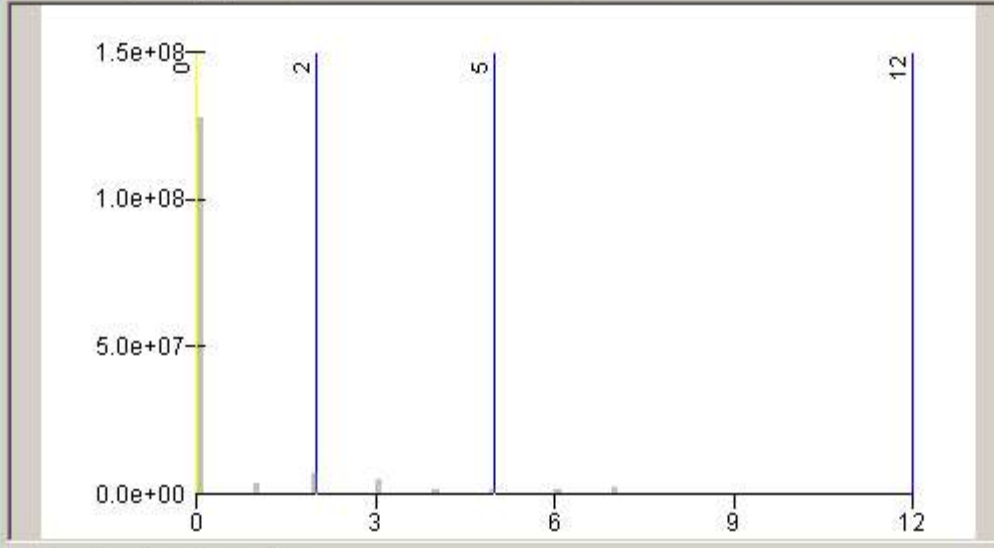
Classification Statistics

Count:	148985460
Minimum:	0
Maximum:	12
Sum:	69,436,426.96
Mean:	0.466061769
Standard Deviation:	1.367553624

Break Values %

0
2
5
12

Snap breaks to data values

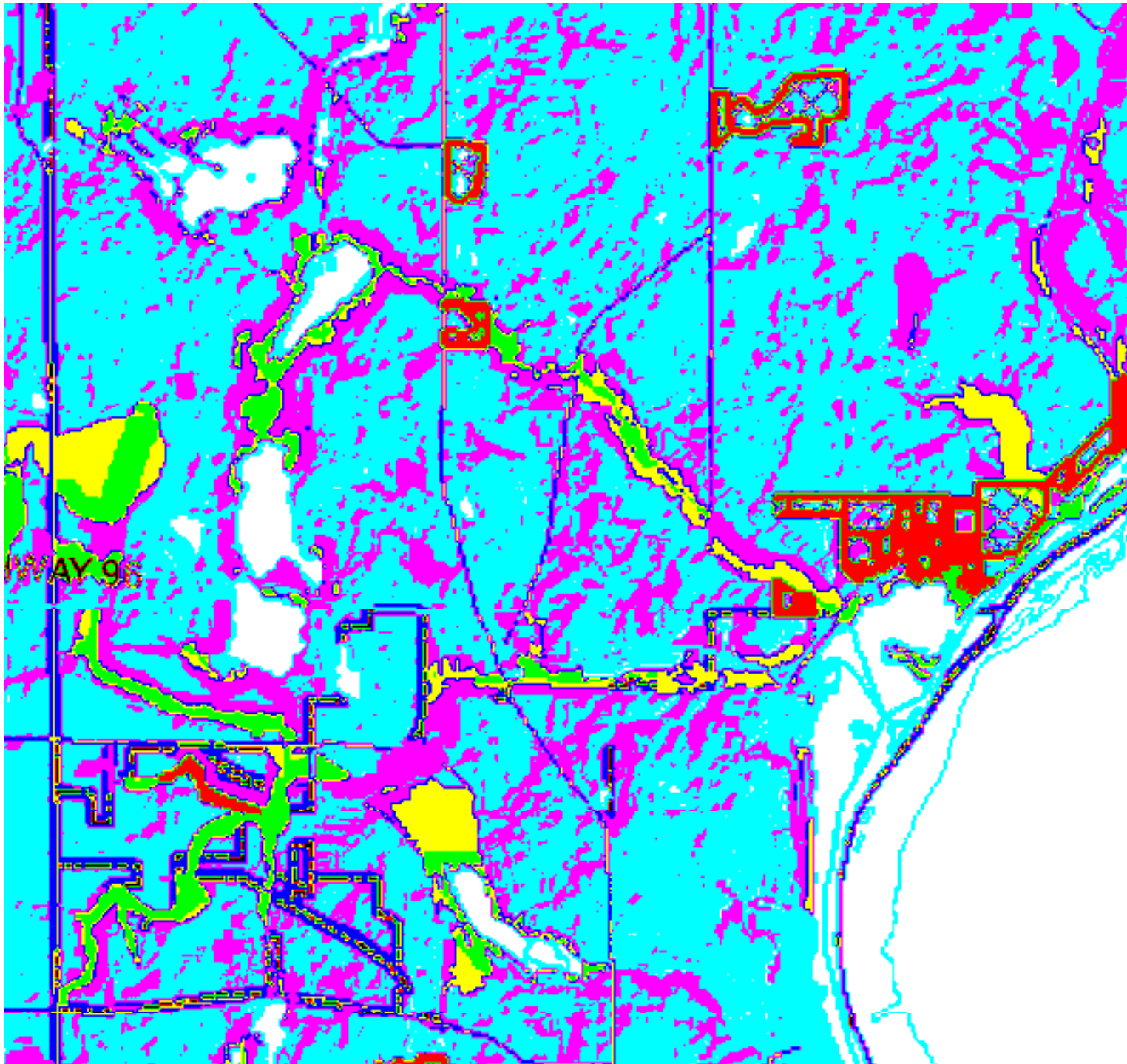


0
Y
0



Map Products

Surface Water Module



- Undeveloped land adjacent to a stream

- Highly Erodible Soils

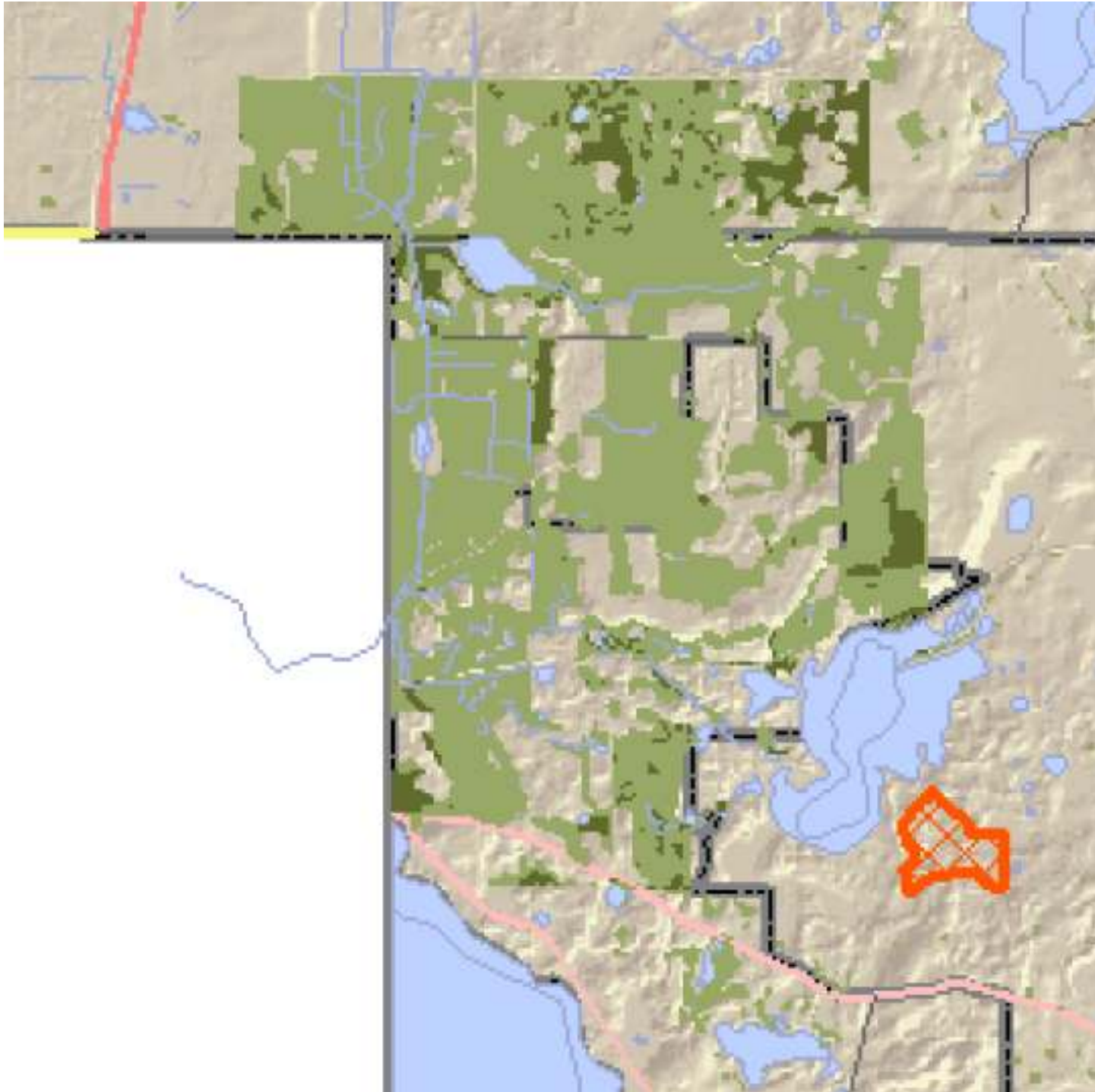
- Tributary wetlands

- DFIRMS

- Rich fen present

Map Products

Drinking Water Module



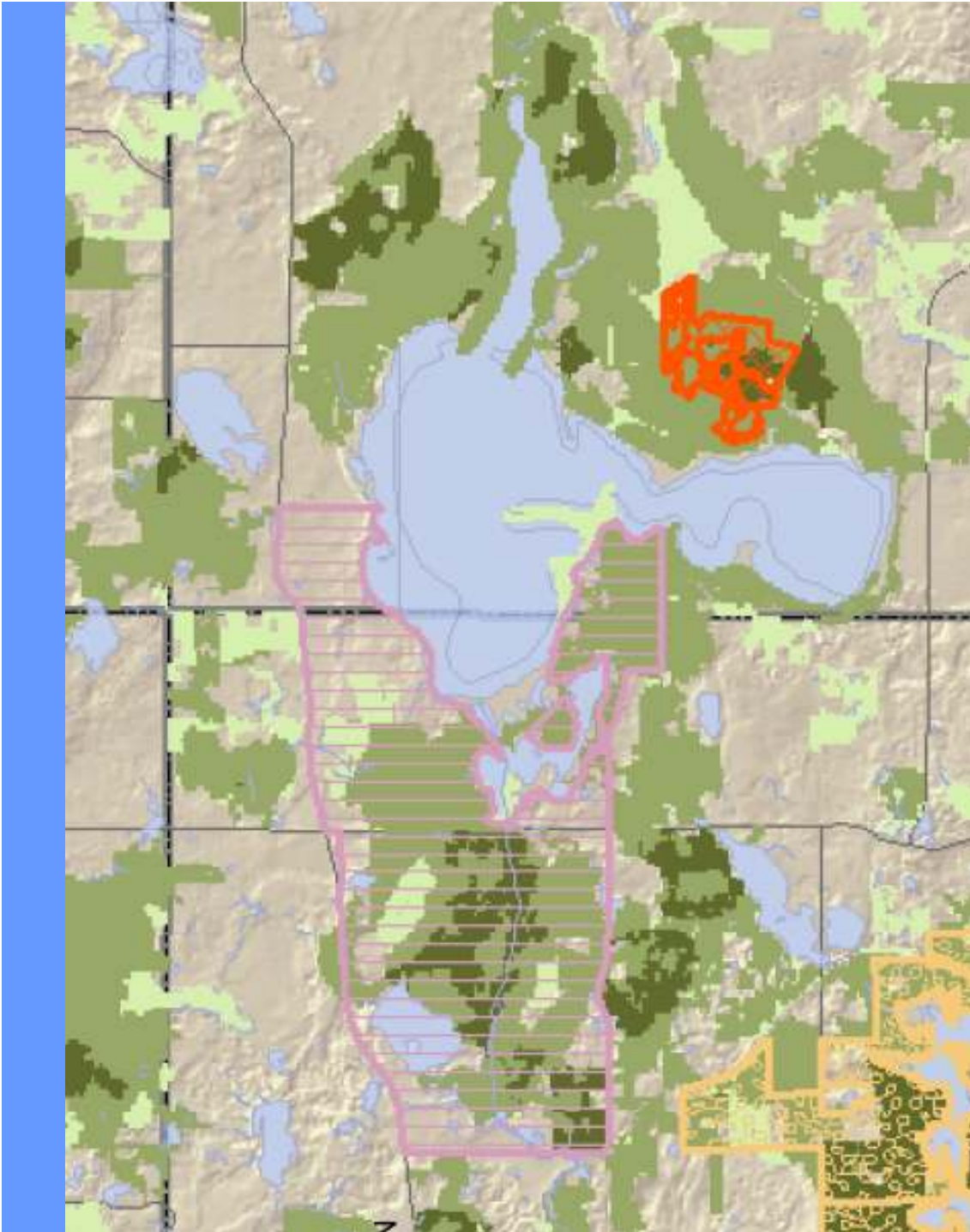
- Undeveloped lands within the DWSMA Vulnerability Area

- Mapped as high infiltration potential

- Upland depressional areas present

Map Products

Ecological Module



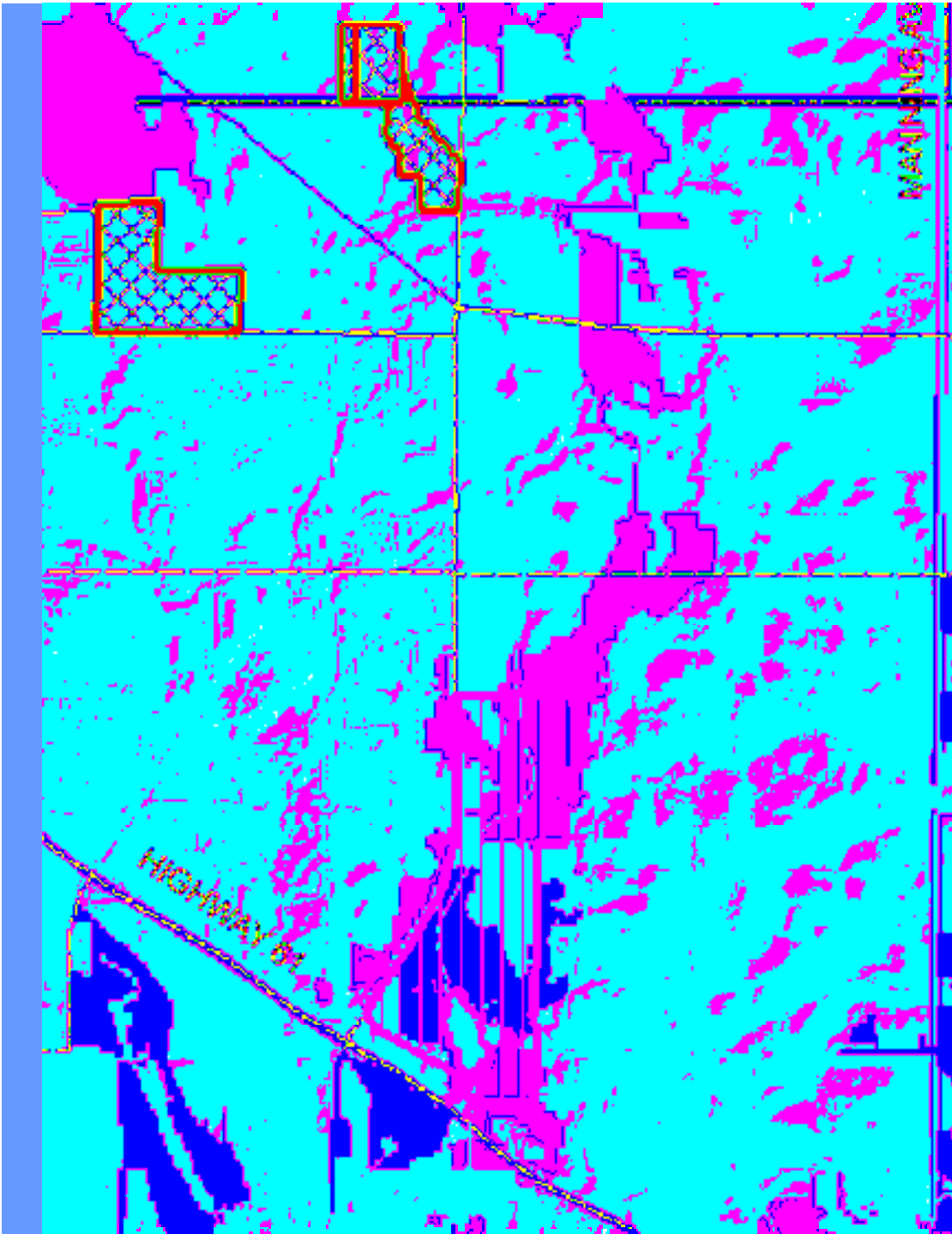
- Wetland complexes

- Woodlands
- Grasslands

- Higher quality community rankings

Map Products

Connectivity



- Eco patches are connected by connectivity module

- Example from Cottage Grove Ravine area.

Thanks!

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