



WILLAMETTE VALLEY WET-PRAIRIE RESTORATION MODEL

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WHAT IS A WILLAMETTE VALLEY WET-PRAIRIE

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What is a Wet-Prairie

Importance

Current Status

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Question

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Data Acquisition

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Geoprocessing

Assigning Priority

Final Overlay

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Hot Spot Analysis

Getis-Ord

Cluster & Outlier

Moran's I

Conclusions

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- ⊙ Native species (Forbes and Graminoids)
- ⊙ Rare plant species
- ⊙ Less than 5% woody plant species
- ⊙ Often dominated by Tufted Hairgrass and found in Oak Savannah
- ⊙ Seasonally wet
- ⊙ Inclusions of vernal pools
- ⊙ High plant diversity
- ⊙ Flood plain and lower elevation valley terraces
- ⊙ Hydric soils

IMPORTANCE OF WET-PRAIRIES

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- ◎ Historically covered a large portion of the Willamette Valley
- ◎ Habitat for rare and imperiled species
 - ◎ i.e. Nelson's Checkermallow, Bradshaw's Lomatium, Willamette Daisy.
- ◎ Provide important ecological services
- ◎ Impoverished, fragmented, and blinking out of existence
- ◎ Templates for ecosystem recovery

CURRENT STATUS OF WET-PRAIRIE

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- ③ Less than 1% of the 1850 Willamette Valley wet-prairie remains intact today
- ③ Wet-prairie habitat is a priority for restoration by State, Federal, and Non-governmental organizations
- ③ Restoration efforts are currently actively in progress on both private and public lands

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- ❖ What areas in the Willamette Valley eco-region provide various levels of suitable opportunities for wet-prairie restoration?
- ❖ Are there discernible landscape patterns in the GIS model that show suitable wet-prairie restoration areas?
- ❖ Is there a visual correlation between the placement of existing wet-prairie mitigation projects and areas identified as suitable for restoration by the GIS wet-prairie restoration model?
- ❖ How many acres in each class does the restoration model identify as suitable for wet prairie restoration?

METHODS

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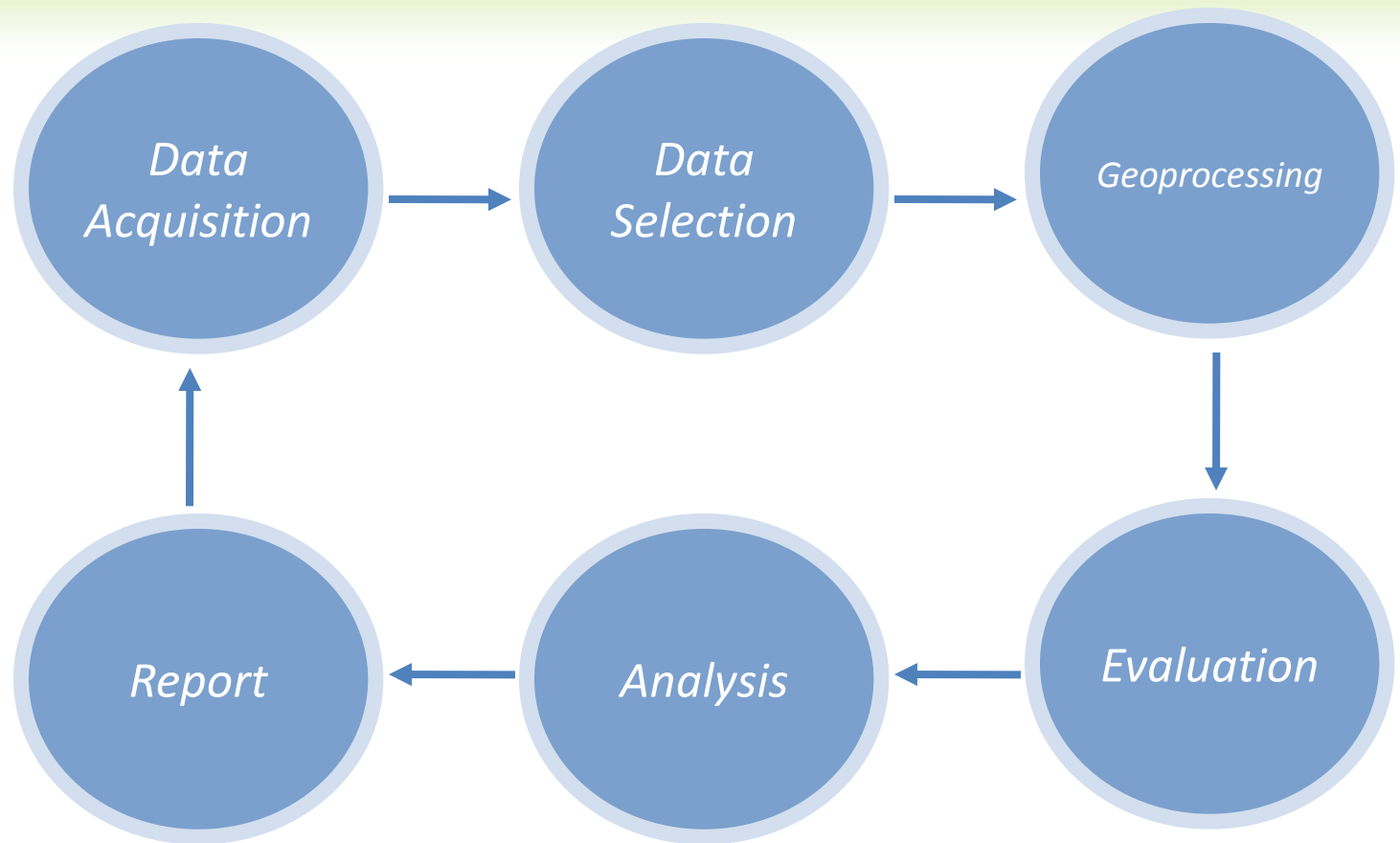
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⊙ County Soils

⊙ Rare Plants

⊙ Land Ownership

⊙ Historic Vegetation

⊙ Current Wetlands

⊙ Stream/Rivers

⊙ Flood Plain

⊙ State Line

⊙ Wetlands

⊙ Land Use

⊙ Cites

⊙ Major Highways

⊙ Mitigation Banks

⊙ WV Eco-regions boundary

⊙ Hydrologic Units

⊙ County Borders

⊙ Anadromous Fish

⊙ Wildlife

DATA SELECTION

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Primary Data Layers

- ⊙ County Soils
- ⊙ Rare Plants
- ⊙ Land Ownership
- ⊙ Historic Vegetation
- ⊙ Current Wetlands
- ⊙ Land Use

Secondary Data Layers

- ⊙ Cites
- ⊙ Major Highways
- ⊙ Mitigation Banks
- ⊙ WV Eco-regions
boundary

GEOPROCESSING

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Standard Protocol Applied to All Data Layers

- ③ “Select by Attribute” to identify records needed for the analysis
- ③ Export to separate feature class
- ③ Union to clip of Willamette Valley Ecoregion
- ③ Add field to attribute table and use field calculator to assign value “0” or “1”
- ③ Polygon-to-Raster Conversion
- ③ Reclassify

GEOPROCESSING - HYDRIC SOILS

GEOPROCESSING

Methods

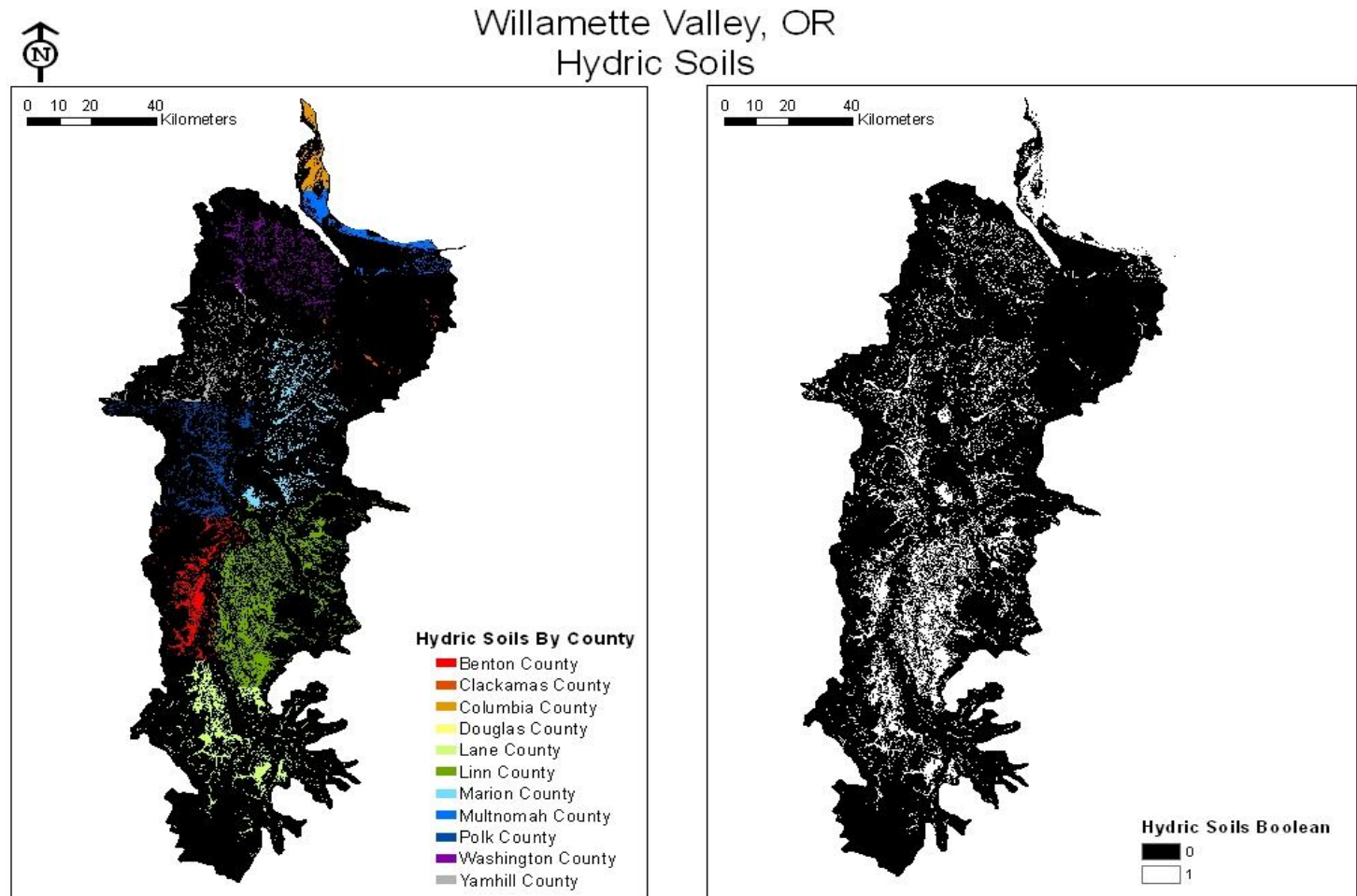
Data Acquisition

Data Selection

Geoprocessing (1)

Assigning Priority

Final Overlay



Data Source:
<http://www.or.nrcs.usda.gov/technical/soil/hydric.html>
NAD 1983 UTM Zone 10N

GEOPROCESSING

CURRENT WETLANDS

Methods

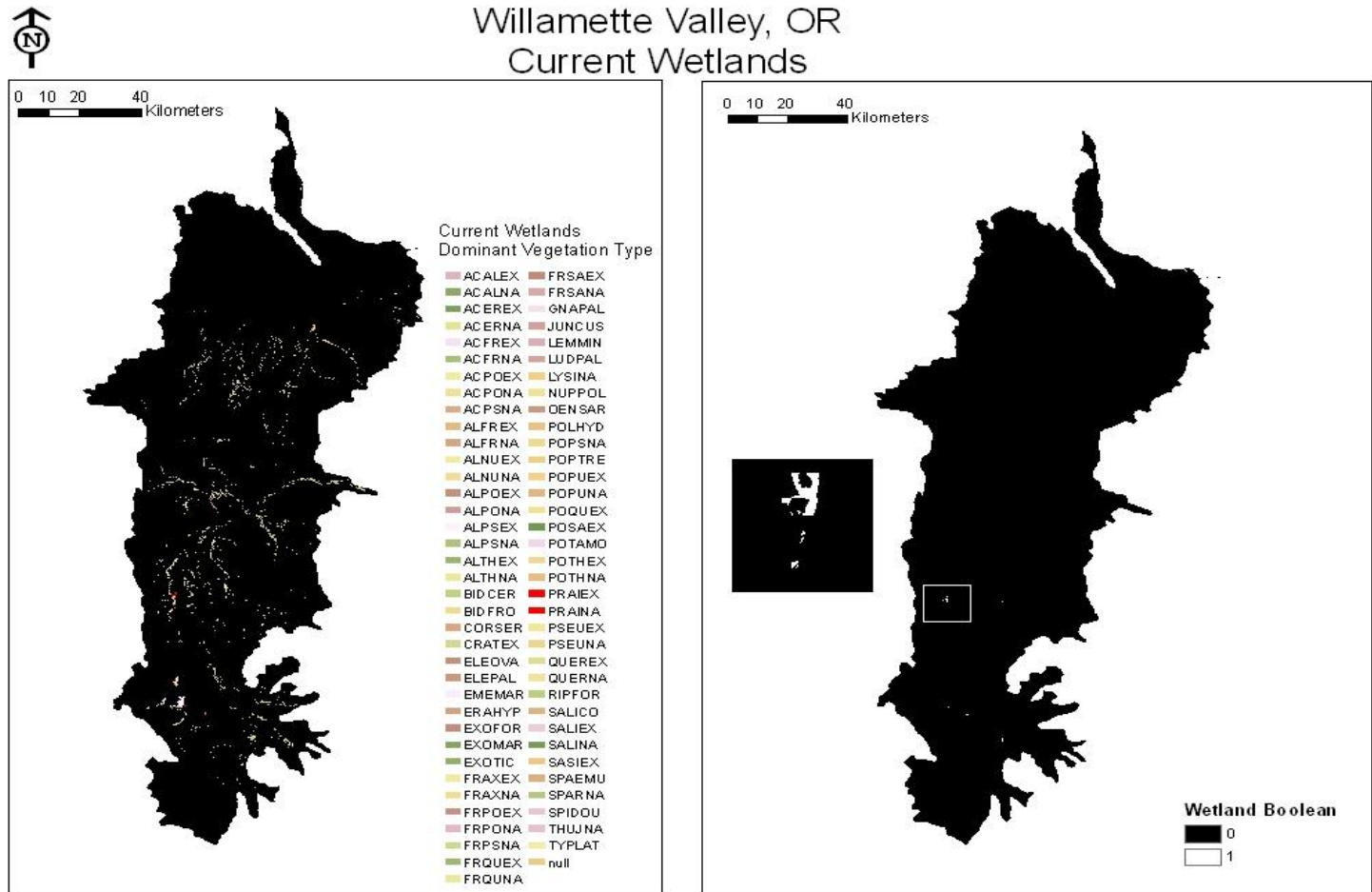
Data Acquisition

Data Selection

Geoprocessing (2)

Assigning Priority

Final Overlay



Data Source:
The Nature Conservancy
Funded by EPA
NAD 1983 UTM Zone 10N

GEOPROCESSING

HISTORIC VEGETATION

Methods

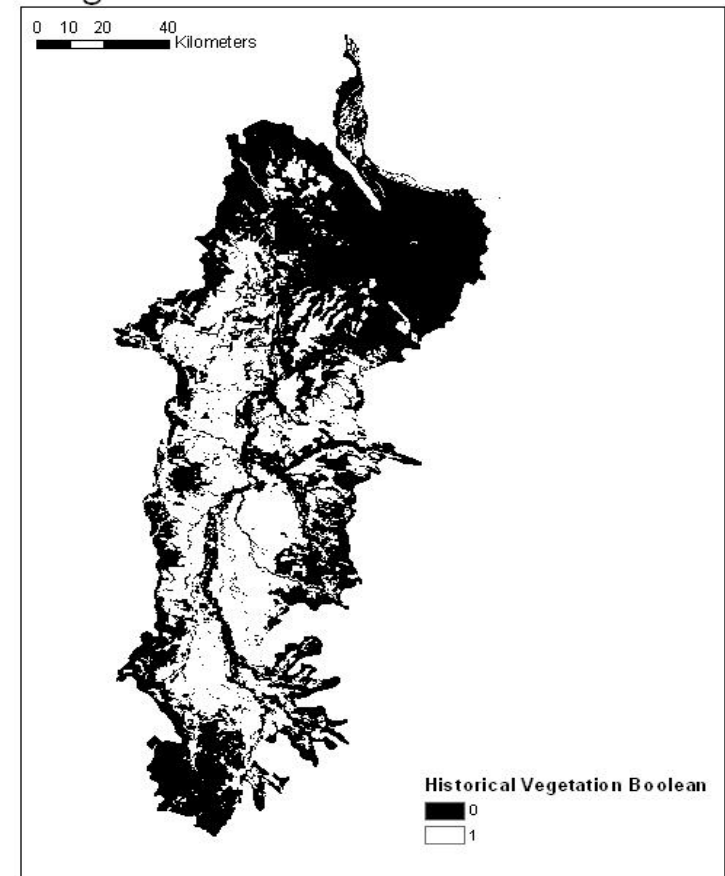
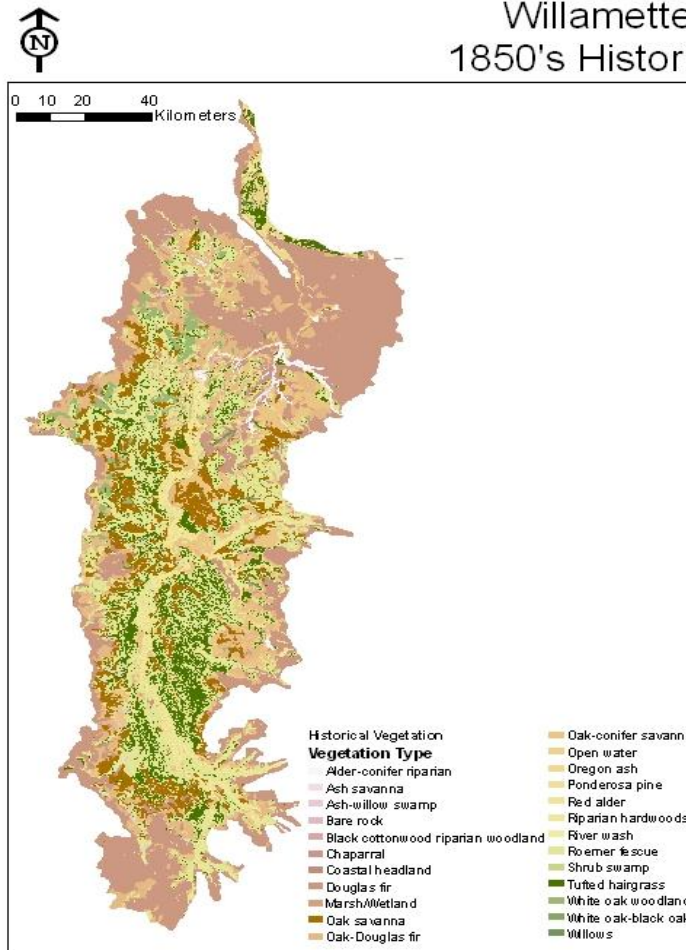
Data Acquisition

Data Selection

Geoprocessing (3)

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Data Source:
General Land Office Cadastral Survey
Bureau of Land Management
NAD 1983 UTM Zone 10N

GEOPROCESSING

RARE PLANTS



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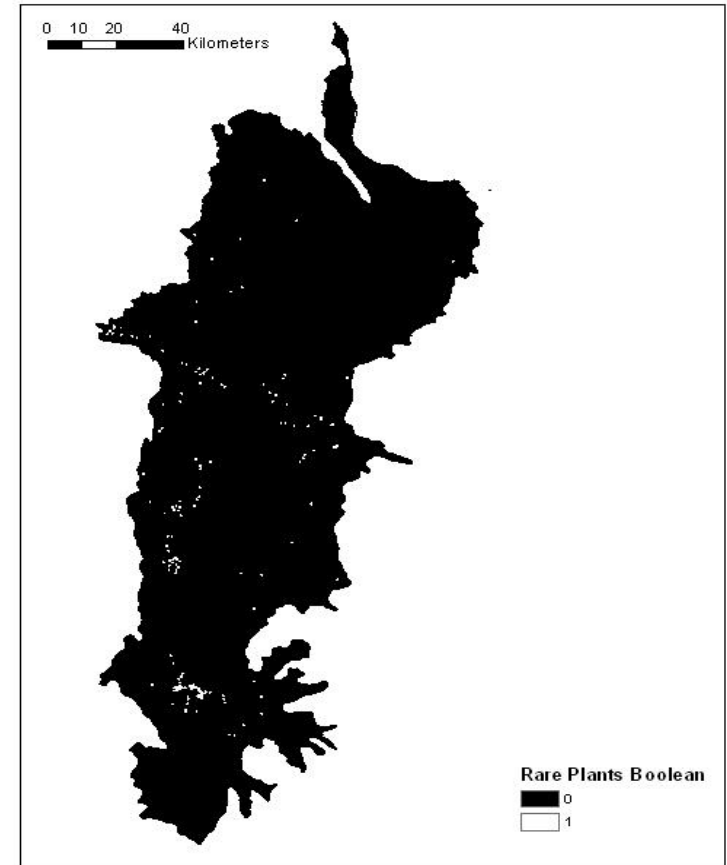
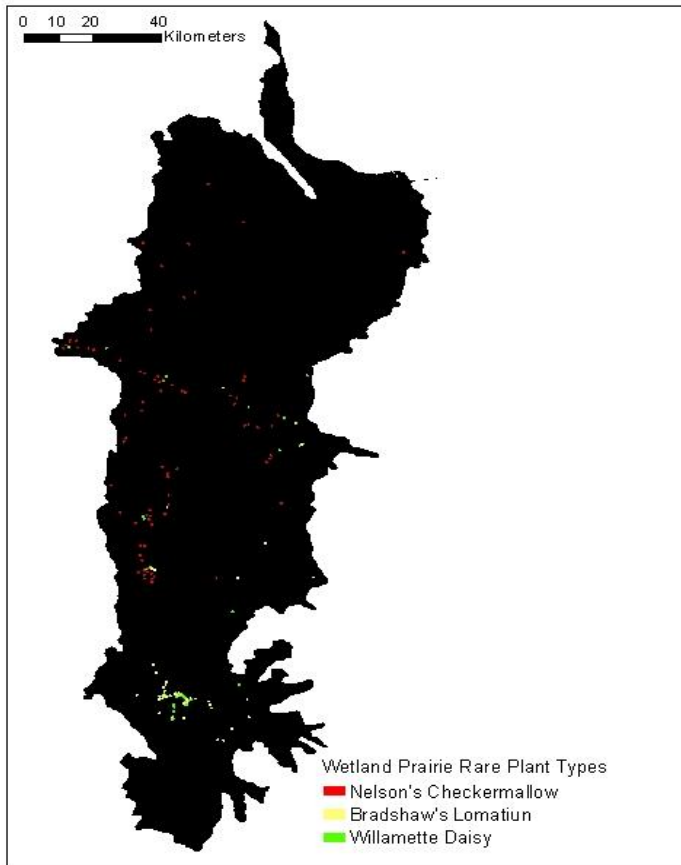
Geoprocessing (4)

Assigning Priority

Final Overlay



Willamette Valley, OR
Wetland Prairie Rare Plants



Data Source:
USDA-NRCS
NAD 1983 UTM Zone 10N



Final Overlay



GEOPROCESSING

LAND OWNERSHIP

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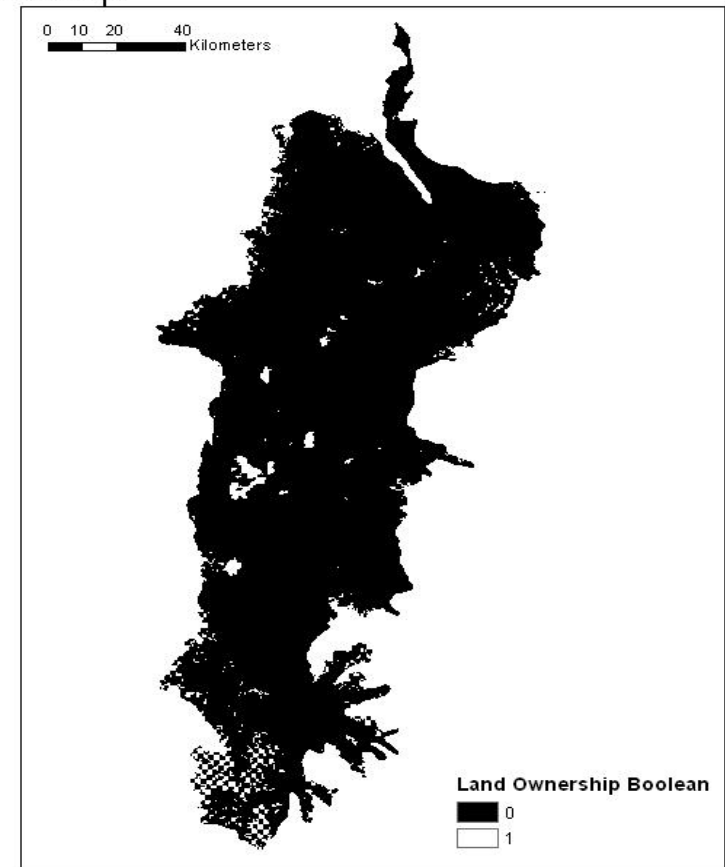
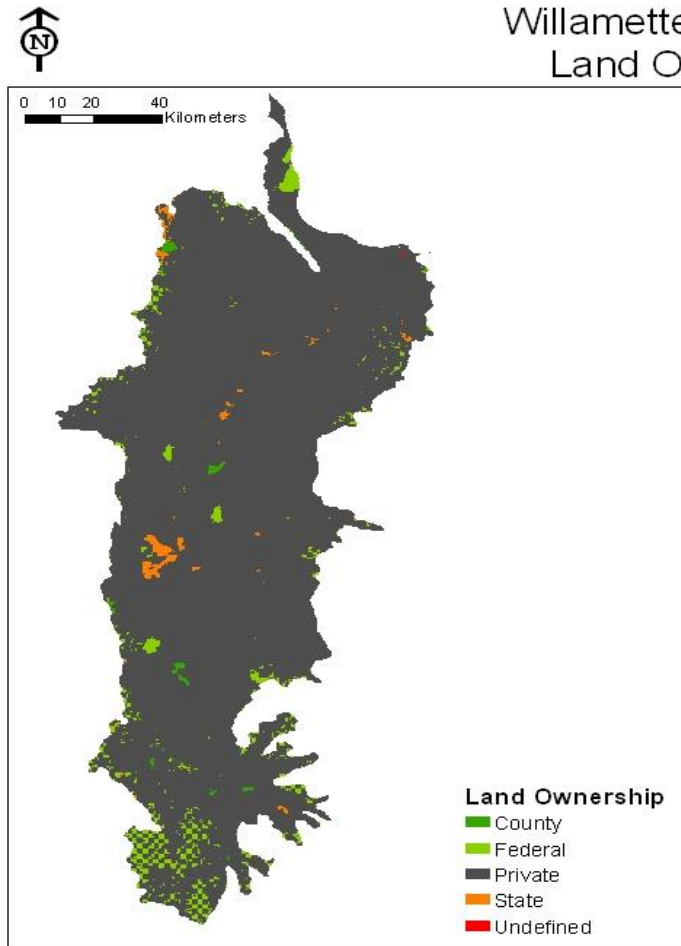
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Data Source:
Oregon Department of Forestry
NAD 1983 UTM Zone 10N

FINAL GEOPROCESSING STEPS

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- ② “Weighted Sum”, Add all six layers
- ② Assign weights of each layers
- ② Select “SUM” as weighting measurement
- ② Use “Times” function to remove cities and highways from model analysis
- ② Reclassify Raster
- ② Using Field calculator in the attribute table we generated acres field for number of acres per class
- ② Convert Raster to Vector in order to perform analyses

ASSIGNING PRIORITY

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Layer Name	Weighted Value
Ownership	1
Land Use	2
Hydric Soils	3
Rare Plant Species	4
Historic Vegetation	4
Current Wetlands	5

FINAL OVERLAY

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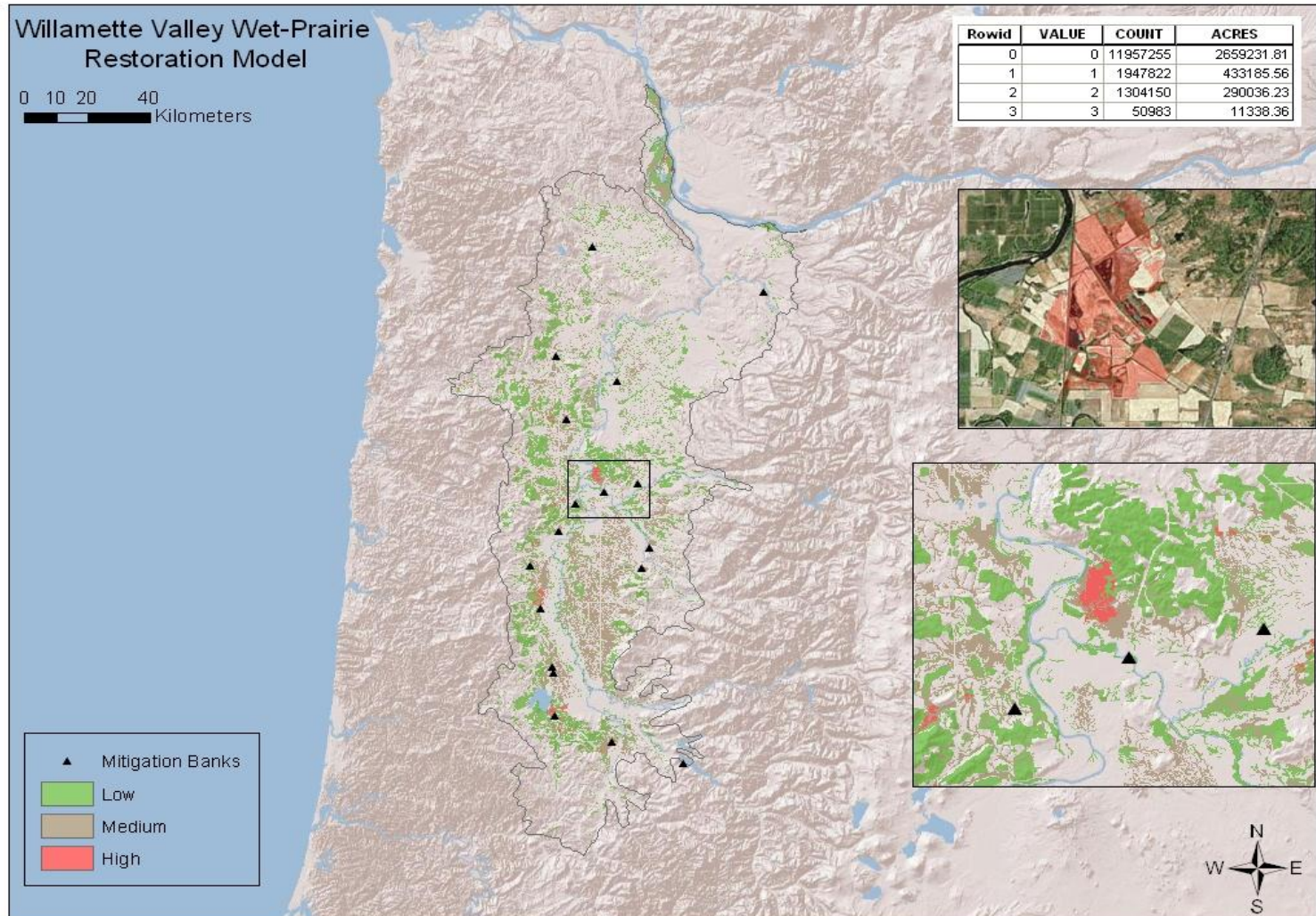
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HOT SPOT GETIS-ORD

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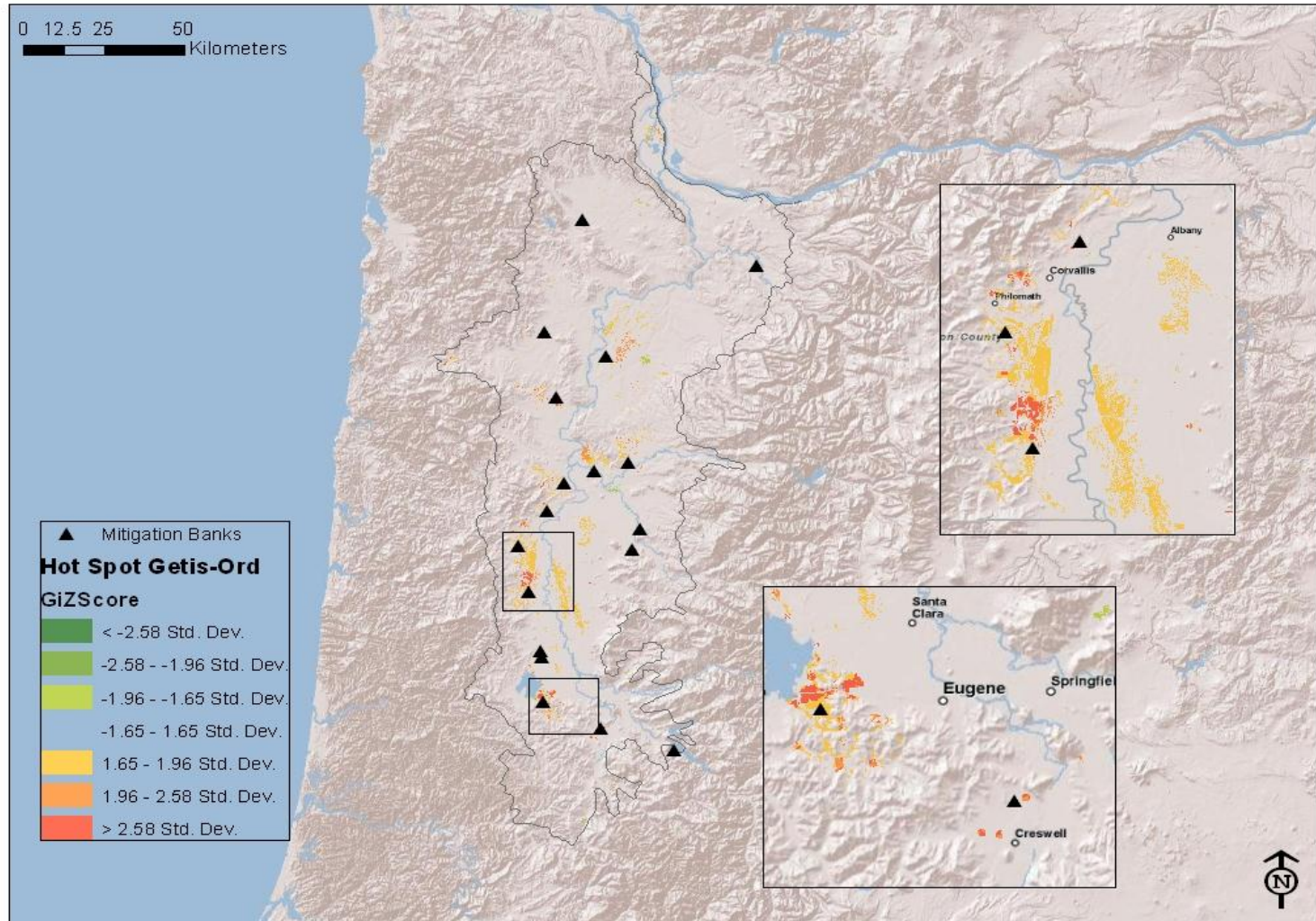
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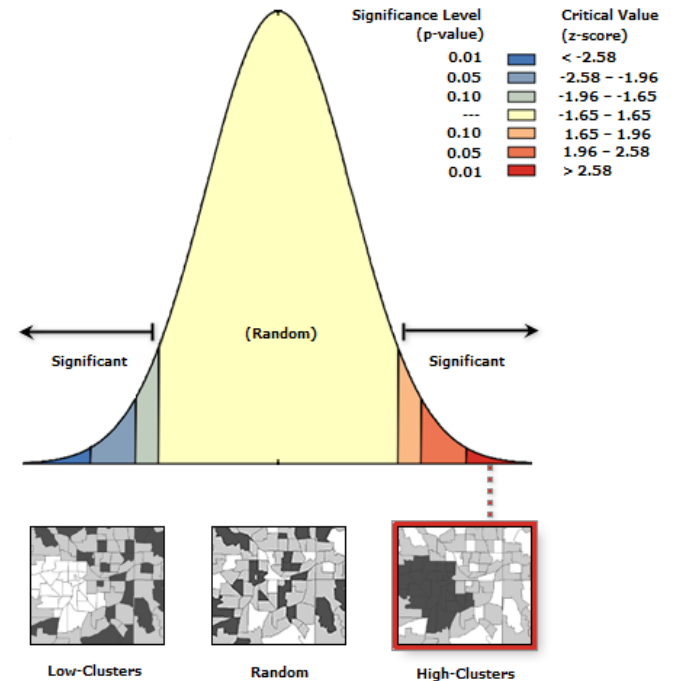
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High-Low Clustering Report (Getis-Ord General G)

General G Summary

Observed General G:	0.000006
Expected General G:	0.000004
Variance:	0.000000
z-score:	108.658518
p-value:	0.000000



ANALYSIS

CLUSTER AND OUTLIER MORANS I

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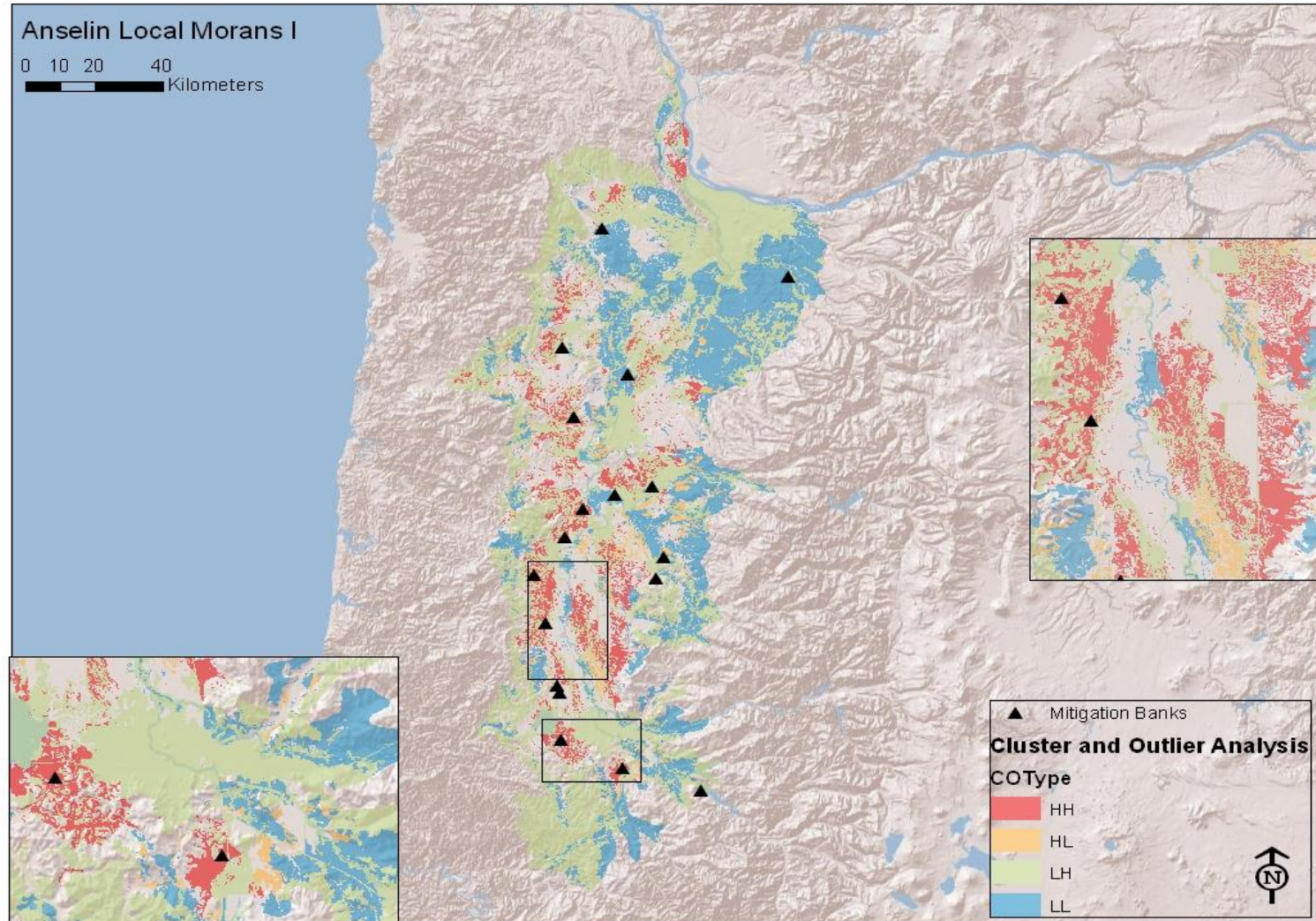
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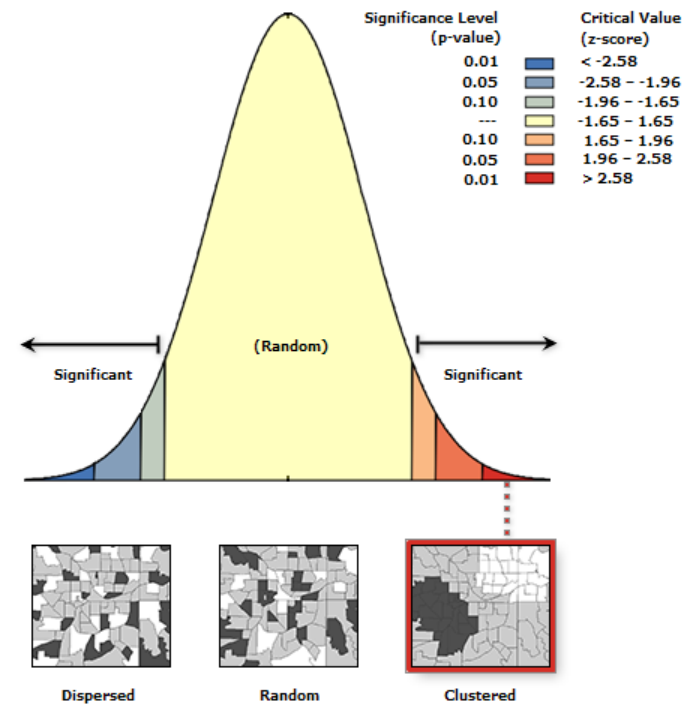
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Spatial Autocorrelation Report (Morans I)

Moran's Index: 0.156152
Expected Index: -0.000009
Variance: 0.000000
z-score: 483.637900
p-value: 0.000000



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- ❖ **What areas in the Willamette Valley eco-region provide various levels of suitable opportunities for wet-prairie restoration?**

Mid to Southern Valley

- ❖ Are there discernible landscape patterns in the GIS model that show suitable wet-prairie restoration areas?
- ❖ Is there a visual correlation between the placement of existing wet-prairie mitigation projects and areas identified as suitable for restoration by the GIS wet-prairie restoration model?
- ❖ How many acres in each class does the restoration model identify as suitable for wet prairie restoration?

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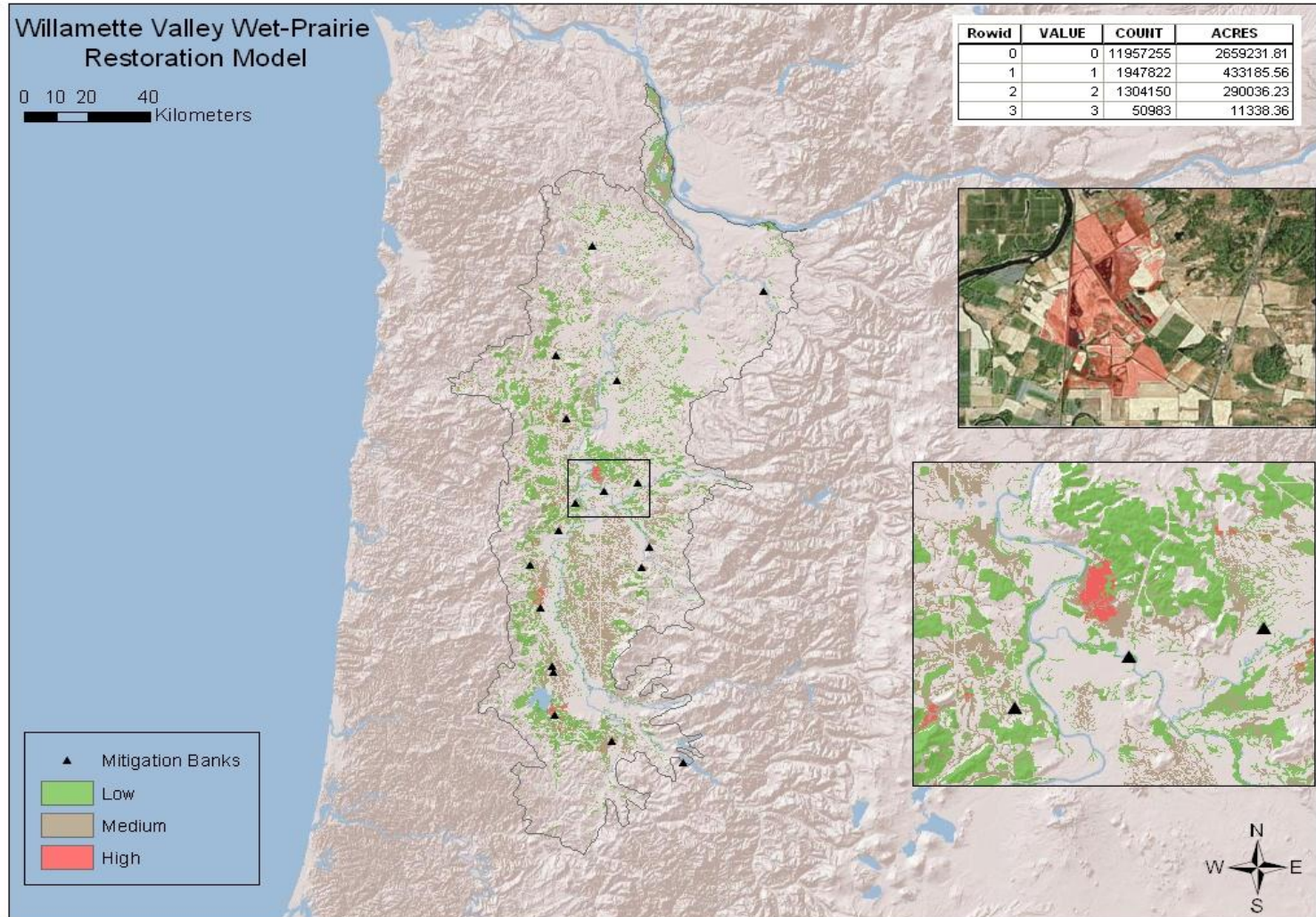
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- ❖ What areas in the Willamette Valley eco-region provide various levels of suitable opportunities for wet-prairie restoration?
- ❖ **Are there discernible landscape patterns in the GIS model that show suitable wet-prairie restoration areas?**
Yes. Clustering and hot spot analysis showed these patterns.
- ❖ Is there a visual correlation between the placement of existing wet-prairie mitigation projects and areas identified as suitable for restoration by the GIS wet-prairie restoration model?
- ❖ How many acres in each class does the restoration model identify as suitable for wet prairie restoration?

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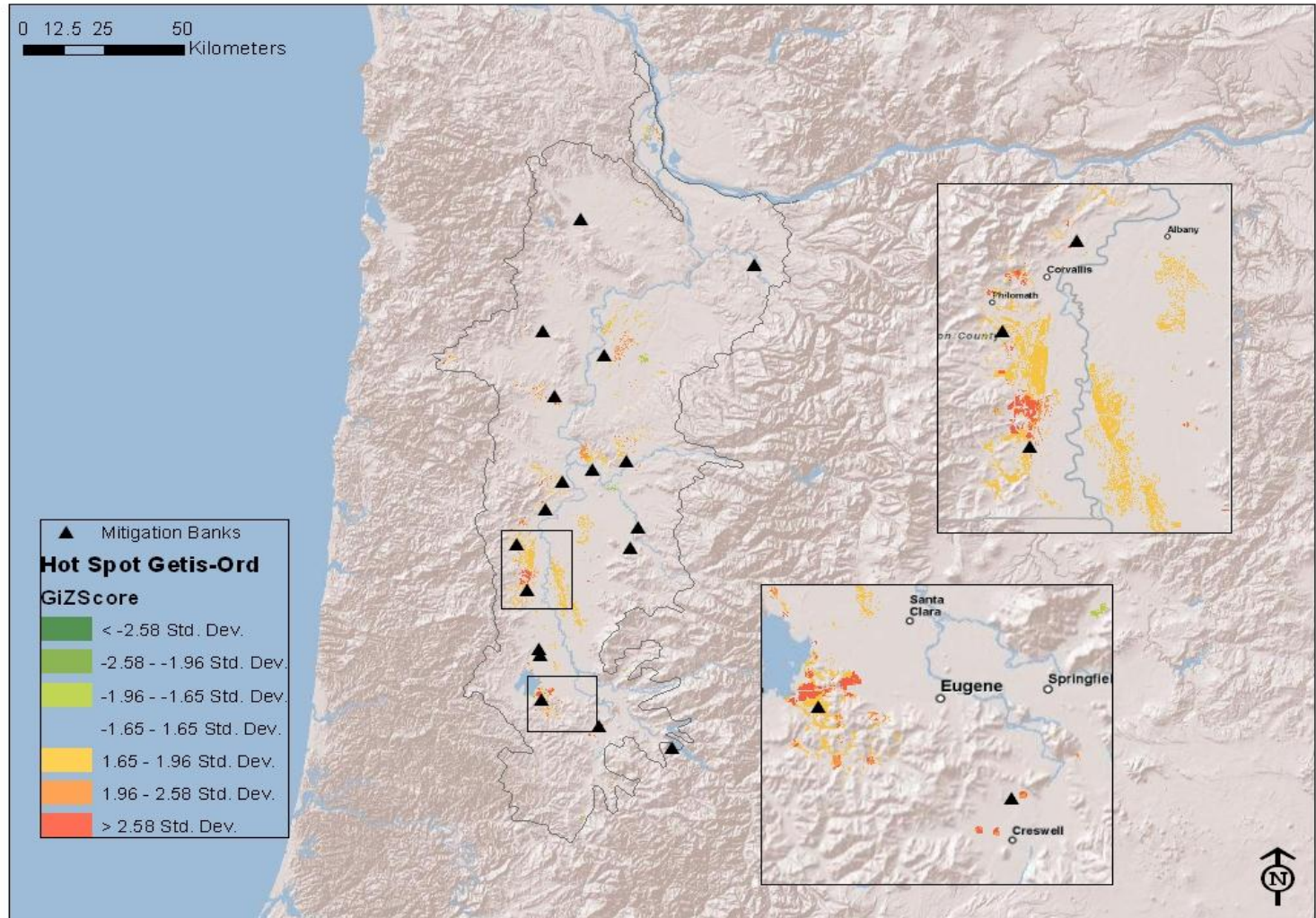
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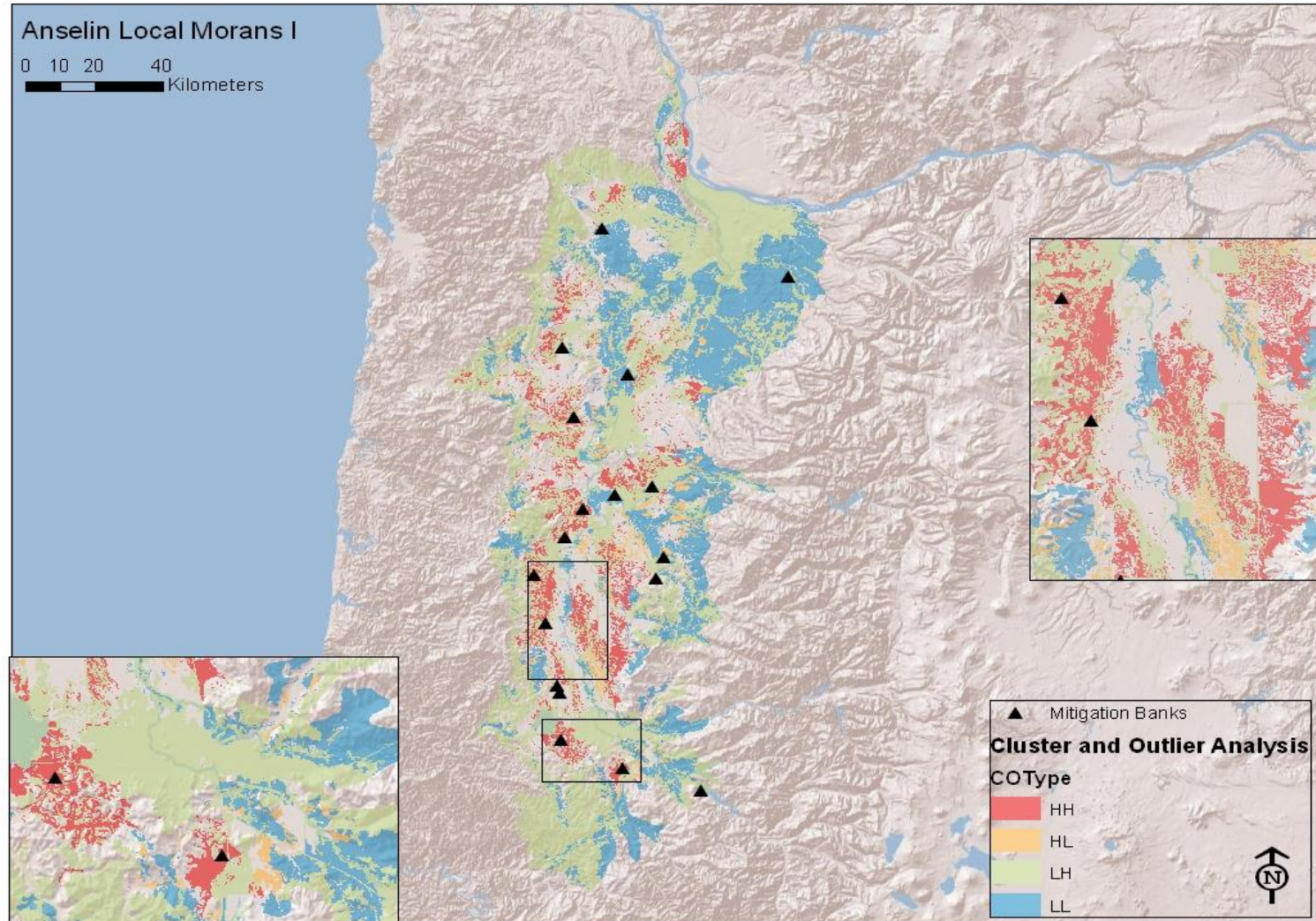
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- ❖ What areas in the Willamette Valley eco-region provide various levels of suitable opportunities for wet-prairie restoration?
- ❖ Are there discernible landscape patterns in the GIS model that show suitable wet-prairie restoration areas?
- ❖ **Is there a visual correlation between the placement of existing wet-prairie mitigation projects and areas identified as suitable for restoration by the GIS wet-prairie restoration model?**

Yes. Mitigation banks appeared to be visually correlated.

- ❖ How many acres in each class does the restoration model identify as suitable for wet prairie restoration?

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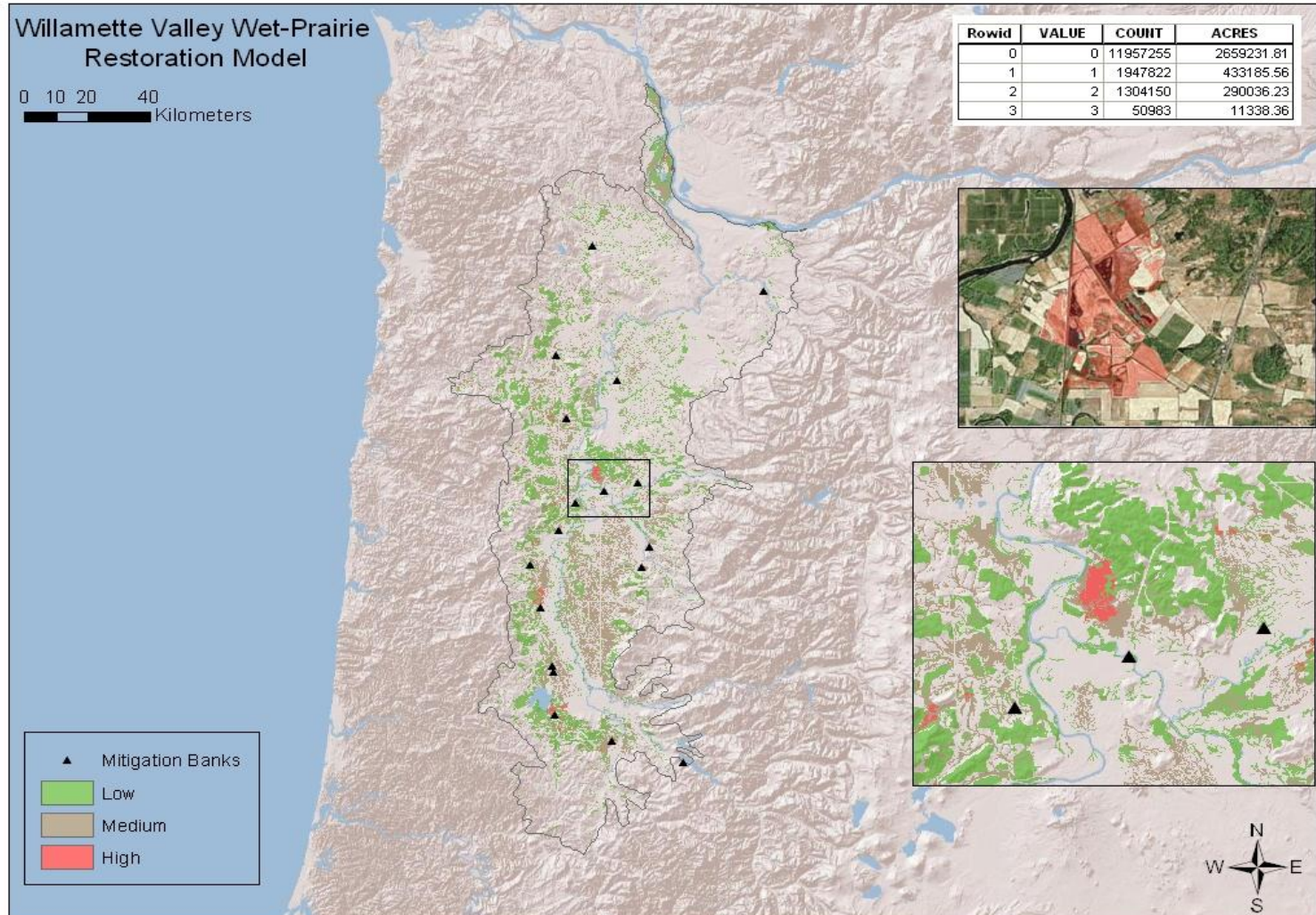
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- ❖ Are there discernible landscape patterns in the GIS model that show suitable wet-prairie restoration areas?
- ❖ Is there a visual correlation between the placement of existing wet-prairie mitigation projects and areas identified as suitable for restoration by the GIS wet-prairie restoration model?
- ❖ **How many acres in each class does the restoration model identify as suitable for wet prairie restoration?**

734,560 acres in the top three classes.

FUTURE DIRECTIONS

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- ❖ Conduct a formal aerial photo investigation to eliminate unsuitable areas
- ❖ Develop a methodology to validate model through field observations
- ❖ Perform a random sampling of visits to potential sites indicated by the analysis
- ❖ Add flood plain layer to analysis
- ❖ Select a fourth field hydrologic unit to do a more detailed analysis of how well the model performs

QUESTIONS ?

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REFERENCES

- ⊙ City Boundaries - Geographic Information Services Unit, Oregon Department of Transportation (ODOT);
- ⊙ Highways – Earth Systems Research Institute;
- ⊙ Land Cover – Northwest Habitat Institute;
- ⊙ Mitigation Banks – Oregon Office U.S. Fish and Wildlife Service;
- ⊙ Soils – Natural Resource Conservation Service - <http://soildatamart.nrcs.usda.gov/>;
- ⊙ Willamette Valley Ecoregion – World Wildlife Fund;
- ⊙ Historic Vegetation – Oregon Natural Heritage Program;
- ⊙ Willamette Valley Wetlands – Oregon Natural Heritage Program; and
- ⊙ Rare Plants – Oregon Office U.S. Fish and Wildlife Service.