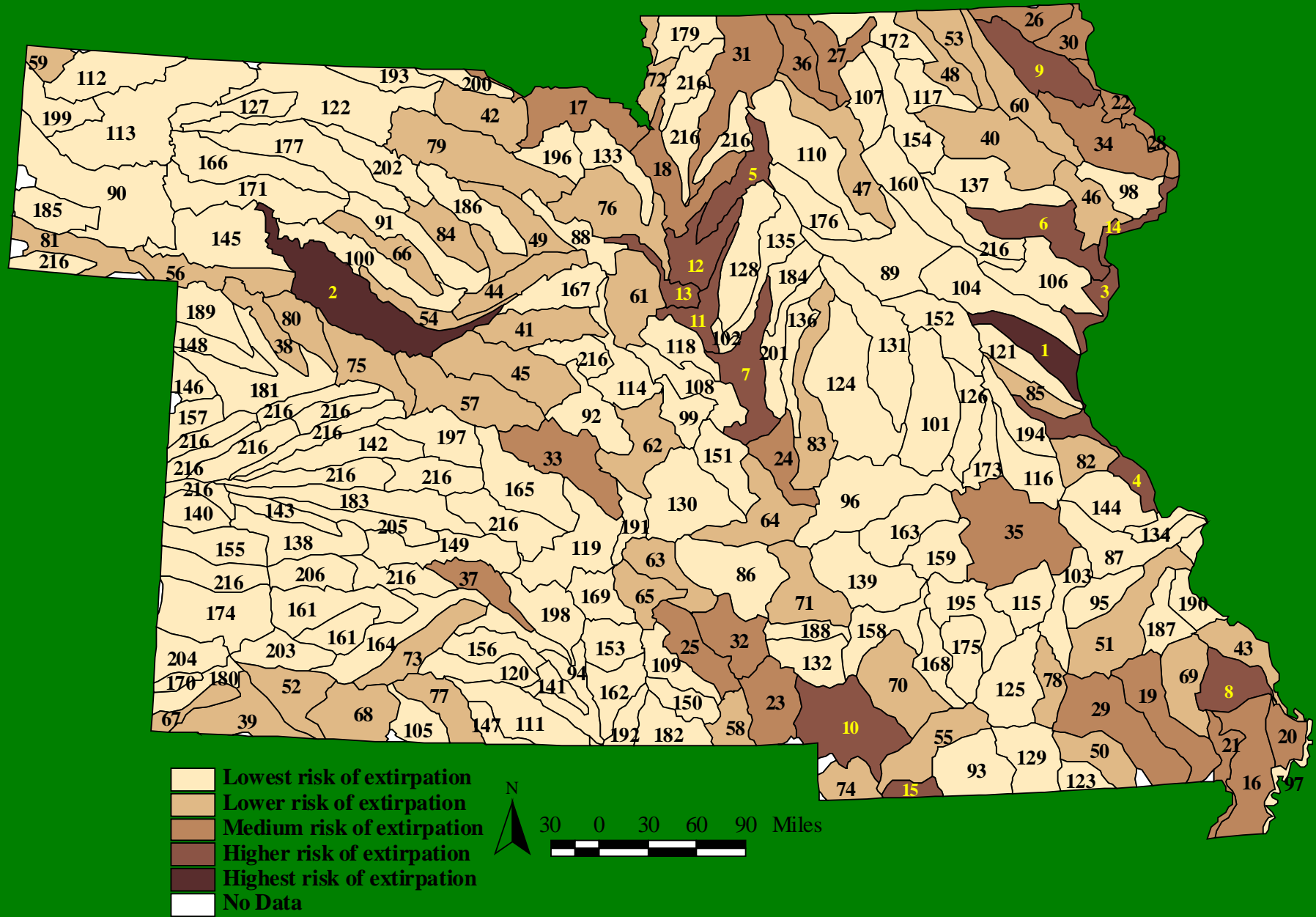
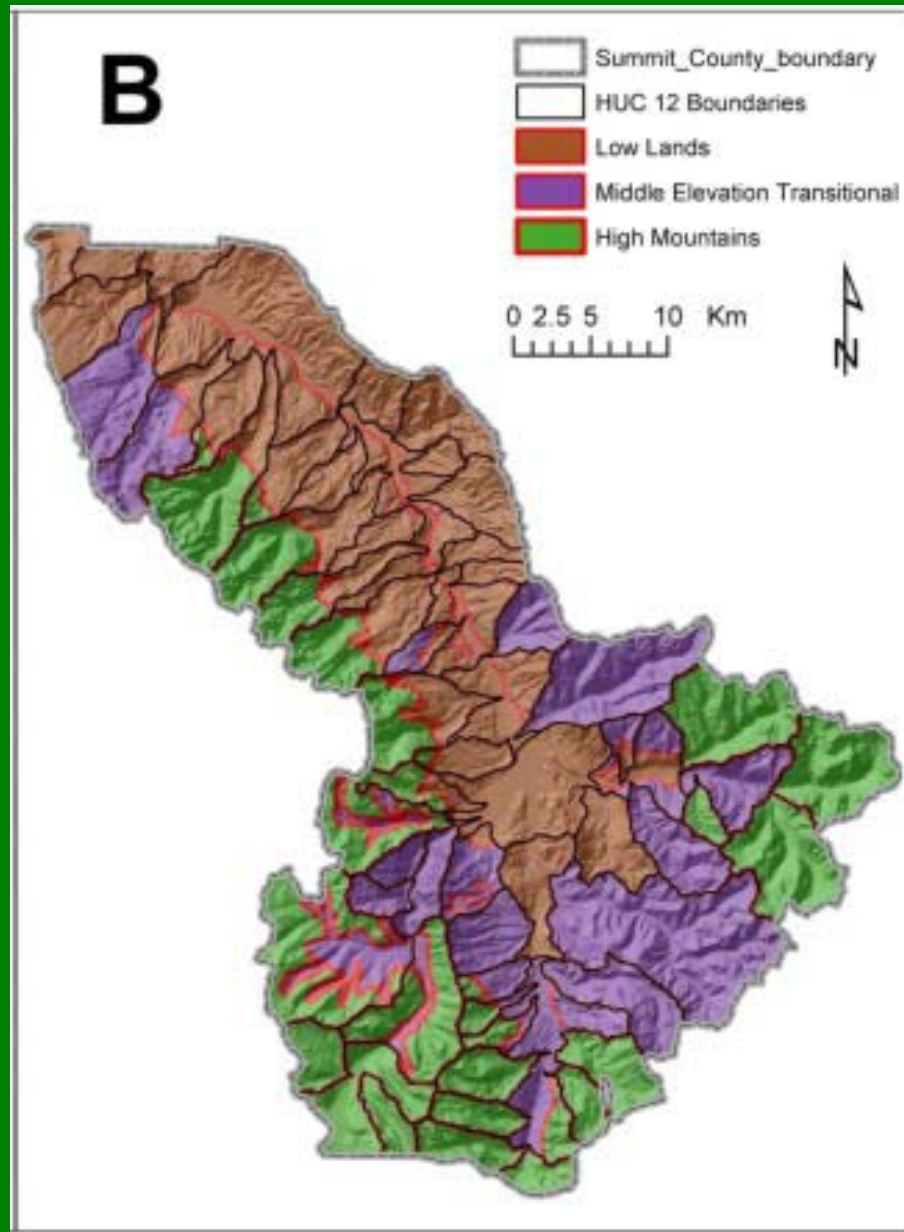


Ranked marginal increase in Regional wetland species extirpation risk avoided per unit Section 404 permit review effort

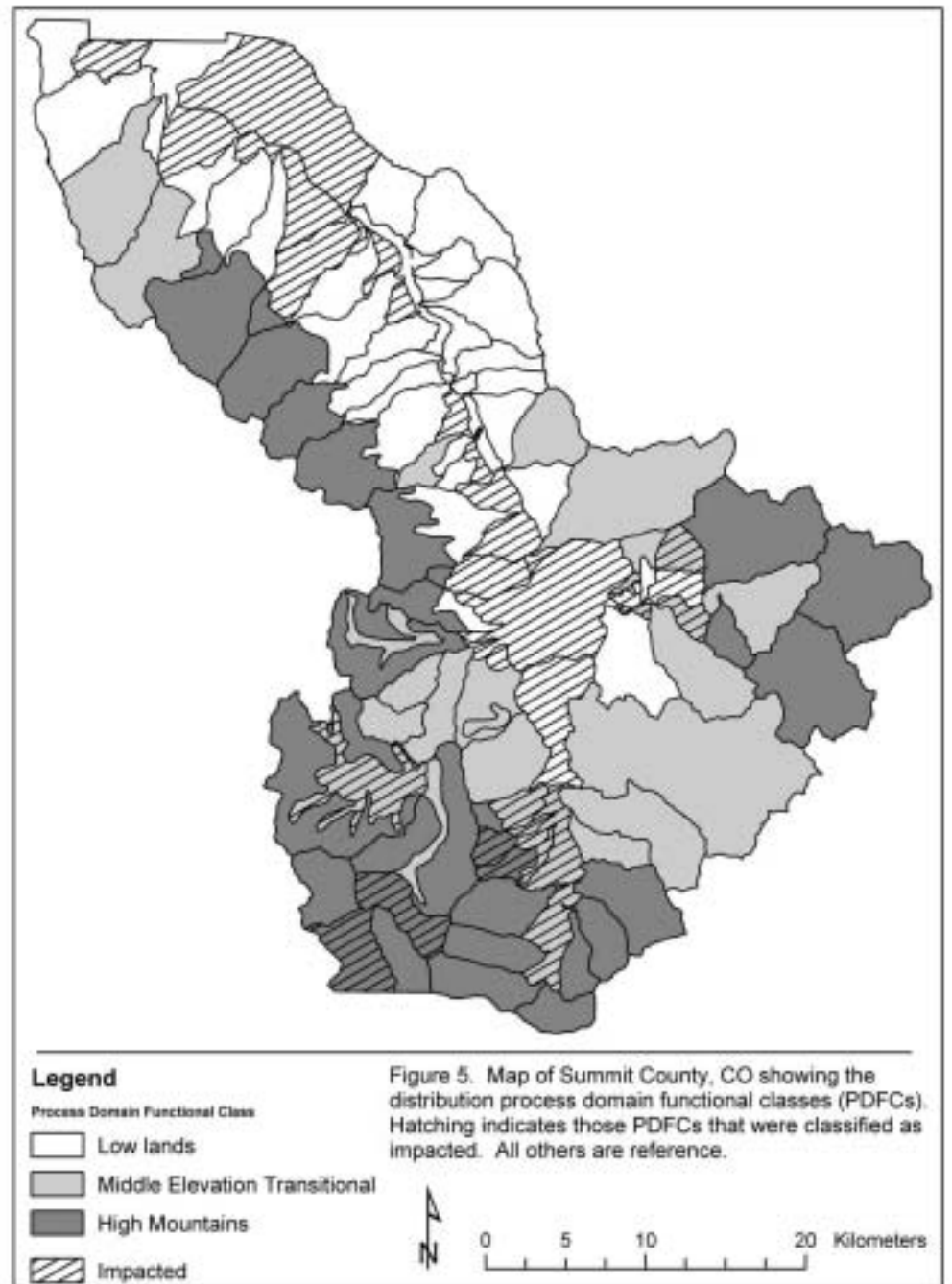


Comparability of Landscapes

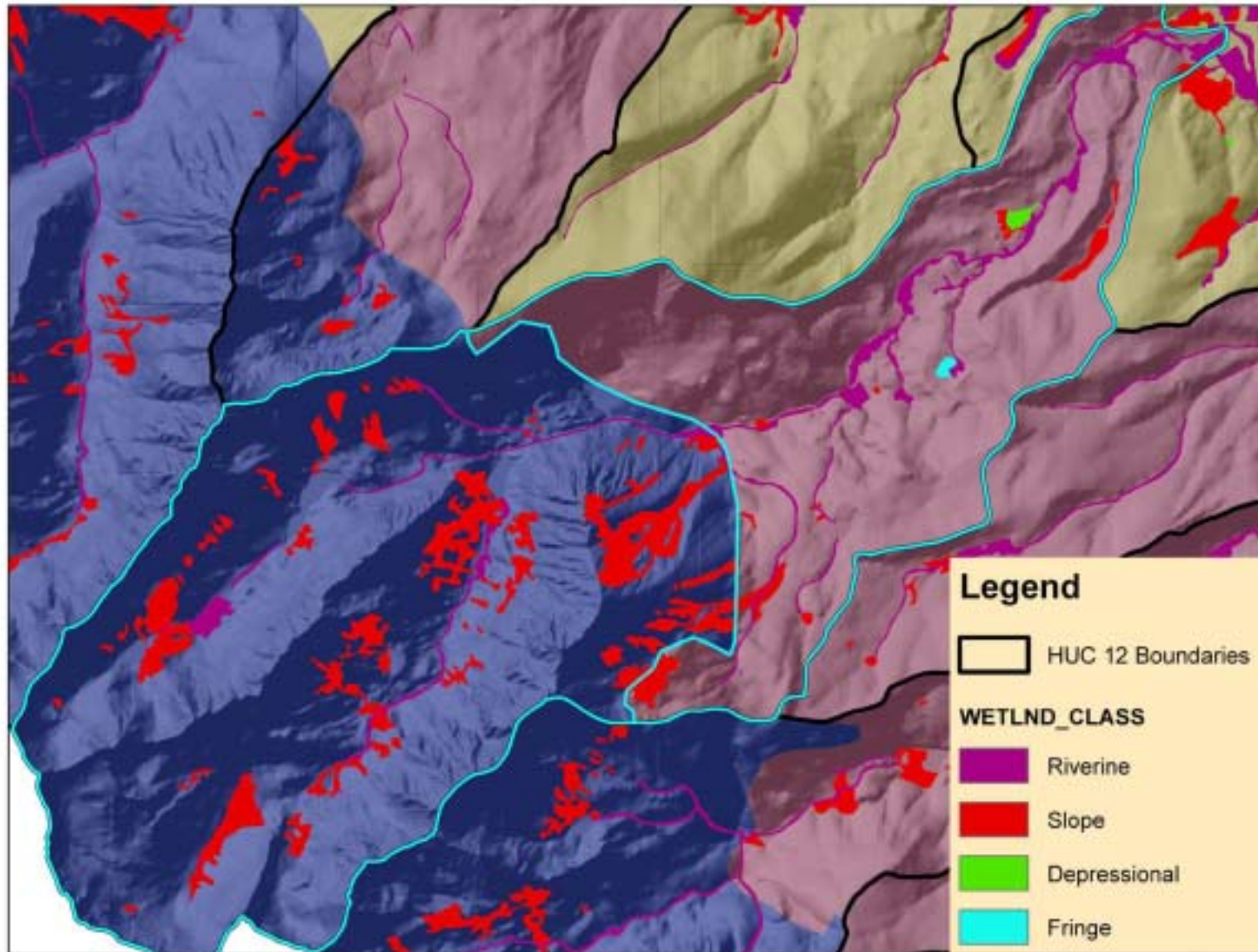


“Profile Slides”
Courtesy of Brad Johnson,
Colorado State University

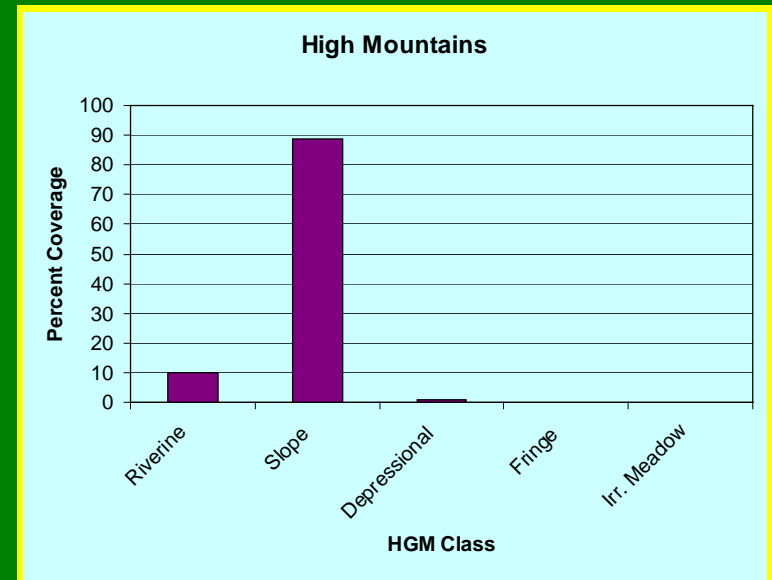
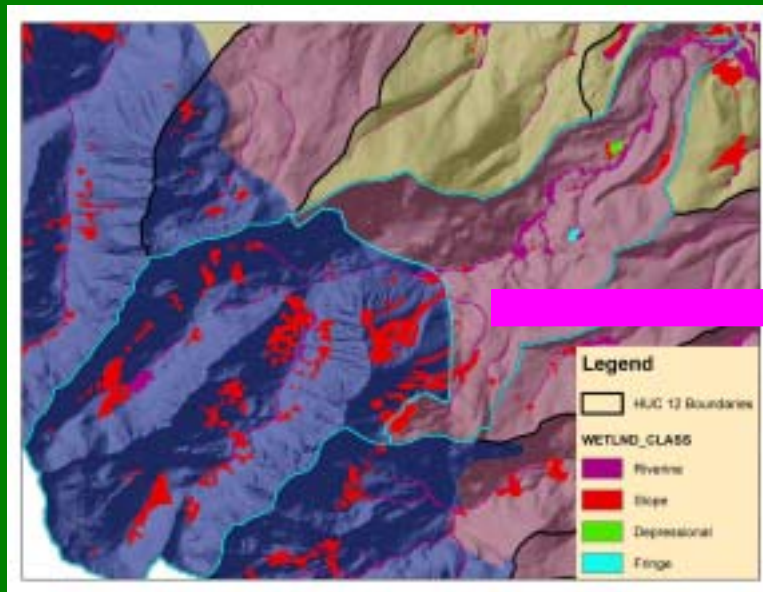
Determine Reference Status



Wetland Mapping and Classification

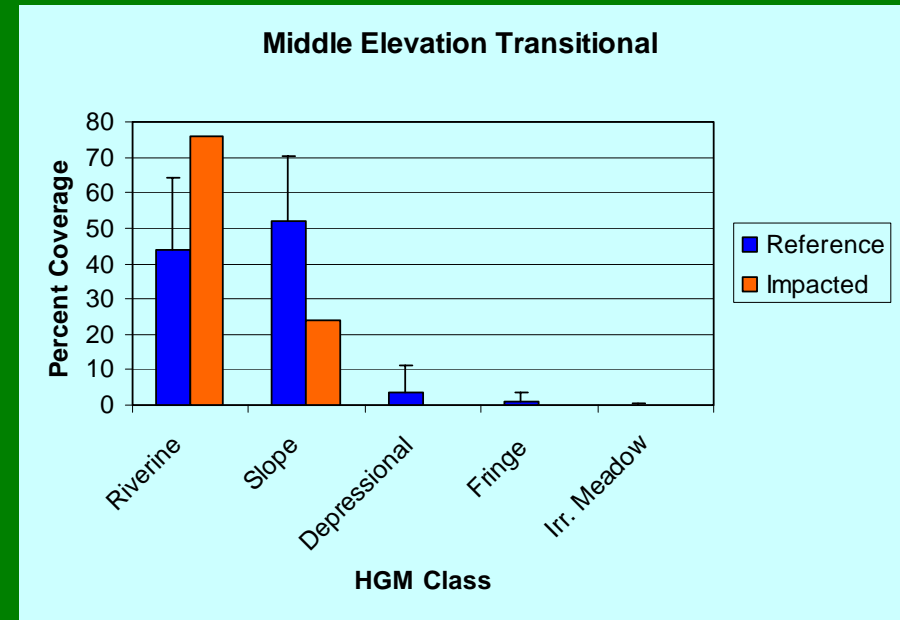
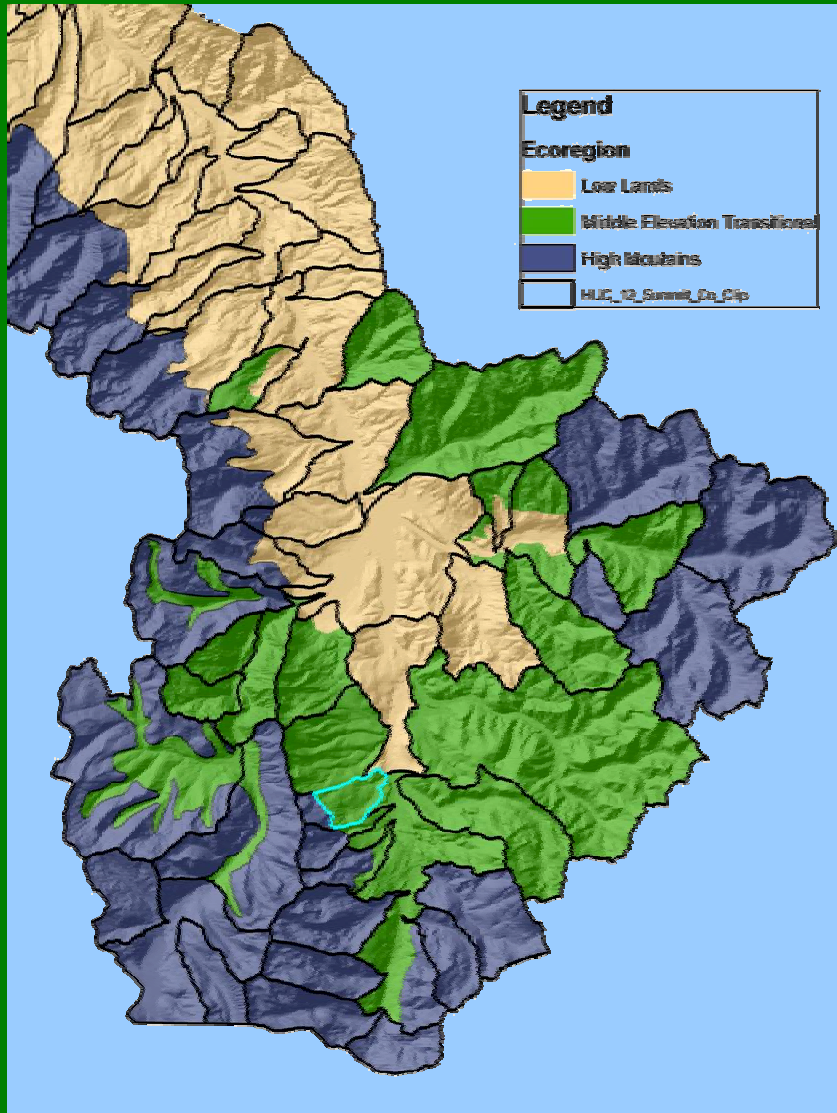


Links Between Landscapes and Wetlands



- An individual profile is the composite of many wetlands, which likely have different levels of functioning and condition
- Wetland profiling complements and provides a context for site-based approaches

A Second Example



Wetland Hydrogeomorphic Key for the Evaluation of Compensatory Wetland Mitigation Projects

1. Project site (e.g., proposed for fill) is a wetland that is typical of the wetland landscape profile depicted for the broader wetland planning area.....**2**

1. Site is a wetland that is a-typical of the wetland landscape profile (not natural).....**Low risk**

2. Site is a wetland of a particular HGM class that is common relative to the wetland landscape profile.....**3**

2. Site is a wetland of a particular HGM class that is historically diminished or rare relative to the wetland landscape profile.....**4**

3. Site is a wetland that is in good ecological condition..... **4**

3. Site is a wetland that shows degradation caused by minor disturbance.....**4**

3. Site is a wetland that shows significant degradation caused by major disturbance.....**Low risk**

4. Site is a wetland of a particular HGM class that is complex in structure and “DTR”**High risk**

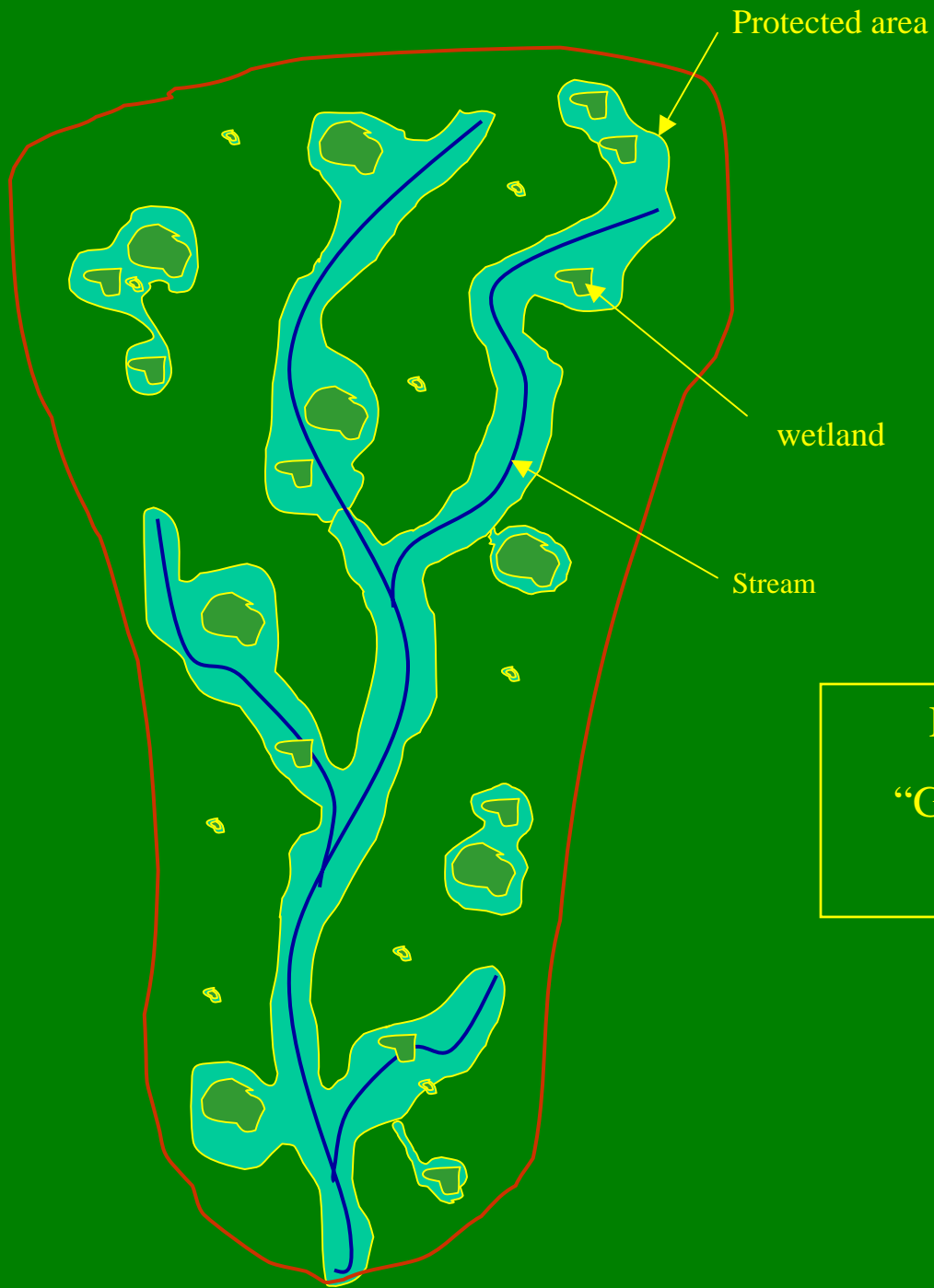
4..Site is a wetland of a particular HGM class that is simple in structure.....**5**

5. Site is located within a watershed that is (relatively) ecologically and hydrologically intact.....**Low risk**

5. Site is located within a watershed that is experiencing rapid unplanned environmental change attributed to urbanization, agricultural conversation or other resource development**Uncertain risk**

5. Site is designated within a planned highly urbanized or otherwise engineered landscape..... **High risk**

Risk = Probability that mitigation project will meet goals



Evaluate Different
“Green-infrastructure”
Scenarios

Function and Condition

We tend to think of each wetland as individual systems, and characterize them individually.

Wetlands perform functions collectively across the landscape

“The link between function and condition lies in the assumption that ecological integrity is an integrating “super function” of wetlands. If condition is excellent (i.e. equal to reference condition), then the functions of that wetland type will also occur at reference levels”

Fennessy et al., 2004

“Level 2” Assessment Method - ORAM

ORAM v. 3.0 Field Form Qualitative Rating

Site: _____ Rater(s): _____ Date: _____

Metric 1. Wetland Area (size).

score: _____ criteria: _____

Select one size class and assign score:

- 1-10 acres (1-2) 20+ (3) plus
- 25 to <50 acres (3 to 4) 125-250 (4) plus
- 75 to <125 acres (4 to 5) 150 (4) plus
- 2 to <50 acres (1-2) to <100 (3) plus
- 0.3 to <1 acres (1) 10 to <1.25 (2) plus
- 0.1 to <0.3 acres (0.5) to <0.125 (1) plus
- <0.1 acres (0.5) (0) plus

Metric 2. Upland buffers and surrounding land use.

score: _____ criteria: _____

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffer(s) average 30m (>300) or more around wetland perimeter (1)
- MODERATE. Buffer(s) average 20m to <30m (50 to <150ft) around wetland perimeter (4)
- NARROW. Buffer(s) average 10m to <20m (25 to <75ft) around wetland perimeter (1)
- VERY NARROW. Buffer(s) average <10m (<25ft) around wetland perimeter (0)

2b. Identify of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, pasture, cropland, utility area, etc. (0)
- LOW. 2nd forest (<10 years), shrubland, young second growth forest, etc. (2)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation refuge, new fallow field, etc. (3)
- HIGH. Urban, industrial, open pasture, new clearing, mining, construction, etc. (4)

Metric 3. Hydrology.

score: _____ criteria: _____

3a. Presence of Water. Score at that spot.

- High pH groundwater (3)
- Other groundwater (2)
- Precipitation (1)
- Seasonal/surface water (lake or stream) (0)

3b. Connectivity. Score at that spot.

- 100 year floodplain (1)
- Between disturbance and other human use (0)
- Part of watershed (e.g. forest, complex) (1)
- Part of riparian or upland corridor (1)

3c. Stream water depth. Select only one and assign score.

- 0.7-2.7 dm (3)
- 0.4 to 0.7 dm (2) to 0.1 dm (1)
- 0.4 dm (<1.5 dm) (1)

3d. Modifications to state of hydrologic regime. Score one or double check and average.

- None or minor alteration (0)
- Accidental (2)
- Deliberate (3)
- Planned or no recovery (4)

3e. Check all disturbances observed.

<input type="checkbox"/> fire	<input type="checkbox"/> soil source (disturbance)
<input type="checkbox"/> mts	<input type="checkbox"/> mining/quarry
<input type="checkbox"/> dms	<input type="checkbox"/> road/road ERI bank
<input type="checkbox"/> dirt	<input type="checkbox"/> dredging
<input type="checkbox"/> construction liquid	<input type="checkbox"/> other

Metric 4. Habitat Alteration and Development.

score: _____ criteria: _____

4a. Substrate/structure. Score one or double check and average.

- None or none required (0)
- Minimal (1)
- Recovering (2)
- Planned or no recovery (4)

4b. Habitat development. Select only one and assign score.

- Excellent (1)
- Very good (2)
- Good (3)
- Moderately good (4)
- Fair (5)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none required (0)
- Accidental (2)
- Recovering (3)
- Planned or no recovery (4)

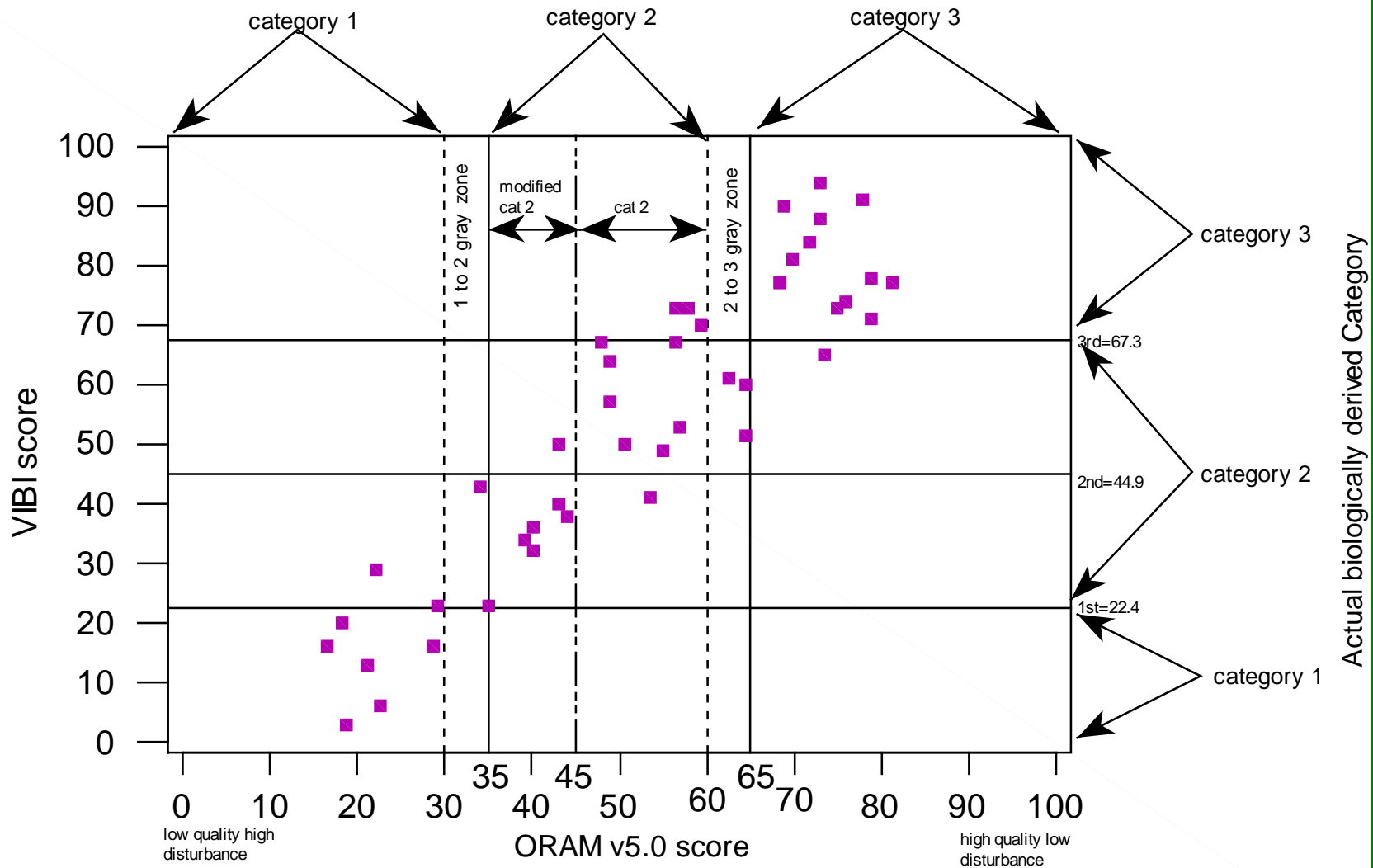
4d. Check all disturbances observed.

<input type="checkbox"/> mowing	<input type="checkbox"/> strip-clearing removal
<input type="checkbox"/> herbicide	<input type="checkbox"/> herbicide/soil herbicide removal
<input type="checkbox"/> herbicide	<input type="checkbox"/> herbicide removal
<input type="checkbox"/> intensive clearing	<input type="checkbox"/> dredging
<input type="checkbox"/> heavy debris removal	<input type="checkbox"/> burning
<input type="checkbox"/> public petroleum	<input type="checkbox"/> soil bank perturbation

score: _____

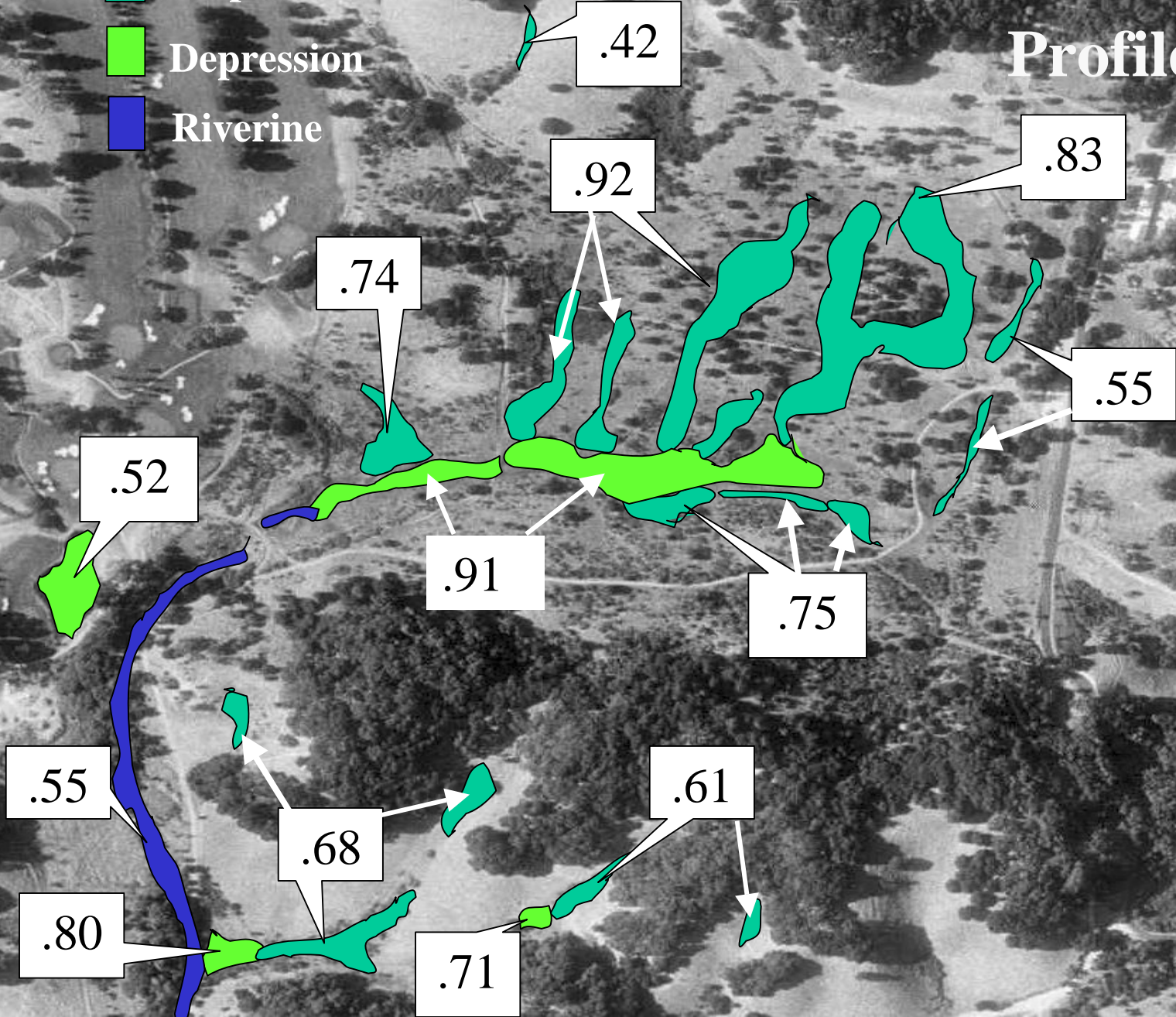
last revised 1 February 2004 gjs

Category using biologically calibrated ORAM score



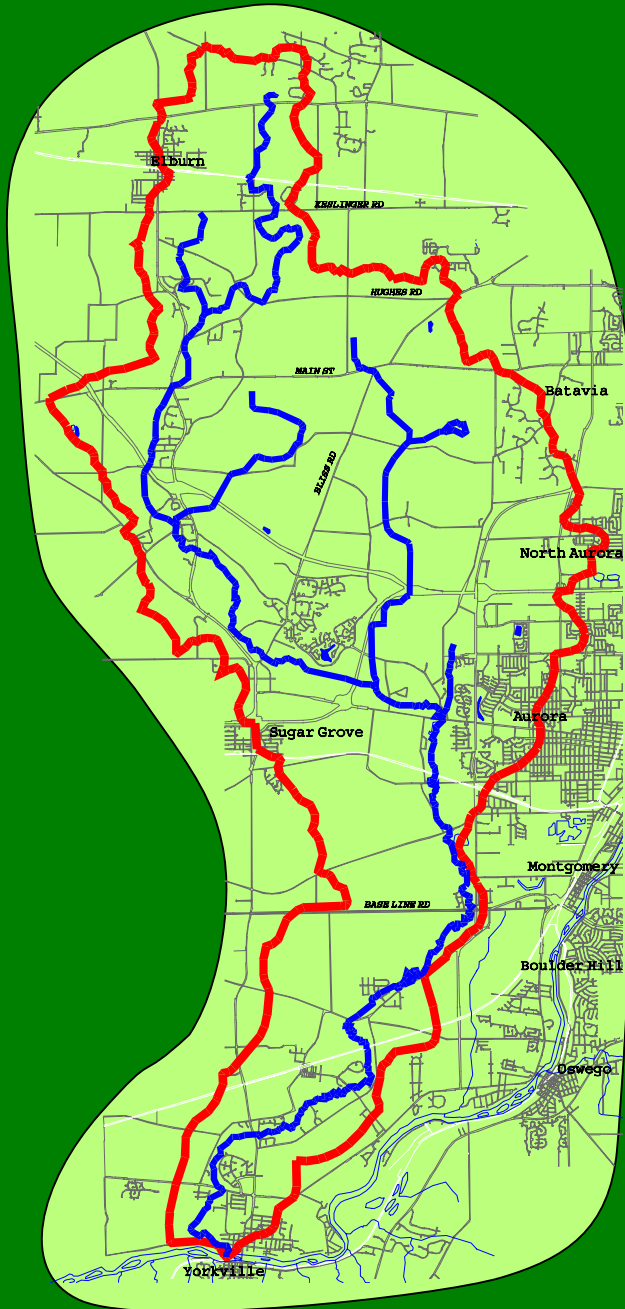
CRAM Watershed Profile

- Seeps
- Depression
- Riverine

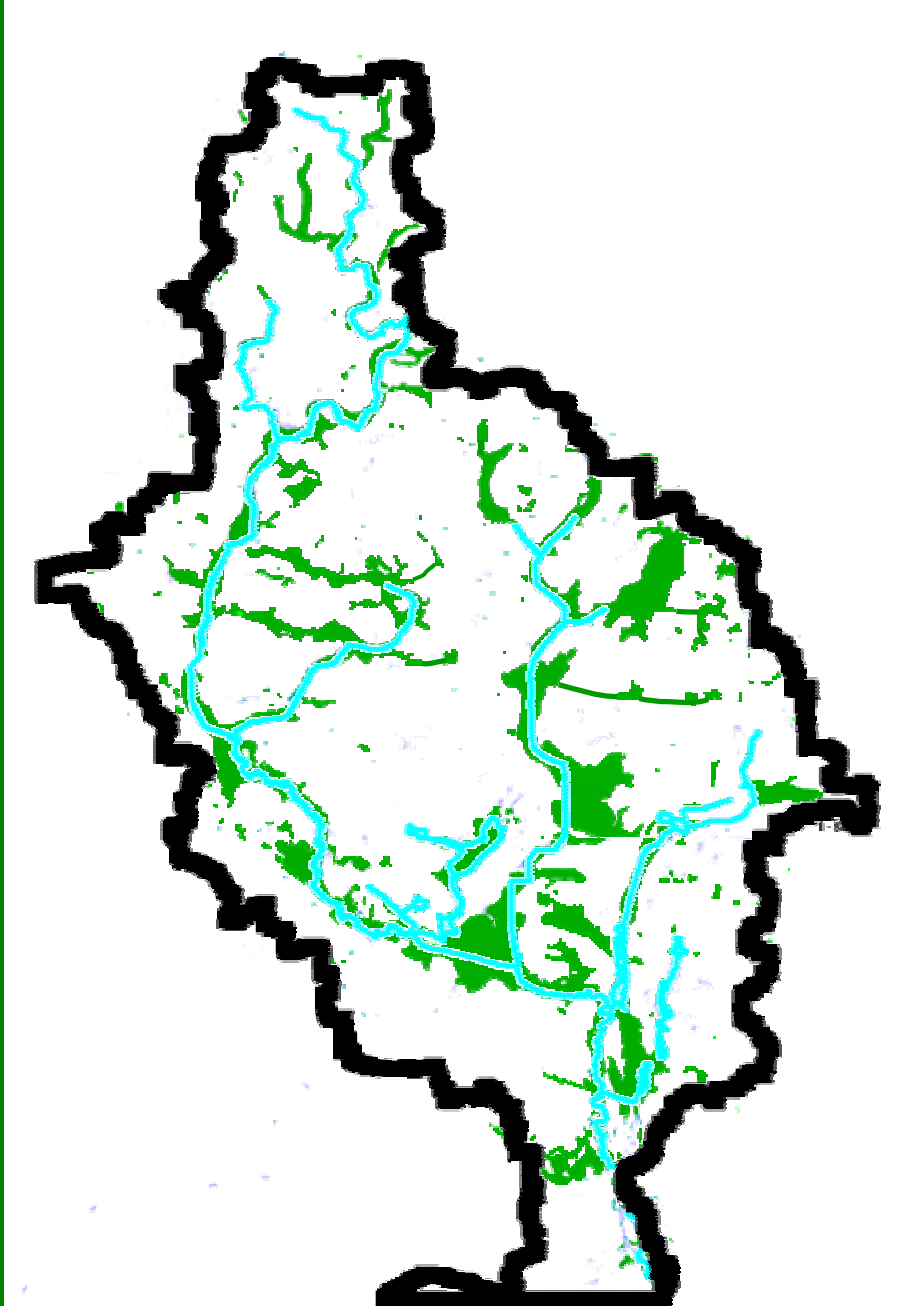


Blackberry Creek Watershed Alternative Futures Analysis

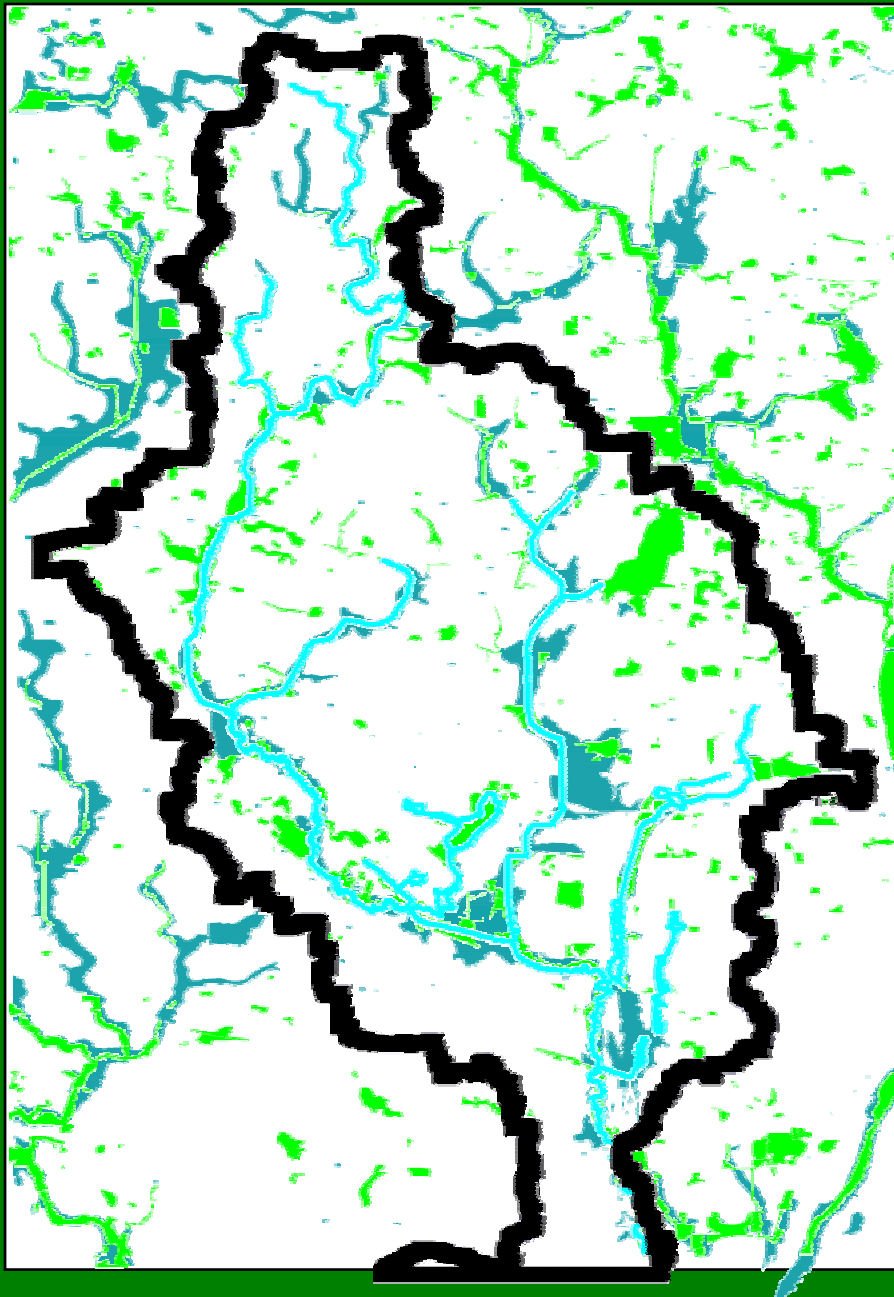
- Develop Potential Alternative Futures for the Watershed
- Evaluate the Hydrologic and Habitat Implications of those Futures



Water Resources Open Space Plan



Water Resources



Watershed Boundary



Blackberry Creek



Floodplain

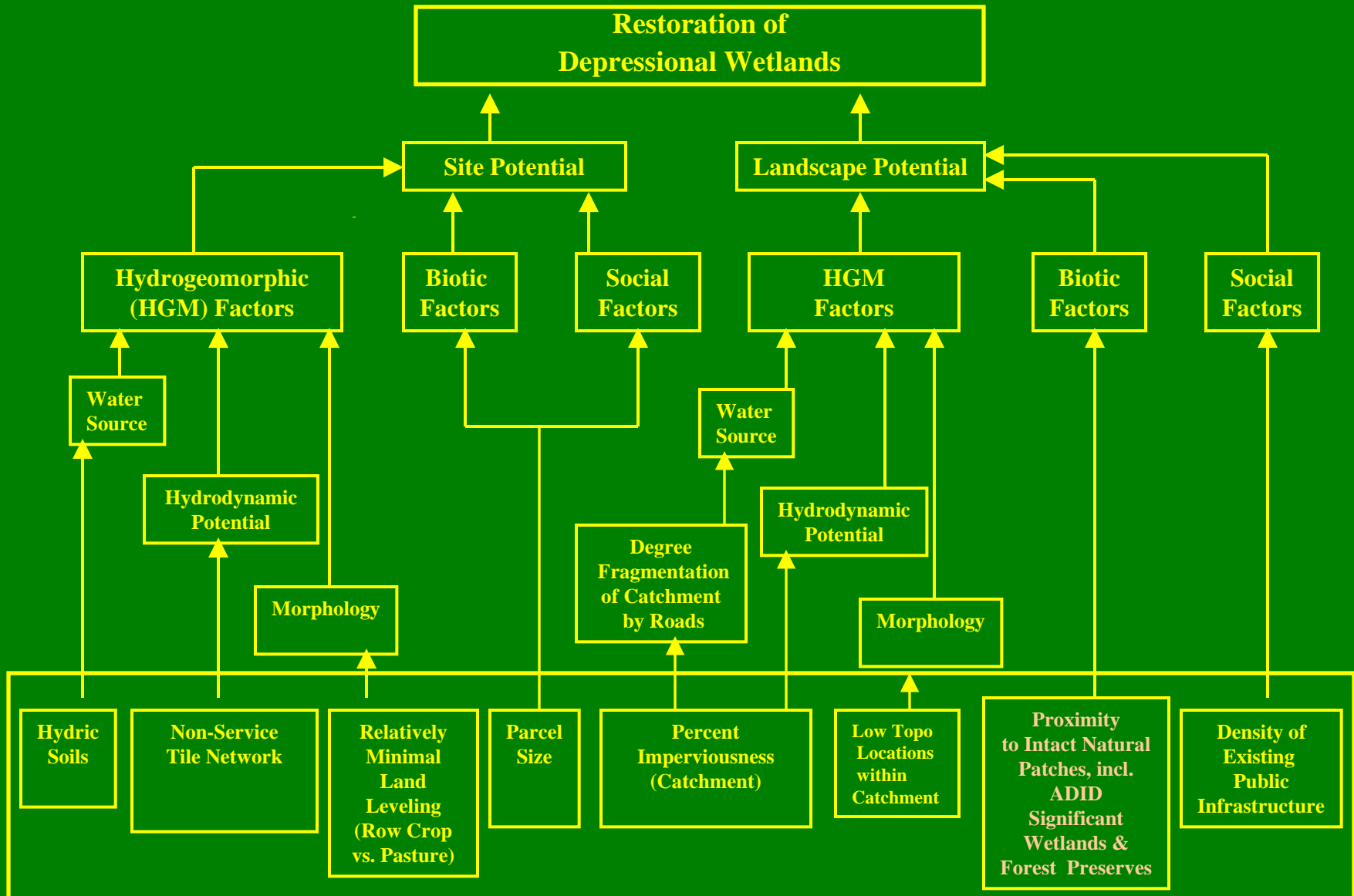


Wetlands

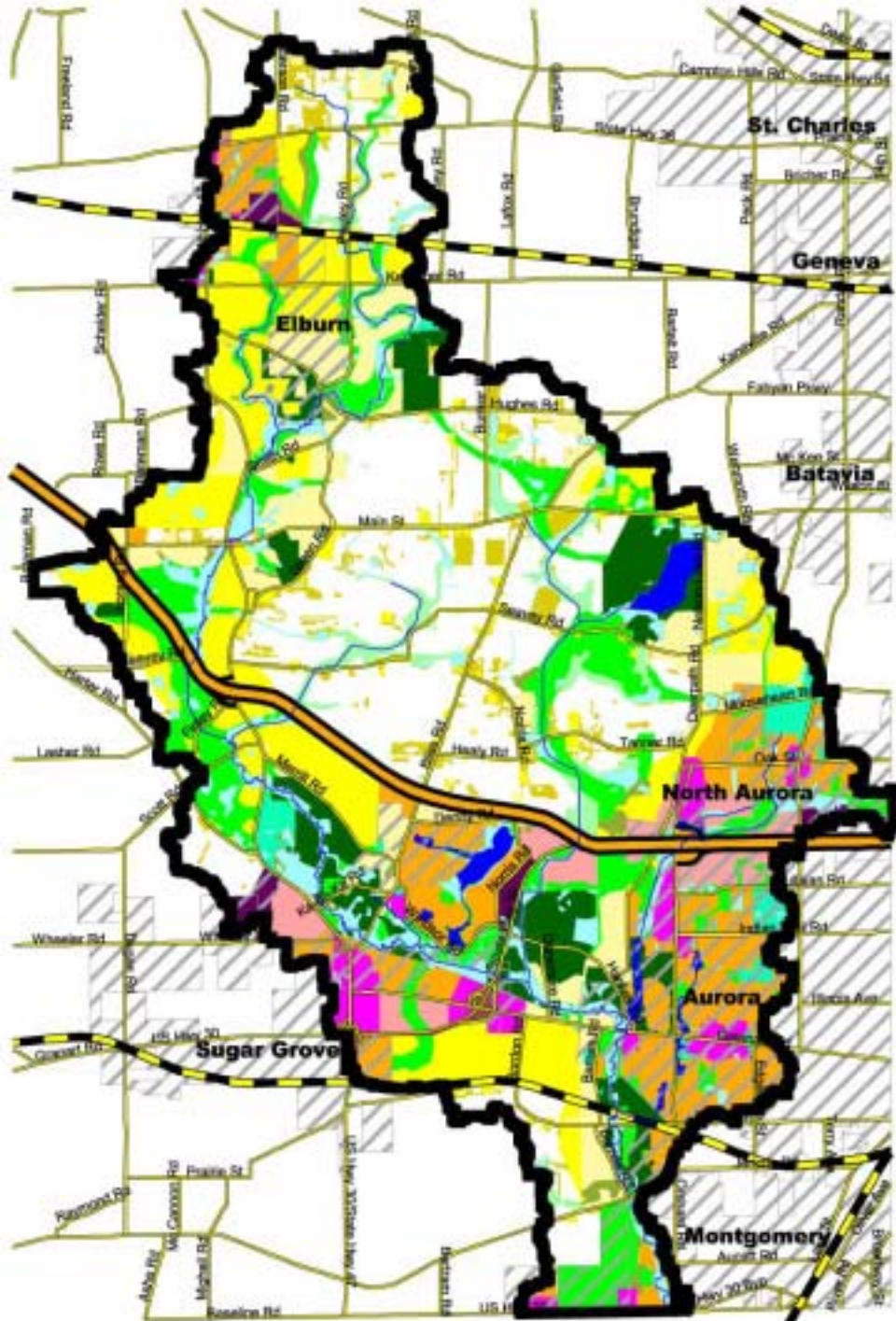


Hydric Soils

Allocation of Depressional Wetland Restoration Projects for the Blackberry Creek Watershed: A Conceptual Model



Conservation Scenario



LEGEND

- Watershed Boundary
- Blackberry Creek
- Metra Rail Road
- Highway
- Major Road
- Municipalities

Conservation Scenario Land Use

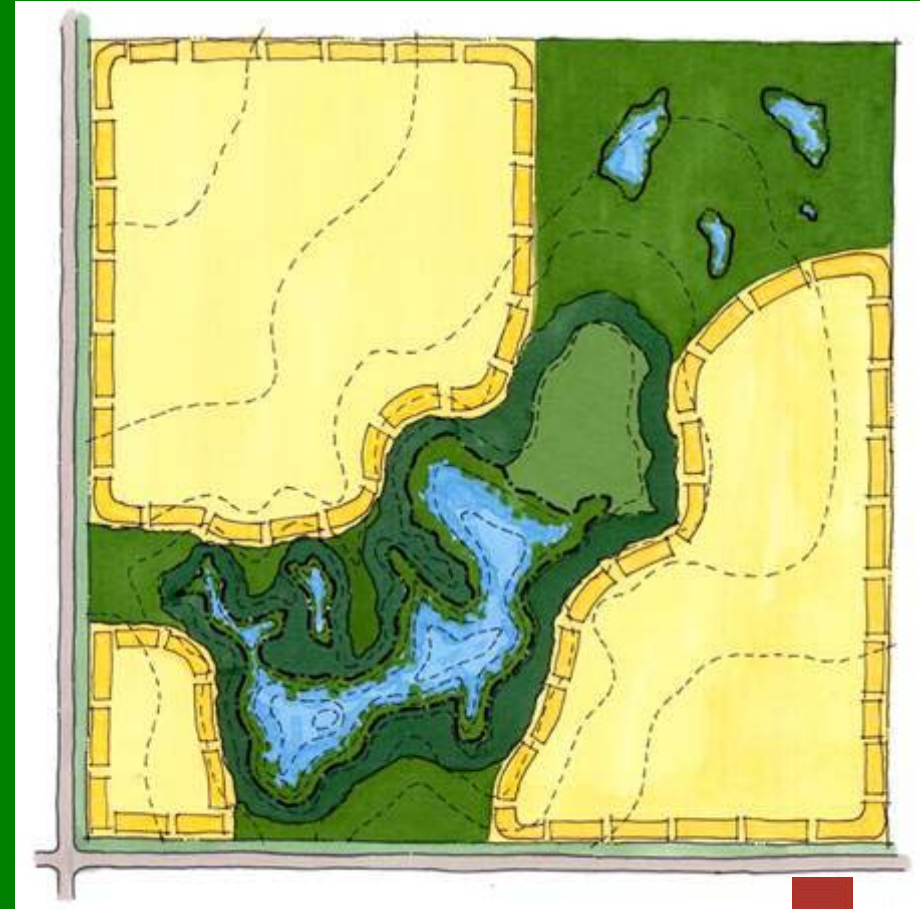
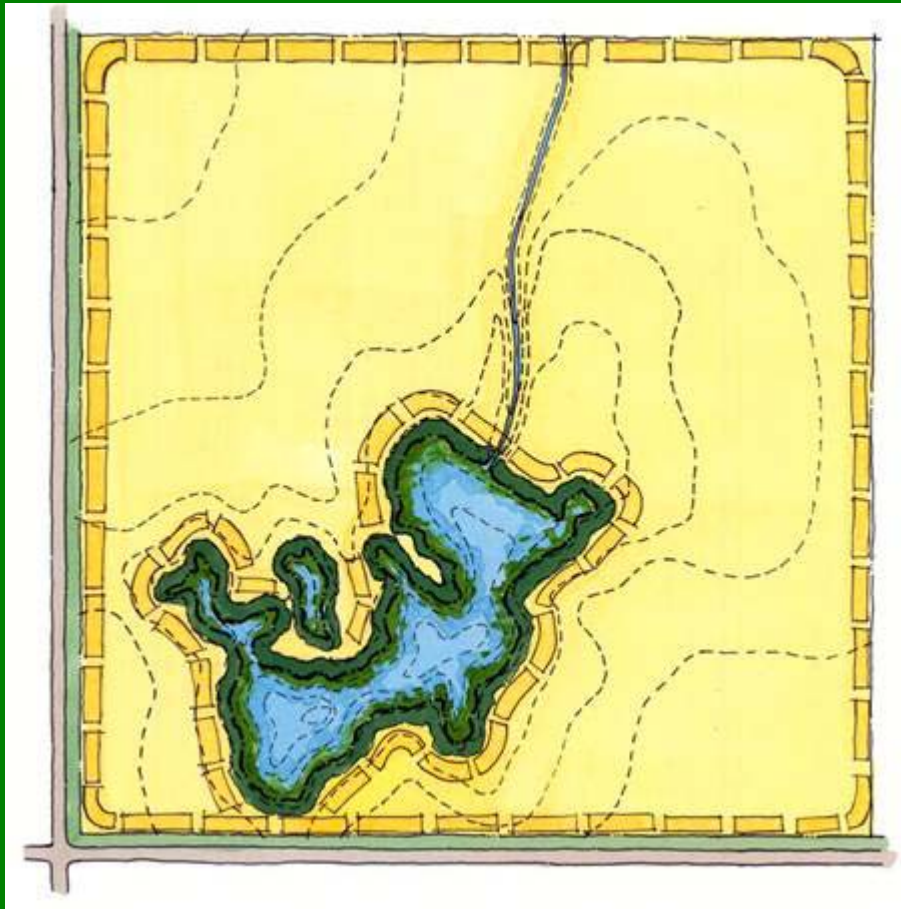
- Commercial
- Industrial
- Office/Research
- Institutional
- Transportation
- Urban Residential
- Rural Residential
- Estate Residential
- Agriculture
- Existing Rural Grassland
- Forest Preserve
- Proposed Open Space
- Agriculture Resource Buffer
- Additional Open Space
- Wetland
- Water



Wetland Template

Conventional

Conservation



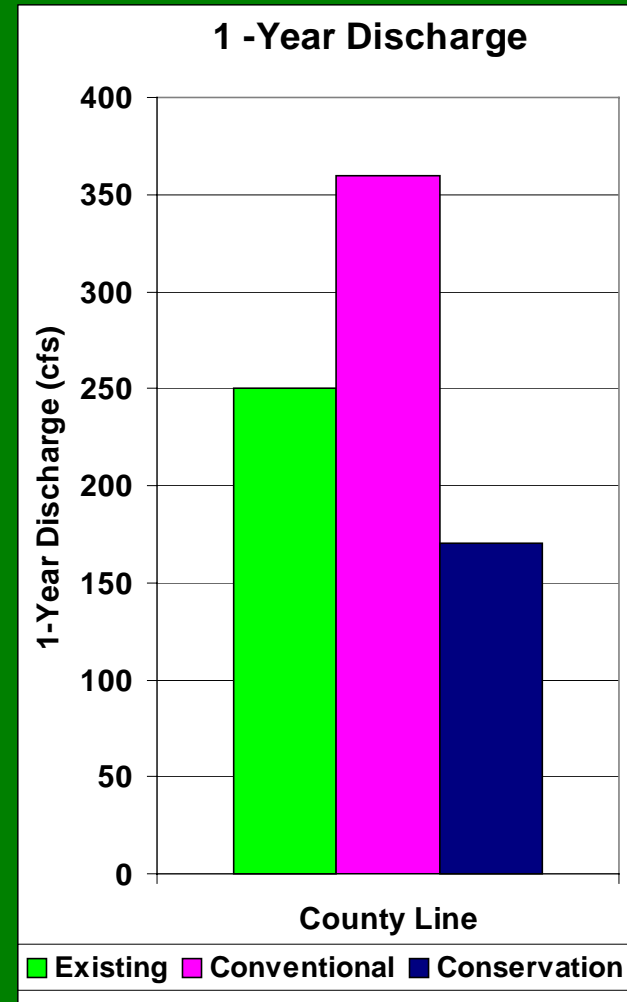
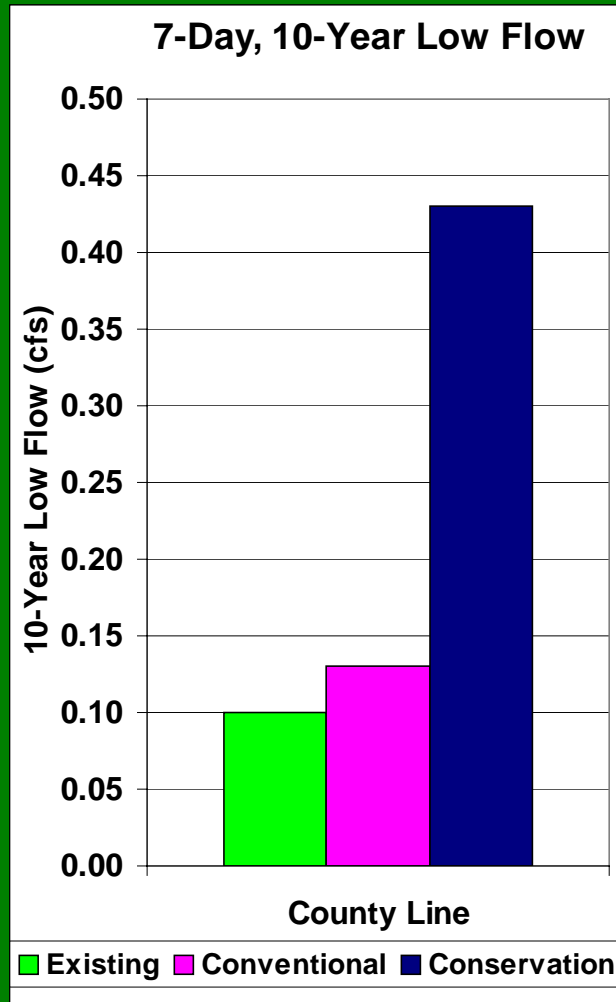
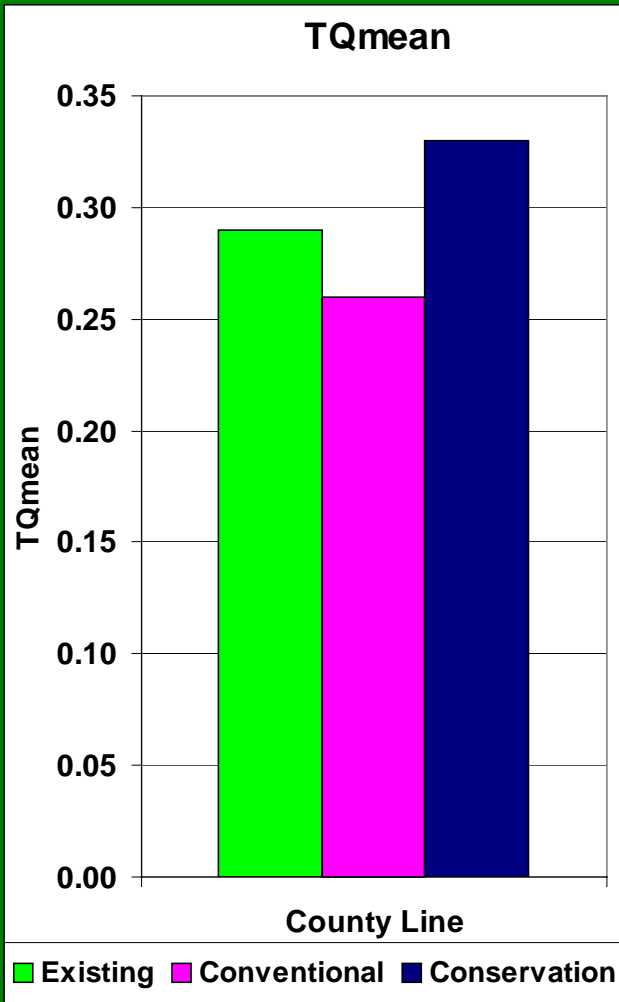
Moderate Density Residential

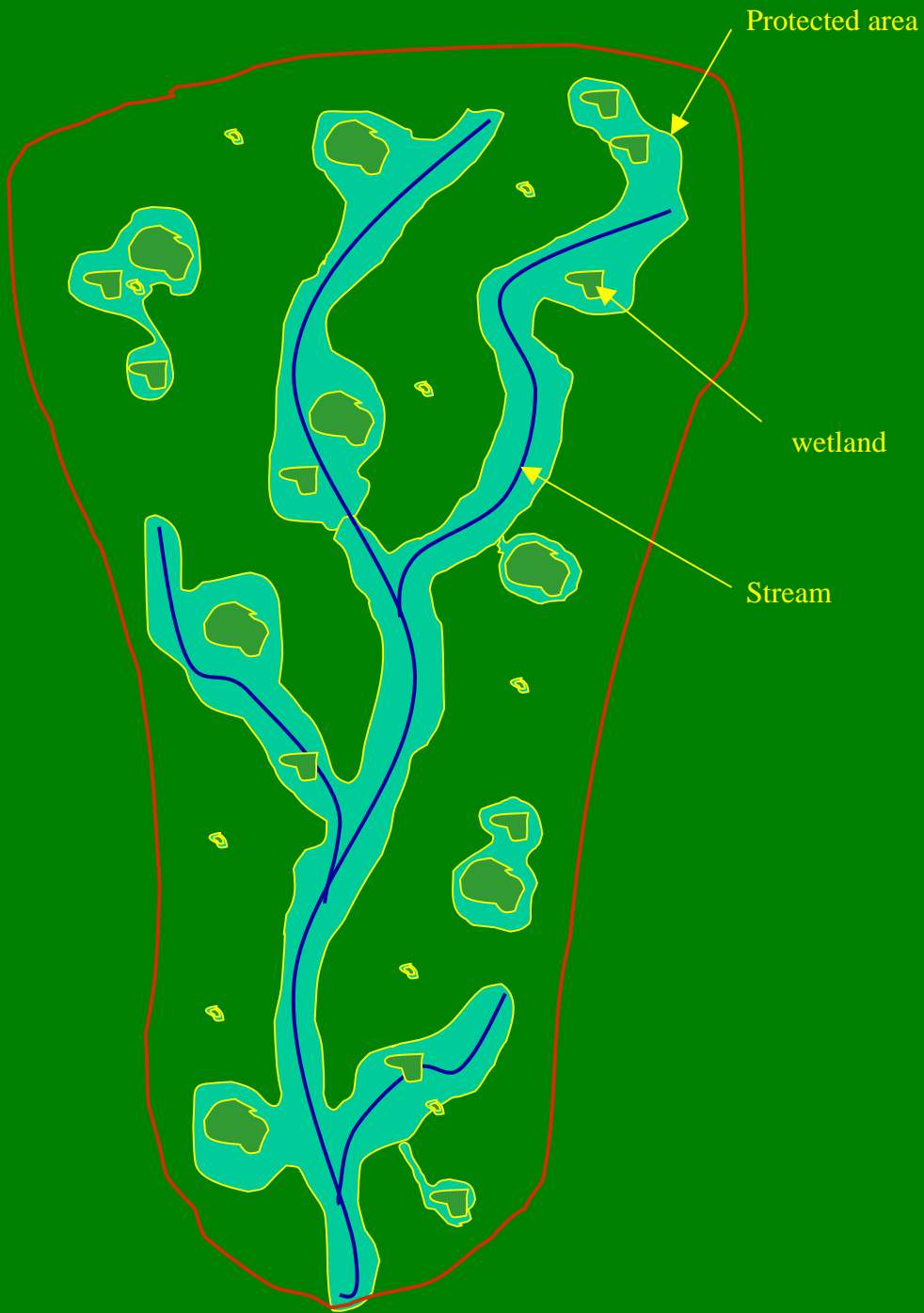
Conventional

Conservation



Evaluation Results





$$\begin{aligned} & \text{SAMP or ADID} \\ & + \\ & \text{Alternative Futures} \\ & = \\ & \text{Compensatory} \\ & \text{Mitigation in a} \\ & \text{Watershed Context} \end{aligned}$$