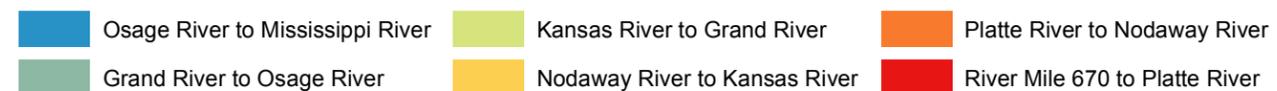
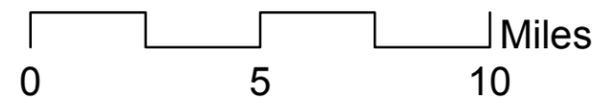
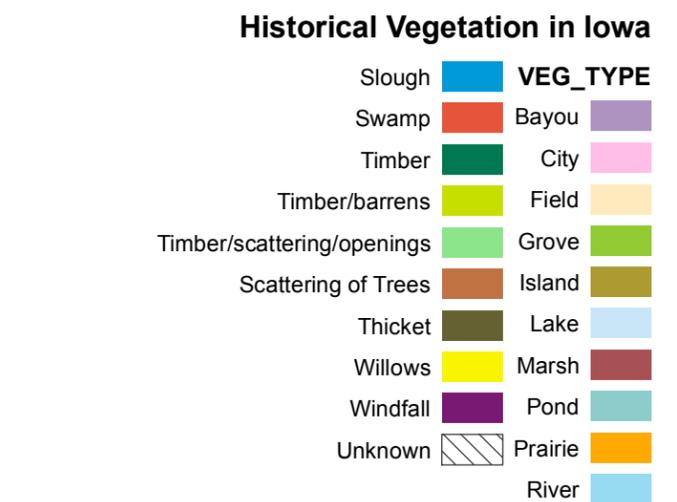
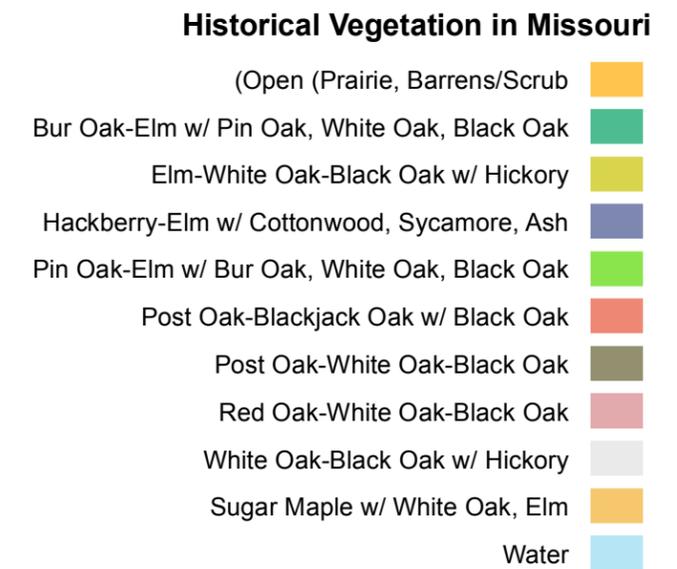
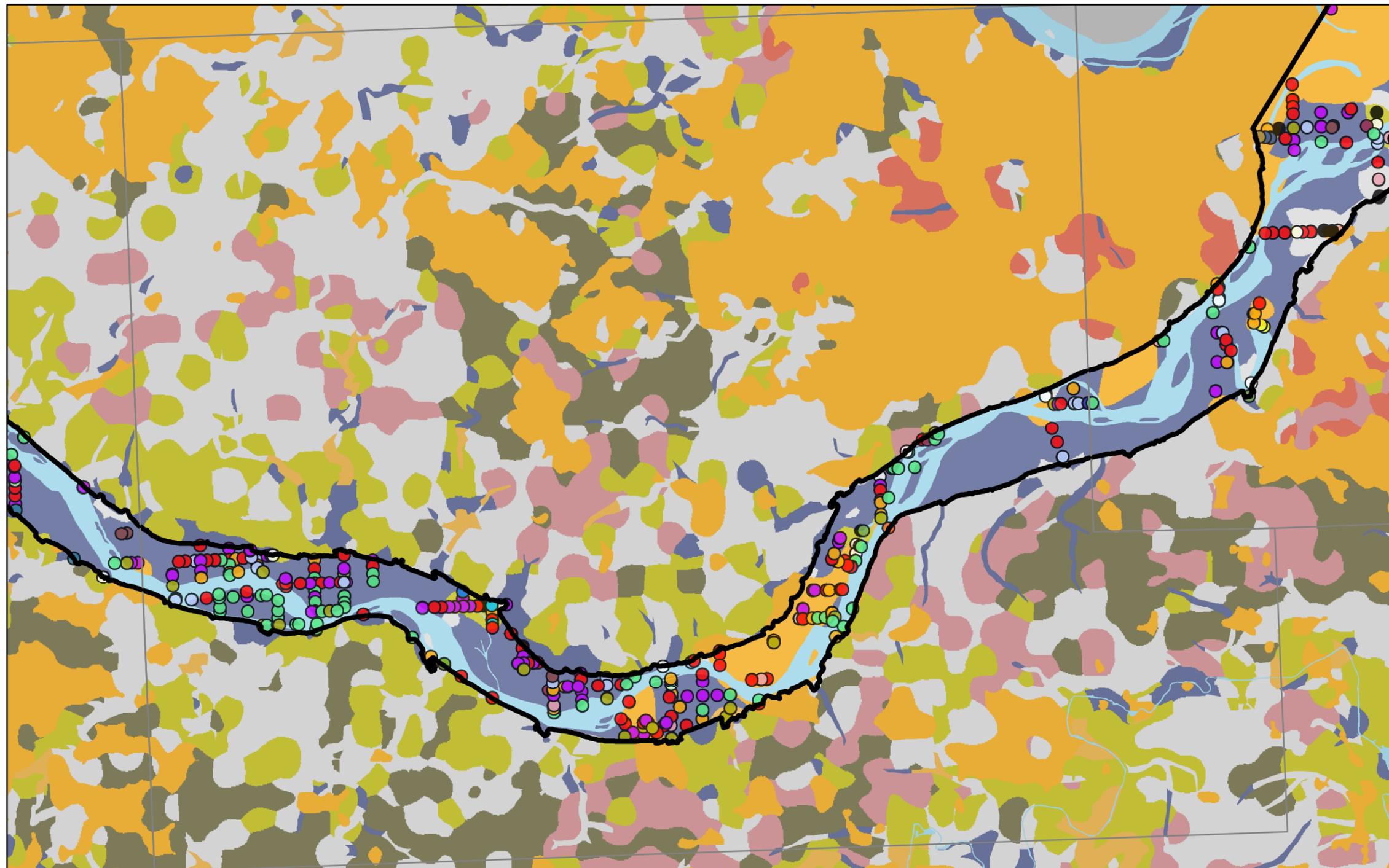
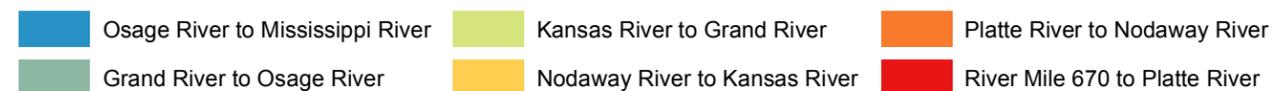
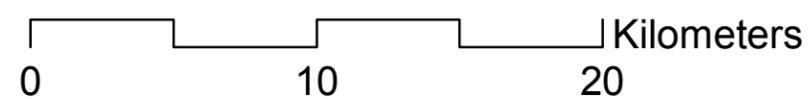
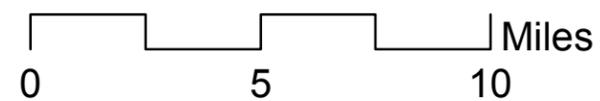


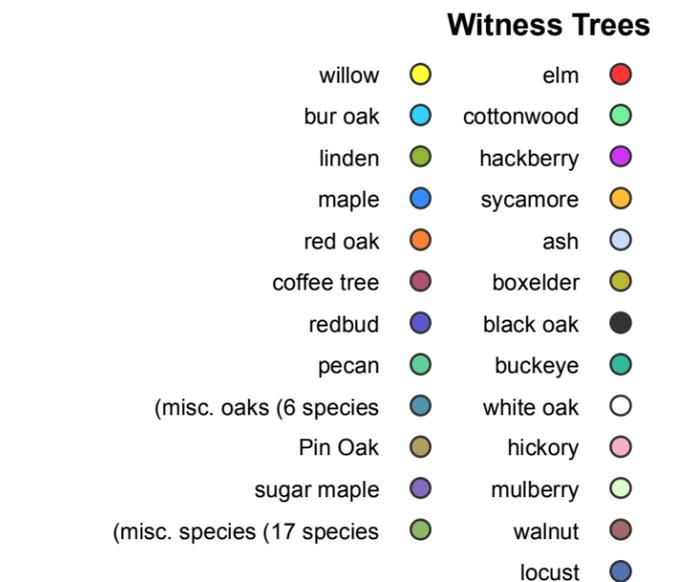
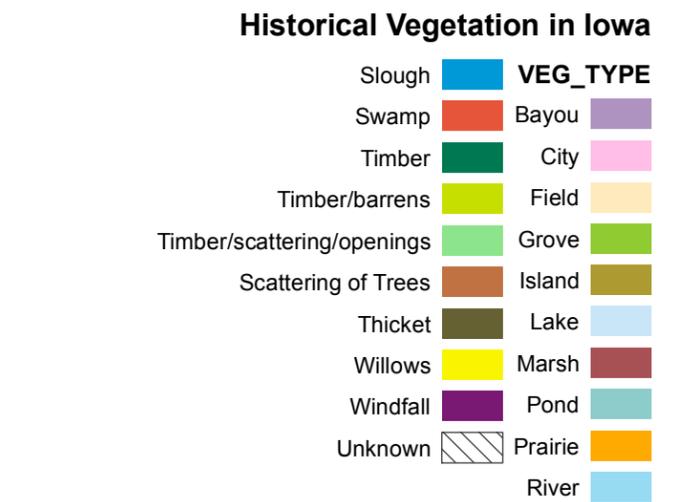
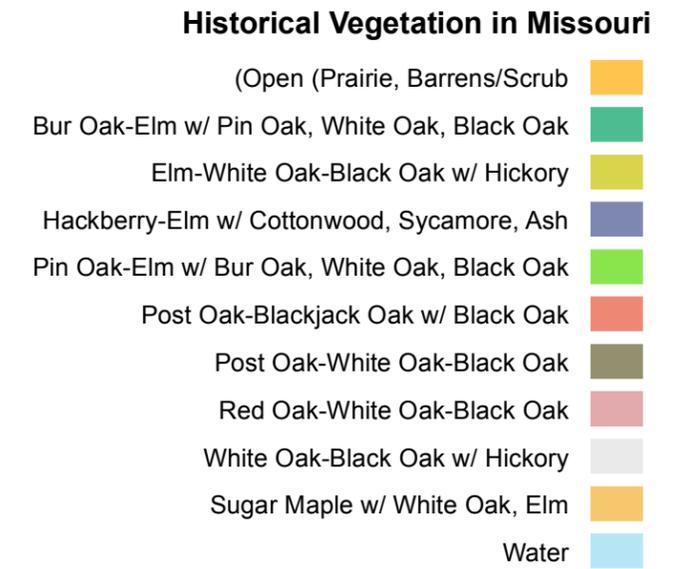
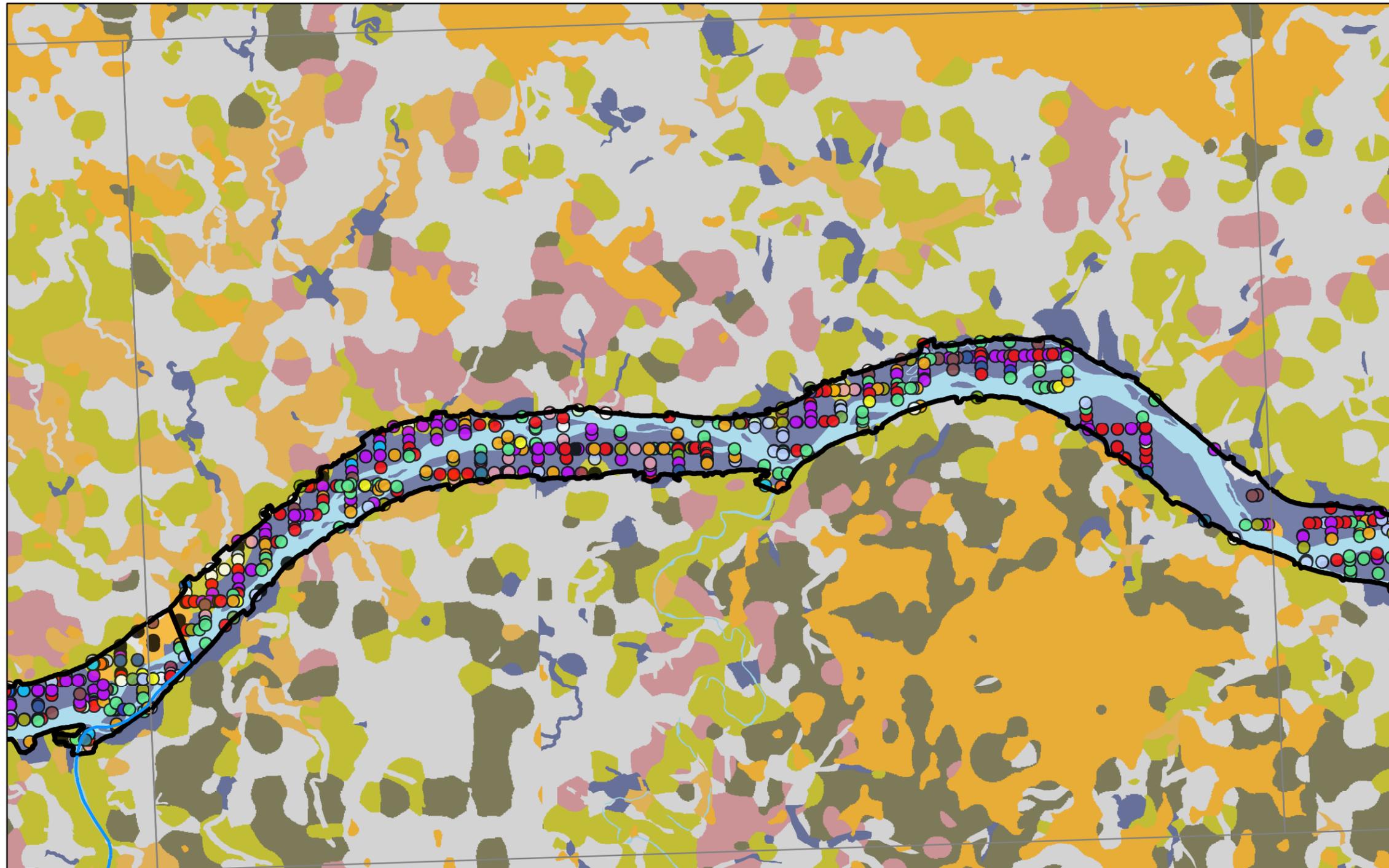
## MS-10 Potential Historical Vegetation



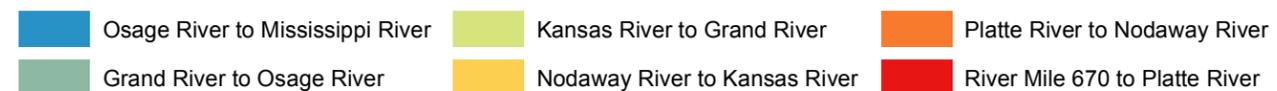
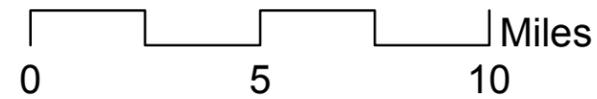


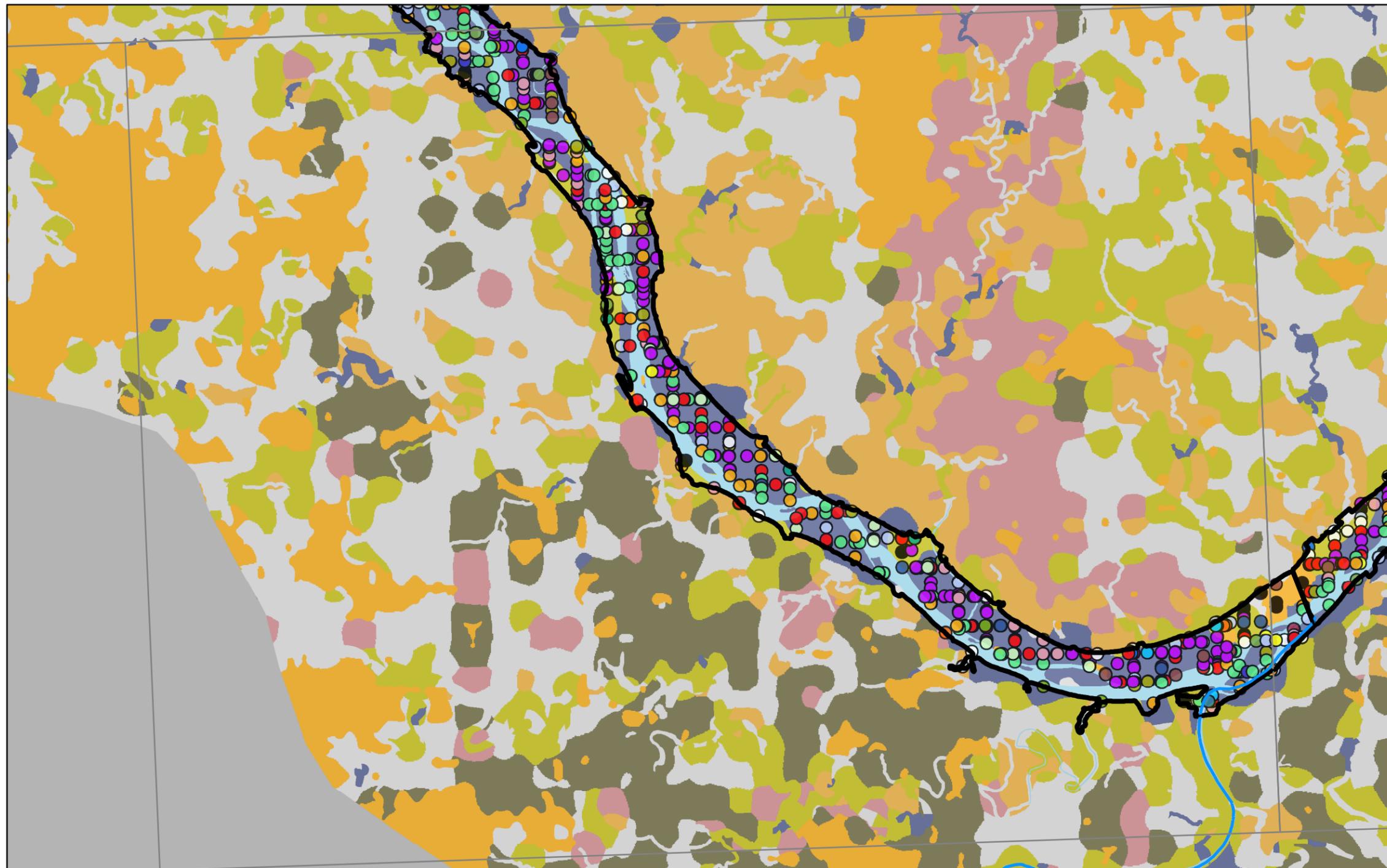
## MS-10 Potential Historical Vegetation





## MS-10 Potential Historical Vegetation





### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

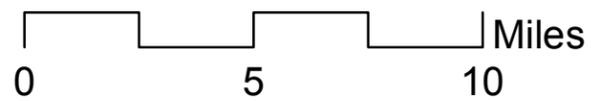
- |                            |  |   |
|----------------------------|--|---|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                   |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>       |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>          |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: orangeyellow;">■</span> |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>        |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>       |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>     |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>       |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>          |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>     |
|                            |  | River <span style="color: lightblue;">■</span>    |

### Witness Trees

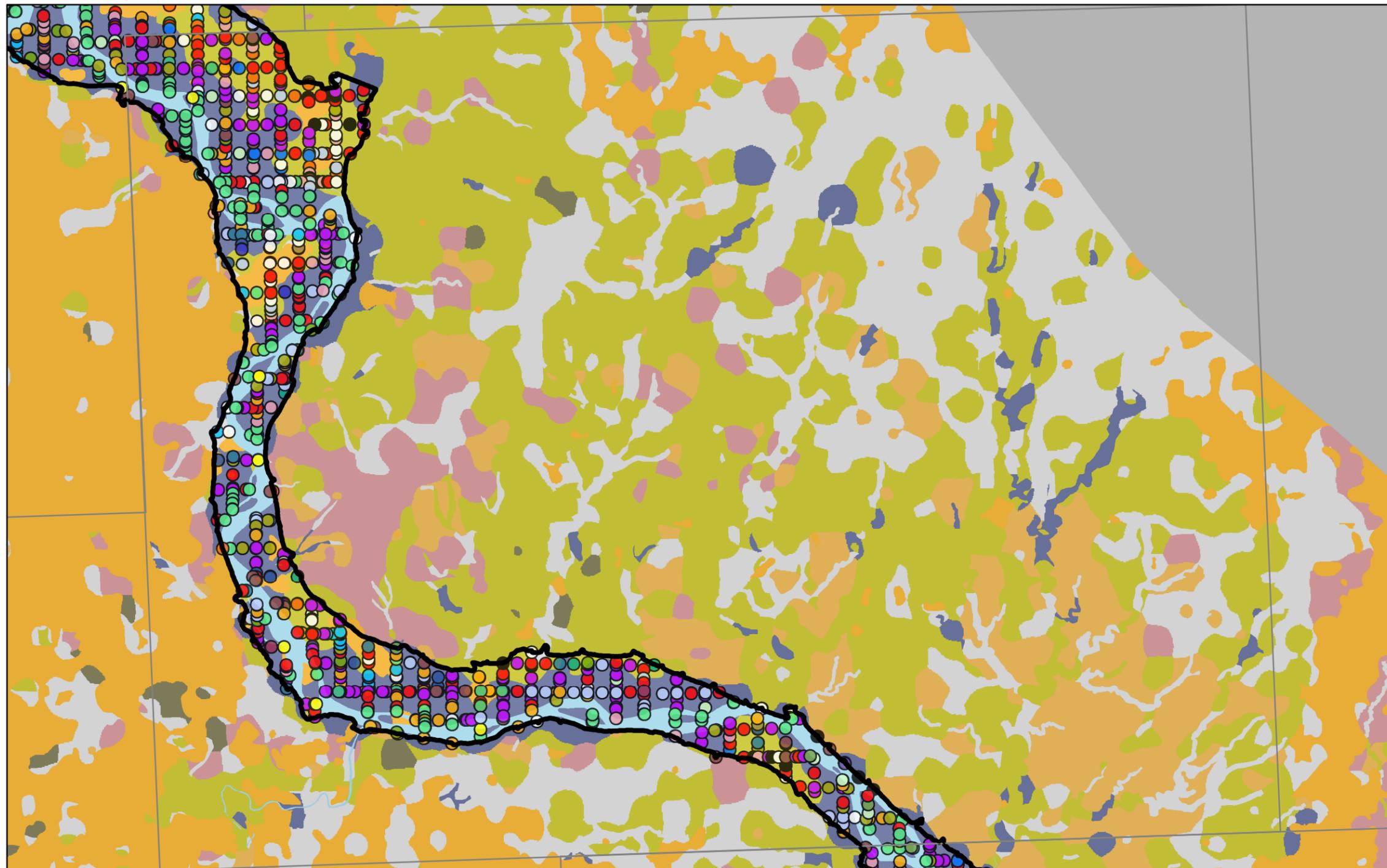
- |                             |   |            |   |
|-----------------------------|---|------------|---|
| willow                      | <span style="color: yellow;">●</span>     | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>       | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: lightgreen;">●</span> | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>       | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span>     | ash        | <span style="color: lightblue;">●</span>  |
| coffee tree                 | <span style="color: maroon;">●</span>     | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: blue;">●</span>       | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>       | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: blue;">●</span>       | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>      | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span>     | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>      | walnut     | <span style="color: brown;">●</span>      |
|                             |   | locust     | <span style="color: blue;">●</span>       |



## MS-10 Potential Historical Vegetation



- |  |   |   |
|--|---|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River    | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: orangeyellow;">■</span> Nodaway River to Kansas River | <span style="color: red;">■</span> River Mile 670 to Platte River   |



### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

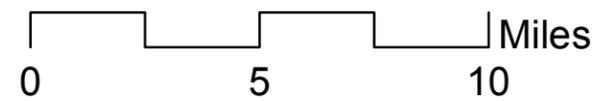
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                  |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>      |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>         |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: lightyellow;">■</span> |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>       |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>      |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>    |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>      |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>         |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>    |
|                            |  | River <span style="color: lightblue;">■</span>   |

### Witness Trees

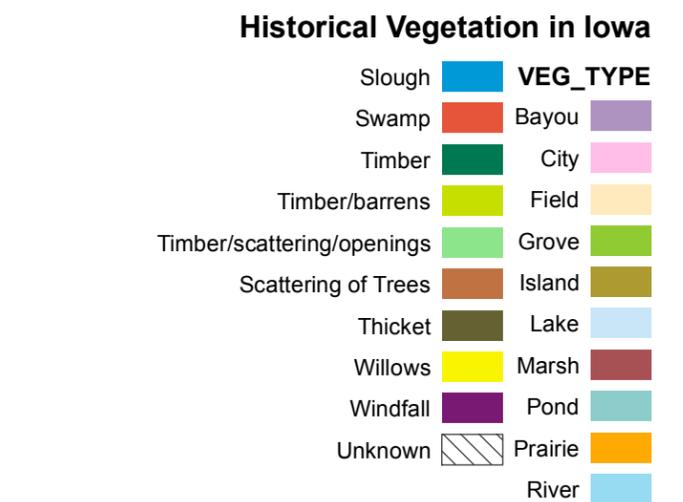
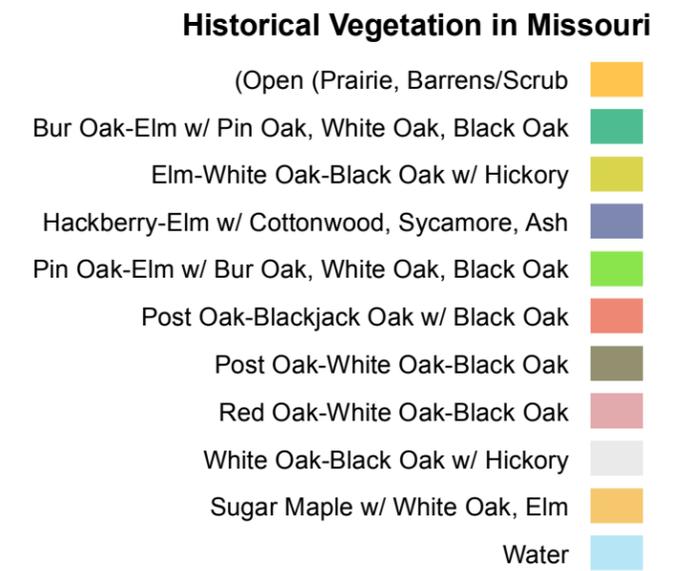
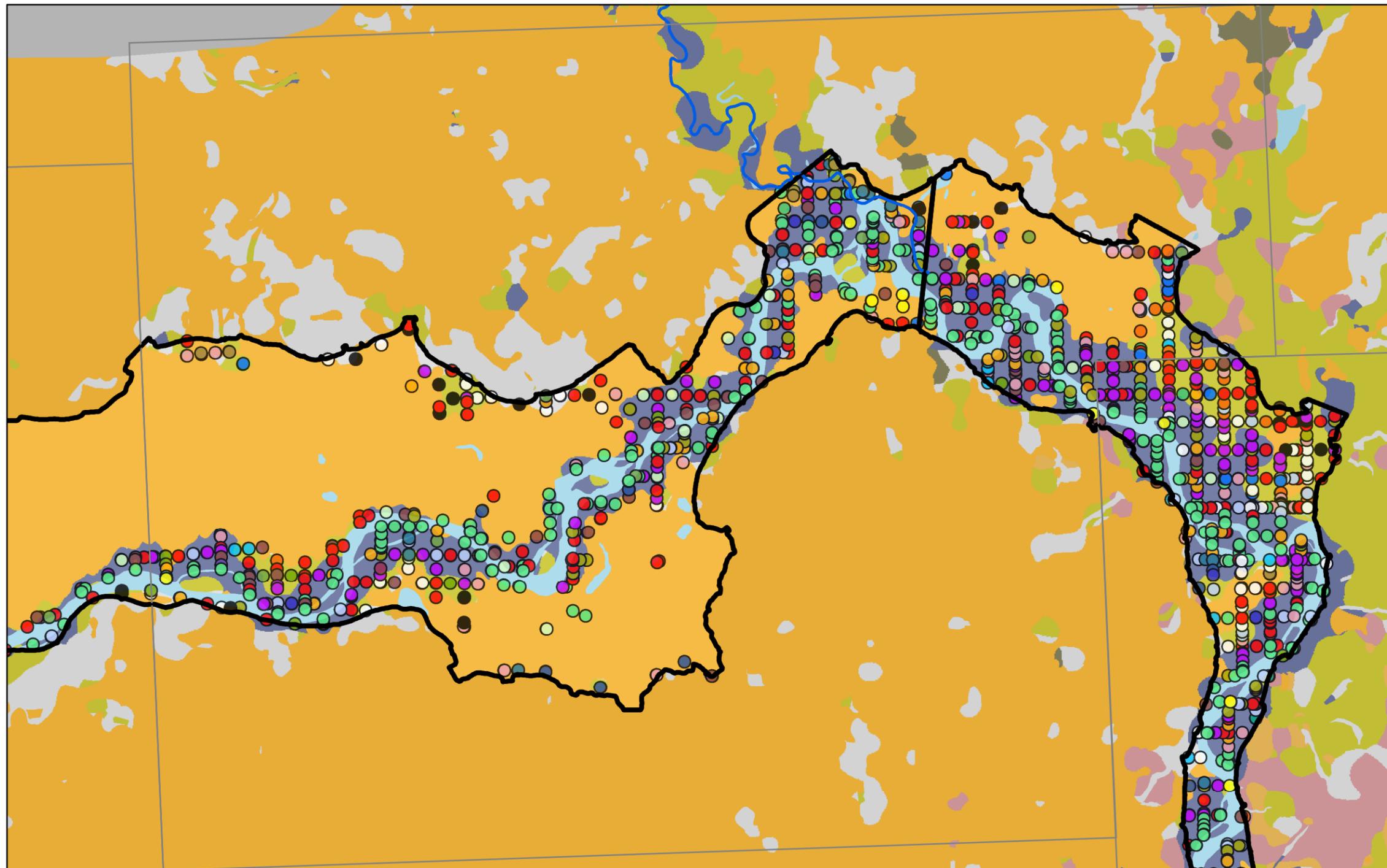
- |                             |  |            |   |
|-----------------------------|--|------------|---|
| willow                      | <span style="color: yellow;">●</span>    | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>      | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: olive;">●</span>     | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>      | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span>    | ash        | <span style="color: lightblue;">●</span>  |
| coffee tree                 | <span style="color: maroon;">●</span>    | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: blue;">●</span>      | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>      | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: lightblue;">●</span> | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>     | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span>    | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>     | walnut     | <span style="color: brown;">●</span>      |
|                             |  | locust     | <span style="color: blue;">●</span>       |



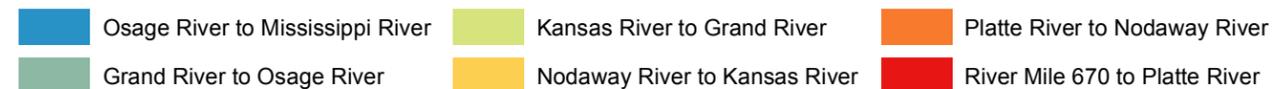
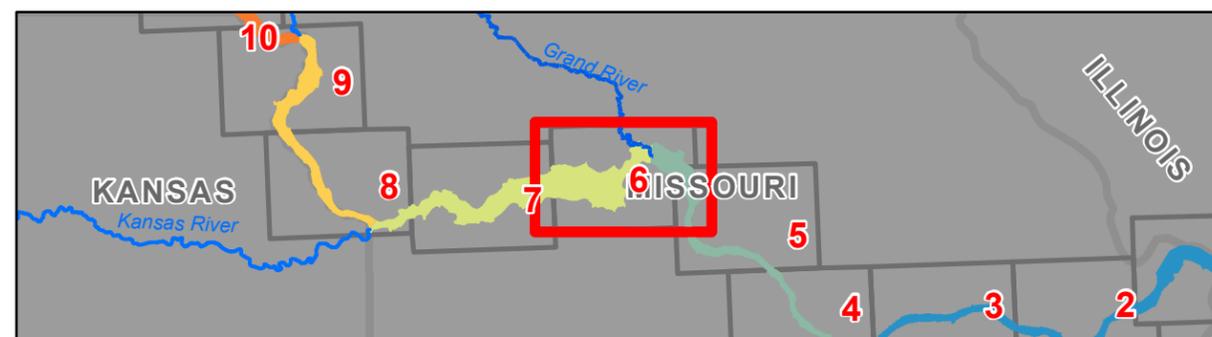
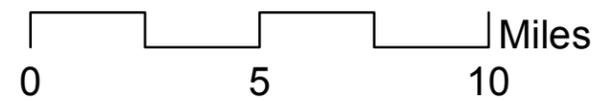
## MS-10 Potential Historical Vegetation

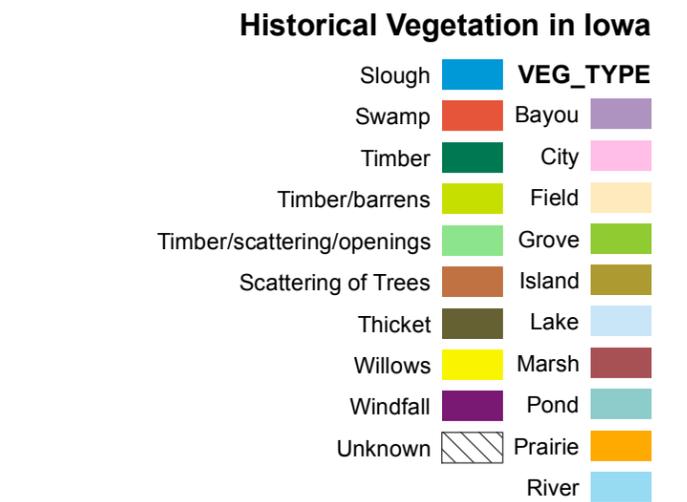
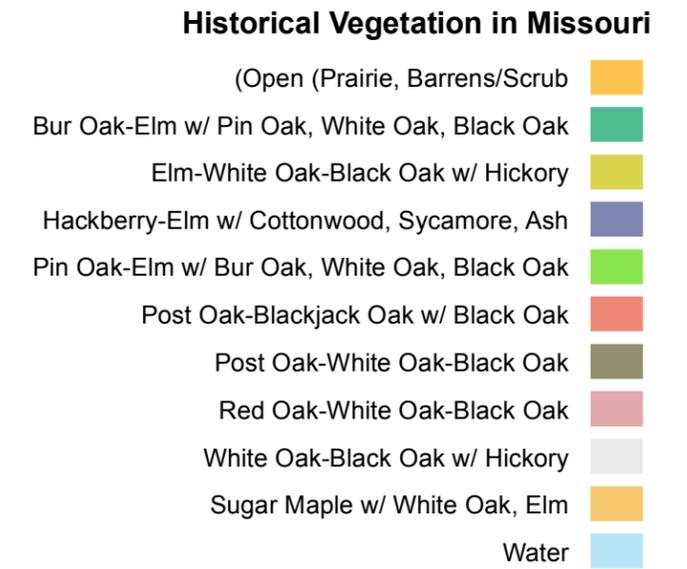
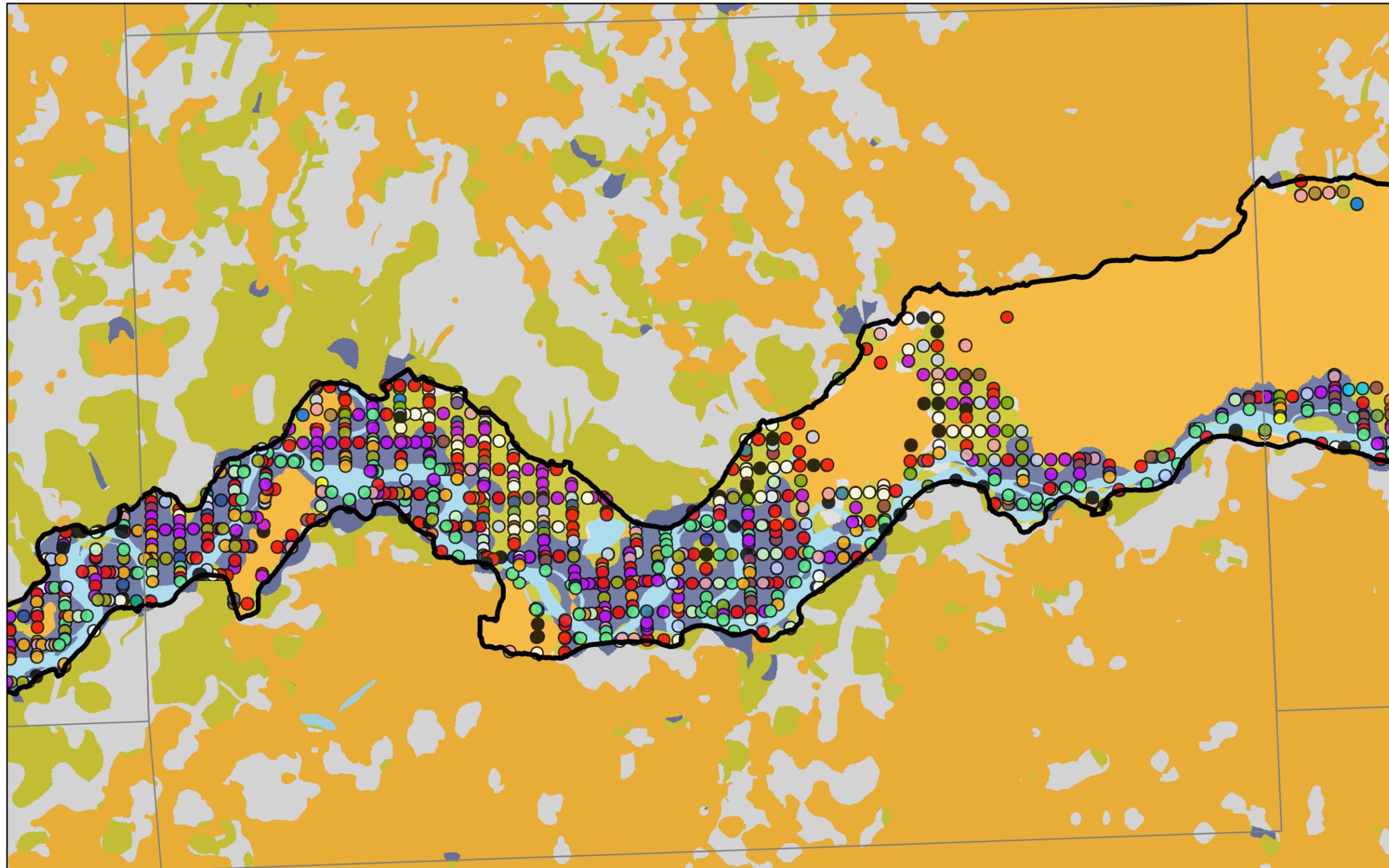


- |  |  |   |
|--|--|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: yellow;">■</span> Nodaway River to Kansas River    | <span style="color: red;">■</span> River Mile 670 to Platte River   |

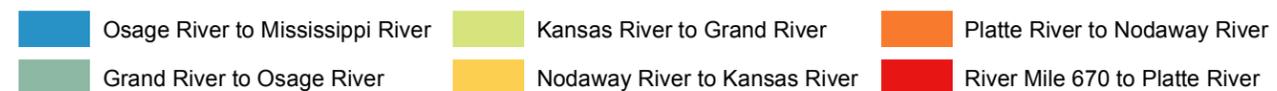
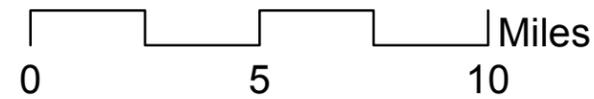


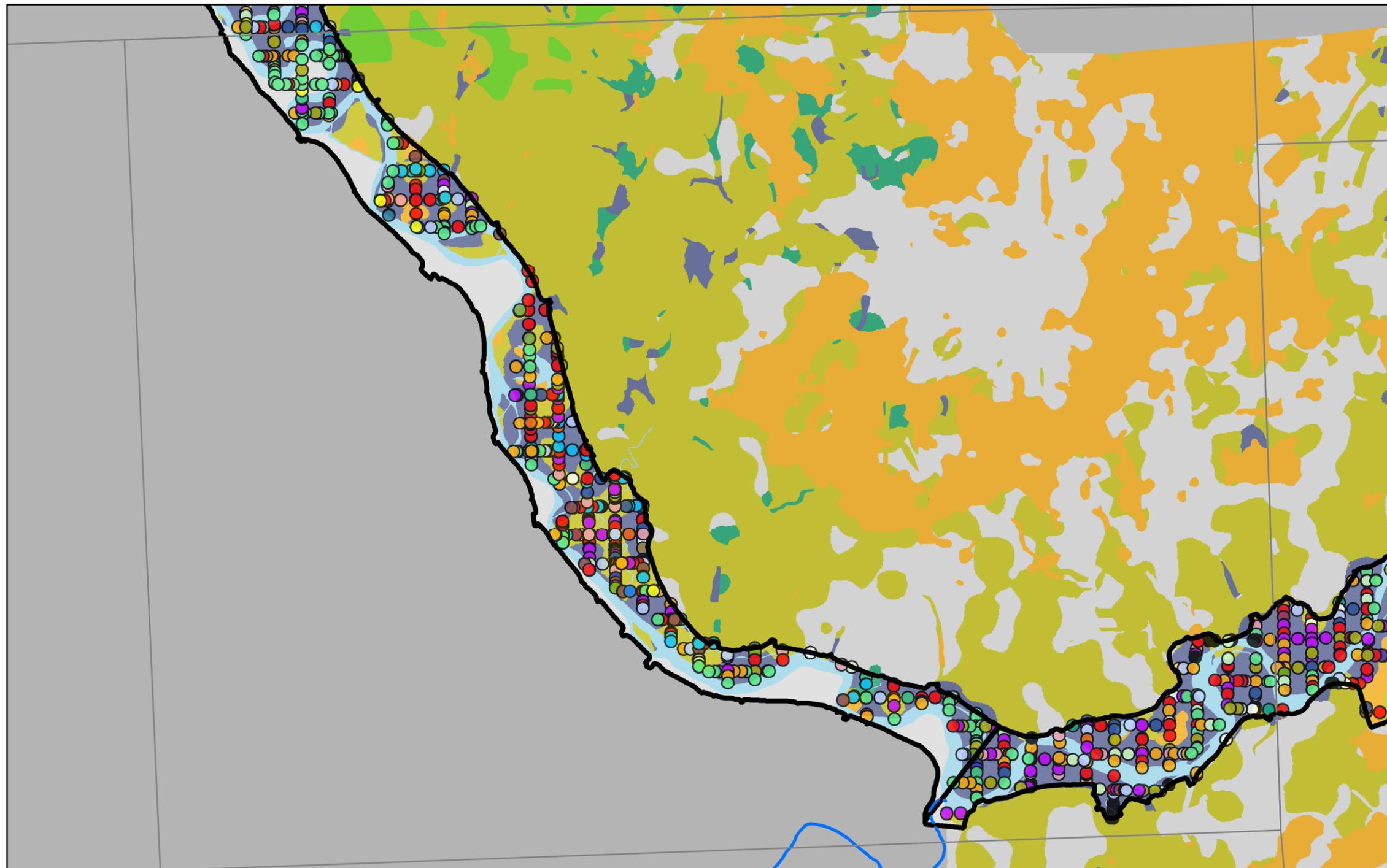
## MS-10 Potential Historical Vegetation





## MS-10 Potential Historical Vegetation





### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

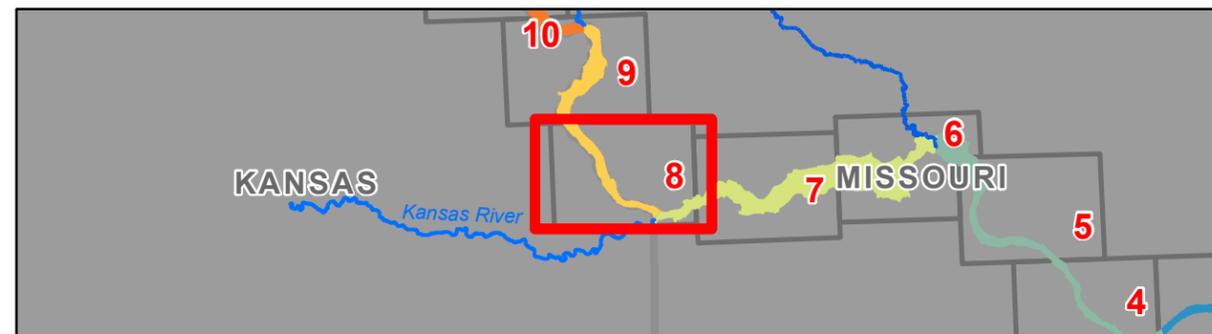
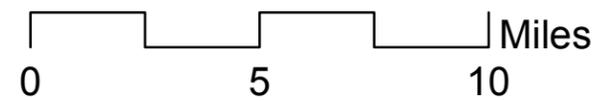
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>    |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>       |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: orange;">■</span>    |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>     |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>    |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>  |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>    |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>       |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>  |
|                            |  | River <span style="color: lightblue;">■</span> |

### Witness Trees

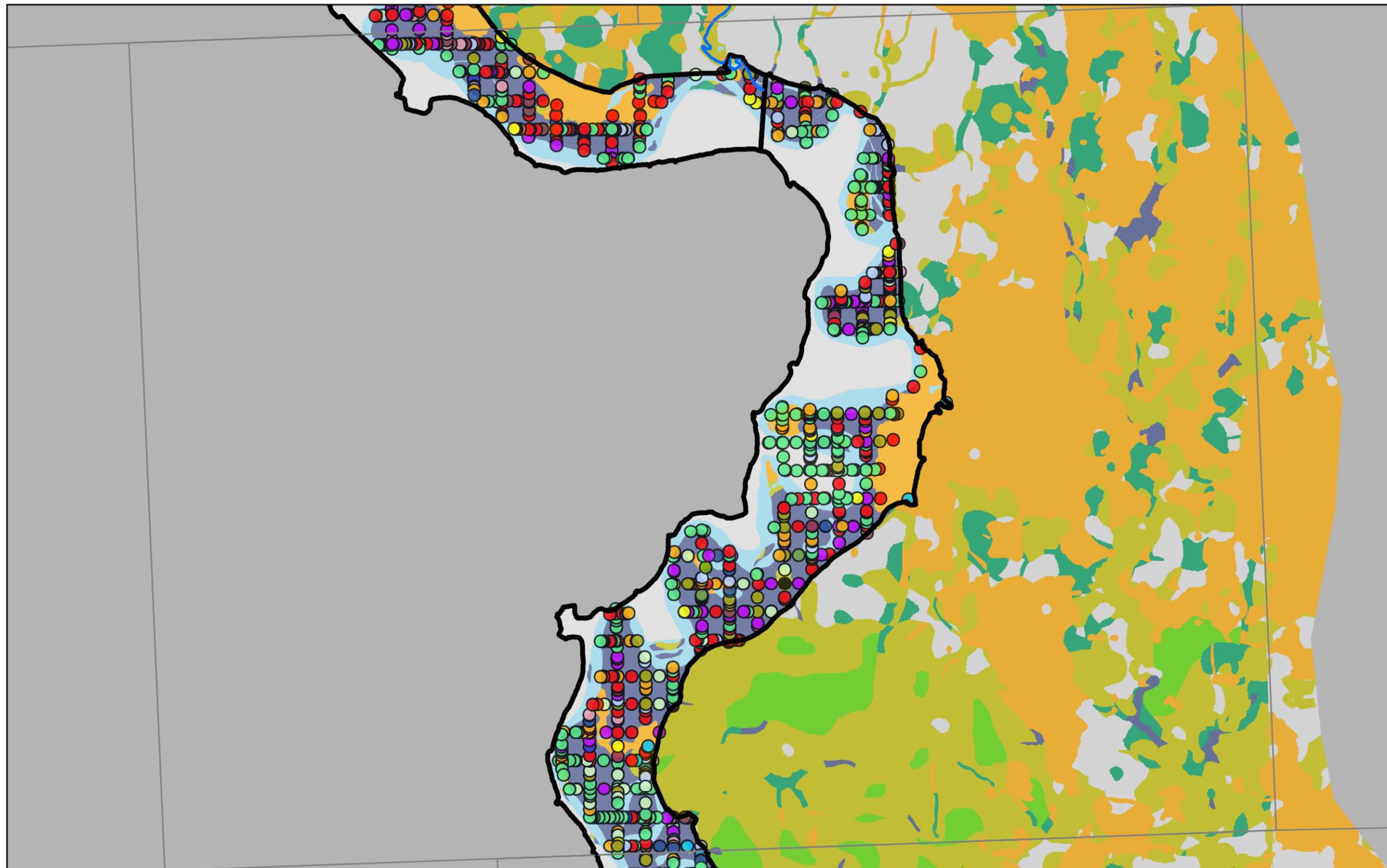
- |                             |   |            |   |
|-----------------------------|---|------------|---|
| willow                      | <span style="color: yellow;">●</span>     | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>       | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: lightgreen;">●</span> | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>       | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span>     | ash        | <span style="color: grey;">●</span>       |
| coffee tree                 | <span style="color: maroon;">●</span>     | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: purple;">●</span>     | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>       | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: blue;">●</span>       | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>      | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span>     | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>      | walnut     | <span style="color: brown;">●</span>      |
|                             |   | locust     | <span style="color: blue;">●</span>       |



## MS-10 Potential Historical Vegetation



- |  |  |   |
|--|--|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: yellow;">■</span> Nodaway River to Kansas River    | <span style="color: red;">■</span> River Mile 670 to Platte River   |



### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

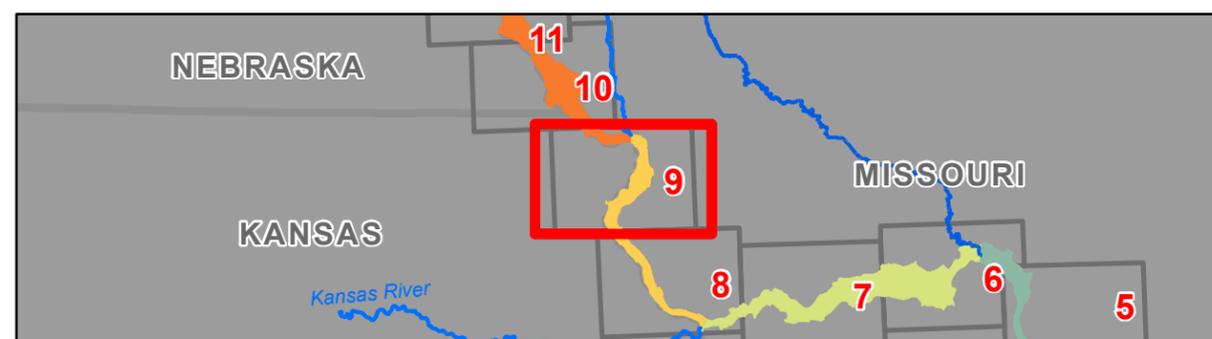
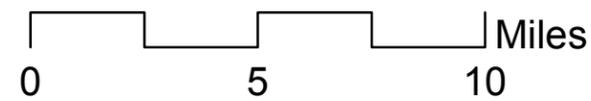
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                  |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>      |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>         |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: lightyellow;">■</span> |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>       |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>      |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>    |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>      |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>         |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>    |
|                            |  | River <span style="color: lightblue;">■</span>   |

### Witness Trees

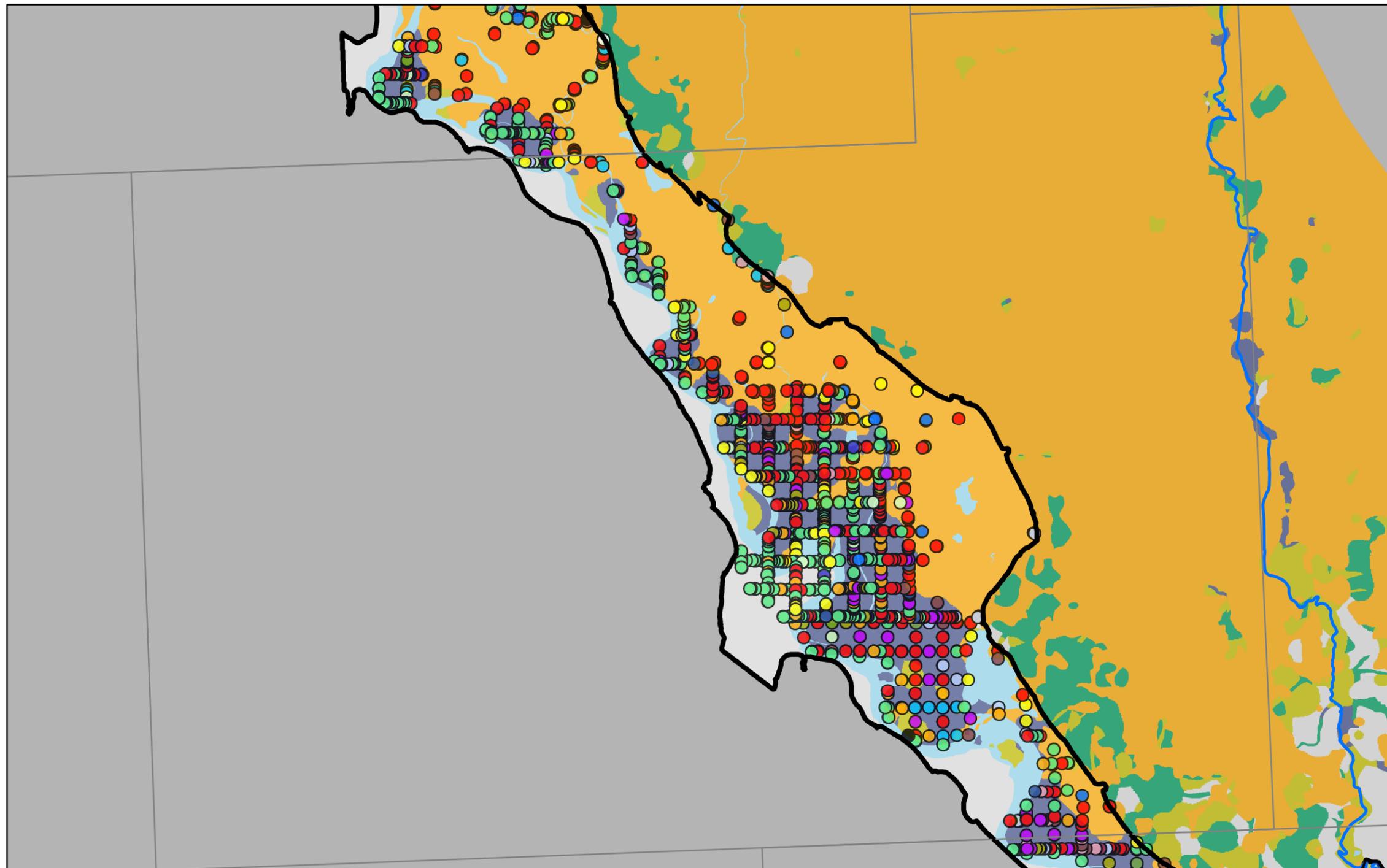
- |                             |  |            |   |
|-----------------------------|--|------------|---|
| willow                      | <span style="color: yellow;">●</span>    | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>      | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: olive;">●</span>     | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>      | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span>    | ash        | <span style="color: lightblue;">●</span>  |
| coffee tree                 | <span style="color: maroon;">●</span>    | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: purple;">●</span>    | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>      | buckeye    | <span style="color: teal;">●</span>       |
| (misc. oaks (6 species)     | <span style="color: lightblue;">●</span> | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>     | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span>    | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>     | walnut     | <span style="color: brown;">●</span>      |
|                             |  | locust     | <span style="color: blue;">●</span>       |



## MS-10 Potential Historical Vegetation



- |  |  |   |
|--|--|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: yellow;">■</span> Nodaway River to Kansas River    | <span style="color: red;">■</span> River Mile 670 to Platte River   |



### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

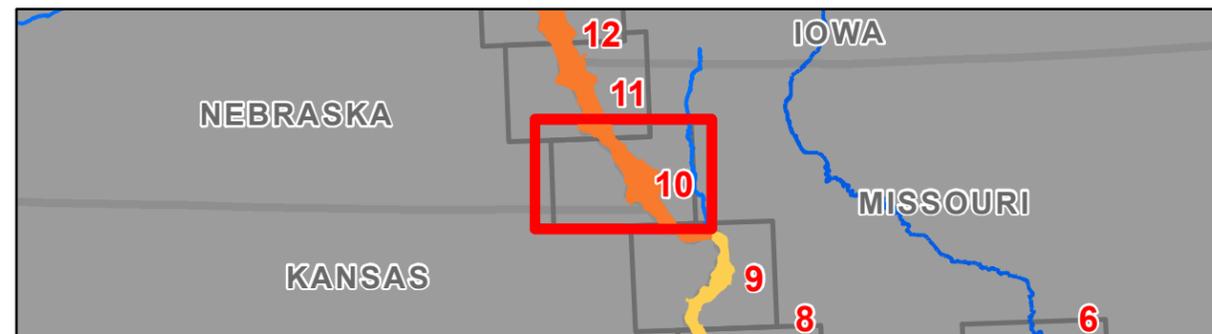
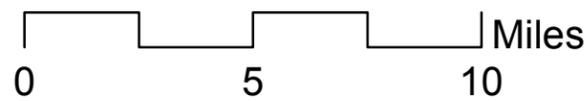
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                  |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>      |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>         |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: lightorange;">■</span> |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>       |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>      |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>    |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>      |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>         |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>    |
|                            |  | River <span style="color: lightblue;">■</span>   |

### Witness Trees

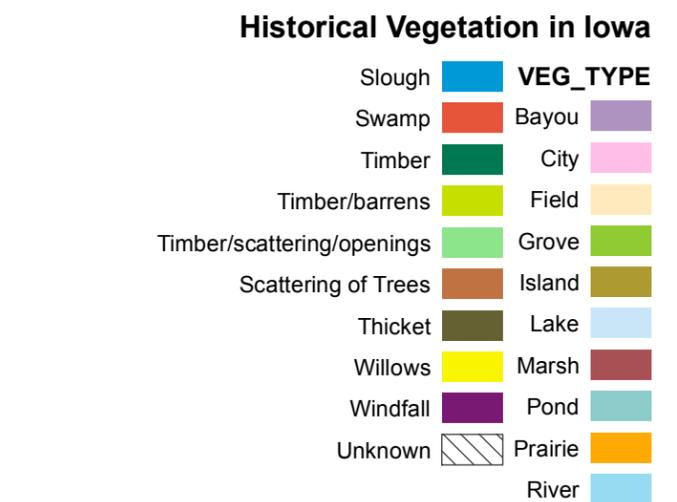
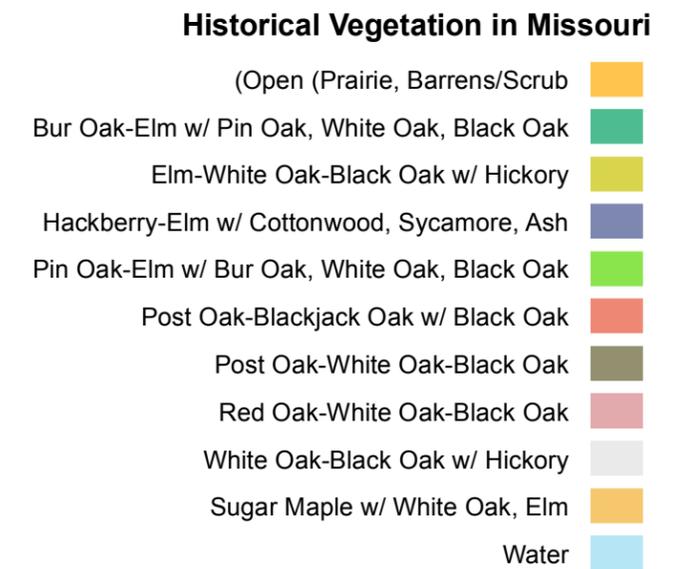
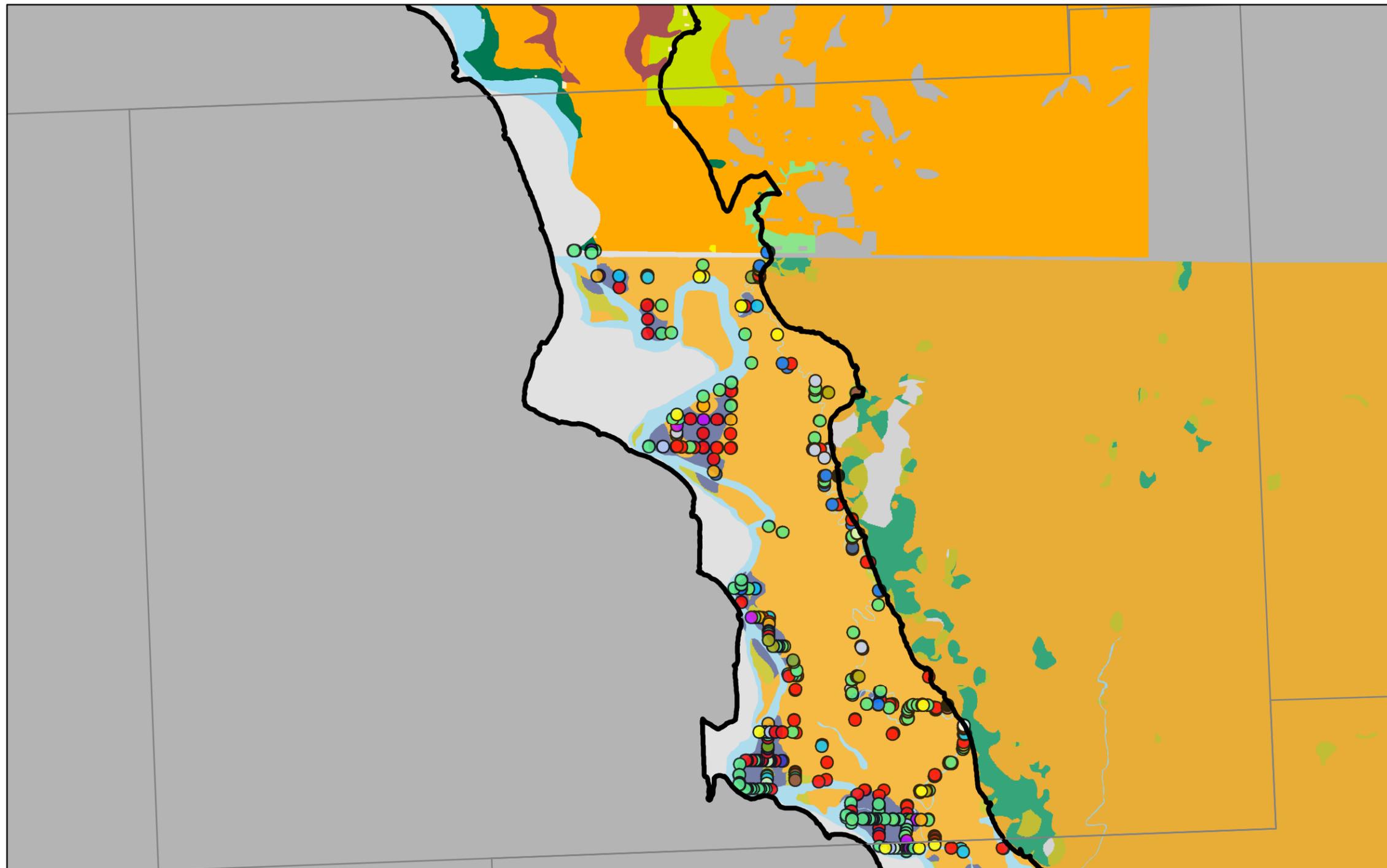
- |                             |                                       |            |   |
|-----------------------------|---------------------------------------|------------|---|
| willow                      | <span style="color: yellow;">●</span> | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>   | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: olive;">●</span>  | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>   | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span> | ash        | <span style="color: lightblue;">●</span>  |
| coffee tree                 | <span style="color: maroon;">●</span> | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: purple;">●</span> | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>   | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: blue;">●</span>   | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>  | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span> | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>  | walnut     | <span style="color: brown;">●</span>      |
|                             |                                       | locust     | <span style="color: blue;">●</span>       |



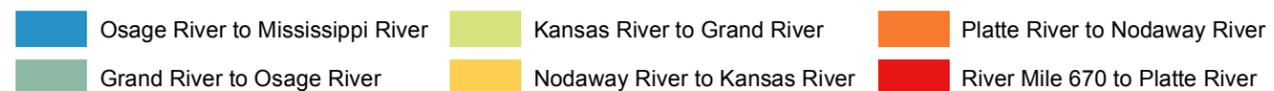
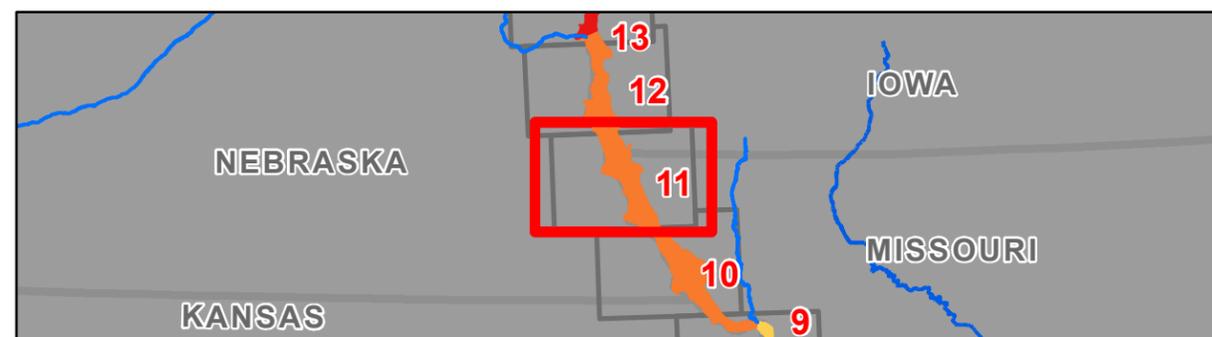
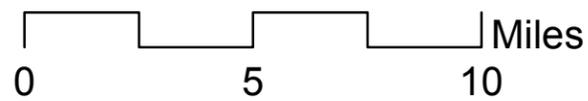
## MS-10 Potential Historical Vegetation

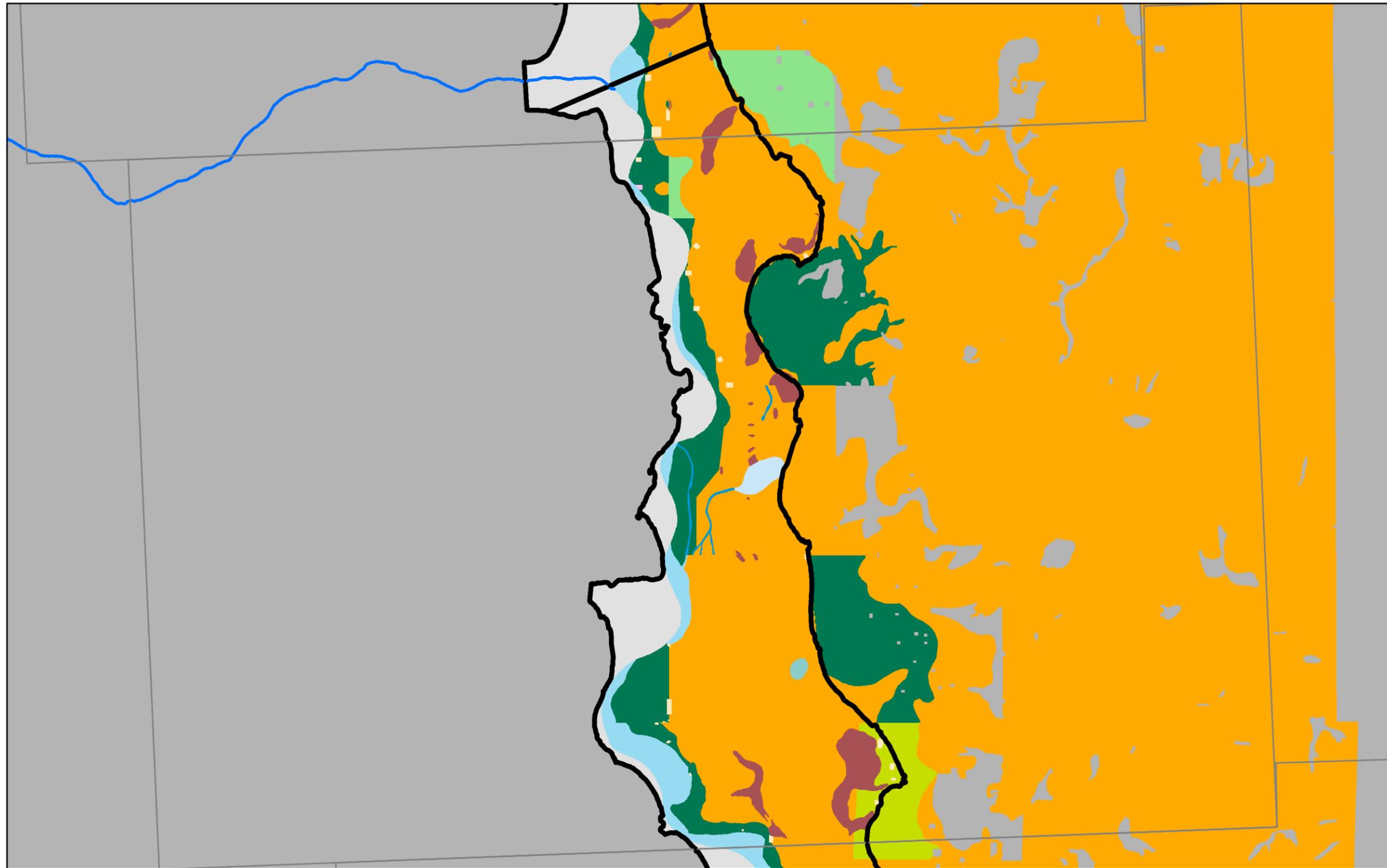


- |  |  |   |
|--|--|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: yellow;">■</span> Nodaway River to Kansas River    | <span style="color: red;">■</span> River Mile 670 to Platte River   |



## MS-10 Potential Historical Vegetation





### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

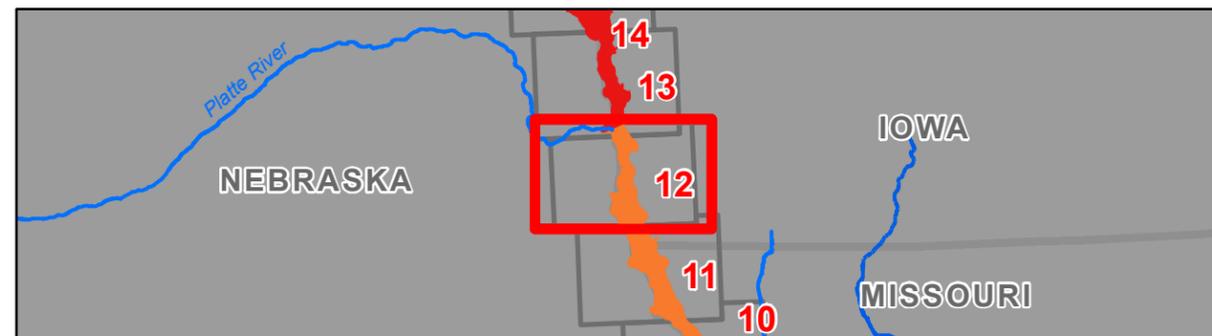
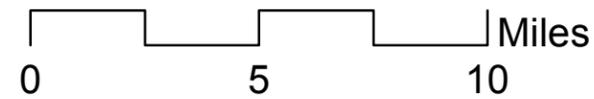
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>    |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>       |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: orange;">■</span>    |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>     |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>    |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>  |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>    |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>       |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>  |
|                            |  | River <span style="color: lightblue;">■</span> |

### Witness Trees

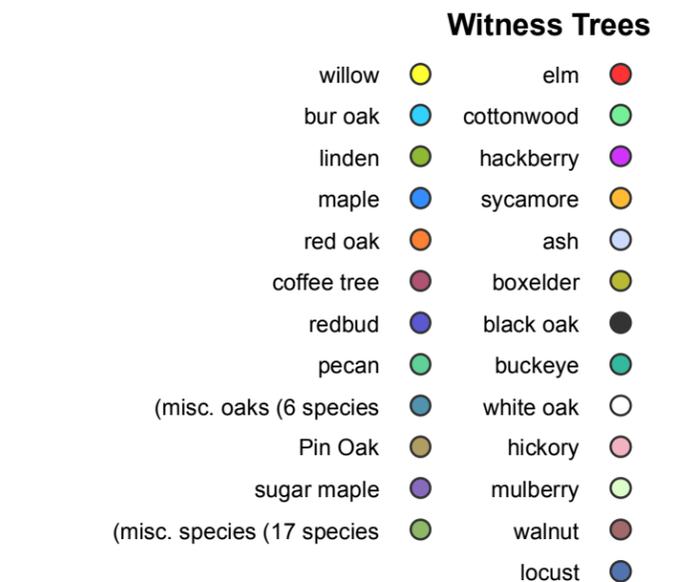
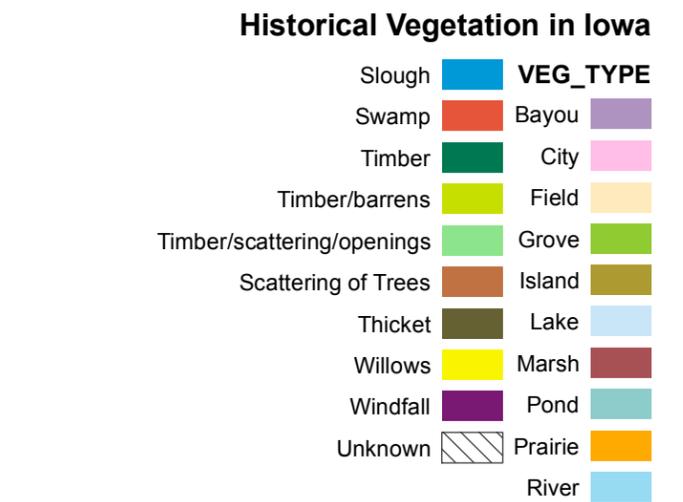
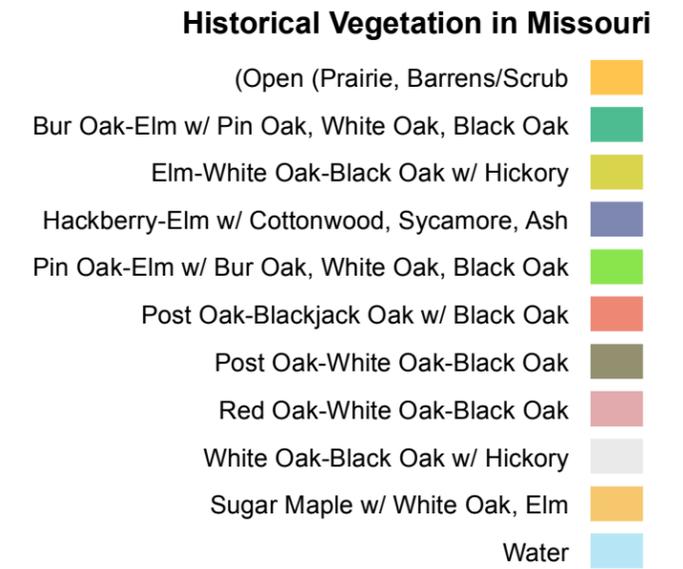
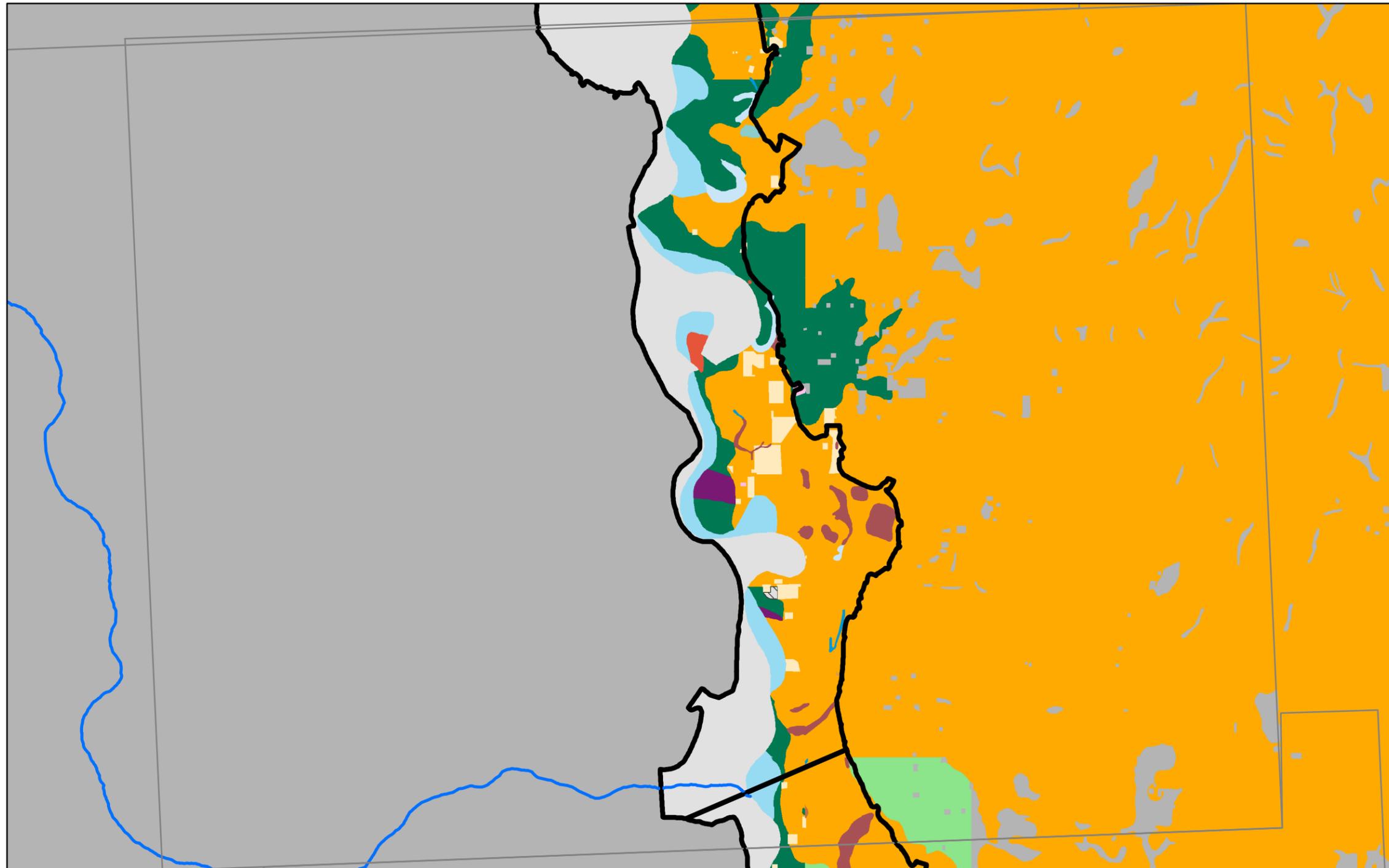
- |                             |                                       |            |   |
|-----------------------------|---------------------------------------|------------|---|
| willow                      | <span style="color: yellow;">●</span> | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>   | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: olive;">●</span>  | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>   | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span> | ash        | <span style="color: grey;">●</span>       |
| coffee tree                 | <span style="color: maroon;">●</span> | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: purple;">●</span> | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>   | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: blue;">●</span>   | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>  | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span> | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>  | walnut     | <span style="color: brown;">●</span>      |
|                             |                                       | locust     | <span style="color: blue;">●</span>       |



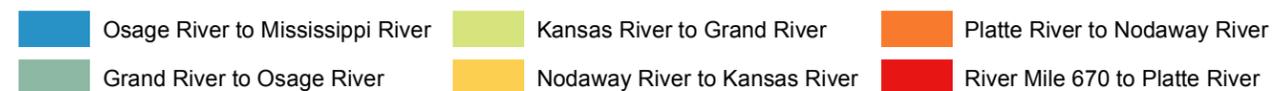
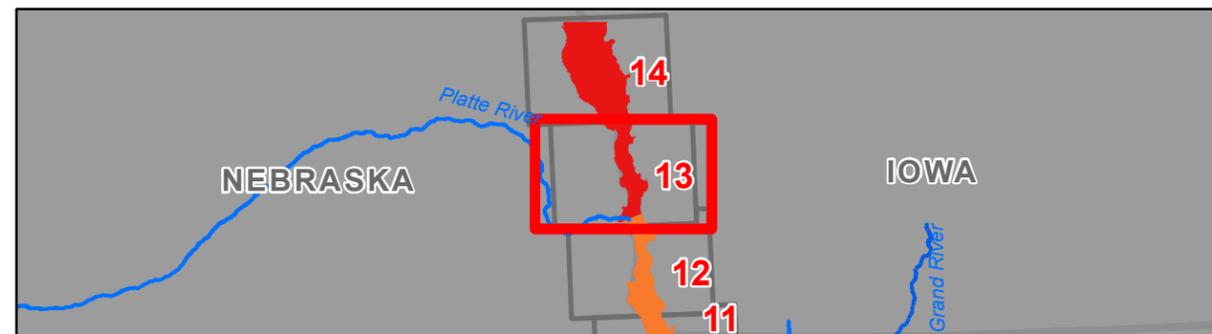
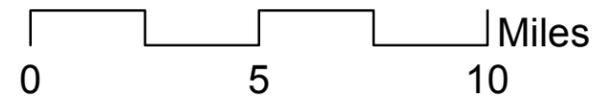
## MS-10 Potential Historical Vegetation

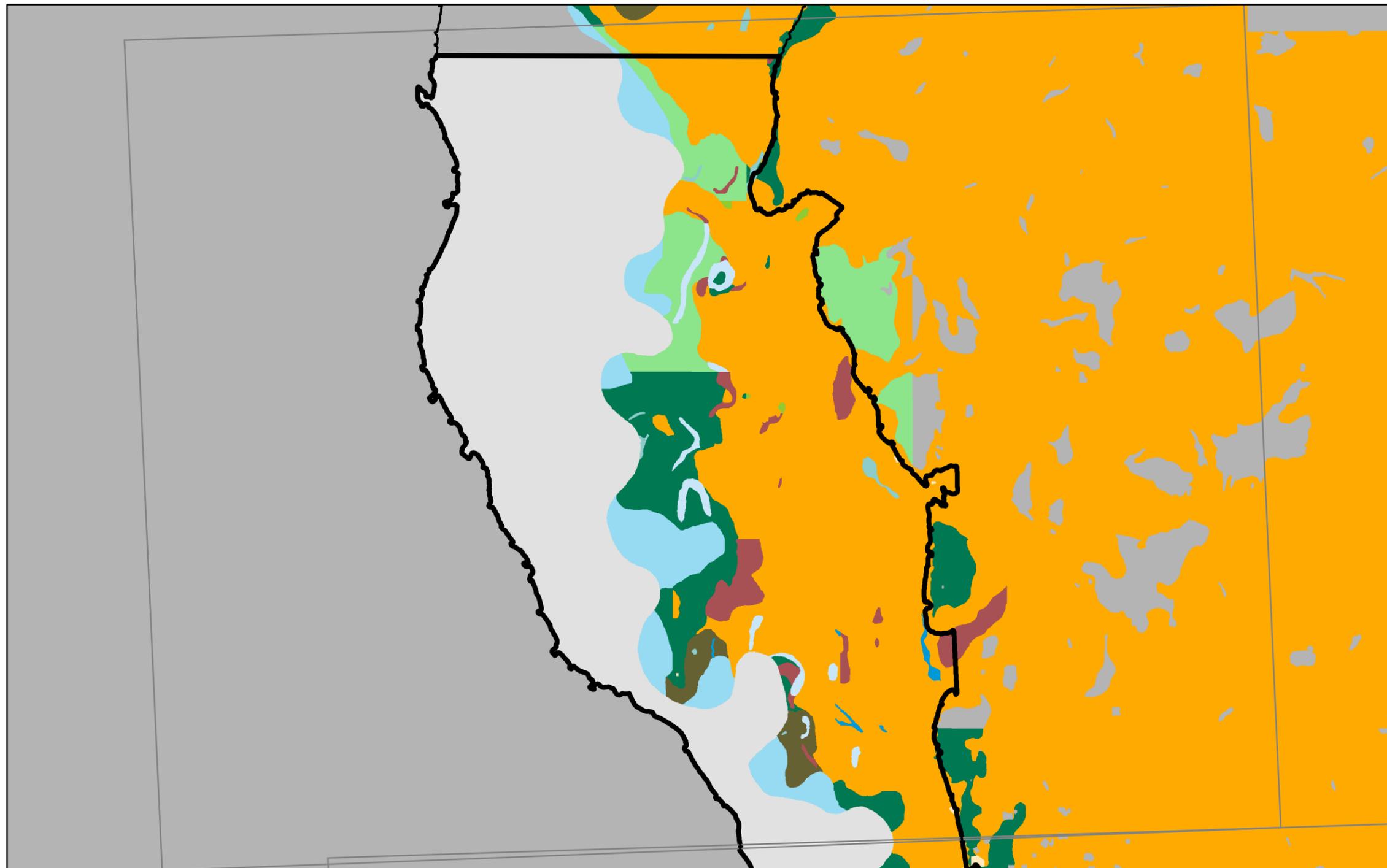


- |  |  |   |
|--|--|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: yellowgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: orange;">■</span> Nodaway River to Kansas River    | <span style="color: red;">■</span> River Mile 670 to Platte River   |



## MS-10 Potential Historical Vegetation





### Historical Vegetation in Missouri

- (Open (Prairie, Barrens/Scrub) ■
- Bur Oak-Elm w/ Pin Oak, White Oak, Black Oak ■
- Elm-White Oak-Black Oak w/ Hickory ■
- Hackberry-Elm w/ Cottonwood, Sycamore, Ash ■
- Pin Oak-Elm w/ Bur Oak, White Oak, Black Oak ■
- Post Oak-Blackjack Oak w/ Black Oak ■
- Post Oak-White Oak-Black Oak ■
- Red Oak-White Oak-Black Oak ■
- White Oak-Black Oak w/ Hickory ■
- Sugar Maple w/ White Oak, Elm ■
- Water ■

### Historical Vegetation in Iowa

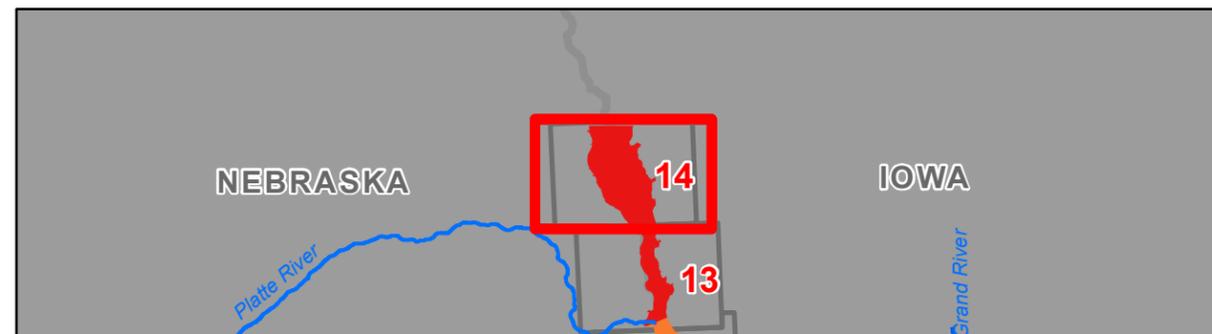
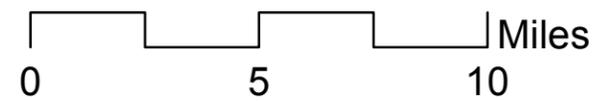
- |                            |  |  |
|----------------------------|--|--|
| Slough                     | <span style="color: blue;">■</span>  | <b>VEG_TYPE</b>                                |
| Swamp                      | <span style="color: red;">■</span>   | Bayou <span style="color: purple;">■</span>    |
| Timber                     | <span style="color: darkgreen;">■</span>   | City <span style="color: pink;">■</span>       |
| Timber/barrens             | <span style="color: yellowgreen;">■</span>   | Field <span style="color: orange;">■</span>    |
| Timber/scattering/openings | <span style="color: lightgreen;">■</span>  | Grove <span style="color: green;">■</span>     |
| Scattering of Trees        | <span style="color: brown;">■</span>   | Island <span style="color: olive;">■</span>    |
| Thicket                    | <span style="color: darkolivegreen;">■</span>  | Lake <span style="color: lightblue;">■</span>  |
| Willows                    | <span style="color: yellow;">■</span>  | Marsh <span style="color: maroon;">■</span>    |
| Windfall                   | <span style="color: purple;">■</span>  | Pond <span style="color: teal;">■</span>       |
| Unknown                    | <span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> | Prairie <span style="color: orange;">■</span>  |
|                            |  | River <span style="color: lightblue;">■</span> |

### Witness Trees

- |                             |  |            |   |
|-----------------------------|--|------------|---|
| willow                      | <span style="color: yellow;">●</span>    | elm        | <span style="color: red;">●</span>        |
| bur oak                     | <span style="color: cyan;">●</span>      | cottonwood | <span style="color: green;">●</span>      |
| linden                      | <span style="color: limegreen;">●</span> | hackberry  | <span style="color: purple;">●</span>     |
| maple                       | <span style="color: blue;">●</span>      | sycamore   | <span style="color: orange;">●</span>     |
| red oak                     | <span style="color: orange;">●</span>    | ash        | <span style="color: grey;">●</span>       |
| coffee tree                 | <span style="color: maroon;">●</span>    | boxelder   | <span style="color: olive;">●</span>      |
| redbud                      | <span style="color: purple;">●</span>    | black oak  | <span style="color: black;">●</span>      |
| pecan                       | <span style="color: teal;">●</span>      | buckeye    | <span style="color: green;">●</span>      |
| (misc. oaks (6 species)     | <span style="color: blue;">●</span>      | white oak  | <span style="color: white;">○</span>      |
| Pin Oak                     | <span style="color: brown;">●</span>     | hickory    | <span style="color: pink;">●</span>       |
| sugar maple                 | <span style="color: purple;">●</span>    | mulberry   | <span style="color: lightgreen;">●</span> |
| (misc. species (17 species) | <span style="color: green;">●</span>     | walnut     | <span style="color: brown;">●</span>      |
|                             |  | locust     | <span style="color: blue;">●</span>       |



## MS-10 Potential Historical Vegetation



- |  |   |   |
|--|---|---|
| <span style="color: blue;">■</span> Osage River to Mississippi River | <span style="color: lightgreen;">■</span> Kansas River to Grand River | <span style="color: orange;">■</span> Platte River to Nodaway River |
| <span style="color: green;">■</span> Grand River to Osage River      | <span style="color: yellow;">■</span> Nodaway River to Kansas River   | <span style="color: red;">■</span> River Mile 670 to Platte River   |

MS-10 Witness tree calculations taken from GLO Survey notes of the Missouri River, mouth to River Mile 553.

Witness Tree Calculations: Mouth to the Osage River

SPECIES	Count of SPECIES	% of TOTAL	Average of BASAL AREA	Average of DIAM	Max of DIAM
elm	300	20.96%	221.7	15.4	48
cottonwood	264	18.45%	430.3	19.3	84
hackberry	261	18.24%	174.3	13.8	36
sycamore	135	9.43%	571.9	22.6	72
boxelder	87	6.08%	104.2	11.1	20
ash	78	5.45%	251.8	15.3	74
white oak	49	3.42%	357	18.4	50
hickory	47	3.28%	163.4	13.1	36
black oak	37	2.59%	271.3	17	36
walnut	33	2.31%	455.1	20.4	48
mulberry	26	1.82%	104.7	11.1	20
linden	17	1.19%	362.1	20.1	33
locust	11	0.77%	305.9	15.5	48
redbud	11	0.77%	53.5	7.9	12
willow	11	0.77%	36.5	6.5	10
bur oak	10	0.70%	538.2	23.8	36
coffee tree	8	0.56%	124	12.1	20
red oak	8	0.56%	442	22.3	30
maple	6	0.42%	147.7	12.7	20
butternut	3	0.21%	360.2	21.3	24
pecan	3	0.21%	193.7	15.3	20
pin oak	3	0.21%	206.6	13.7	26
red oak or pin oak	3	0.21%	121.5	12	16
sassafras	3	0.21%	85.1	10.3	12
sugar maple	3	0.21%	560.5	25	36
cedar	2	0.14%	64.4	9	10
cherry	2	0.14%	152.4	13	18
pawpaw	2	0.14%	24	5.5	6
swamp white oak	2	0.14%	183.8	15	18
unknown	2	0.14%	153.9	14	14
birch	1	< 0.1%	28.3	6	6
cypress	1	< 0.1%	227	17	17
dogwood	1	< 0.1%	78.5	10	10
hawthorn	1	< 0.1%	50.3	8	8
<b>TOTAL</b>	<b>1,431</b>				

Witness Tree Calculations: Osage River to the Grand River

SPECIES	Count of SPECIES	% of TOTAL	Average of BASAL AREA	Average of DIAM	Max of DIAM
hackberry	501	19.15%	180.6	13.6	36
elm	386	14.76%	291.1	16.9	70
cottonwood	379	14.49%	480.1	20.2	104
sycamore	224	8.56%	725.4	25.6	72
boxelder	160	6.12%	101.2	10.7	24
ash	154	5.89%	165.1	13.2	36
hickory	133	5.08%	124	11.5	30
white oak	109	4.17%	448.2	20.5	65
walnut	87	3.33%	549.2	22	60
mulberry	82	3.13%	78.1	9.5	18
black oak	65	2.48%	252	16.2	40
red oak	46	1.76%	317.9	17.6	48
linden	36	1.38%	409.9	21.1	36
locust	35	1.34%	223.8	15.5	30
maple	34	1.30%	241.5	16.1	36
bur oak	24	0.92%	727.4	28.3	48
willow	24	0.92%	46.5	6.4	18
pecan	21	0.80%	270.2	16.5	36
coffee tree	19	0.73%	170	13.8	26
buckeye	16	0.61%	75.3	9.2	15
redbud	16	0.61%	37.7	6.6	10
birch	12	0.46%	156.8	13.7	18
butternut	9	0.34%	131.5	11.9	20
pawpaw	7	0.27%	11	3.7	4
post oak	7	0.27%	375.8	20.7	32
oak	6	0.23%	479.9	22	40
sugar maple	4	0.15%	235	17.3	18
dogwood	3	0.11%	14.1	4	5
red oak or pin oak	3	0.11%	579.1	23.3	36
hawthorn	2	< 0.1%	50.3	8	8
hornbeam	2	< 0.1%	28.3	6	6
pin oak	2	< 0.1%	113.1	12	12
blackjack oak	1	< 0.1%	113.1	12	12
cedar	1	< 0.1%	113.1	12	12
cherry	1	< 0.1%	113.1	12	12
crabapple	1	< 0.1%	38.5	7	7
hedgeapple	1	< 0.1%	19.6	5	5
persimmon	1	< 0.1%	201.1	16	16
pine	1	< 0.1%	153.9	14	14
unknown	1	< 0.1%	78.5	10	10
<b>TOTAL</b>	<b>2,616</b>				

Witness Tree Calculations: Grand River to the Kansas River

SPECIES	Count of SPECIES	% of TOTAL	Average of BASAL AREA	Average of DIAM	Max of DIAM
elm	450	18.83	236.2	15.4	109
cottonwood	370	15.48	381.8	18.3	109
hackberry	278	11.63	157	13.1	40
sycamore	192	8.03	447.1	21	60
white oak	168	7.03	308.9	18	50
ash	134	5.61	135.7	12.4	30
black oak	114	4.77	274.3	17.1	48
walnut	114	4.77	345.9	18.7	48
boxelder	112	4.69	122.7	11.6	44
hickory	103	4.31	118.2	11.5	24
mulberry	88	3.68	117.4	11.9	18
locust	52	2.18	249	16.5	40
linden	49	2.05	233.1	16	30
coffee tree	22	0.92	200.8	15.2	30
willow	18	0.75	79.8	9.5	15
pin oak	16	0.67	157.9	12.7	24
sugar maple	14	0.59	217.1	15.7	24
redbud	13	0.54	57.9	8.4	12
maple	12	0.5	217.6	14.8	36
red oak or pin oak	10	0.42	306.3	17.8	40
bur oak	8	0.33	190.4	14.9	20
birch	5	0.21	521.7	23.4	36
hawthorn	5	0.21	34.7	6.6	8
pecan	5	0.21	205.5	15.6	22
red oak	5	0.21	318.6	18.8	30
unknown	5	0.21	127.2	12	18
blackjack oak	4	0.17	120.4	12.3	15
buckeye	4	0.17	84.8	10	14
dogwood	4	0.17	13.7	4	6
pawpaw	4	0.17	22.2	5.3	6
post oak	4	0.17	454	21	40
plum	3	0.13	7.1	3	3
hornbeam	2	< 0.1%	78.5	10	10
black gum	1	< 0.1%	1017.9	36	36
cherry	1	< 0.1%	28.3	6	6
swamp white oak	1	< 0.1%	254.5	18	18
<b>TOTAL</b>	<b>2,390</b>				

Continued on next page

Witness tree calculations taken from GLO Survey notes of the Missouri River, mouth to River Mile 553.

Witness Tree Calculations: Kansas River to the Nodaway River

SPECIES	Count of SPECIES	% of TOTAL	Average of BASAL AREA	Average of DIAM	Max of DIAM
cottonwood	484	23.52%	630.5	23.5	72
elm	410	19.92%	307.5	17.5	79
sycamore	225	10.93%	517.5	22.5	60
hackberry	215	10.45%	203.6	14.8	40
boxelder	137	6.66%	152.1	12.1	79
mulberry	100	4.86%	155.1	12.4	69
bur oak	93	4.52%	557.7	24.2	50
ash	84	4.08%	193	14.4	34
locust	67	3.26%	360.7	19.2	48
hickory	51	2.48%	183.9	14.7	24
walnut	46	2.24%	718.4	28	60
willow	30	1.46%	74	9.1	18
red oak	24	1.17%	815.6	31.3	48
white oak	16	0.78%	304.1	18.9	28
linden	14	0.68%	314.8	18.8	30
pecan	14	0.68%	472.6	23.1	36
coffee tree	11	0.53%	209.3	15.8	24
redbud	7	0.34%	60.5	8.4	14
black oak	5	0.24%	486.9	22	40
maple	5	0.24%	527.9	23.8	36
buckeye	4	0.19%	64.4	9	10
chinquapin oak	3	0.15%	221.2	16.3	20
hornbeam	3	0.15%	73.3	9.3	12
pawpaw	3	0.15%	28.8	6	7
cherry	2	0.10%	78.5	10	10
unknown	2	0.10%	392.7	20	30
hawthorn	1	< 0.1%	63.6	9	9
pin oak	1	< 0.1%	113.1	12	12
plum	1	< 0.1%	63.6	9	9
<b>TOTAL</b>	<b>2,058</b>				

Witness Tree Calculations: Nodaway River to River Mile 553

SPECIES	Count of SPECIES	Count of SPECIES2	Average of BASAL AREA	Average of DIAM	Max of DIAM
elm	694	30.60%	231.6	15.3	60
cottonwood	646	28.50%	674.9	24	96
sycamore	165	7.30%	430.5	20.8	50
hackberry	148	6.50%	118.1	11.5	28
willow	119	5.20%	37.5	6.2	20
ash	84	3.70%	155.9	12.6	38
walnut	74	3.30%	254.8	16	48
maple	59	2.60%	311.6	17.3	50
mulberry	58	2.60%	83.6	9.9	18
bur oak	52	2.30%	448.2	21.6	60
boxelder	51	2.20%	119.7	10.7	48
locust	45	2.00%	244.2	15.4	48
hickory	17	0.70%	193.8	13.8	36
linden	11	0.50%	238.5	15.4	32
redbud	11	0.50%	31.3	6.1	10
white oak	11	0.50%	329	19.3	36
coffee tree	6	0.30%	133.3	12.7	16
black oak	4	0.20%	58.9	8.5	10
unknown	4	0.20%	424.5	20	40
basswood	1	0.00%	153.9	14	14
buckeye	1	0.00%	153.9	14	14
cherry	1	0.00%	78.5	10	10
dogwood	1	0.00%	3.1	2	2
hawthorn	1	0.00%	50.3	8	8
oak	1	0.00%	28.3	6	6
plum	1	0.00%	28.3	6	6
red oak	1	0.00%	452.4	24	24
<b>TOTAL</b>	<b>2,267</b>				

Witness Tree Calculations: ALL Study Reaches

SPECIES	Count of SPECIES	% of TOTAL	Average of BASAL AREA	Average of DIAM	Max of DIAM
elm	2,240	20.81%	255.3	16	109
cottonwood	2,143	19.91%	550.2	21.7	109
hackberry	1,403	13.04%	171.6	13.5	40
sycamore	941	8.74%	545.1	22.6	72
boxelder	547	5.08%	120.6	11.3	79
ash	534	4.96%	173.3	13.4	74
mulberry	354	3.29%	112.6	11.1	69
walnut	354	3.29%	434.9	20.3	60
white oak	353	3.28%	358.3	18.9	65
hickory	351	3.26%	139.8	12.3	36
black oak	225	2.09%	268.3	16.8	48
locust	210	1.95%	282.7	16.9	48
willow	202	1.88%	47.7	7	20
bur oak	187	1.74%	531.2	23.5	60
linden	127	1.18%	309.9	18.3	36
maple	116	1.08%	282.5	16.7	50
red oak	84	0.78%	473.6	22.1	48
coffee tree	66	0.61%	177.9	14.3	30
redbud	58	0.54%	46.8	7.4	14
pecan	43	0.40%	323.2	18.5	36
buckeye	25	0.23%	78.2	9.5	15
pin oak	22	0.20%	160.6	12.8	26
sugar maple	21	0.20%	269.6	17.3	36
birch	18	0.17%	251	15.9	36
pawpaw	16	0.15%	18.8	4.8	7
red oak or pin oak	16	0.15%	322.8	17.8	40
unknown	14	0.13%	257.9	15.7	40
butternut	12	0.11%	188.7	14.3	24
post oak	11	0.10%	404.2	20.8	40
hawthorn	10	0.09%	43.8	7.4	9
dogwood	9	0.08%	19.9	4.4	10
cherry	7	0.07%	97.4	10.6	18
hornbeam	7	0.07%	61.9	8.6	12
oak	7	0.07%	415.4	19.7	40
blackjack oak	5	0.05%	118.9	12.2	15
plum	5	0.05%	33	6	9
cedar	3	0.03%	80.6	10	12
chinquapin oak	3	0.03%	221.2	16.3	20
sassafras	3	0.03%	85.1	10.3	12
swamp white oak	3	0.03%	207.3	16	18
basswood	1	0.01%	153.9	14	14
black gum	1	0.01%	1017.9	36	36
crabapple	1	0.01%	38.5	7	7
cypress	1	0.01%	227	17	17
hedgeapple	1	0.01%	19.6	5	5
persimmon	1	0.01%	201.1	16	16
pine	1	0.01%	153.9	14	14
<b>TOTAL</b>	<b>10,762</b>				