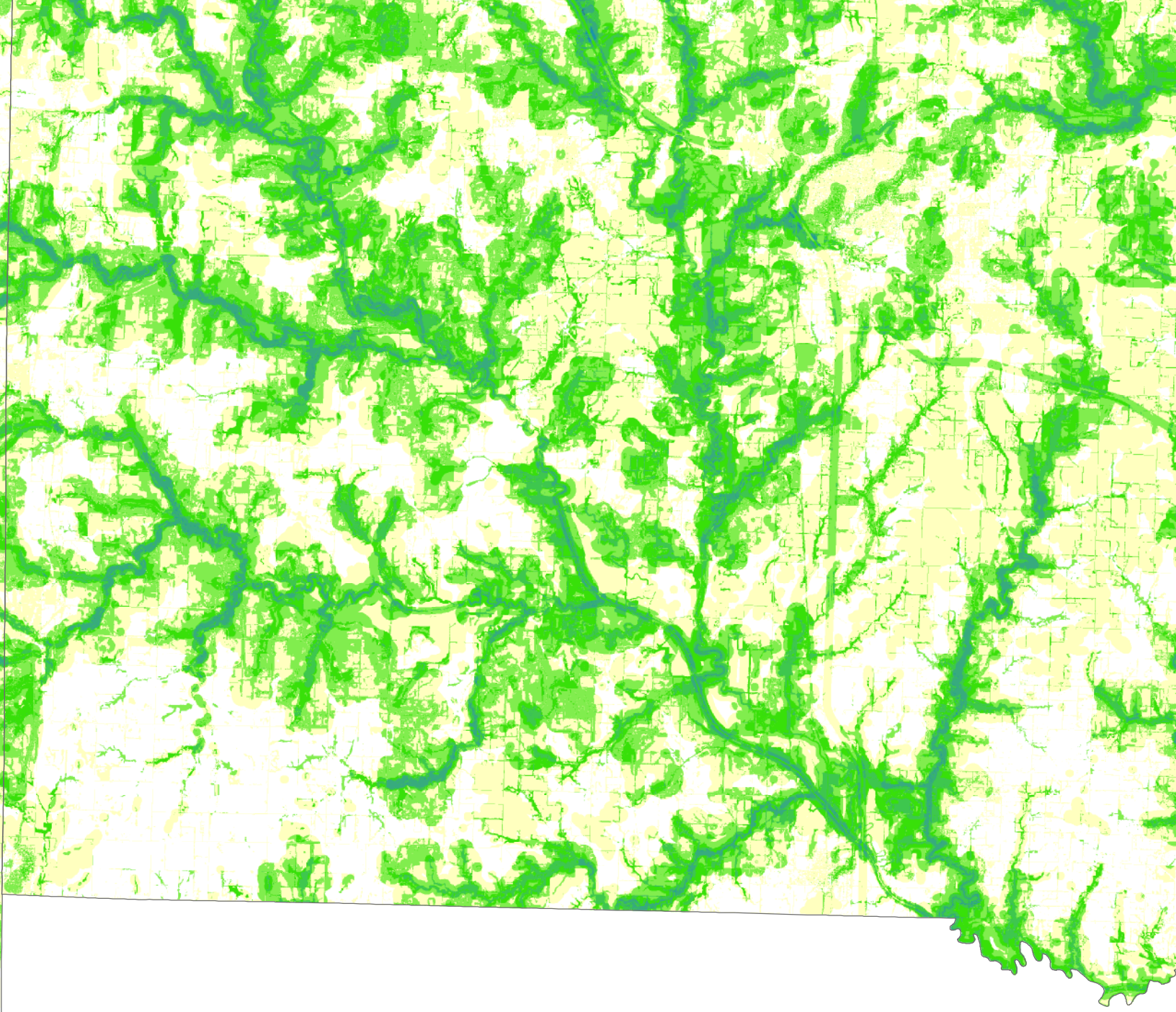

PHASE 1 GREEN INFRASTRUCTURE FRAMEWORK

CONNECTING PEOPLE TO NATURE

MARC
MID-AMERICA REGIONAL COUNCIL

BNIM

Biohabitats

BIKE WALK KC

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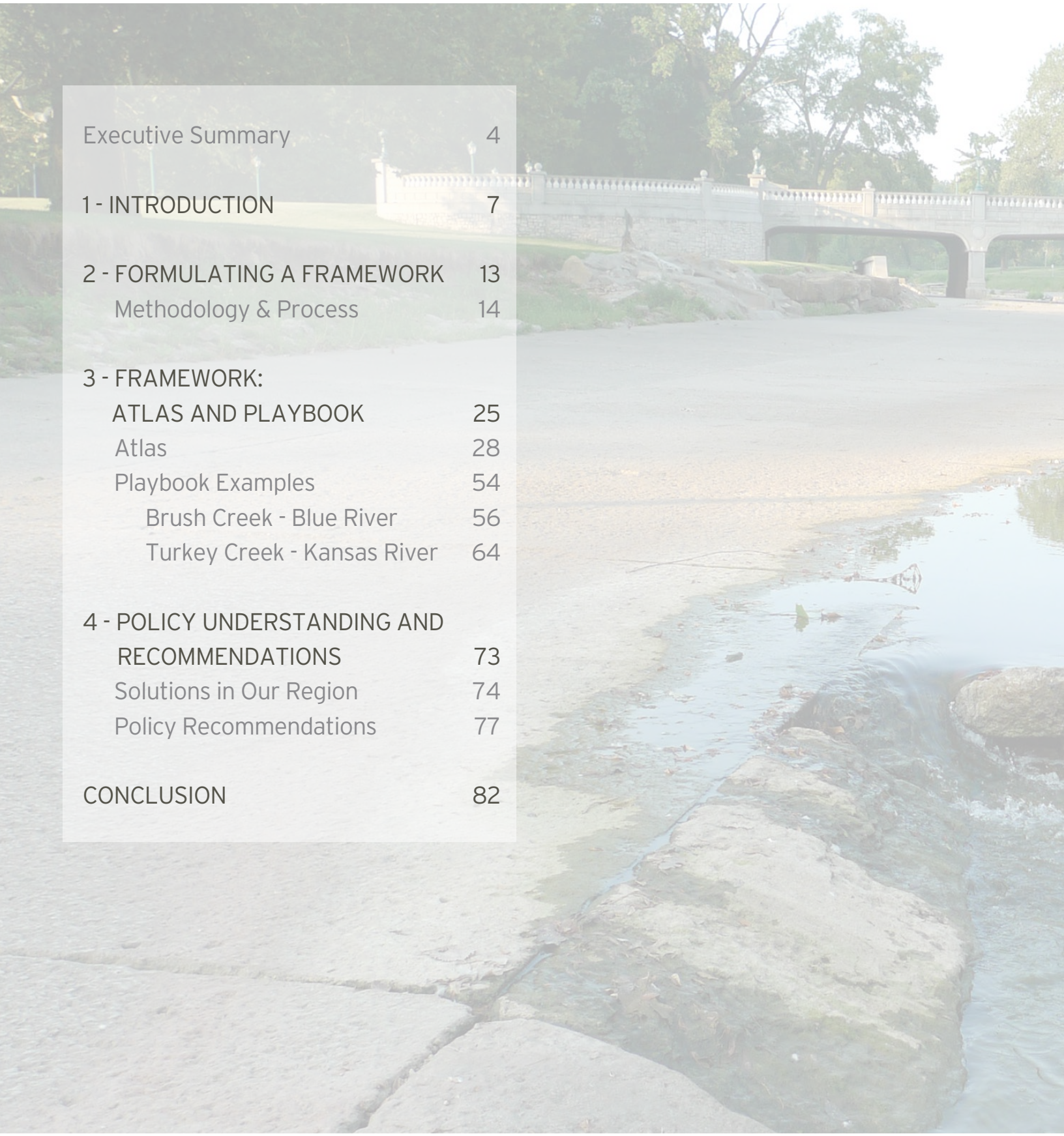

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

WHY GREEN INFRASTRUCTURE?

Today, the Greater Kansas City region is struggling to address myriad environmental, economic and social challenges that impact human health and well-being. These include exposure to air, water and soil pollution; select access to green space and quality foods; access to jobs; and greater susceptibility to flooding from storm events and climatic shifts. Measured data over the past half century has shown an increase of four inches of average annual rainfall. It is predicted that rainfall will continue to increase through the last half of this century by as much as six inches of average annual rainfall.

The backbone of good regional planning is a framework that reestablishes and integrates ecological processes into the heart of the region's cultural and economic fabric. The work of the Phase 1 Green Infrastructure Framework sets the stage for quality of life that is based on regeneration — a process of analysis and engagement with the purpose of integrating living systems with human aspirations.

Green, or living, infrastructure solutions, are solutions that simultaneously help to alleviate the pressures of wet-weather events as well as provide important amenities to our communities. In addition to providing the ecosystem services of cleaning the air and slowing and cleaning water, living systems also improve the economic value of our built environment and connect people to nature and to one another. Pathways for water are also pathways for pedestrians, cyclists, and provide healthy lifestyle and mobility opportunities that are needed for the health and resilience of our community systems.

PHASE 1 PROCESS & OUTCOMES

The work of Phase 1 used existing data and plan documents on ecological systems, transportation systems, population forecasts, land use and health indicators, to establish a preliminary understanding of highest value and need for green infrastructure solutions. This quantitative analysis was held in balance with the qualitative input provided by an Advisory Committee and stakeholder engagement. The stakeholder groups identified priority goals and strategies to implement green infrastructure solutions in their communities.

The resulting draft framework exemplifies a method to organize information that is responsive to the stakeholder input received while assisting users with the prioritization and implementation of green infrastructure solutions. The draft framework is comprised of regional-scale maps to identifying priority areas, called the Atlas; and a Playbook of watershed-scale maps, zoomed into the priority areas to detail the integrated system of project opportunities. The Phase 1 maps are preliminary analyses of priority areas and systems of opportunities to provide examples of how the framework can be used to describe processes of integrated planning, design and implementation.

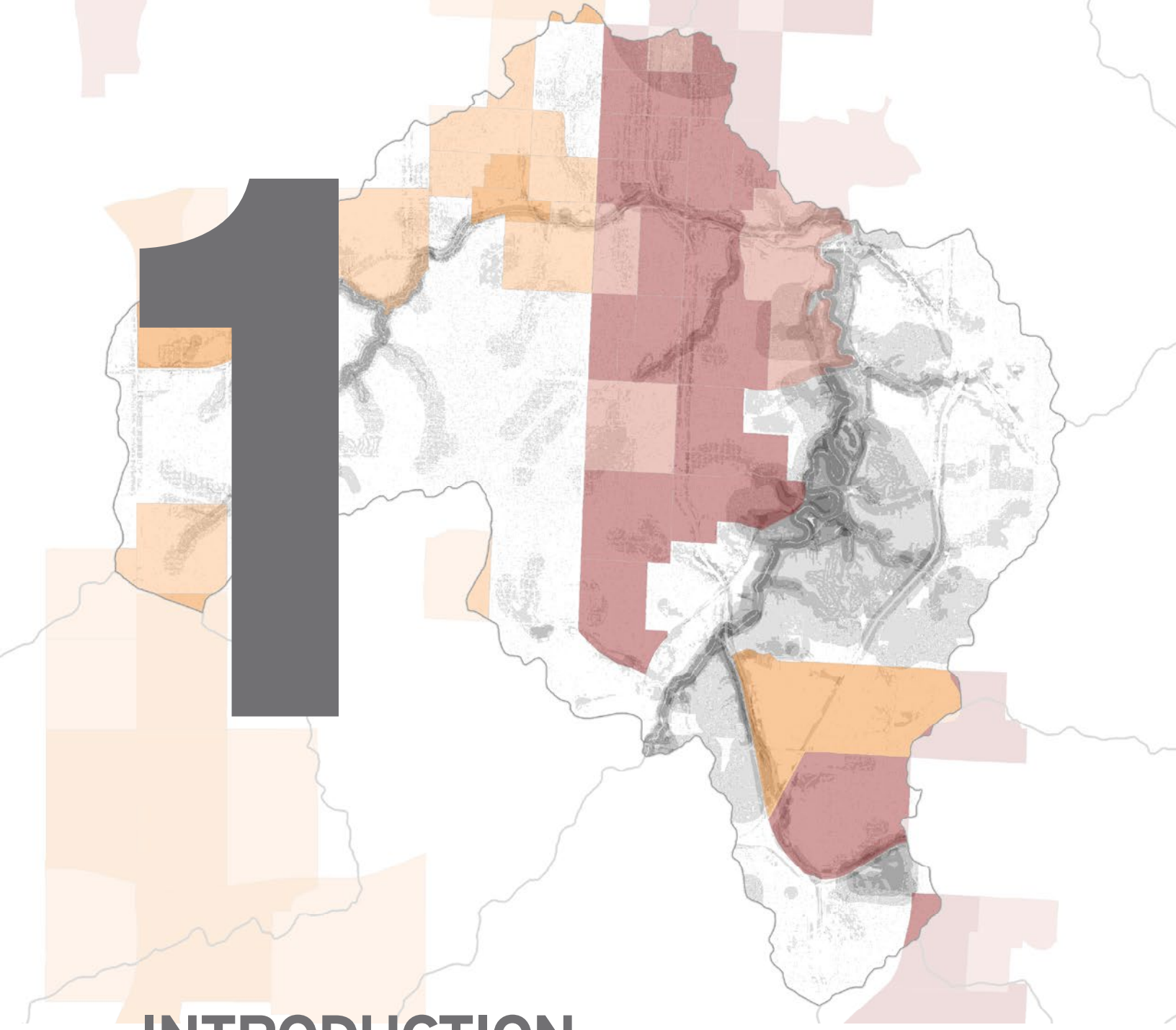
Implementation often requires multi-sector partnerships and policies that clarify decision-making and expectations for the future of a project. The last chapter of this report shares lessons learned from regional successes as well as recommendations for tools that clarify a path for implementing integrated green infrastructure strategies with multiple community benefits. These recommended tools are woven into the regional priority areas and the watershed project opportunities.

RECOMMENDATIONS & NEXT STEPS

The next phases of work to flesh out the Green Infrastructure Framework include:

- Additional ecological and human systems research.
- Analysis and map refinement.
- Process definition for opportunity area implementation.
- Green infrastructure solution and policy refinement.
- Communications platform and web-based Framework interface.

Maintaining the momentum of Phase 1 engagement and enthusiasm is key to success of the development and use of the Framework. Feedback from communities and organizations that test the Framework will inform its evolution and opportunities for integration. We must continue this important work to help stakeholders of the Greater Kansas City region make strong investments in a resilient future.



1

INTRODUCTION

The Phase 1 Green Infrastructure Framework for the nine-county Greater Kansas City region focuses on integrating multiple human and social benefits with natural resource conservation and restoration. The framework provides a structure to illustrate not only the presence and health of the natural systems, but also the layered opportunities for protection, connection and enhancement of our communities.

The Phase 1 Green Infrastructure Framework is an early stage of the analysis and planning for green infrastructure implementation. This phase introduces a method to provide a wide audience with information and tools to solve infrastructure challenges using ecological solutions. This method relies on informed and cooperative decision-making across jurisdictions for a more resilient future in the Greater Kansas City region.

WHAT IS GREEN INFRASTRUCTURE?

The Environmental Protection Agency (EPA) defines green infrastructure as, "... a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits." The Nature Conservancy defines green infrastructure solutions as, "... planned and managed natural and semi-natural systems which can provide more categories of benefits, when compared to traditional gray infrastructure." Both of these commonly accepted definitions focus on benefits to the environment and to people.

The systems that the Nature Conservancy definition refers to are often soil- or vegetation-based and include planning approaches (e.g. tree preservation, stream buffer zone protection and impervious surface reduction) as well as physical strategies (e.g. tree planting, prairie restoration, stream bank stabilization, and permeable pavement). Green infrastructure treats rain as a key ingredient to solutions rather than a waste and thereby allows community development goals to align with water, land and air quality goals.

An expanded approach to green infrastructure has the potential to connect our region's natural resources to people in ways that create networks of environmental, economic and social benefits in all communities.

WHAT CAN GREEN INFRASTRUCTURE MEAN TO OUR COMMUNITIES?

The communities of our region have begun to share priority goals for green infrastructure (see Chapter 2). Just as significant as the goals for improving the health of our rivers and streams, is a desire to connect people equitably to nature and to foster a pride of place in their Heartland communities. Too often our most vulnerable populations are the most susceptible to the negative impacts of a degraded environment and extreme weather events. Some communities suffer increased pollution and related health issues based on proximity to major roadways. Many have aging streets and sewers that flood in all rain events and more severely in the increasing number of flash floods. Our communities with higher rates of poverty also deal with lack of access to economic opportunities while struggling to pay for inefficient or poorly maintained buildings that are not safe for their inhabitants during the increasing number of very hot and very cold days. Many communities also lack access to connected green space, pathways and tree canopy, which help to buffer pollution impacts and provide opportunities for active living and safe pedestrian and bike pathways.

Community stakeholders have expressed their need for a green infrastructure framework that can address place-based priorities and issues of inequity. A vision emerged for a flexible framework that can inform a wide audience on priority ecological areas that also intersect communities of greatest need. This framework will illustrate the integrated solutions and benefits as well as documenting recommended processes, partnerships and unique successes for each opportunity area.

Success begets success. As the framework accumulates various typologies of successful integrated systems planning, momentum and networks will increase, and more communities will find it easier to implement the integrated green infrastructure solutions.

HOW CAN GREEN INFRASTRUCTURE WORK FOR THE GREATER KANSAS CITY REGION?

The Greater Kansas City region has a history of research and planning related to the environment, transportation, and economic development. (Such as MetroGreen, complete/green street policies, an Eco-Logical Action Plan, the Clean Air Action Plan, the Planning Sustainable Places program, the Mid-America Regional Council/ American Public Works Association Best Management Practices manual, a regional forest policy framework, and the regional natural resource inventory.) **This phase of green infrastructure planning uses existing data and plans to identify opportunities for implementation of integrated green infrastructure solutions as links to multiple human, natural and economic benefits.**

The region also has a strong network of organizations that are ready to act on ecological restoration projects and desire clear guidance. "DO now!" was a major theme of the green infrastructure goal-setting workshop. The framework described in this report aspires to connect the existing plans and data to show the priority intersections between resource values and opportunities for multiple benefit projects. The Phase 1 maps are preliminary analyses that illustrate a few examples of places where green infrastructure solutions can achieve multiple benefits and leverage investment. These maps will be refined in next phases, outlined to the right, to show more priority areas, connect places with similar challenges, and share more specific opportunities for processes and projects that connect people and natural resources.

The following chapters accomplish three goals: clarify the analysis and formulation of the regional planning framework; provide policy recommendations to assist implementation of priority goals; and illustrate an approach to scalable green infrastructure priorities. Priority mapping starts at a regional scale (Atlas maps), and then zooms in to a watershed scale (Playbook examples), and finally to examples of site and community scale projects. These examples suggest a methodology for developing green infrastructure priority projects and for revealing the synergistic benefits of particular opportunities to stakeholders in that place. In the online Appendix you can find the description of data collection, workshop facilitation materials and notes, as well as the detailed description of how the natural resource data was analyzed to achieve the preliminary prioritization results shown on the regional scale maps.

On the right is a general proposal of next steps. The funding is not currently committed.

ADAPTIVE PROCESS TO CREATE THE GREEN INFRASTRUCTURE FRAMEWORK

PHASE 1:
- Goal-Setting Workshop & Data Analyses
- Preliminary Framework: Atlas & Playbook

We Are Here!

PHASE 2:
- Ongoing Projects & Partners Survey
- Additional Ecological, Social, Health, & Transportation Research

Refine Atlas
Playbook Expansion

PHASE 3:
- Systems-based Implementation Guidelines
- Transect Refinement
- Policy & Incentive Refinement

Refine Atlas
Playbook Expansion

PHASE 4:
- Site Scale Systems Projects & Development
- Communication Platform
- Dynamic Online Framework

Refine Atlas
Playbook Expansion

PHASE 1 GREEN INFRASTRUCTURE FRAMEWORK

2

FORMULATING A FRAMEWORK

A green infrastructure framework is a method for organizing information that assists with the prioritization and implementation of green infrastructure solutions. In order to propose a useful and adaptive framework for the Greater Kansas City region, the consultant team began by studying the existing data and plans of the region to understand how green infrastructure systems may connect them. Next, a diverse group of Greater Kansas City stakeholders was assembled to share their aspirations and goals for how to inform green infrastructure solutions in their communities. The resulting framework uses the data and the qualitative input to prioritize places with great value, need, and the potential to implement solutions quickly and share lessons widely.

METHODOLOGY & PROCESS

The team went through a series of processes starting with data collection, plan review, and precedent study, followed by a goal-setting workshop, synthesis of feedback, and data analysis. This chapter summarizes these steps and concludes with how the process established a framework.

EXISTING DATA

The first step to creating a clear approach to Phase 1 regional green infrastructure planning was to collect and evaluate the current datasets underlying the region's environmental and transportation plans, programs and policies.

The team utilized MARC Geographic Information Services (GIS) data in the areas of:

- Environment
- Transportation & Infrastructure
- Land use
- Demographic data
- Health data
- Employment data

We collected additional natural resource data from The Nature Conservancy and health data from the 500 Cities Project. The team also used information from MetroGreen planning, the Natural Resource Inventory studies, Green Infrastructure indicators studies, Outlook 2040, the SmartMoves transit plan, the USDA Forest Assessment for the region, the Missouri Guide to Green Infrastructure, the Middle Blue River Urban Waters Federal Partnership projects ("Renew the Blue"), the KC Native Plant Initiative project map and strategic plan, and the EPA's most recent report on the 319 program.

In addition to synthesizing data from the region, a brief literature review was conducted to identify relevant national and international models that are having the most positive impact on increasing the health and connectedness of natural ecosystems and transportation systems.

The purpose of the effort was not to provide a comprehensive list of green infrastructure techniques, but rather to canvass some of the innovators and leaders in the field, which serve as touch points in green infrastructure planning. Green Infrastructure strategies vary depending on the regional context, types of environmental issues, and the selected focal metrics of the lead groups. Of the select

reference projects, six examples comprise a short list that each have a special relevance to the Greater Kansas City region, whether in terms of ecological scale, biodiversity, transportation planning, the local ecoregion, or an overall comparable scope and quality.

1. The George Washington Region 2011 Regional Green Infrastructure Plan
2. Regional Advance Mitigation Planning
3. Ecoregional Conservation in the Osage Plains/Flint Hills Prairie
4. Green City, Clean Waters: The Philadelphia Green Infrastructure Plan
5. City Biodiversity Index (Singapore Index): Urban Biodiversity
6. San Jose and the Urban Village

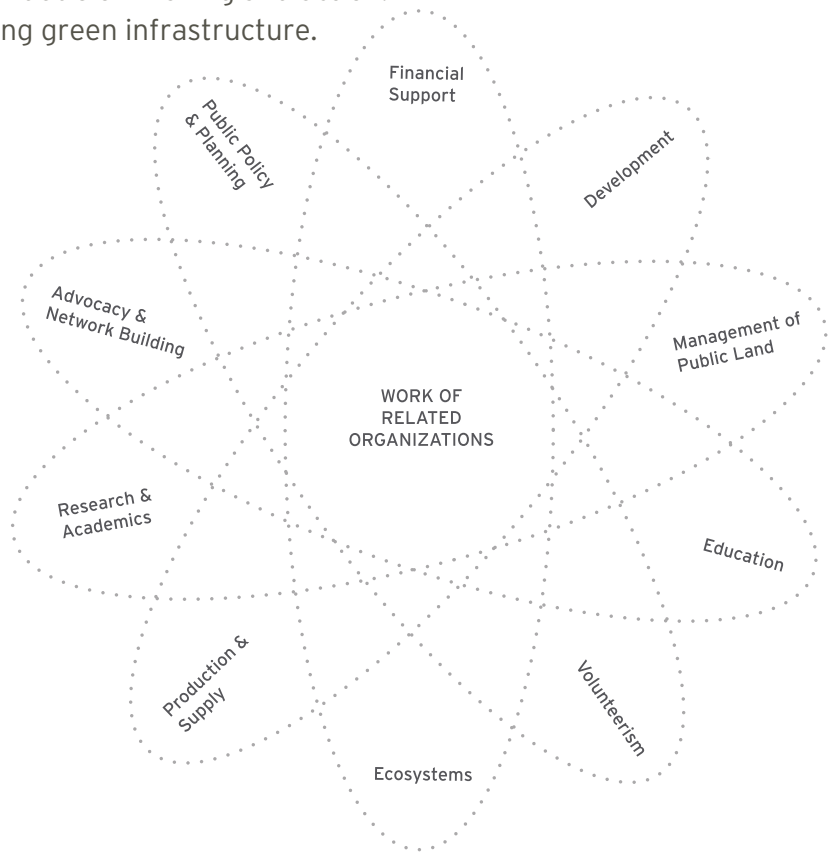
(For more detailed information on data collection, plan collection and model green infrastructure work, see the Appendix, sections A and B at www.marc.org/GIFramework.)

STAKEHOLDER WORKSHOP

A regional workshop was held in November 2016 to accomplish four main outcomes:

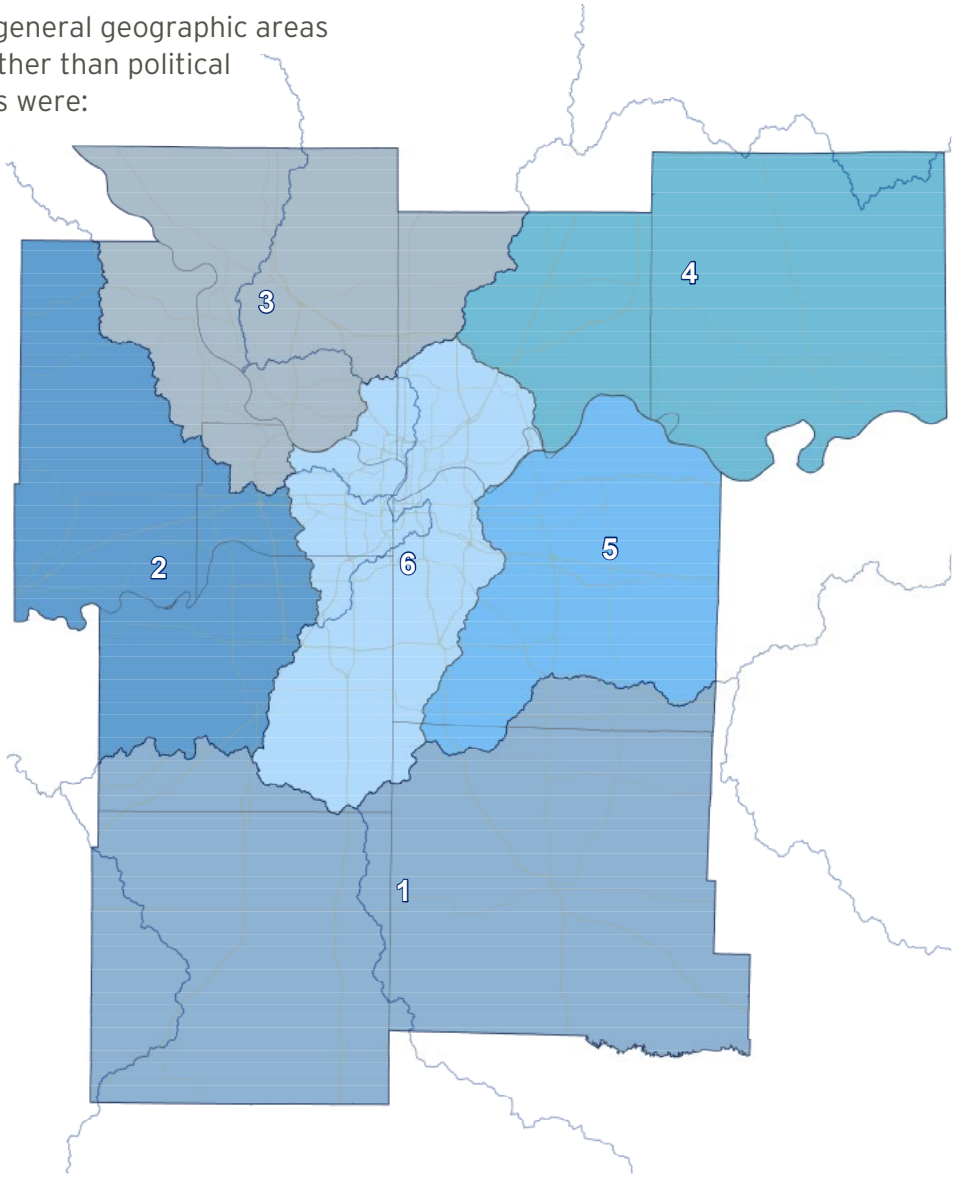
- Establish consensus on the value of green infrastructure.
- Draft goals and strategies for natural resource conservation and restoration.
- Discuss methods of integrating regional decision-making and action.
- Build local partnerships for implementing green infrastructure.

The invitation to the workshop went out to Mid-America Regional Council's regular contact list of environmental organizations and municipal departments, plus careful additions from the regional communities of healthcare providers, K-12 education, arts, grassroots organizations, developers, and neighborhood and business leaders. This broad list of invitees represents the interests of all the interrelated systems of health we seek to connect and enhance in the green infrastructure framework.



The workshop tables were divided by general geographic areas and by large watershed boundaries rather than political boundaries. These six watershed areas were:

1. Southern Watersheds – rural
2. Lower Kansas, West – suburban
3. Northwest – suburban
4. Lower Missouri, Northeast – rural
5. Lower Missouri, East – suburban
6. Urban Confluence



To inform the goal-setting and strategy conversation our team gave a presentation on the potential wide-spread benefits of using green infrastructure as a catalyst to conserve or restore natural systems. Green infrastructure systems of connected projects provide ecological services that connect and balance our ecosystem especially as climate conditions become less stable. Building up the resilience embodied in healthy natural systems would better position for the projected trends of climate change while decreasing the pressure of development on our aging systems and creating more efficient and effective methods of meeting demands for clean water, biodiverse habitat and clean air. Just as complex microscopic ecologies work in the soil to create healthy conditions, so must our regional and community relationships work to find opportunities to create community "nutrients" from waste and reinvent our challenges into the building blocks of health and efficiency.

System Inventory

During the workshop, the team also shared the preliminary system inventory of the region. The ecological resources of the Greater Kansas City region are related to physical resources and landscape context. Key factors such as topography, geology, and water resources interact to control ecosystem characteristics such as plant community type, wildlife use, and the occurrences of sensitive species. Human activities such as transportation, stormwater drainage, and development further influence habitat features via disturbance and management practices.

This inventory shows not only our current state but looks to our geology and conservation areas to show presettlement conditions as a way to understand the patterns of health and plan for the future in better alignment with our natural systems. The inventory included preliminary maps of:

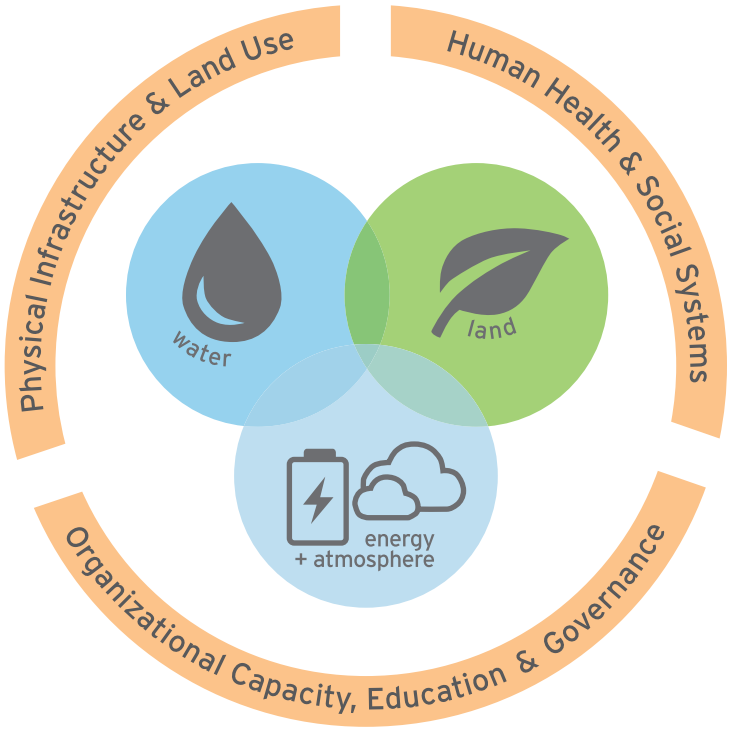
- How our region fits into the major categories of ecosystem and migratory patterns of the continent.
- Ecoregions within our region defining soil and habitat varieties.
- Hydrology.
- Surficial geology.
- Heritage landscapes.
- Parks and open space.
- Population centers.
- Activity centers of economic development and transportation connections.
- Jobs and transit.
- Land use and municipal goals for future land use.
- Income and brownfields.
- Confluence — Intersection study of impervious surface and predicted population change.
- Opportunity study — Intersection of corridors (natural and man-made), conservation areas, and predicted population change.

(To view the maps, see the Appendix, section C at www.marc.org/GIFramework.)

Prioritized Goals And Strategies

The facilitated dialogue of each workshop watershed area focused on using the inventory description and the knowledge of the diverse group around the table to select, compose and prioritize goal areas and strategies for Water, Land and Energy and Atmosphere. Then the groups discussed key opportunities for integrating green infrastructure into their work, and what information and measures will help to make the case and stimulate connected regional projects.

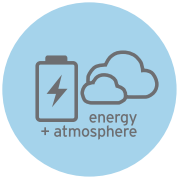
(For details on goal setting worksheets, and recorded watershed dialogue, see the Appendix, section C at www.marc.org/GIFramework.)



The priority goals that emerged from this workshop and informed the team's analysis were:

- Improve health of rivers and streams.
- Connect people to water – education, advocacy, access.

- Improve quality of life with green infrastructure amenities.
- Improve local habitat.
- Establish conservation priorities.



- Regulate the microclimate with living systems.
- Improve air quality.
- Reduce energy consumption.

Other Synthesized Input

Other big ideas that the workshop group shared that inform the design and methodology of creating a green infrastructure framework were:

- Create a compelling and understandable case for a very wide audience to access.
- Identify place-based priorities that highlight who we are and how we connect with our natural systems to create healthy cities — emphasize people, equity, access.
- Emphasize areas of nexus such as water and energy, and trees and transit.
- Demonstrate integrated green infrastructure. Should start with cities that take the lead and ripple out — schools and public spaces are key change agents to demonstrate and connect people to nature.

Although it was beyond the scope of this preliminary work, stakeholder input emphasized the desire for Mid-America Regional Council to assist with communication material and launching a social forum for partners to connect. Many regional partners noted that this communication should be happening in a place that people are already looking. The message should be kept up to date and show the multiple benefits in a plain-spoken way, such as, "Check out our updated street! Now our neighborhood doesn't flood anymore, and we also have a great new walking path that takes us to our community garden/market/park."

This regional input highlighted the need to have a flexible, plain-spoken way to access information that drives green infrastructure work in priority areas, including: data, example processes to integrate networks of projects, policy recommendations and a way to show the lessons and outcomes with a wide range of participants.

Project Example for Integrated Sustainability Education

The region's public schools face many challenges in preparing urban youth for a technology-driven economy. Green infrastructure projects present opportunities to engage urban youth in STEM education using the natural environment as a learning tool. Communities and school districts should explore the role school campuses could play as sites for demonstration projects and the potential for youth engagement in the process of designing, constructing, and maintaining green infrastructure elements.

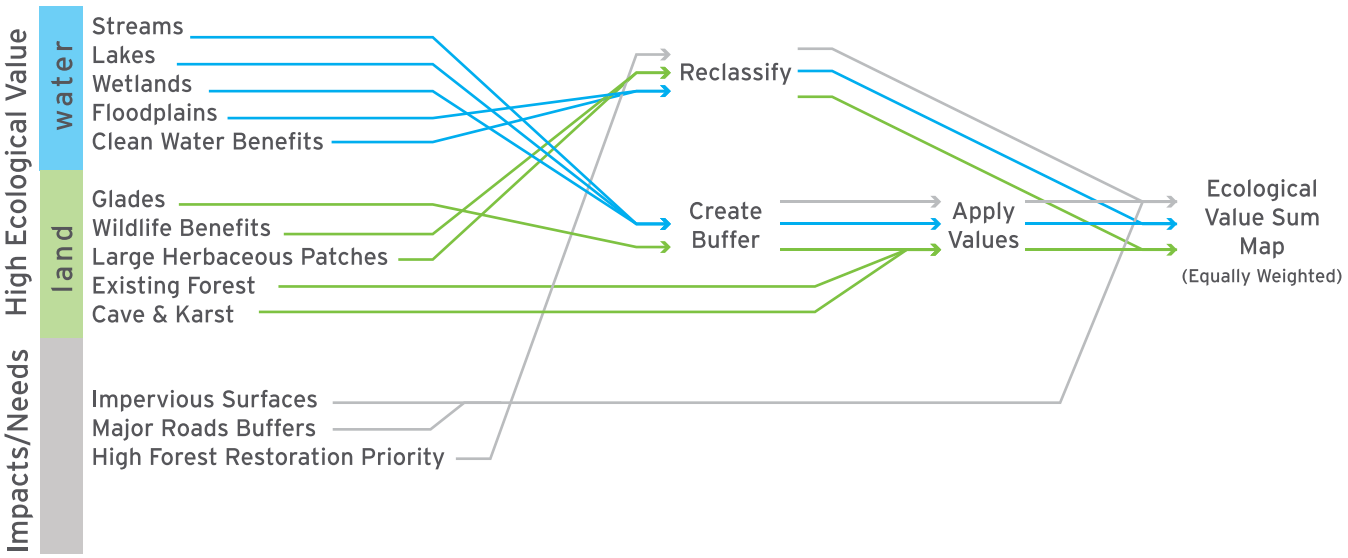
GIS ANALYSIS

Following the workshop synthesis, two GIS (geographic information systems) analyses on high ecological value areas in relation to areas of impact and need were modeled. The preliminary results of the GIS conservation suitability (sensitivity) analysis are presented in the map on the right. Darker areas reflect a higher number of good quality attributes for conservation. Lighter areas suggest areas that may be better suited for potential restoration, mitigation, or development compatibility. Based on the GIS analysis, water resources and wetlands emerge as high value areas. The need analysis served as a secondary suitability criteria to evaluate where high-value resources overlap with current needs. Data inputs relating to resource needs included impervious surface, major roads with a 100-meter buffer, and priority forest restoration areas (identified by Mid-America Regional Council's previous GIS Assessment of Regional Forest and Natural Resource Priorities). The flowchart at the bottom of this page depicts a simplified version of all the factors and GIS analysis process that created the Ecological Value map on the right.

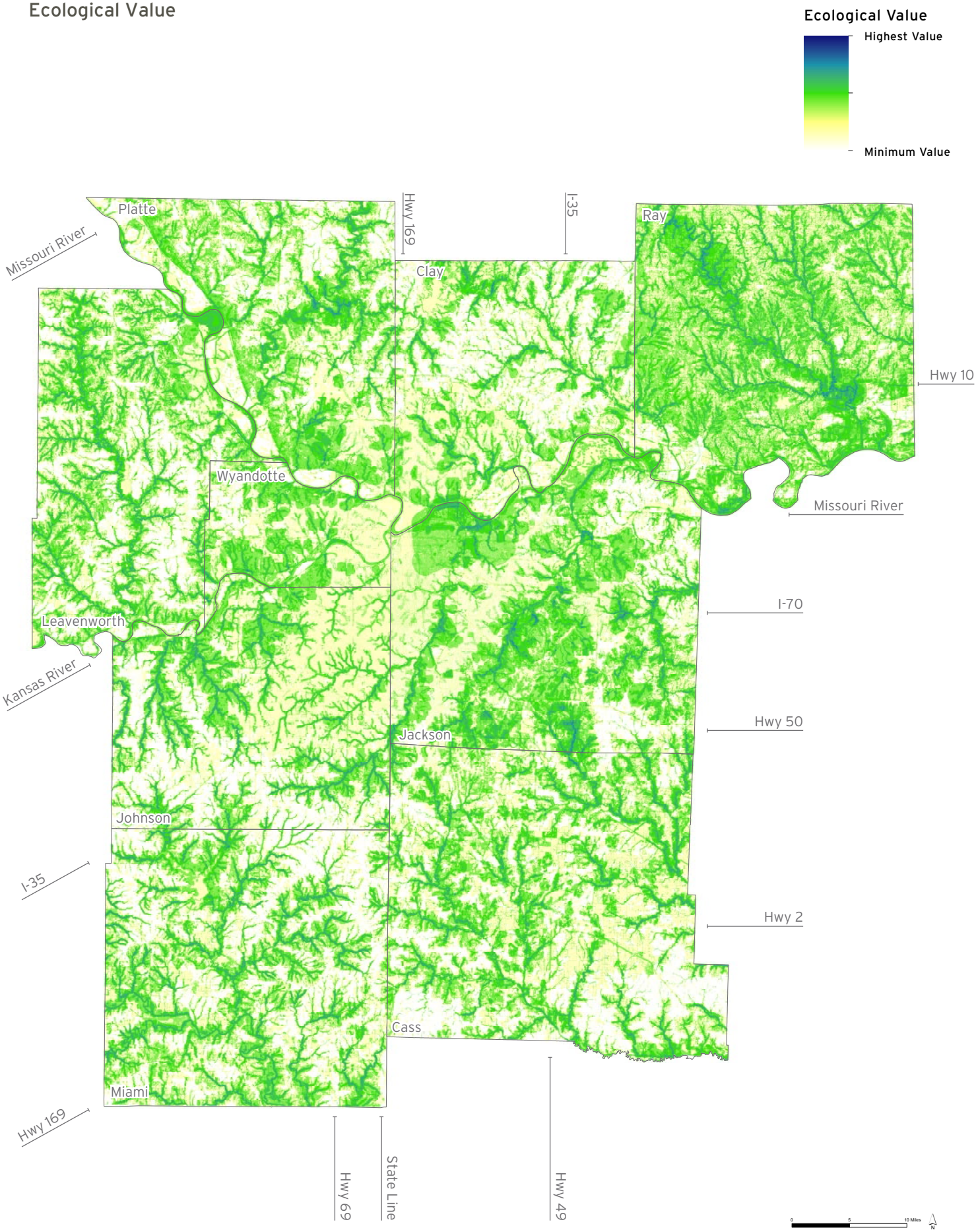
This analysis created the ecological base on which to build the framework, which is explained next.

(For a description of the step-by step analysis process used to determine the regional foundation of ecological value and need please see the Appendix, section D at www.marc.org/GIFramework.)

GIS Suitability Factors & Process



Ecological Value



Criteria Informing the Framework

In addition to being a high-value ecological area from the suitability analysis (i.e. in need of conservation or restoration) the priority areas must also possess attributes associated with three other non-geospatial criteria for near-term implementation to serve as catalysts. These include: momentum, accessibility and proximity. All four criteria are further described below.

MOMENTUM

- Projects Already Started
- Partners in Place

ACCESSIBILTY

- Translatable to Wide Audience
- Projects' Lessons Learned
- Exemplify Replication & Education

PROXIMITY

- Connect The Dots / Ripple Effect
- Through Trails, Schools or Recreation Links

NEED

- Natural Resource & Human Health Need
- Nexus of Food, Active Living, Jobs, Water, Energy, Transportation

Phase 1 Green Infrastructure Framework

Emerging from the analysis and feedback, the Phase 1 Green Infrastructure Framework is a two-part framework that shows need and benefits to people based on specific place-based solutions or initiatives. The two parts of the framework are as follows:

Atlas:

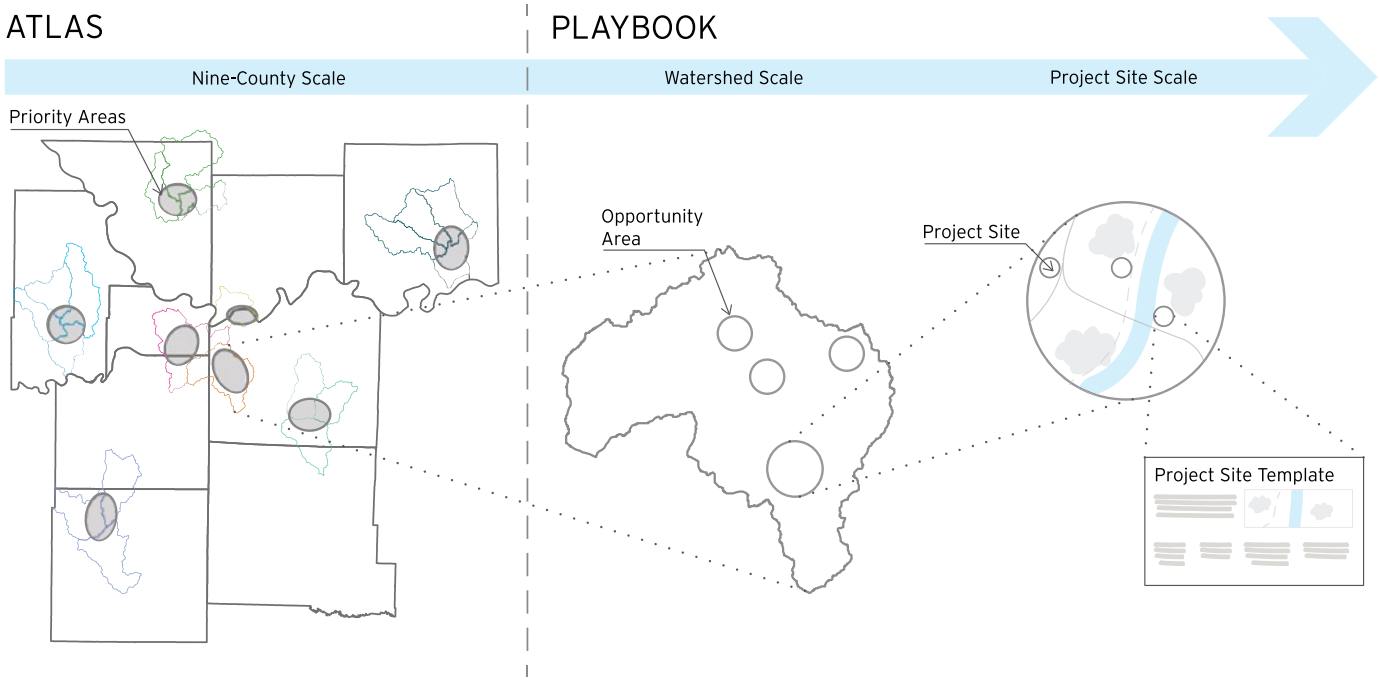
An Atlas shows priority areas for integrated green infrastructure strategies at a regional scale.

Playbook:

The Playbook displays the priority areas of opportunity and tells the story for each opportunity area within its watershed – why here, who is here (partners), what is special about it, what is relatable to other places (key issues and partners), how to layer in additional benefits and what to measure.

The Playbook works at two scales, starting at the watershed scale with opportunity areas to understand the interconnectivity of ecological and human systems, then scaling down to community and site scale projects.

The diagram below depicts how the two playbook scales relate to the MARC region, using the nine-county area, then zooming into community/site scale projects.



The next chapter contains the first draft of the Atlas maps and two Playbook examples, based on the criteria described on the left. The playbook identifies the first round of opportunity areas. The next phase will develop additional examples. Therefore, the intent of this preliminary framework of the Atlas and example Playbook are intended to be tested, edited and grown into a more complete regional analysis.

PHASE 1 GREEN INFRASTRUCTURE FRAMEWORK

3

FRAMEWORK: ATLAS AND PLAYBOOK

This chapter illustrates a first draft of the Green Infrastructure Framework. The framework begins with a series of regional-scale maps called the Atlas, which highlight priority areas based on value and need. The next section zooms in to two priority areas at a watershed-scale. These are Playbook examples. At this scale opportunity areas are highlighted to show the places with the most potential to use an integrated green infrastructure approach for multiple benefits to the environment and community. Lastly, images of site scale solutions are pictured for each opportunity area along with a site scale project development template.

This chapter illustrates the composition of the Phase 1 Green Infrastructure Framework. It starts with an explanation of transects and how they would be applied to the framework in future phases. Next, the maps shown here are the first draft of analysis and illustration for this framework. The framework begins with the highest view — a regional scale. The regional scale maps are called the Atlas and serve to highlight priority areas based on value and need. The next section zooms in on the priority areas described in the Atlas — the watershed-scale Playbook. Two examples of this scale are shown here, the Middle Blue River watershed and the Turkey Creek watershed. In the watershed-scale maps, opportunity areas are highlighted and numbered. These opportunity areas show places with the most potential to use an integrated, green infrastructure approach for multiple benefits to the environment and community. Lastly, images of site scale solutions are pictured for each opportunity area. A template for the next smaller scale — site scale project development — is included to show how the Playbook may be refined in future phases to detail solutions and processes of systems-based planning, design and implementation.

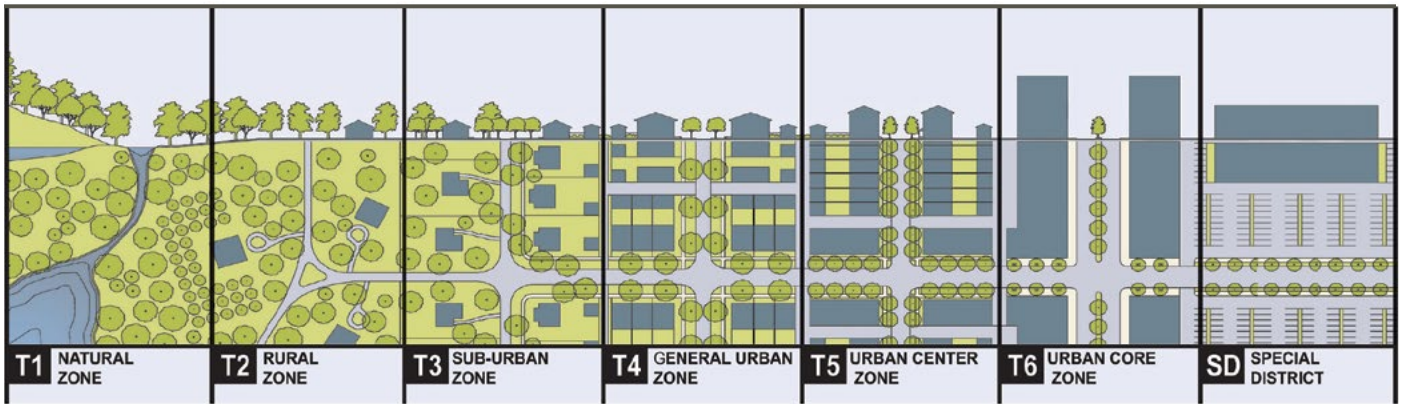
TRANSECTS

Because our region covers so many types and intensities of land use, transect descriptions become a useful way to describe similar environments that may share types of solutions. Transects are an analytical tool used to identify a geographic series of environments and their transitions. Environments with consistently identifiable characteristics are identified as a zone. The urban-to-rural transect identifies the range of habitats that can be identified by the intensity of urban development, and, by extension, the relationship between the built and natural environment. Each type of zone is described on the following page.

As illustrated later in the chapter, transects were identified for each of the Atlas' priority areas.

The transect zones are as follows:

- **T-1 Natural Zone:** Unsettled wild lands, including lands unsuitable for development due to topography, hydrology, or other environmental features.
- **T-2: Rural Zone**: Sparsely populated open space or farmland.
- **T-3: Suburban Zone**: Low-density suburban development. Characterized by natural plantings, residential uses on large lots, and large blocks. Streets may be curvilinear to accommodate environmental features.
- **T-4: General Urban Zone:** Residential urban. Includes some mixed use, as well as a wider variety of building types, landscaping, and setbacks. Blocks are medium-sized.
- **T-5: Urban Center Zone:** Higher-density, mixed-use urban development. Uses include retail, office, and higher densities of residential uses. Blocks are small, with frequent streets, wide sidewalks and streetscape plantings. Buildings are generally close to the street.
- **T-6: Urban Core Zone:** Highest-density urban downtown. Greatest variety of uses and building types. Blocks may be larger than in T-5, with streetscape plantings and buildings close to the street.
- **Civic Zone**: Civic buildings and spaces appropriate to their respective transect zone
- **Special District:** Areas with buildings that do not conform to any of the normative transect zones due to their function, position, or configuration.



Center for Applied Transect Studies. (2009). SmartCode Version 9.2. Duany Plater-Zyberk & Company

ATLAS

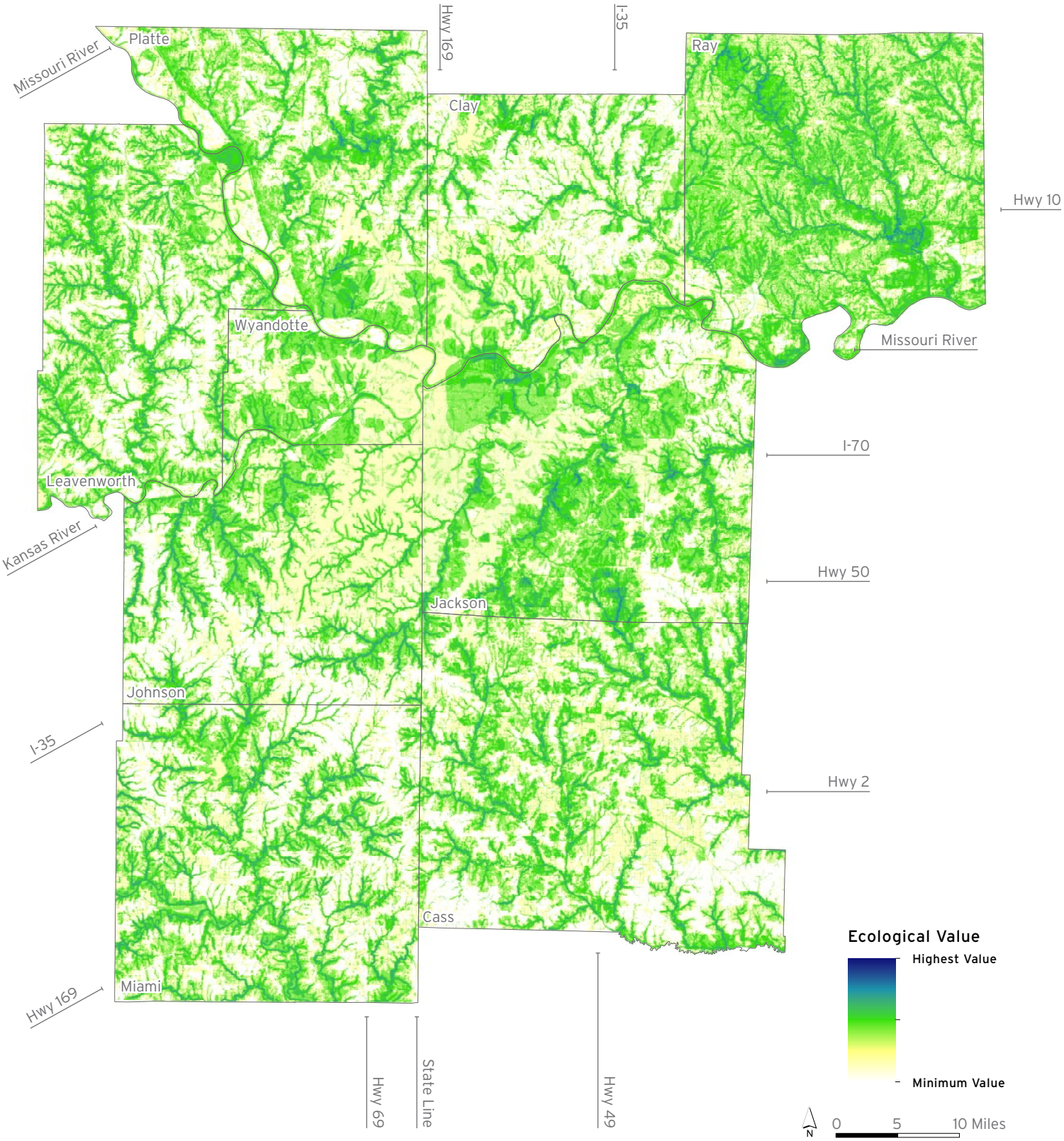
Atlas maps at the regional scale highlight priority areas. The priority areas emerge from not only intersection of geospatial need, but also from the criteria described previously: momentum, access, proximity and need. The atlas maps highlight projects across the transect zones from urban to rural to represent the challenges and solutions that have the most benefit to all regional constituents.

The first atlas map, Ecological Value, provides the background and context for the subsequent analysis maps. The next three maps, — Transportation Investments, MetroGreen Corridors and Transportation Equity — provide inventory and analysis of the region's transportation network. The Human Impact on Land, Activity Centers and Social Conditions maps show the analysis of each related to the ecological value. The last regional map overlays the other seven maps to identify the most intersections, resulting in the hotspots and example priority areas described.

This is the first phase of the plan, and much more comprehensive analysis is required. Priority areas identified take into consideration the data we have analyzed to date, and the feedback from the regional participants. These are the first examples of key challenges and solutions with more to come in future phases of work.

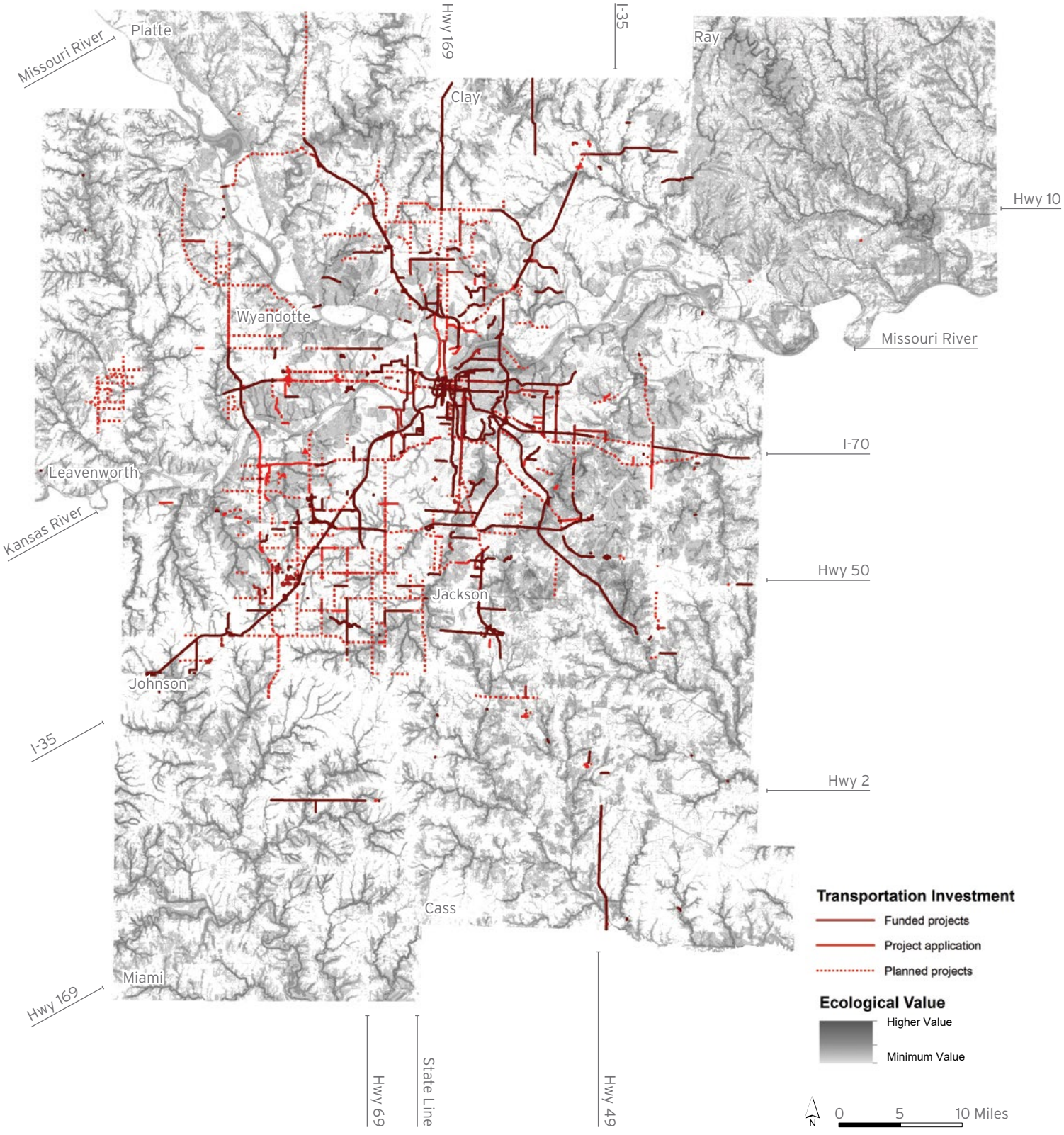
Ecological Value

This map shows the water and land areas of the region with the highest ecological value. Ecological Value criteria are defined by the presence of streams, lakes, wetlands, floodplains, glades, caves and karst, forest, and large herbaceous areas, along with weighted combinations of ecosystem service benefits for clean water and wildlife. The darkest colors show the greatest overlap of these value criteria, and therefore the highest ecological value.



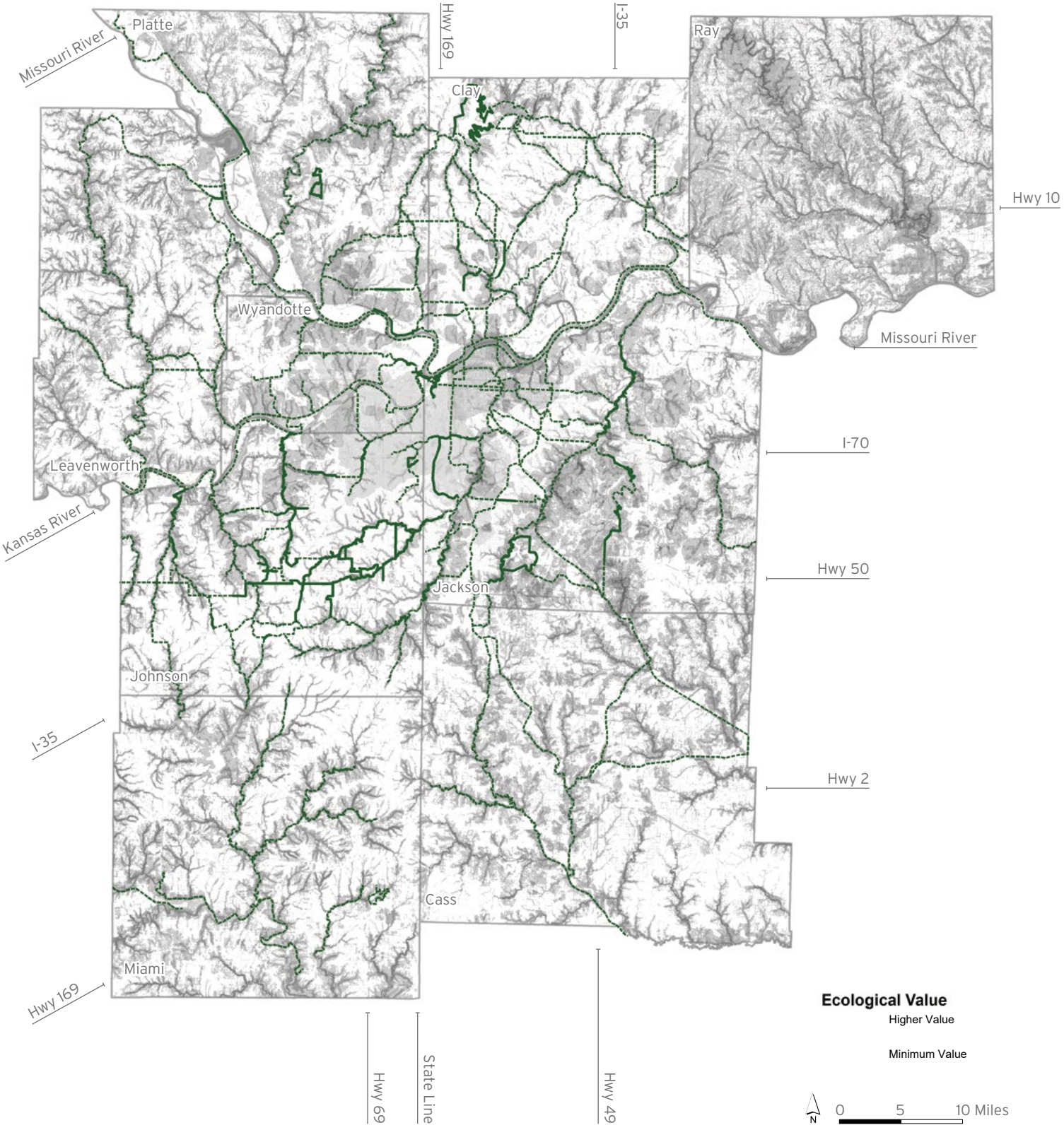
Transportation Investments

This inventory map details planned transportation investments in the Kansas City region, including roadway, transit, bicycle and pedestrian projects. The darkest solid lines represent projects with funding allocated and should be implemented in the next five years. The brighter red lines represent designed projects that have not secured funding. The dashed red lines represent other projects that are identified in the regional Transportation Outlook 2040 plan, but would be implemented in the longer term.



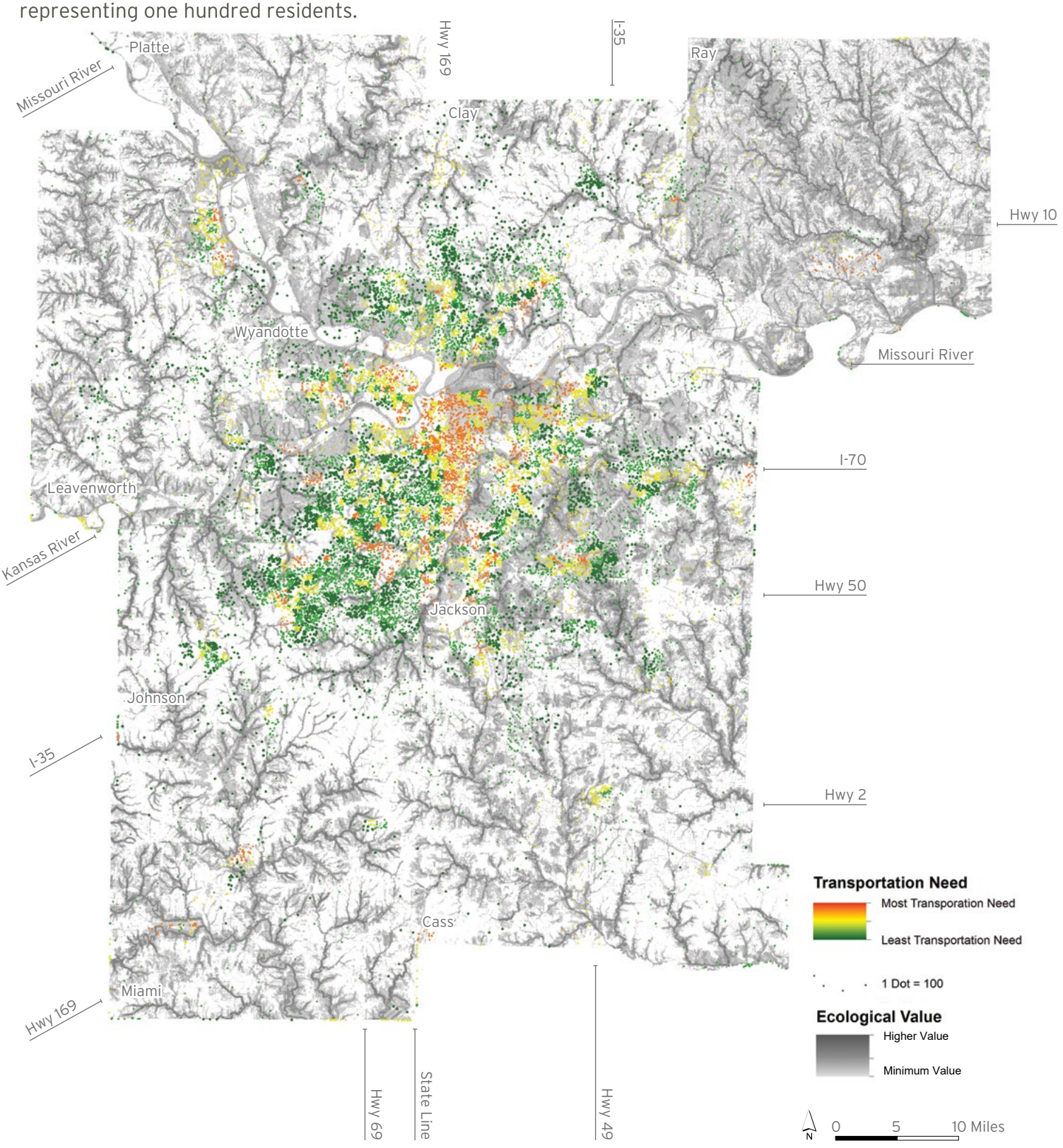
MetroGreen® Corridors

This inventory map identifies where existing and planned MetroGreen corridors align and intersect with areas of ecological value. MetroGreen is an initiative to establish an interconnected regional network of trails and green corridors, and includes recreational and ecological components. The solid green lines on this map represent established MetroGreen trail corridors. The dashed lines represent proposed MetroGreen connections.



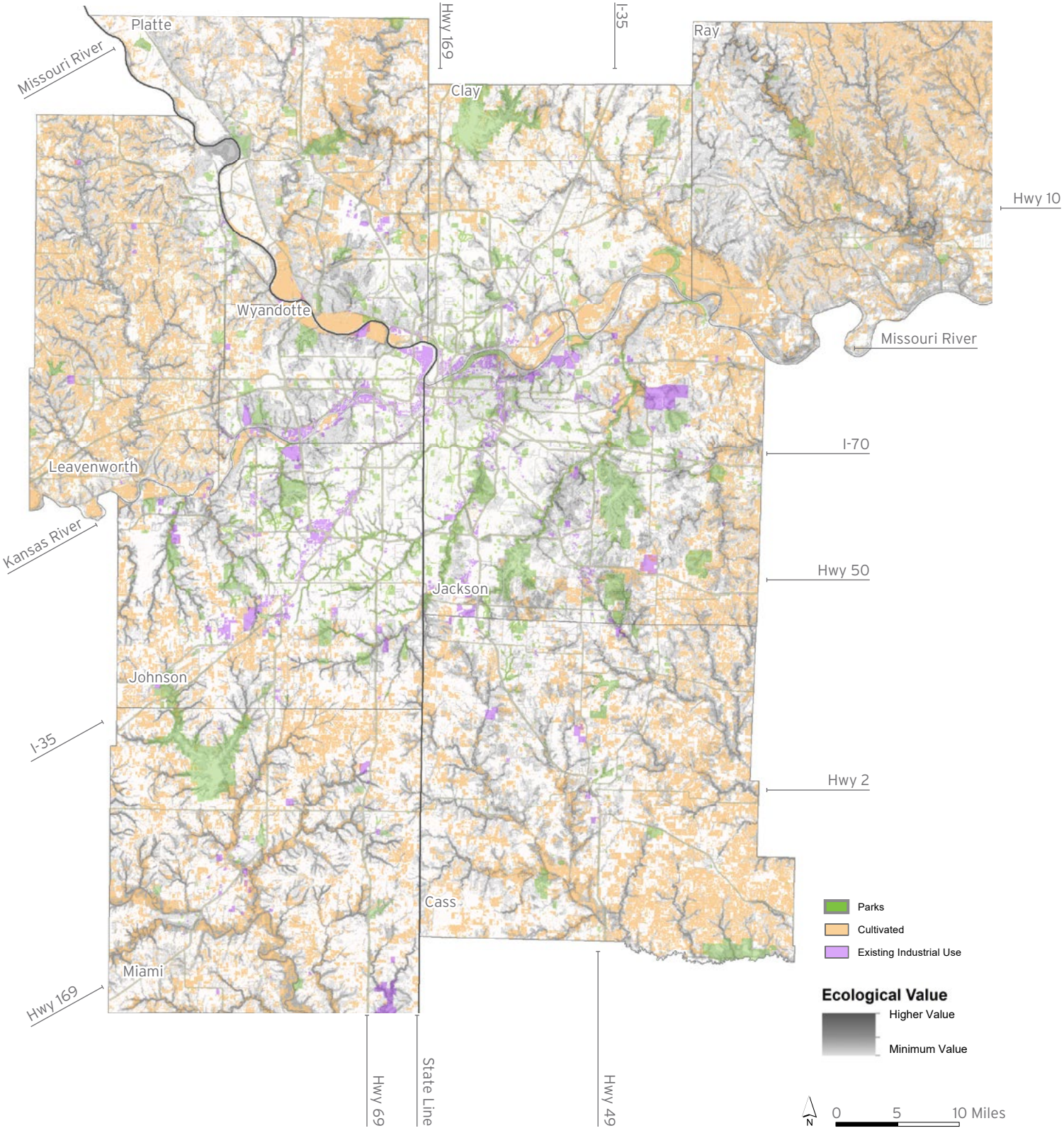
Transportation Equity

This analysis map identifies areas with a high need for transit and other alternative modes of transportation, with orange representing greater need and green representing less need. This transportation need index is a composite of a variety of demographic and socioeconomic factors related to mobility (including: percent of residents aged under 18, percent of residents aged over 65, percent of households in poverty, percent of zero-car households, percent of workers commuting via transit, bike, or on foot, percent of disabled residents, and job-worker balance). The dots on the map show population density, with each dot representing one hundred residents.



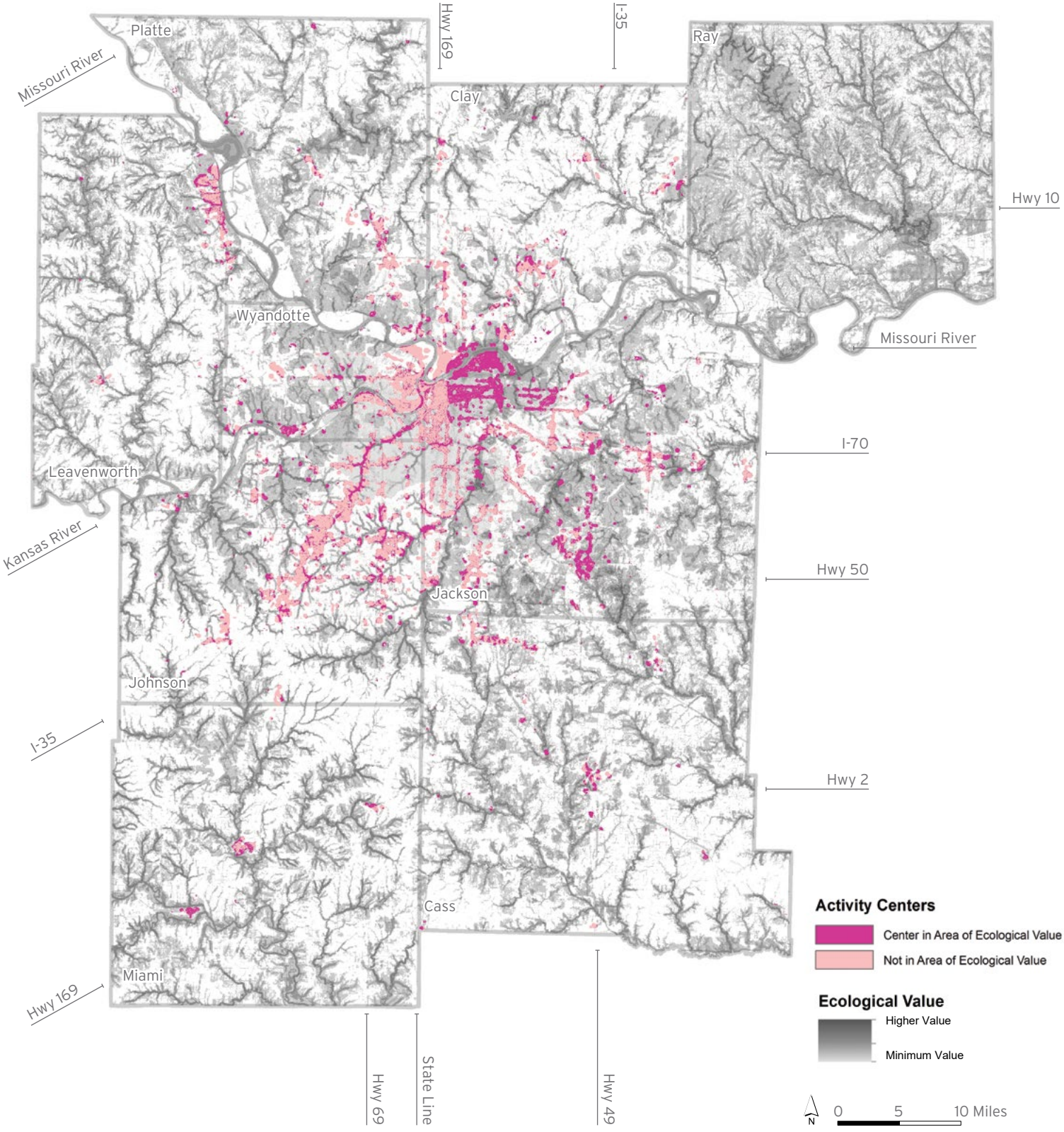
Human Impact on Land

This analysis map shows the factors of cultivated land, industrial land and park land owned and operated by municipalities in proximity to areas of ecological value. This illustrates pollution pressures and opportunities to manage land in a more ecologically sensitive manner to benefit our streams, rivers, lakes and habitat connections.



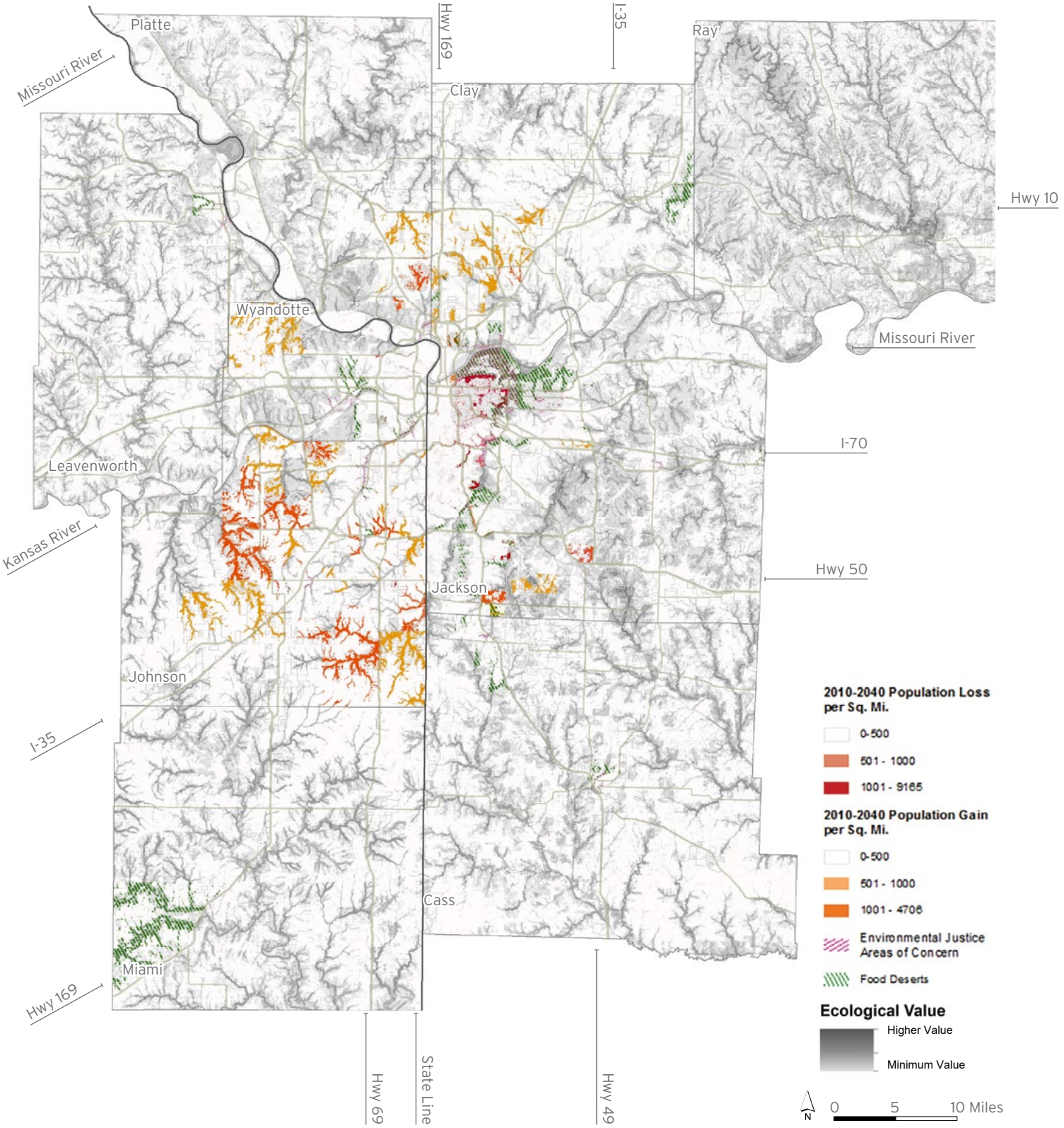
Activity Centers

The region's Metropolitan Transportation Plan, Transportation Outlook 2040, identifies a network of activity centers and corridors that provide a framework for prioritizing transportation investments. Activity centers are areas with a concentration of population and employment. This map shows the intersection of designated activity centers with areas of ecological value. Places where these layers overlap are opportunities for action. They combine both a high priority to invest and develop, and a strong imperative to respond to ecological needs.



Social Conditions

This intersection analysis map combines data on areas of concern for environmental justice, food deserts, and population growth/decline areas to show where areas of key social-system challenges intersect with areas of high ecological value. Green infrastructure solutions that create healthy community foundations are the most important in the most vulnerable or disconnected communities. Connecting these communities to the benefits of healthy ecological, economic, and social network can not only create pathways to wealth-building, but also to a holistic green infrastructure approach to community resilience.



PRIORITY AREAS FOR GREEN INFRASTRUCTURE

The priority map focuses on implementation in areas of highest value and need. The priority areas described in the following eight examples were selected based on the intersection of the highest values of the factors illustrated in the previous Atlas maps — ecological value, transportation equity, high-impact land use, designated activity centers, and a selection of indicators for vulnerable populations. The factors of the intersection analysis are not weighted during this phase of work. The intersections result in darker areas that have the most overlap of high value factors. In many instances these high-value intersections occur at the confluence of two watersheds. The watersheds define the next smaller scale of evaluation for green infrastructure opportunities in the Playbook.

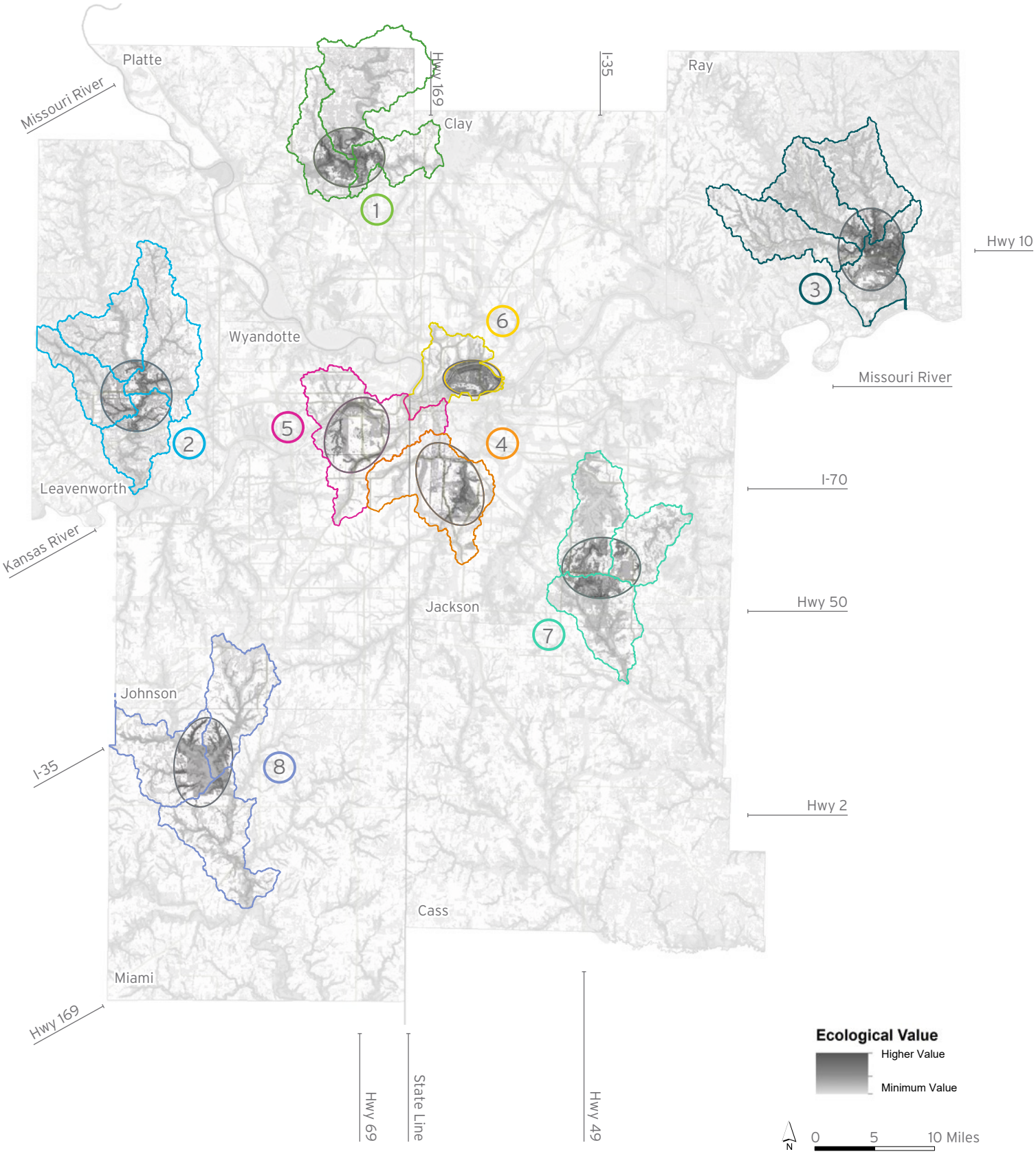
The eight highlighted areas are examples illustrating key challenges and assets across the transect zones of the Greater Kansas City region. This is not a comprehensive list of priority areas. The next steps to refine and expand the number of priority areas on this map include additional research on the factors analyzed, weighting of the factors to more clearly reflect key system values and needs, and weighting of the analysis to show the non-geospatial characteristics associated with momentum, accessibility and proximity. As these priority areas are refined and the Atlas becomes more comprehensive, additional color-coded dots will be added to show places with similar challenges and assets to the priority areas. This addition will help more users throughout the region to expand upon lessons learned and solutions applied.

Applicable tools, policies and programs for ALL:

- Develop partnerships and cross-jurisdictional watershed management programs to open opportunities for integrated, ecologically comprehensive planning and implementation.
- Pursue partnerships and planning efforts based on watershed geography.
- Explore options for department reorganization and improved communication channels within jurisdictions to meet green infrastructure goals.

(See appendix for opportunities and tools)

Priority Areas



PRIORITY AREAS FOR GREEN INFRASTRUCTURE

1 Rural Zone Transect

This rural environment including the small town of **Edgerton, Missouri** is in an area of high, cultivated land use and high-ecological value and need associated with the **Platte River and the Kendzora Conservation Area** (Smithville Lake is just to the east of this area). Three watersheds connect at the center of this area. Allocated transportation funding could be leveraged for implementation of the planned MetroGreen trails as well as conservation and restoration projects to protect the high value high need ecology.

Local benefits:

The Missouri Department of Conservation is updating the long-term master plans for Kendzora Conservation Area, Little Bean Marsh Conservation Area and the Dr. Fredrick Marshall Conservation Area. This agency focuses on providing appropriate recreation opportunities in wild places, and the integrated management practices for restoration and preservation of natural habitats. Integrating the practices of this agency with agencies that manage proximate stream buffer zones, trail development along the Platte River and large landscape restoration along the funded transportation project would extend the environmental benefits of the conservation areas. This coordination would also serve to educate more agencies, land managers and recreational users about integrated conservation and restoration practices to connect and enhance their communities.

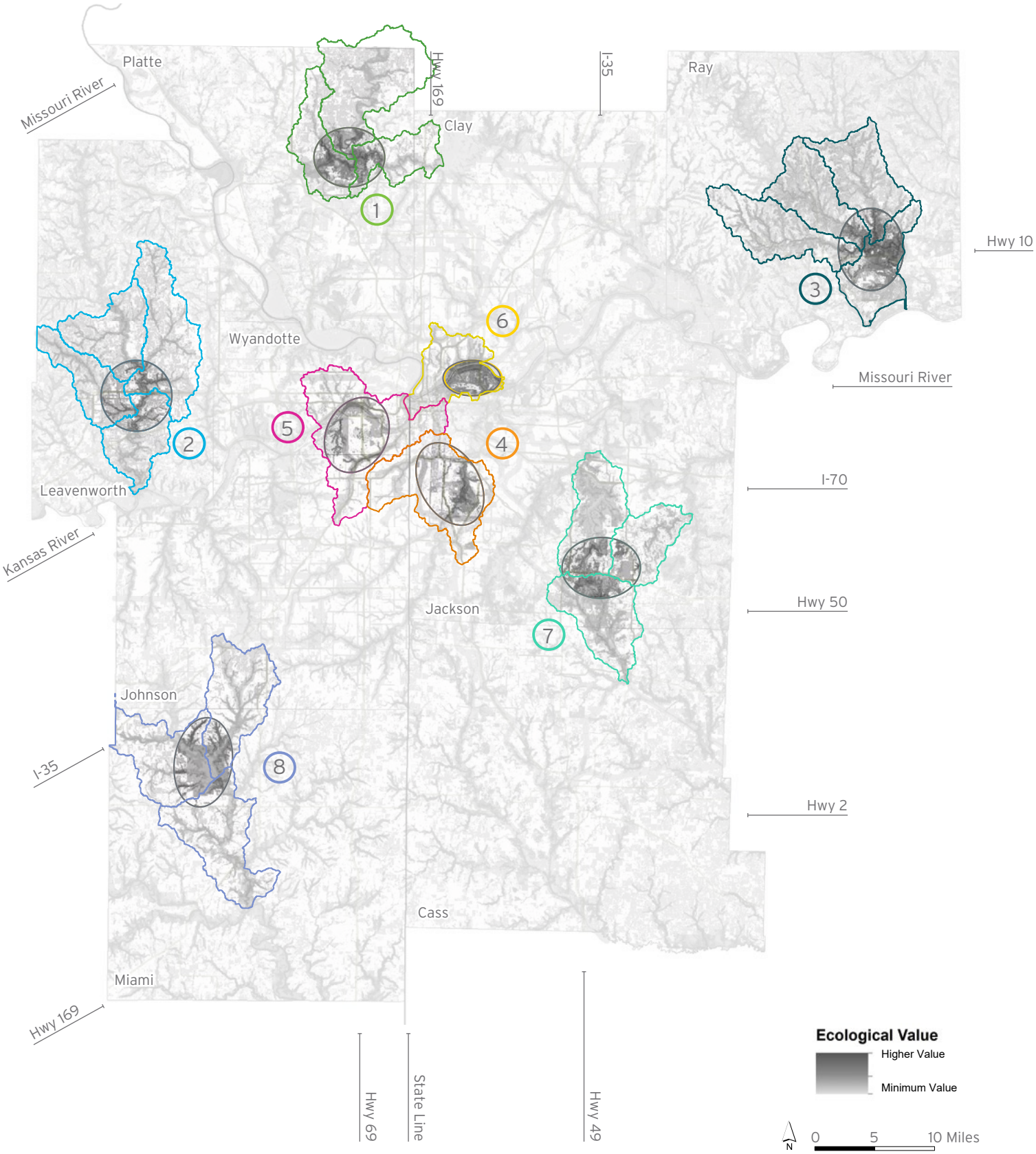
Regional lessons:

This priority area not only provides current success stories in conservation and restoration of a variety of habitats, but also has the momentum and potential of a funded transportation project that could model an integrated process of planning, design and implementation of green infrastructure across jurisdictions and transportation agencies.

Applicable tools, policies and programs:

- Encourage stream buffers and conservation easements to reduce agricultural encroachment on streams.
- Implement planned MetroGreen trails.
- Adopt sediment and erosion control ordinances.
- Pursue active watershed resource conservation and restoration via design, implementation, support for stream setbacks, and achieve stated goals.
- Coordination with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways is highly recommended, particularly in disadvantaged communities disproportionately impacted by highway-related air pollution.

Priority Areas



2 Rural Zone Transect

This rural area of high-ecological value is focused on the impaired water body **Stranger Creek** between the small but growing towns of **Tonganoxie and Basehor, Kansas**. The western part of the region is very high in cultivated land use and has the highest number of impaired streams. MetroGreen trails are planned for this area as is the Woodfield Drive Extension transportation project. The high ecological value and need of this area as well as the potential for this trail corridor to serve as a major north/south educational connector in creek restoration makes this a key rural priority area.

Local benefits:

An integrated watershed approach would include strategically increasing stream buffers along Stranger Creek (conservation areas), stream restoration, coordinated best practices between land managers of cultivated land along the creek, and native habitat restoration of conservation easements. Completing MetroGreen trail connections along Stranger Creek in this area could provide an outstanding community amenity as well. These integrated solutions would result in a decrease in instances of flooding, increase habitat health, and increase in stream health and reduction in downstream pollution.

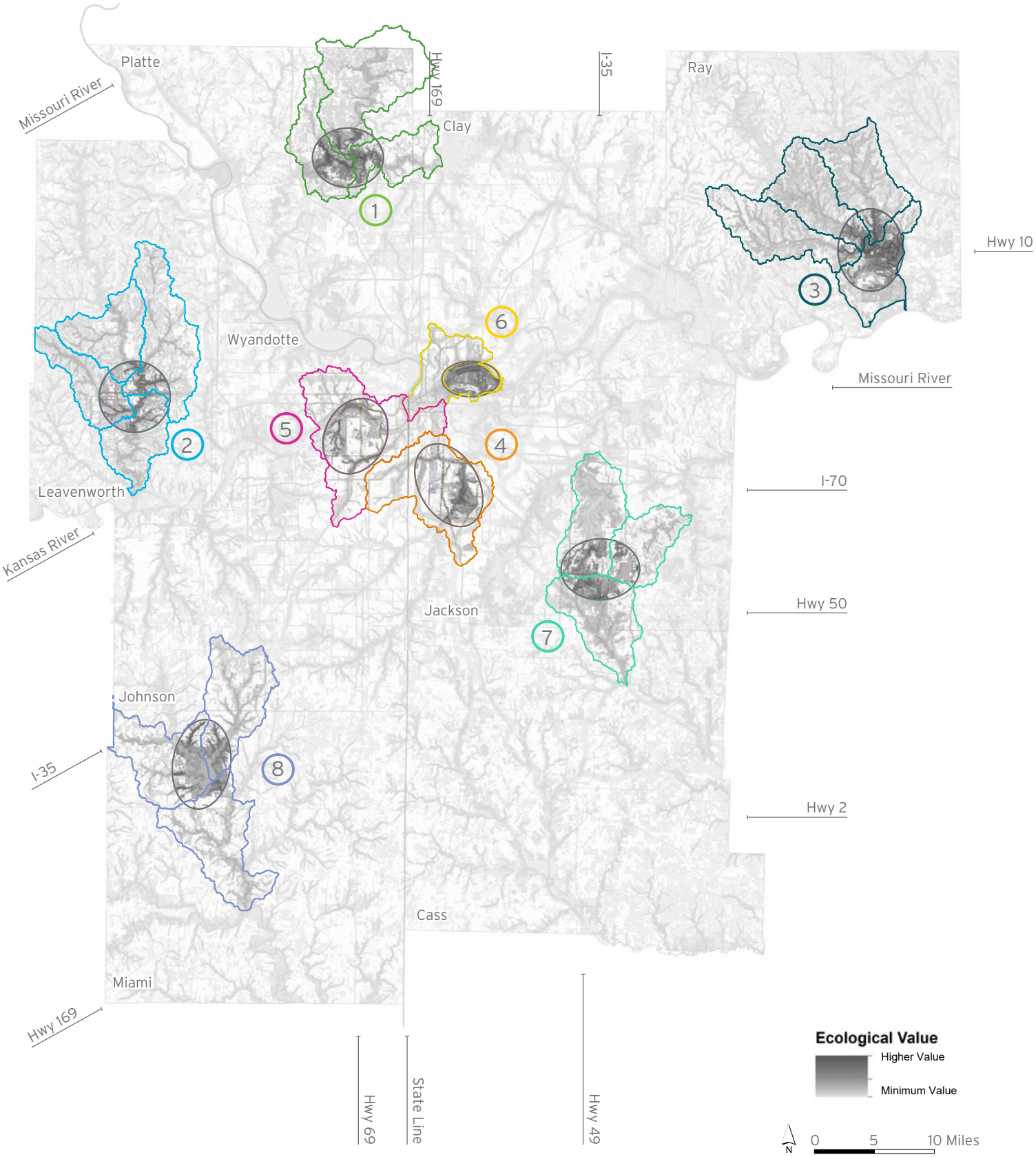
Regional lessons:

Impaired water bodies are a widespread challenge in our region, especially in the western counties. This priority area creates an opportunity to demonstrate an integrated approach to addressing this challenge and simultaneously addressing several of the emerging priority goals of the region: 1) Improve the health of rivers and streams; 2) Connect people to water; 3) Use green infrastructure to create quality of life amenities; 4) Improve local habitat; and 5) Establish conservation priorities.

Applicable tools, policies and programs:

- Encourage stream buffers and conservation easements to reduce agricultural encroachment on streams.
- Develop tree boards and municipal led community forestry programs
- Adopt illicit discharge ordinances.
- Pursue active watershed resource conservation and restoration via design, and implementation to support stream setbacks and achieve stated goals.
- Adopt cluster development ordinances to preserve open space in areas undergoing new development.
- Implement planned MetroGreen trails.

Priority Areas



3 Sub-Urban Zone Transect

The area including the small city of **Richmond, Missouri**, the county seat of Ray County, is highlighted here as very high ecological value area, while also being in an area of high cultivated land use. The priority area resides at the nexus of four watersheds. The significant amount of intact forest in large continuous acreage is a rare and valuable attribute of our region. Protecting and building upon this unique circumstance is a chance to learn from patterns of ecological health associated with heritage or historical landscape conditions and their impacts on water, air and habitat connectivity.

Local benefits:

An integrated approach to green infrastructure could alleviate the flooding this area suffers. While this is a very high ecological value area, encroaching pressures of agricultural land use and increased rainfall will increase the challenges of flooding. A targeted approach to conservation and restoration of enough contiguous parcels of land to return the area to its natural hydrology would likely have beneficial impacts on the Missouri River as well as Richmond and surrounding communities. Green infrastructure streetscape solutions in the small city of Richmond can serve as part of this treatment train, and provide an educational platform for residents and businesses about the community benefits of an integrated approach to green infrastructure.

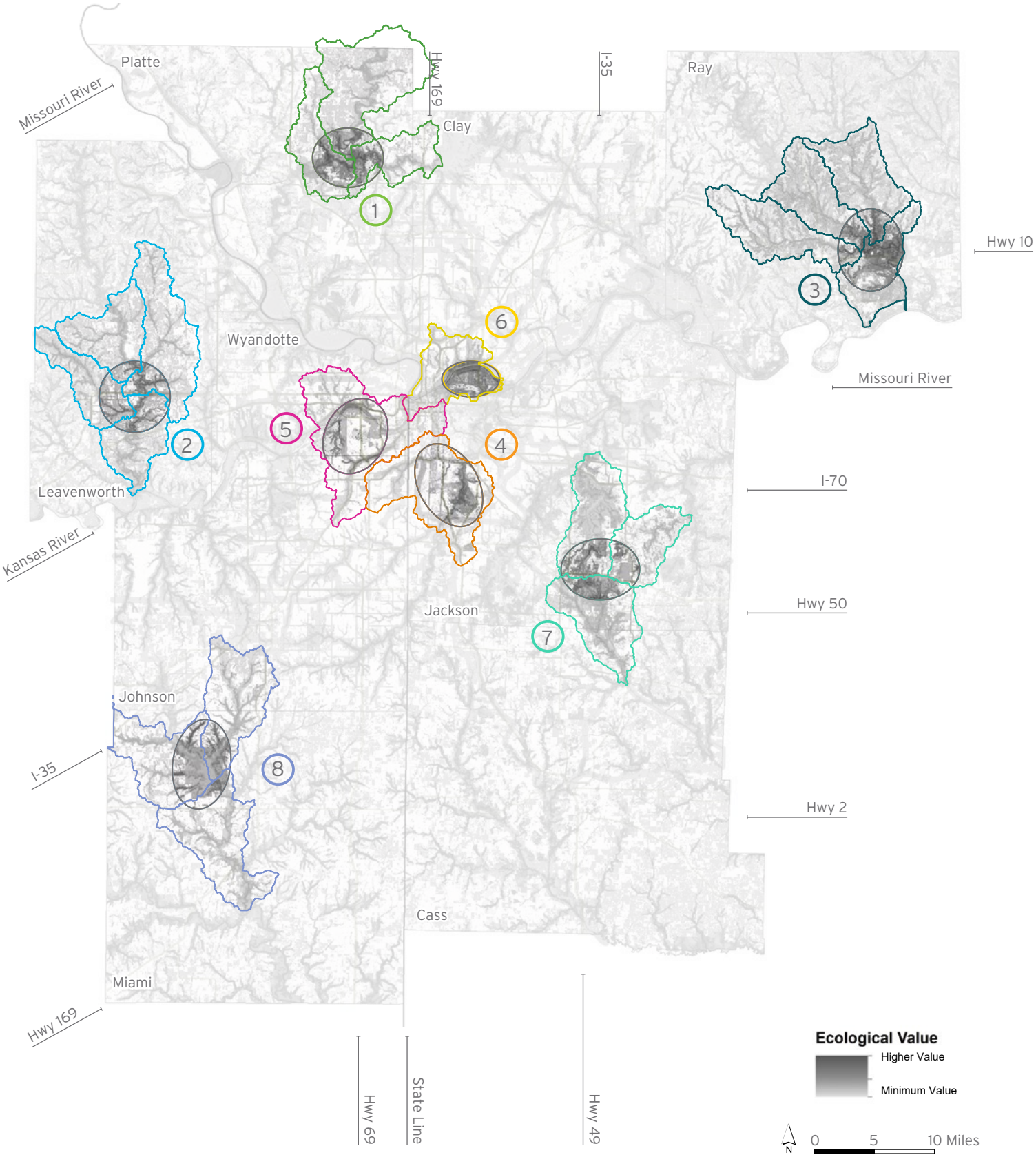
Regional lessons:

Many small cities in the region are highly impacted by surrounding agricultural uses and could apply lessons learned here. A coordinated body of small city participants could create a set of appropriate guidelines or processes for an integrated approach to green infrastructure.

Applicable tools, policies and programs:

- Remove weed and landscape ordinance barriers to native plantings.
- Pursue active watershed resource conservation and restoration via design and implementation to support stream setbacks and achieve stated goals.
- Capitalize on historic district designation to recognize and preserve historic environmental assets.
- Incorporate forest districts in city zoning codes to protect key lands at risk of development pressure.
- Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways, particularly in disadvantaged communities disproportionately impacted by highway-related air pollution.
- Incorporate LEED-rating minimums in municipal facility construction best practices to reduce building emissions.

Priority Areas



4 Sub-Urban Zone Transect

The **Middle Blue watershed** is one of the 19 designated Urban Waters locations in the United States. The urban conditions, including industrial land use, surrounding the Middle Blue River provide great challenges to the ecology and great opportunity since many partners and projects are active in this area. This is in a designated Activity Center in Mid-America Regional Council's Transportation Plan, MetroGreen trails are planned for this area, and transportation projects that are planned for the near to mid-term include:

- 85th Street
- Prospect Avenue Bus Rapid Transit
- U.S. 71 / Interstate-49 Bus Enhancements
- Missouri state Route 350 Express Bus
- Troost Avenue Streetscape
- Urban Rail: Phase Two

Local Benefits

Green infrastructure addresses environmental and social justice issues as well as improvement of public health outcomes. Generating opportunities for transportation and improving access to healthy food through investments in urban agriculture can lead to healthier lifestyles and reduce rates of chronic diseases such as obesity and diabetes.

Furthermore, investments in transit, walkability and bikability has potential to improve economic outcomes by connecting disadvantaged households to jobs and resources through improved transportation mobility.

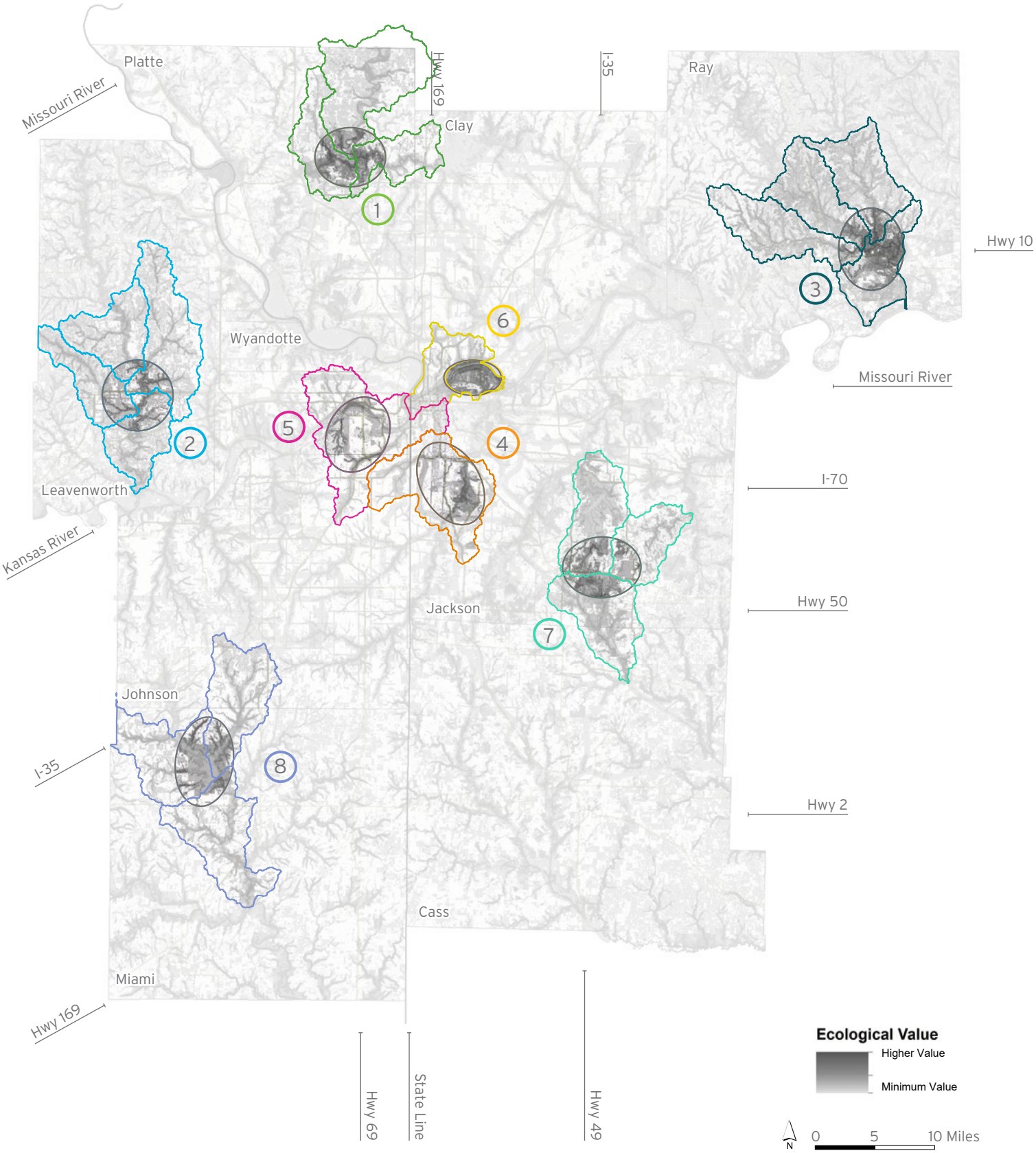
Regional Lessons

The priority area encompasses both areas of population decline and increasing vacancy in east Kansas City, and areas reinvigorated from renewed investments in urban living. This context underscores the need to be more strategic about where and how cities grow and shrink to adapt to dynamic social and environmental trends.

Applicable Tools, Policies and Programs

- Remove weed and landscape ordinance barriers to native plantings.
- Prioritize habitat connection opportunities in park-acquisition decisions, using green corridors and trail systems to provide migratory opportunities for local wildlife.
- Implement planned MetroGreen trails and coordinate parks and trail planning with local and regional activity centers.
- Encourage stream buffers and conservation easements to reduce development encroachment on streams.
- Pursue active watershed resource conservation and restoration via design and implementation and to support stream setbacks and achieve stated goals.
- Adopt urban forestry initiatives.
- Implement green and complete streetscape solutions to reduce impervious surface runoff and reduce single-occupancy vehicle traffic.
- Continue investment in pedestrian, bicycle and transit infrastructure.
- Develop educational programs to inform the public about the benefits of urban green infrastructure solutions and involve urban youth in environmental education.
- Explore the use of incentives to encourage the use of green roofs in new construction.
- Employ education programs targeted toward developers and property managers regarding best practices for the construction and maintenance of green roofs.
- Pursue strategies for brownfield and vacant lot revitalization.

Priority Areas



5 General Urban Zone Transect

This area highlighted in the **Turkey Creek watershed** is significant for its particular strength in the non-geospatial criteria of momentum, access and proximity. Its position directly west of the Middle Blue watershed creates a network of opportunities across watershed boundaries. Development pressure and population growth trends mean that prioritizing action on development and construction-related processes can result in near-term community benefits, including trail connections to activity centers, complete streets and transit-oriented design, enhanced public transit, and low impact development processes. The transportation projects currently slated for this area include:

- Interstate 70 Bus Enhancements
- Interstate 35 and Lamar Interchange
- Interstate 35 Reconstruction
- Shawnee Mission Parkway Transit Service
- Quivira Road Reconstruction
- 18th Street Connector

Local Benefits

Major hospitals and universities within the watershed present opportunities to improve access to healthcare for residents and spark a culture of health. Improving the walkability and bikability of neighborhoods and protecting park and trail amenities enhance opportunities for active lifestyles, and increase access to local healthcare facilities.

Green design can reduce the environmental impact of redevelopment in revitalizing central cities. Stormwater Best Management Practices (BMPs), green roofs, native landscaping and energy efficient design can reduce increased demands on infrastructure and reduce heat island effects, while being attractive and efficient.

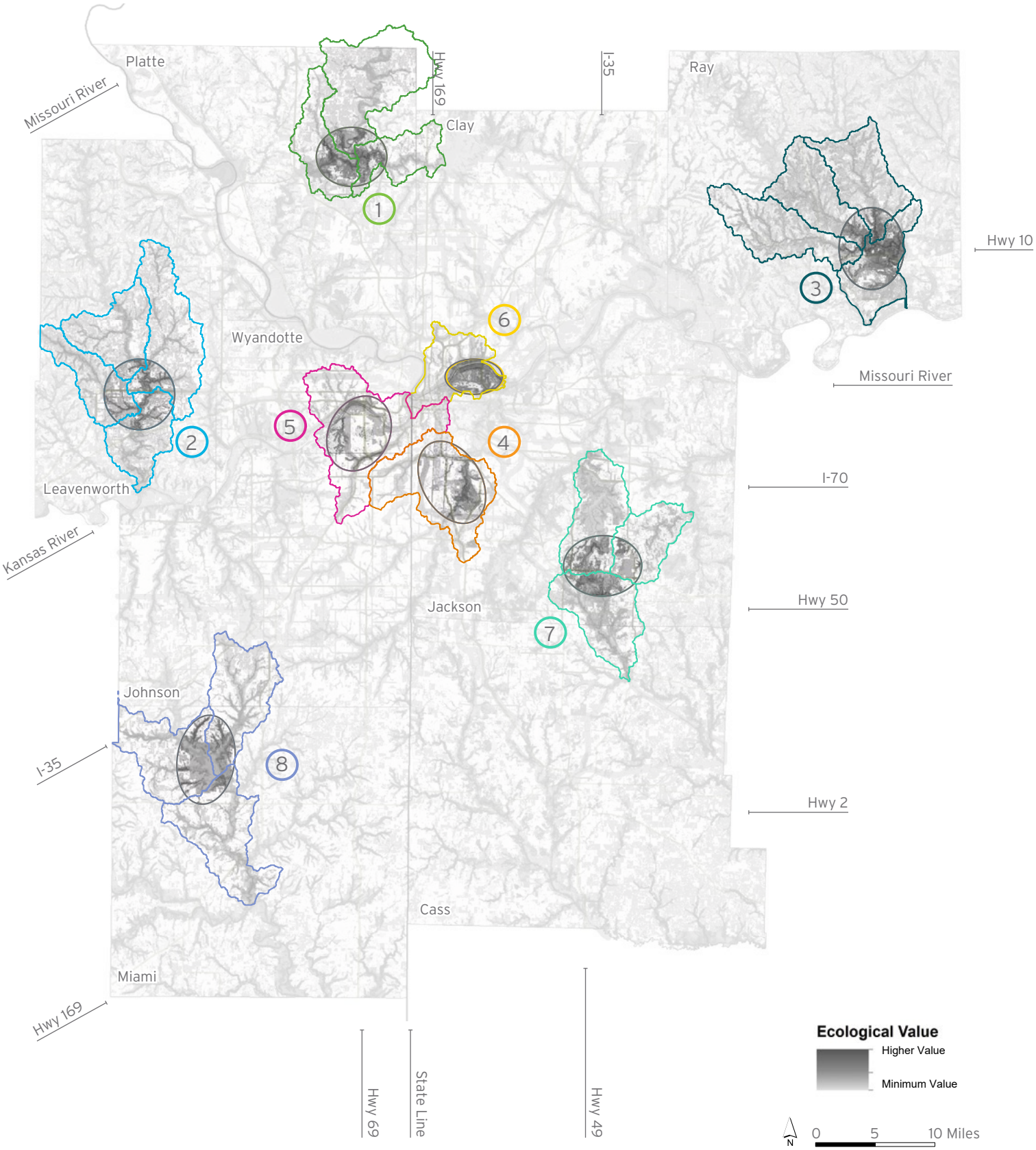
Regional Lessons

The confluence of a number of active projects and partners presents an opportunity to quickly capitalize on current momentum. Turkey Creek stakeholders can blaze the path in showing the region how to quickly incorporate green infrastructure planning and implementation into existing projects.

Applicable Tools, Policies and Programs:

- Prioritize habitat connection opportunities in park acquisition decisions using green corridors and trail systems to provide migratory opportunities for local wildlife.
- Pursue active watershed resource conservation and restoration via design and implementation to support stream setbacks and achieve stated goals.
- Coordinate parks and trail planning with local and regional activity centers.
- Implement green and complete streetscape solutions to reduce impervious surface runoff.
- Adopt form-based zoning codes and transit-oriented development to enhance and preserve the walkability of commercial centers and neighborhoods.
- Continue investment in pedestrian, bicycle and transit infrastructure.
- Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways.
- Incorporate LEED-rating minimums in municipal facility construction best practices to reduce building emissions.
- Explore the use of incentives to encourage the use of green roofs in new construction.
- Employ education programs targeted towards developers and property managers regarding best practices for the construction and maintenance of green roofs.
- Adopt tree canopy ordinances to increase vegetation and shading.
- Remove weed and landscape ordinance barriers to native plantings.

Priority Areas



6 Urban Core Zone Transect

The **Kansas City Northeast Industrial District** is notable for its high degree of issue intersection. This is an area of high ecological value and a regional activity center near downtown Kansas City on the Missouri River occupied by industrial land use. This is also an area of marked social need. The near-term transportation investment is the Lewis and Clark Expressway. Focusing investment in green infrastructure networks in this area could include educational and recreational programs and projects. These would connect more people to the Missouri River and Blue River. These programs would build awareness of the importance, impact and potential amenity of this natural resource that provided the foundational reason for settlement and economy.

Local Benefits

Industrial areas are present challenges for environmental quality. They represent the complex intersection of trade-offs and synergies related to the regional economy, social and environmental justice, environmental degradation, and deeply held cultural values. At the same time, there has been hesitation in aggressively addressing the Missouri River's health, despite the river's role in the environmental and economic well-being of the Kansas City region. Our location on the river means that we have a responsibility for its impact on our downstream neighbors. This confluence of the challenges associated with the Missouri River and industrial land use should not be reasons for paralysis, but for experimentation and action. We benefit locally from the potential improvements in local water quality and potential reconnection to a major cultural, economic, and environmental resource. Action taken here is also an opportunity for the city and region to emerge as a leader in addressing challenges faced by jurisdictions throughout the Missouri River watershed.

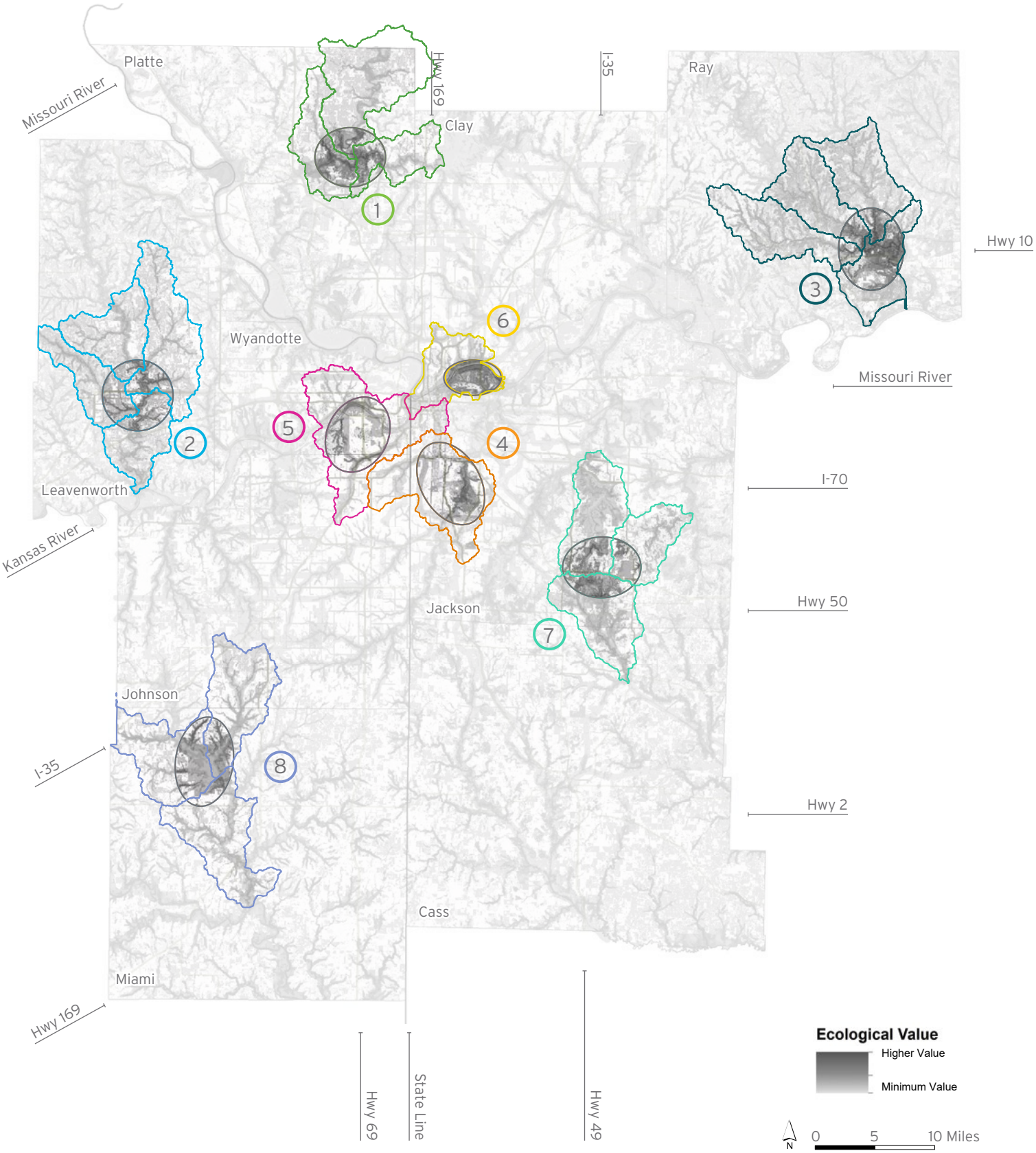
Regional Lessons

The Missouri River is one of the original reasons for settlement in this region, and yet the great majority of cities and towns along the river have turned their backs to this mighty natural resource — developing the most intense and depleting land uses along its banks for the convenience of transporting goods. Monitoring this area's impact on the Missouri River and solutions to increase the natural hydrology of the land will be useful lessons to share throughout the region.

Applicable Tools, Policies and Programs:

- Implement green and complete streetscape solutions to reduce impervious surface runoff and reduce single occupancy vehicle traffic.
- Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways.
- Incorporate LEED-rating minimums in municipal facility construction best practices to reduce building emissions.
- Continue investment in pedestrian, bicycle, and transit infrastructure.
- Explore the use of incentives to encourage the use of green roofs in new construction.
- Employ education programs targeted towards developers and property managers regarding best practices for the construction and maintenance of green roofs.
- Prioritize and strengthen illicit discharge ordinances.

Priority Areas



7 Sub-Urban Zone Transect

This highlighted ecological value area includes the **James A. Reed Memorial Wildlife Area**, proximity to industrial and cultivated land use, and population-gain pressures. The Todd George Interchange/U.S. 50 Highway Reconstruction is a near-term funded transportation project. MetroGreen trails are planned for this corridor as well. Other major transportation projects in this area are:

- Rock Island Commuter Rail
- Blackwell Interchange Improvements
- Park and Ride Lot Development

Local Benefits

Local municipalities include suburban communities whose pastoral landscapes act as amenities for creating attractive residential markets. Protecting the environmental assets that contribute to its pastoral appeal is an opportunity to protect local property values and the natural environments preferred by many regional residents. Reconnecting the fragmented habitats in this area can be an opportunity to weave trail amenities through residential landscapes, as well as buffer farmland and future development from hazards associated with industrial uses.

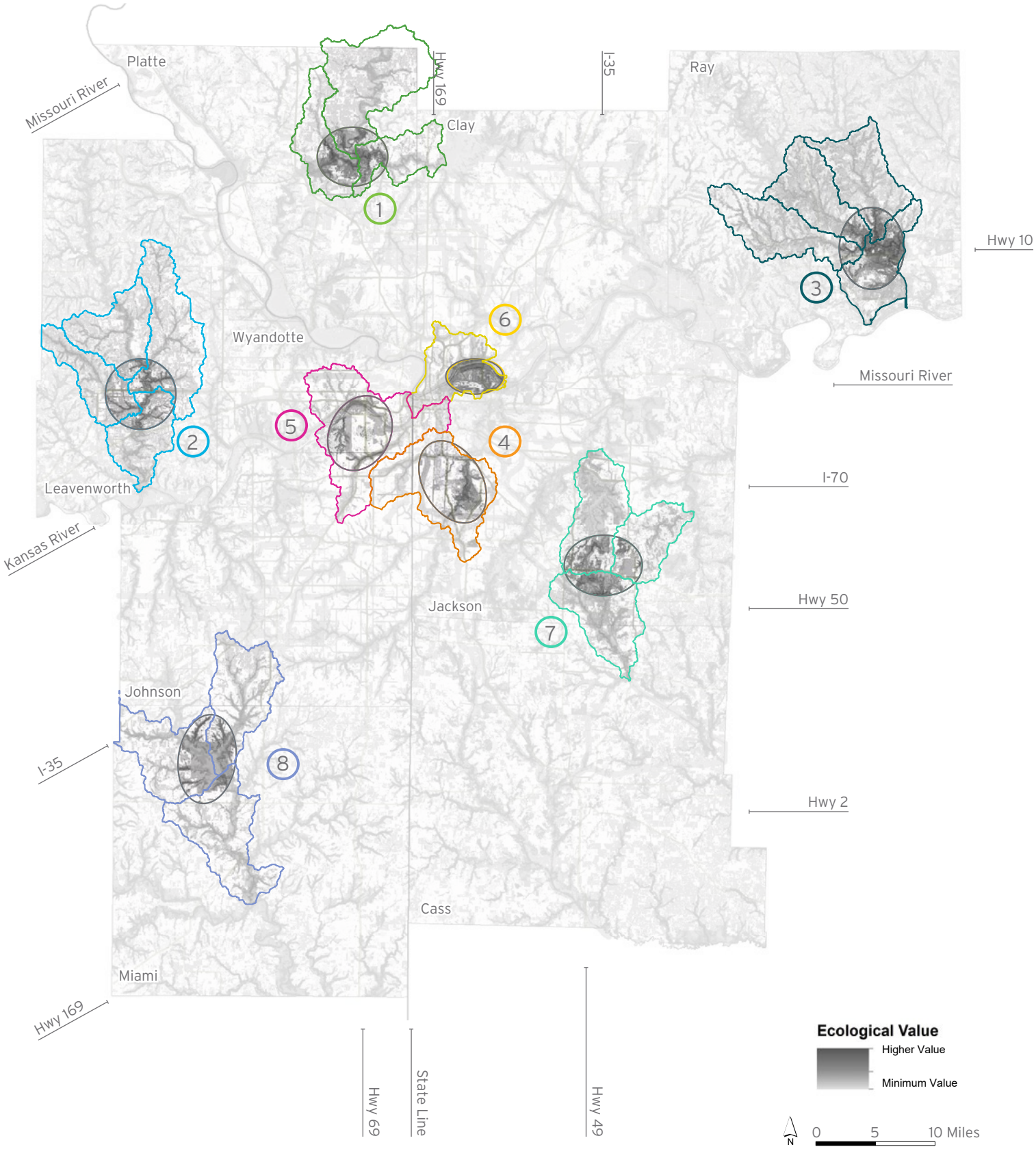
Regional lessons

This priority area illustrates clear opportunities for demonstrating integrated systems management through the restoration of habitat connectivity between multiple major ecological resources. This priority area is at the nexus of diverse, land-use pressures on ecological systems: suburban development pressures, heavy resource extraction, and cultivated lands. The complex political, social, ecological and built-environment relationships between diverse uses is also an exemplary condition for expert facilitation and coordination toward consensus.

Applicable Tools, Policies and Programs

- Encourage stream buffers and conservation easements to reduce both agricultural and development pressures on streams.
- Prioritize habitat connection opportunities in park acquisition decisions using green corridors and trail systems to provide migratory opportunities for local wildlife.
- Pursue broader regional adoption of stream setback ordinances for comprehensive protection of waterways from development pressure.
- Pursue active watershed resource conservation and restoration via design and implementation, to support stream setbacks, reconnect hydrological corridors and habitat hubs.
- Adopt cluster development ordinances to preserve open space in areas undergoing new development.
- Incorporate agricultural and forest districts in city zoning codes to protect key lands at risk of development pressure.
- Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways.
- Implement green and complete streetscape solutions to reduce impervious surface runoff and reduce single occupancy vehicle traffic.
- Incorporate principles of traditional neighborhood development (TND) and new urbanism in city zoning codes for more efficient use of land resources and infrastructure to benefit walkability and livability.

Priority Areas



8 Rural Zone Transect

This area including **Hillsdale Reservoir and State Park** is associated with a regional activity center, transit need, and park land use, which indicates not only management capacity but also access by the greater regional population for sharing knowledge and benefits of conservation and restoration more widely. As is prevalent in the western counties, there is also a great deal of ecological impact from cultivated land. This area also provides example solutions for many of our region's lakes and impaired streams and creeks. The priority area identified is at a confluence of three watersheds. An integrated approach to green infrastructure at this 12,000-acre park and wildlife area could result in multiple local and regional benefits.

Local benefits:

This state-managed land is habitat to many species of fish, fowl and small mammals. The management of habitat types is focused primarily on hunting and recreation. 500 acres of the wildlife area is planted farmland. An integrated approach to identifying key conservation areas, connected habitat and native species restoration, could help to address the pollutants washing downstream from heavy agricultural use north of the park. Demonstrating this approach in the areas where visitors camp, fish and hunt, as well as the protected areas that are not accessed by tourists, will increase awareness of the approach taken to restore habitat and keep the water clean.

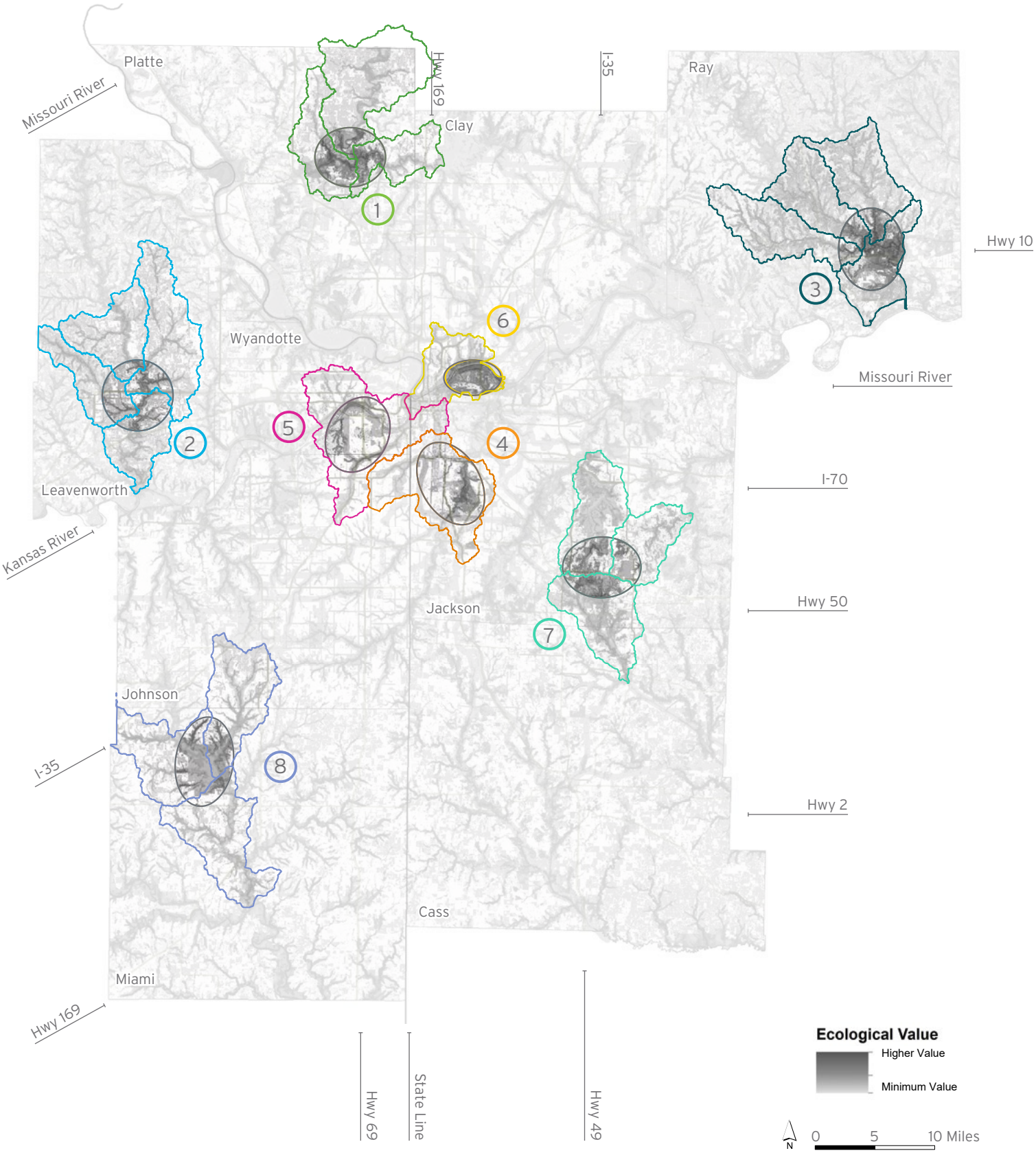
Regional lessons:

The Greater Kansas City region has many lakes, some of which include parkland managed by the counties and associated municipalities (Smithville Lake, Longview Lake, Lake Jacomo, Blue Springs Lake, Lake Winnebago, Lake Lotawana, Lone Jack Lake and Pleasant Hill Lake). All are impacted by the surrounding land use and could benefit from sharing best practices for conservation, restoration and ongoing management to increase the health of the land, water and native species. A coordinated effort between all of the land managers associated with lakes could result in an adoptable set of guidelines for integrated land and water management to reduce non-point source pollutants and increase the habitat for native species at our region's lakes.

Applicable tools, policies and programs:

- Encourage stream buffers and conservation easements to reduce agricultural encroachment on bodies of water.
- Prioritize illicit discharge ordinances for agricultural and industrial uses.
- Coordinate parks and trail planning with regional activity centers.
- Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways.
- Pursue partnerships and planning efforts based on watershed geography — **especially partnerships with state, due to State Park status of lake.**

Priority Areas



PLAYBOOK

The Playbook outlines how to move into action by zooming into priority areas from the Atlas. For this preliminary phase, two example priority areas have been selected as examples for a deeper dive. Each of the examples meets the criteria of need and opportunity with projects and partners that show multiple benefits to the environment and the people of these places.

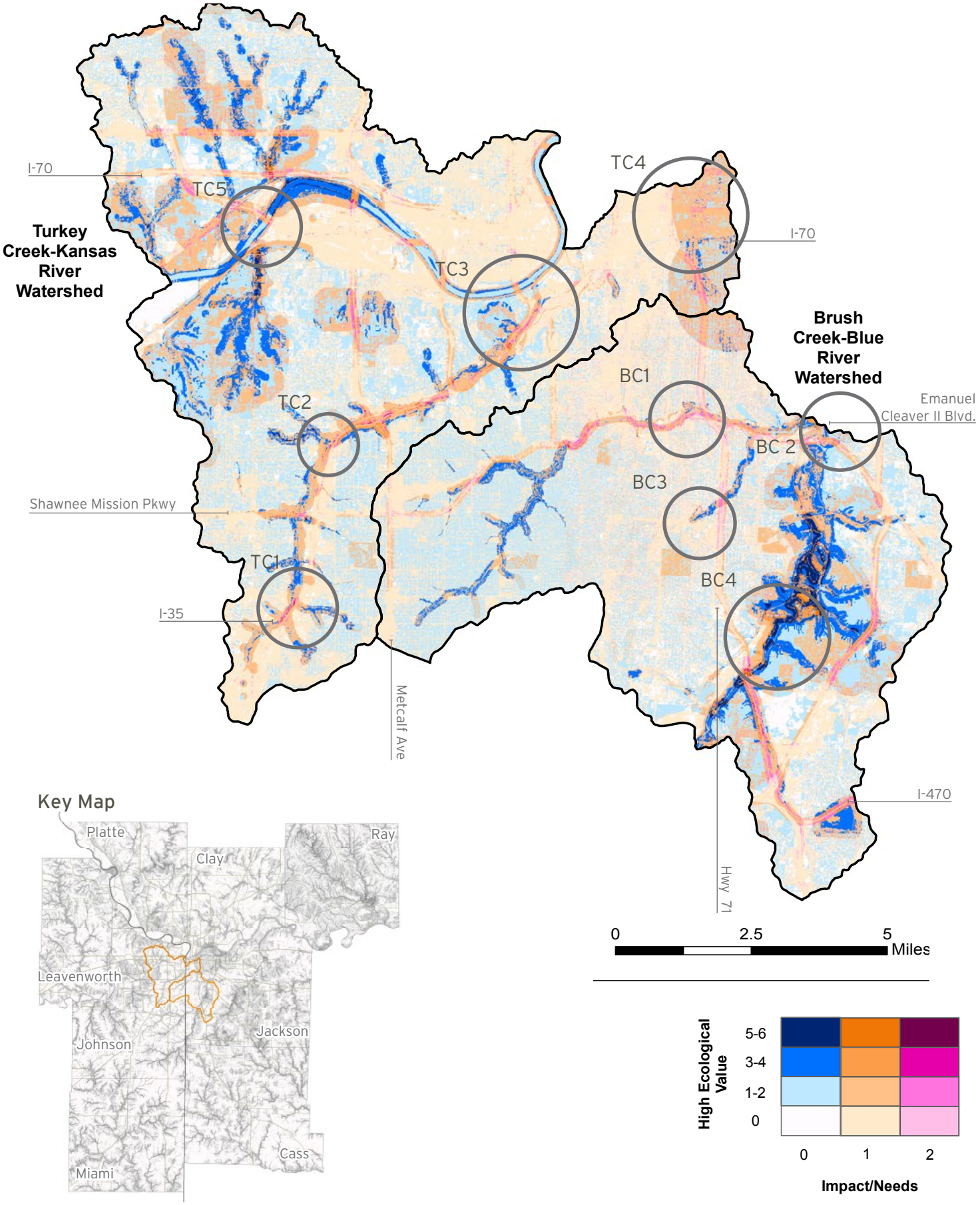
These adjacent watersheds, Brush Creek/Blue River and Turkey Creek/Kansas River, show examples of very different challenges but are united by the MetroGreen trail system, I-35, and instances of large-scale industrial uses in the bends of our rivers, which is a typical challenge seen throughout the region.

The circles within each watershed are opportunity areas labelled with an abbreviation of the watershed name and a number. These opportunity areas were identified through the GIS suitability analysis explained earlier with an additional layer of data on transportation funding. The map to the right presents a more refined picture of how ecological value and ecological impacts and needs intersect in these two example watersheds through a two-variable analysis. The x-axis in the legend identifies how many of the two impacts and needs analysis criteria occur in any given location, as illustrated with blue, orange, and magenta tones. Impacts and needs criteria in this analysis are impervious surfaces with major road buffers and high forest restoration priority areas. Using darkness of tone for the blue, orange, and magenta colors, the y-axis in the legend portrays the amount of high ecological value criteria that overlap with those impacts and needs criteria. Thus lightest blue shows the lowest amount of overlap of impacts and needs with ecological value, while the darkest magenta indicates the highest amount of overlap between those two categories of analysis.

The Turkey Creek/Kansas River watershed network is characterized by population growth trends, connection to our region's largest waterways and major transportation investment. Opportunity areas TC1, TC2 and TC3 are along the I-35 corridor, which is funded for improvement. Opportunity area TC2 includes an opportunity to better connect residential areas to natural areas and restore a portion of Turkey Creek. Opportunity areas TC1, TC3, and TC4 include a number of schools and medical centers, which are key opportunities for campus demonstration projects and community education initiatives. Opportunity areas TC4 and TC5 are directly connected to the Missouri and Kansas Rivers respectively and highlight opportunity for redefining industrial land use practices, highway buffers and habitat restoration, and connection to our heritage sites.

The Brush Creek/Blue River watershed network is characterized by population decline and significant public health challenges as well as strong community leadership. All opportunity areas suffer from lack of access to healthy food. In opportunity areas BC1, BC2 and BC3 there are strong, organized initiatives in urban agriculture including revitalization of vacant lots for food production. The majority of Kansas City, Missouri Water Services pilot green infrastructure projects reside in opportunity area BC4. Funded enhancements to U.S. 71 Highway also connect opportunity area BC1, BC3 and BC4.

Ecological Value with Impacts and Needs



BRUSH CREEK/BLUE RIVER

PLAYBOOK EXAMPLE 1

KEY CONSIDERATIONS

The key natural systems considerations of this watershed are habitat and forestry restoration as well as aquifer recharge zones and creek protection to provide ecosystem services benefitting air quality, stormwater and pollination. The human system considerations include high rates of obesity and diabetes in each of the areas highlighted and a lack of access to healthy food. This is also an area with significant transit need. Population decline in the areas highlighted has created the challenge of abandoned homes and vacant lots. Investment in planning and community engagement has occurred through Mid-America Regional Council Planning Sustainable Places grants, city of Kansas City, Missouri Area Plans, Brownfield mitigation planning (Municipal Farms) and Kansas City, Missouri Water Services Target Green pilot program.

NETWORK CONNECTORS

Network connectors are green infrastructure solutions that address multiple challenges in the highlighted opportunity areas, and link the areas together to strengthen the watershed-scale system of benefits. See diagram to the right for application of each connector.

1. Improve access to healthy food through investments in urban agriculture training and projects.
2. Pursue strategies for brownfield and vacant lot restoration.
3. Remove weed and landscape ordinance barriers to native plantings and community gardens.
4. Adopt urban forestry initiatives.
5. Adopt transit oriented development policy.
6. Continue investment in pedestrian, bicycle and transit infrastructure, including MetroGreen.
7. Implement habitat connections and reforestation alongside the funded transportation improvements on U.S. 71 Highway, Troost and Prospect Avenues.
8. Implement complete and green streetscapes.
9. Develop educational programs to inform the public (all ages) about the benefits of urban green infrastructure solutions and training on how to use and realize the benefits of native plants.
10. Connect people to the river through education, celebration, and bike and pedestrian trails.

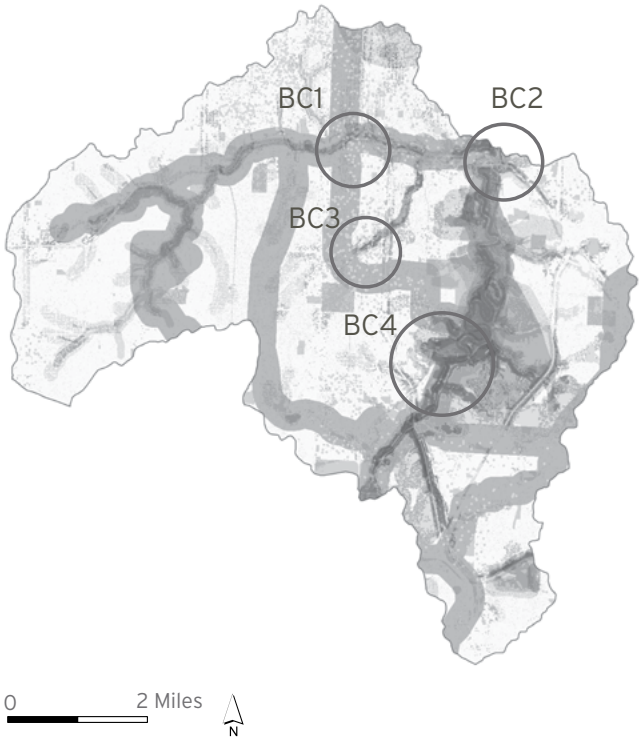
PARTNERS INCLUDE:

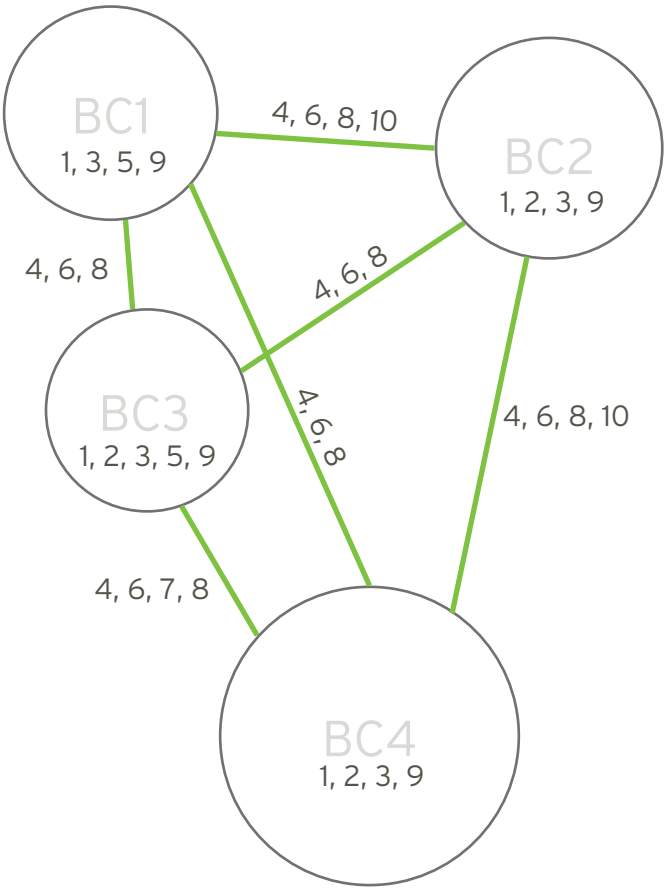
- Environmental Protection Agency (EPA)
- National Park Service
- U.S. Forest Service
- U.S. Geological Survey
- Kansas City, Missouri Water Services
- Middle Blue River Urban Waters Federal Partnership
- The Giving Grove
- KC Native Plant Initiative
- Heartland Conservation Alliance
- Bridging the Gap

BENEFITS AND METRICS

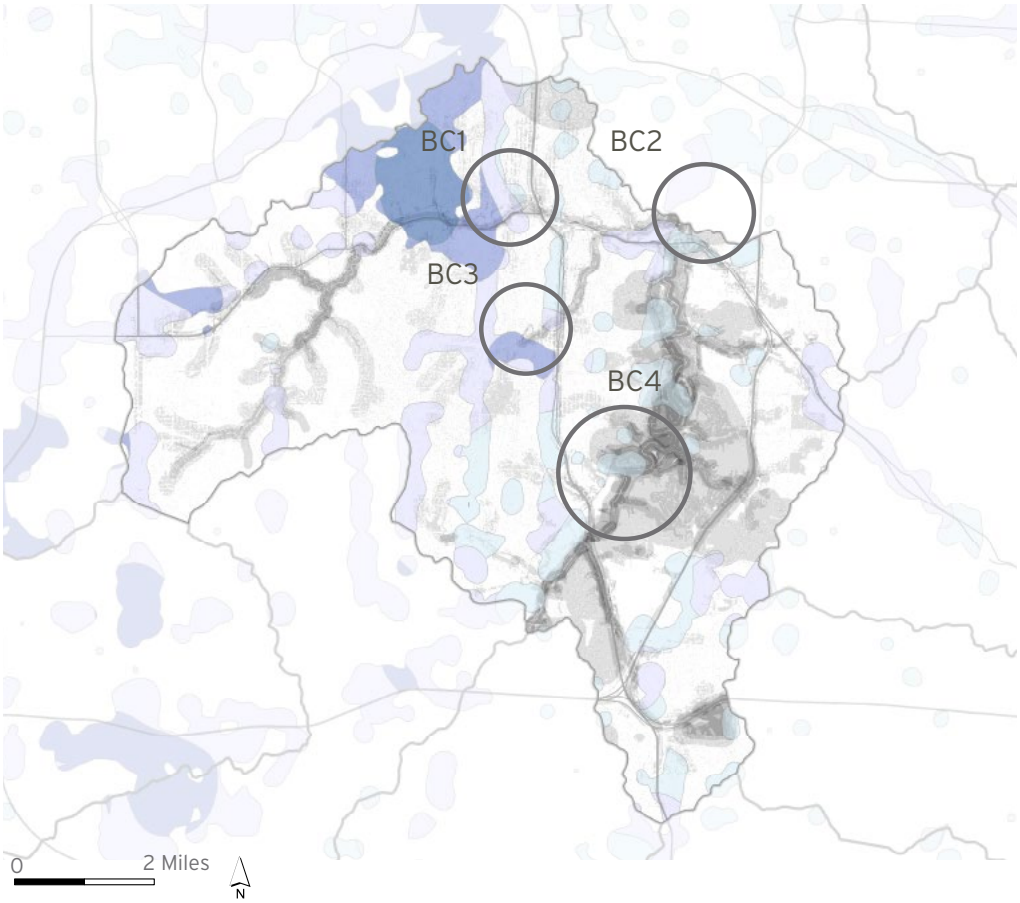
- Transportation equity: need served, job access, reduced poverty.
- Human health and wellness: reduced obesity, reduced diabetes, increased healthy food access.
- Wealth building: higher educational attainment, reduced poverty, increasing population.
- Stream and river quality: volume of water retained in green infrastructure; acres of BMPs, reduction in sediment loads.
- Connected habitat: increased species, acreage of forest in BMPs, acreage of restored prairies.

OPPORTUNITY AREAS AND DIAGRAMMED NETWORK CONNECTORS





Activity Centers



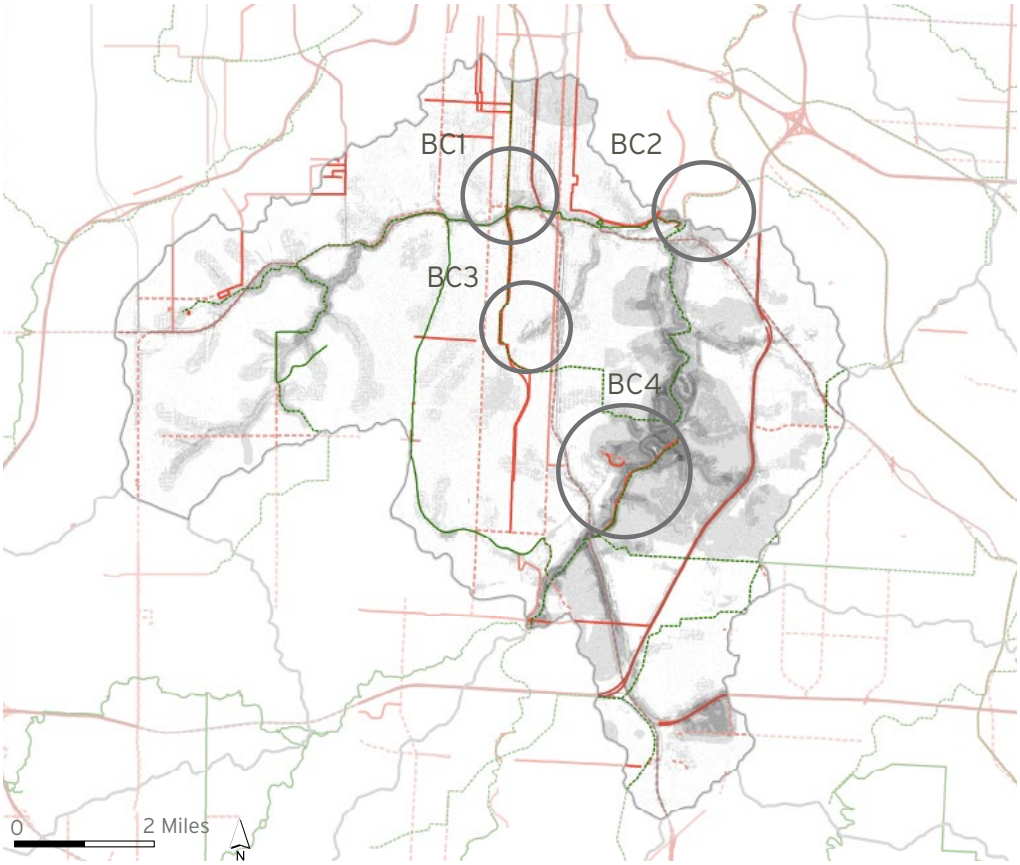
Activity Centers

- Less Intensity of population & employment
- -
- -
- Higher Intensity of population & employment

Ecological Value

- Higher
- Minimum

Transportation Investments



Transportation Investments

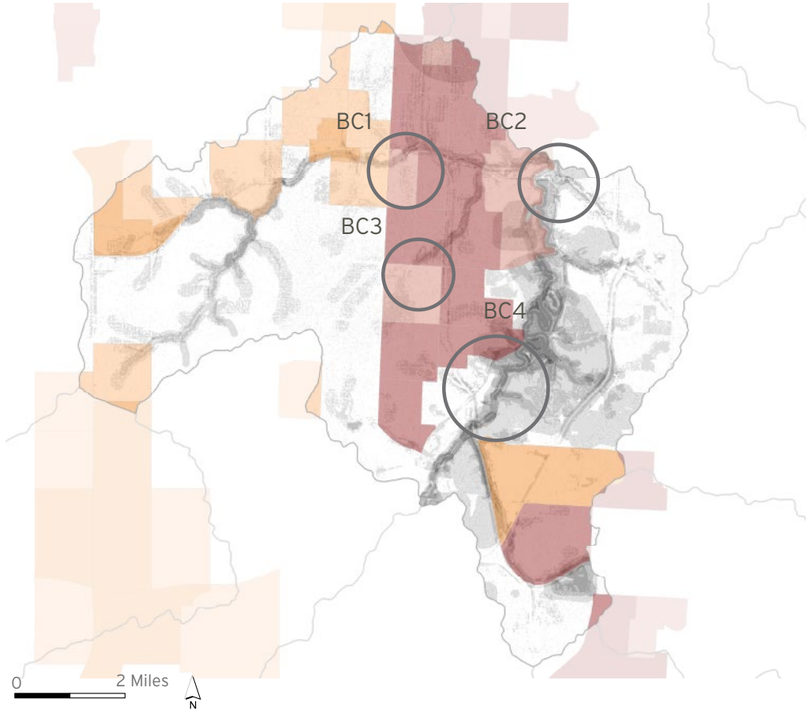
- Funded projects
- Project application
- Planned projects

MetroGreen

- Planned
- Existing

Ecological Value

- Higher
- Minimum



Development Pressure

2010-2040 Population Gain per Sq. Mi.

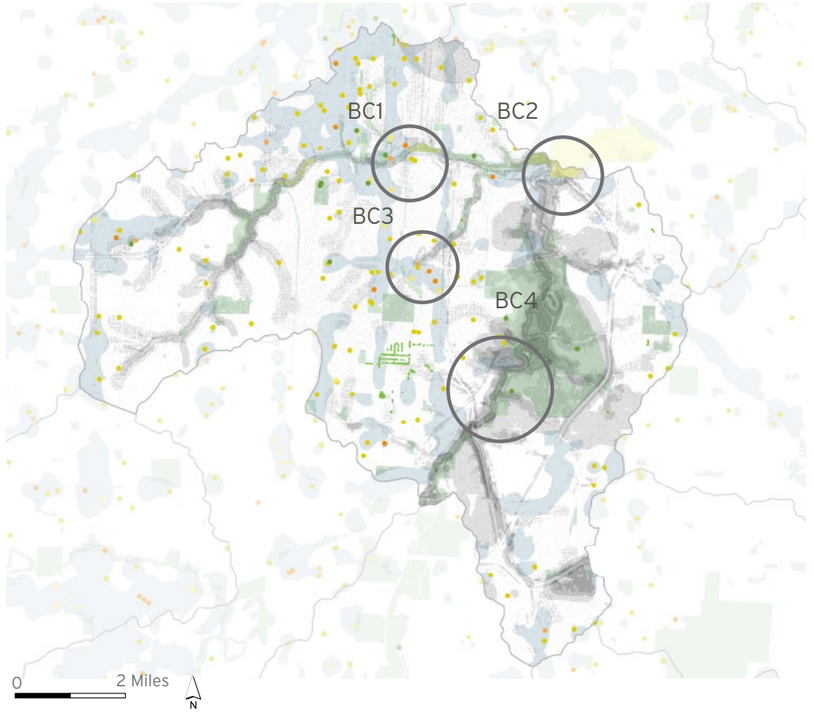
- 0 - 500
- 501 - 1000
- 1001 - 9165

2010-2040 Population Loss per Sq. Mi.

- 0 - 500
- 501 - 1000
- 1001 - 4706

Ecological Value

- Higher
- Minimum

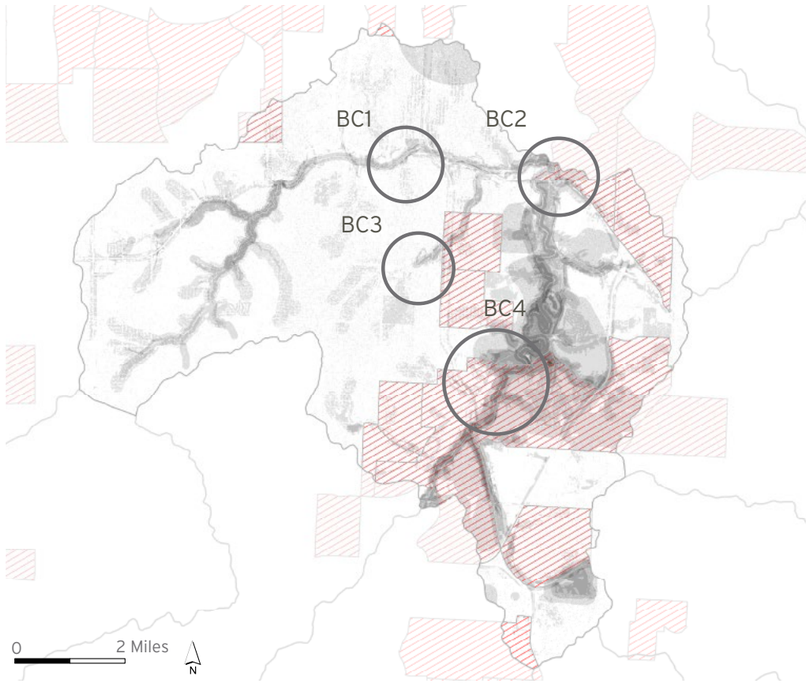


Culture Density & Projects

- Native Plant Iniative Locations
- Renew The Blue Locations
- Existing KCMO Green Infrastructure
- Hospitals
- Police
- Colleges
- Schools
- Parks
- Blue River Urban Waters Federal Partnership Core Projects
- Activity Centers

Ecological Value

- Higher
- Minimum



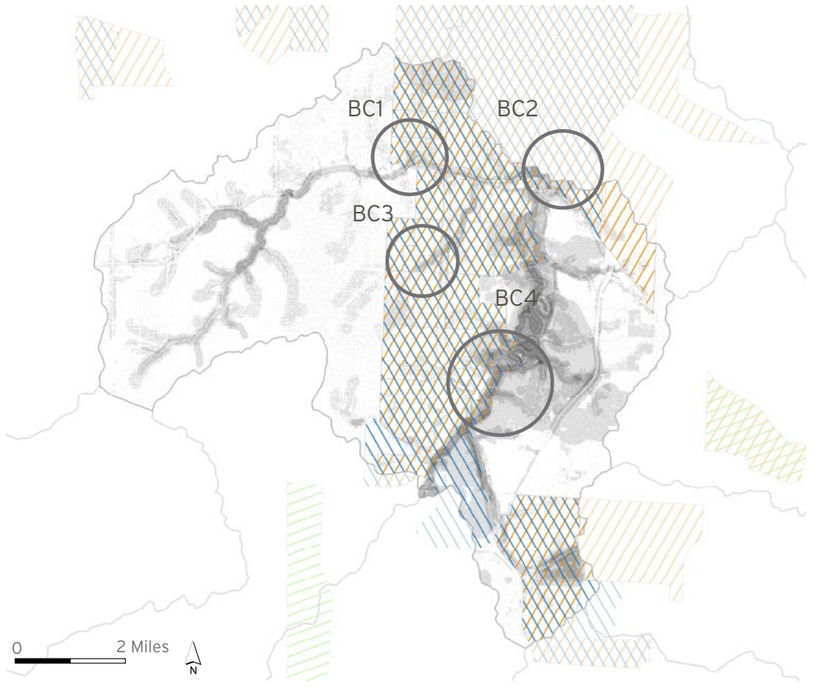
Food Deserts

Limited Income & limited access within 1 urban or 10 rural miles

- Yes

Ecological Value

- Higher
- Minimum



Health Indicators

CDC Obesity Rates

- Above National Average (39.6 - 52.4)

CDC Diabetes Rates

- Above National Average (13.2 - 26.6)

CDC Cancer Rates

- Above National Average (8.8 - 13.7)

Ecological Value

- Higher
- Minimum

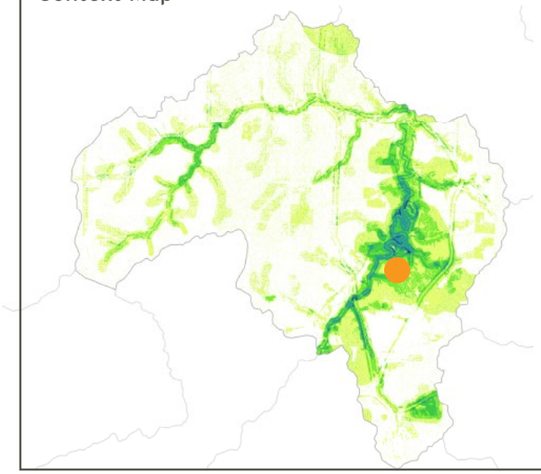
*Rates for both MO & KS

PROJECT SITE A

SUMMARY

Text summarizing project

Context Map



Site Map

- A Description
- B Description
- C Description
- D Description
- E Description
- F Description

PARTNERS

- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name

PLANNED & ONGOING PROJECTS

- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name

REGIONAL CONNECTIONS

- Example
- Example
- Example
- Example
- Example
- Example
- Example
- Example
- Example

KEY ISSUES

- Example
- Example
- Example
- Example
- Example
- Example

OPPORTUNITIES

- Example
- Example
- Example
- Example
- Example
- Example

PROJECT TEMPLATE

The figure to the left is a template for community and project scales, which is the next step for the Playbook. The template will act as a tool to help partners consider the larger network connections and impacts of the project. The sheet will identify key partners, adjacent planned and ongoing projects, regional connections as well as note key issues and opportunities to consider. Community- and site-scale images are on the following page to provide understanding and inspiration for a network of green infrastructure systems.

COMMUNITY OR SITE SCALE EXAMPLES

The images on this page are keyed to the relevant opportunity areas in the Brush Creek/Blue River watershed.

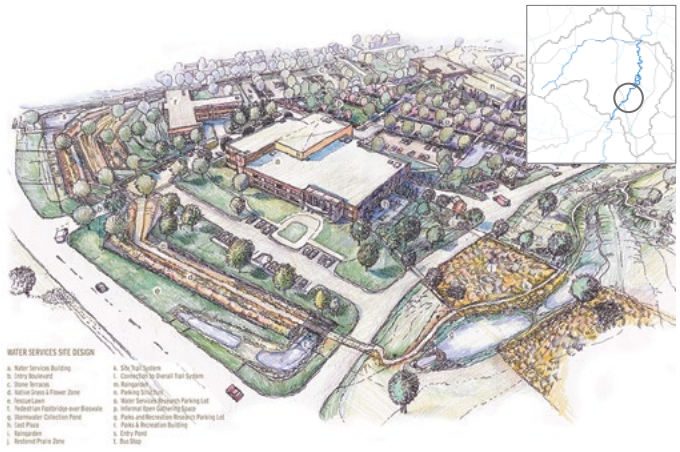
Low-impact parking

Community Agriculture

Campus Development

Community Agriculture

Campus Development – Native Plants, Open Space



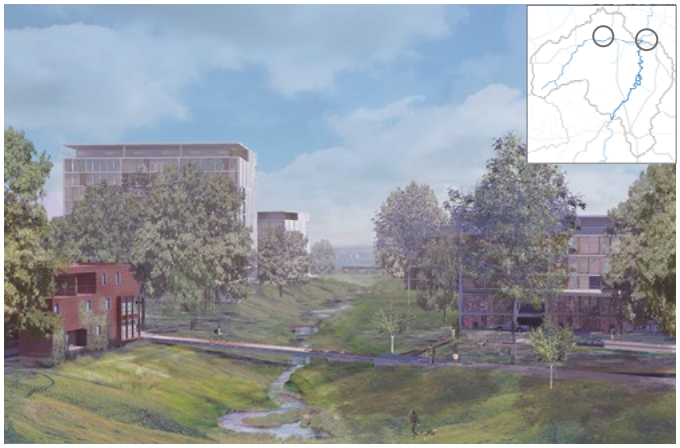
Low-impact Site Design
(KCMO Water Services Master Plan)

Conservation and Development

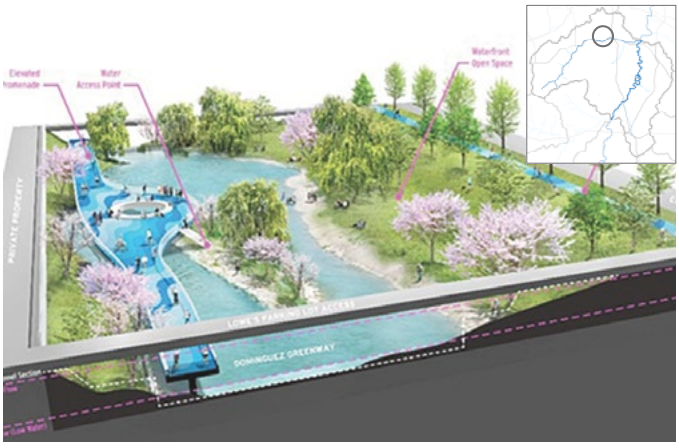
Complete Streets

Creek/Stream Bank Restoration & Recreation

Urban & Suburban Street BMPs



Stream Restoration & Development



Stream Restoration

TURKEY CREEK/KANSAS RIVER

PLAYBOOK EXAMPLE 2

KEY CONSIDERATIONS

This suburban watershed is in a population-growth mode and committed investment in infrastructure and development is high. Therefore in order to integrate the environmental, economic and social benefits of green infrastructure strategies with current projects, timely agreement on the priority implementation moves and/or policy for this area is key. Primary opportunities to connect projects and programs in this watershed are the I-35 corridor native plant buffer and the completion of the planned MetroGreen trails. The locations highlighted have infrastructure investment committed as well as high visibility for model projects.

NETWORK CONNECTORS

Network connectors are green infrastructure solutions that address multiple challenges in the highlighted opportunity areas and link the areas together to strengthen the watershed-scale system of benefits. See diagram to the right for application of each connector.

1. Implement education and demonstration hubs of green infrastructure solutions (i.e. parks, schools, community centers, campuses).
2. Adopt tree canopy ordinances to increase vegetation and shading.
3. Remove weed and landscape ordinance barriers to native plantings.
4. Coordinate parks and trail planning that prioritizes habitat connection opportunities.
5. Establish appropriate stream and river setbacks and restored habitat in buffer zones.
6. Coordinate with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways.
7. Continue investment in pedestrian, bicycle and transit infrastructure.
8. Implement green and complete streetscapes.
9. Create replicable guidelines to address the connection between industrial uses and the river with restoration of habitat and public trail connections.
10. Adopt form-based zoning codes and transit-oriented development to enhance and preserve the walkability of commercial centers, mixed-use areas and neighborhoods.
11. Create partnerships and programs for all-ages wellness programs that streamline access to healthcare and spark a culture of health.
12. Incorporate LEED-rating minimums in construction best practices for commercial, mixed use, institutional and industrial uses to reduce building emissions.
13. Explore the use of incentives to encourage the use of green roofs in new construction.
14. Employ education programs targeted towards developers and property managers regarding best practices for construction and development.

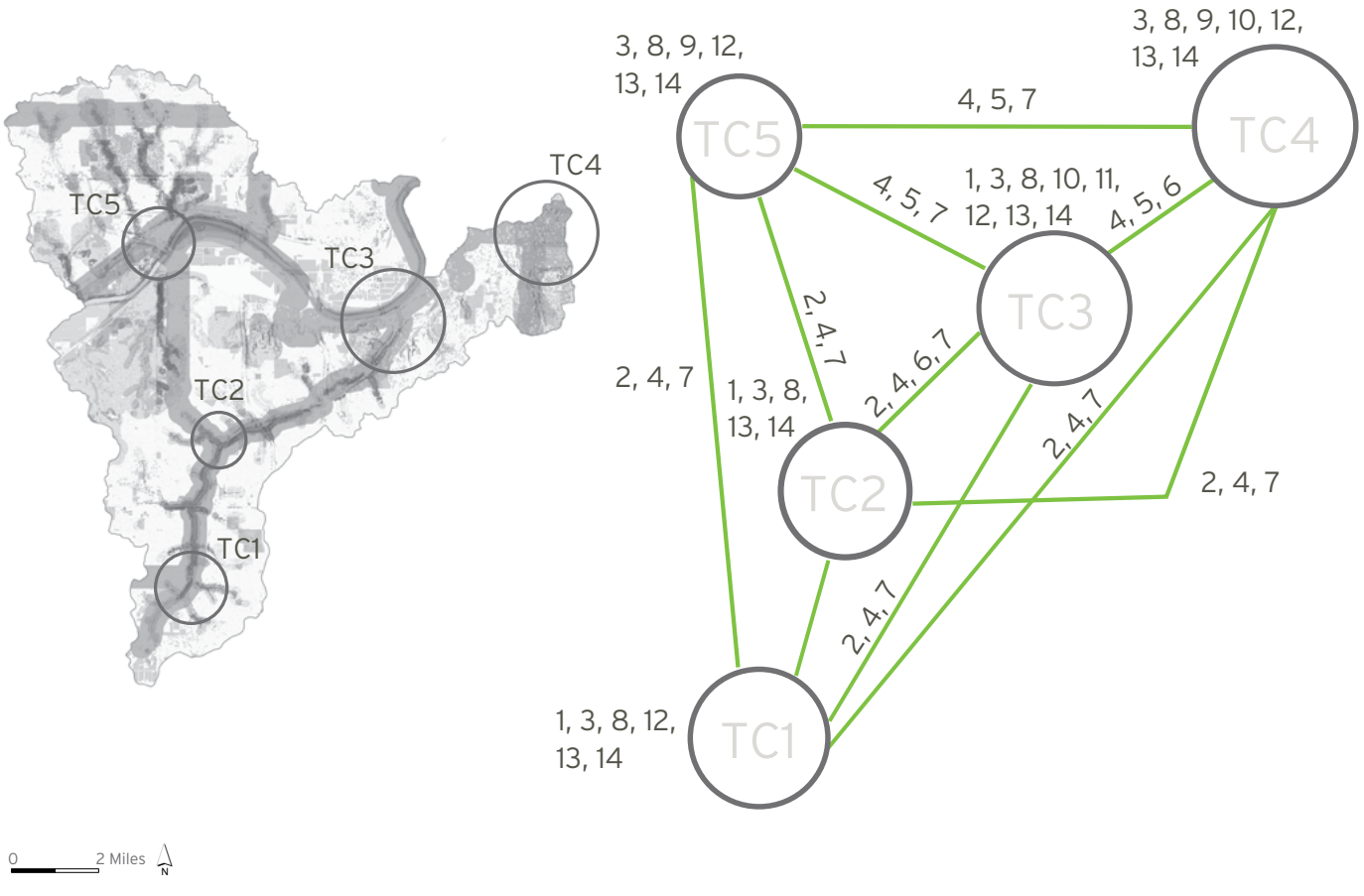
PARTNERS INCLUDE:

- Kansas Department of Transportation (KDOT)
- The Unified Government of Wyandotte County and Kansas City, Kansas
- The city of Shawnee, Kansas
- The city of Merriam, Kansas
- The city of Mission, Kansas
- The city of Fairway, Kansas
- The city of Roeland Park, Kansas
- The city of Overland Park, Kansas

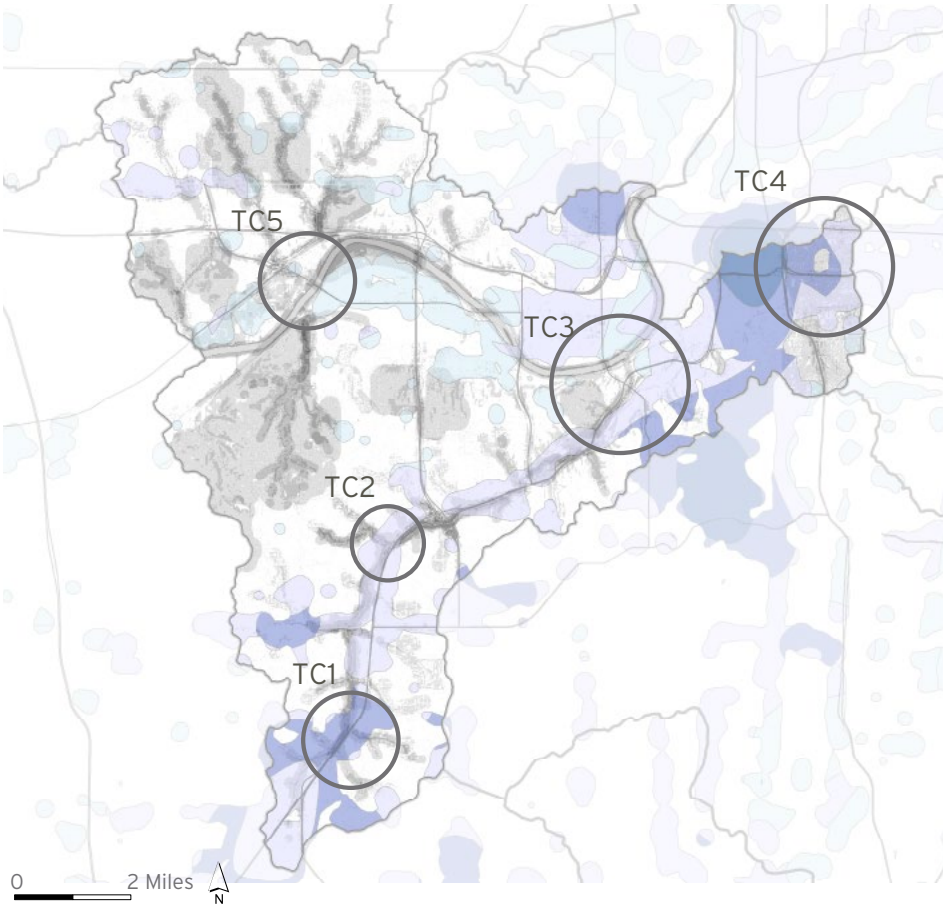
BENEFITS AND METRICS

- Increased property value: average dollar per square-foot rent for commercial and residential.
- Increased local economic activity: number of times a dollar changes in an established district.
- Increased environmental awareness: increased participation in energy-efficiency incentive programs, increased transit ridership, increased cycling, increase in Low-Impact Development practices.
- Stream and river quality: volume of water retained in green infrastructure; acres of BMPs, reduction in sediment loads.
- Connected habitat: increased species, acreage of forest in BMPs, acreage of restored prairies.

OPPORTUNITY AREAS AND NETWORK CONNECTORS



Activity Centers



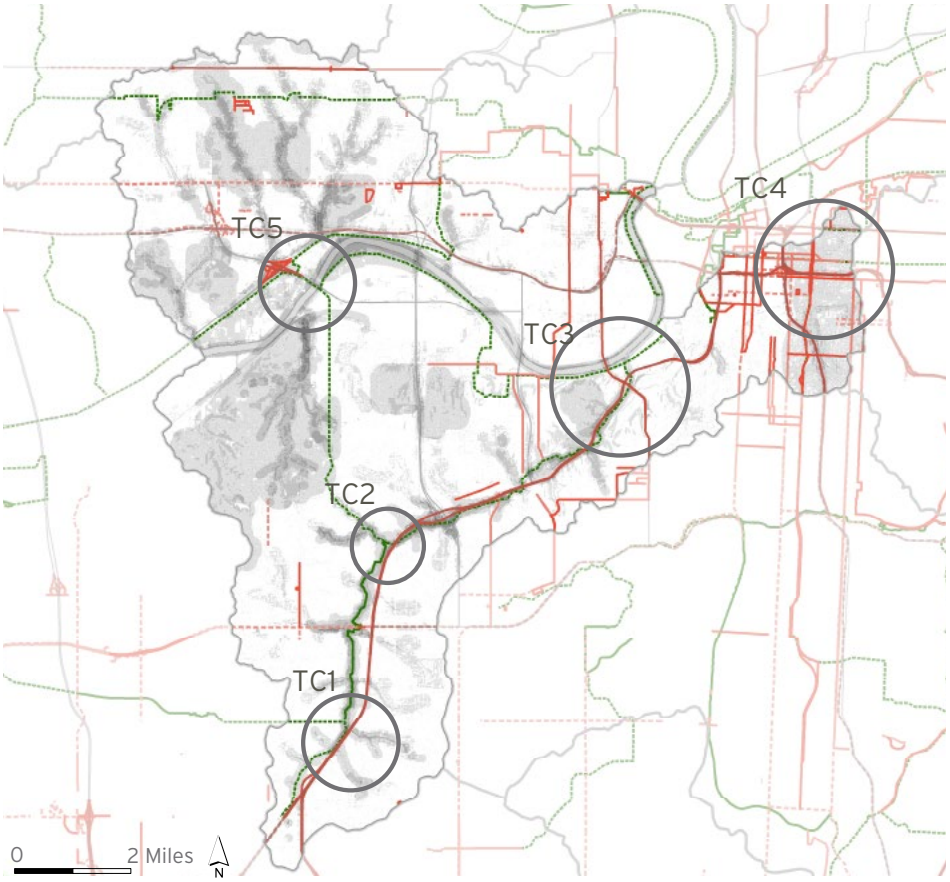
Activity Centers

- Less Intensity of population & employment
- -
- -
- Higher Intensity of population & employment

Ecological Value

- Higher
- Minimum

Transportation Investments



Transportation Investments

- Funded projects
- Project application
- Planned projects

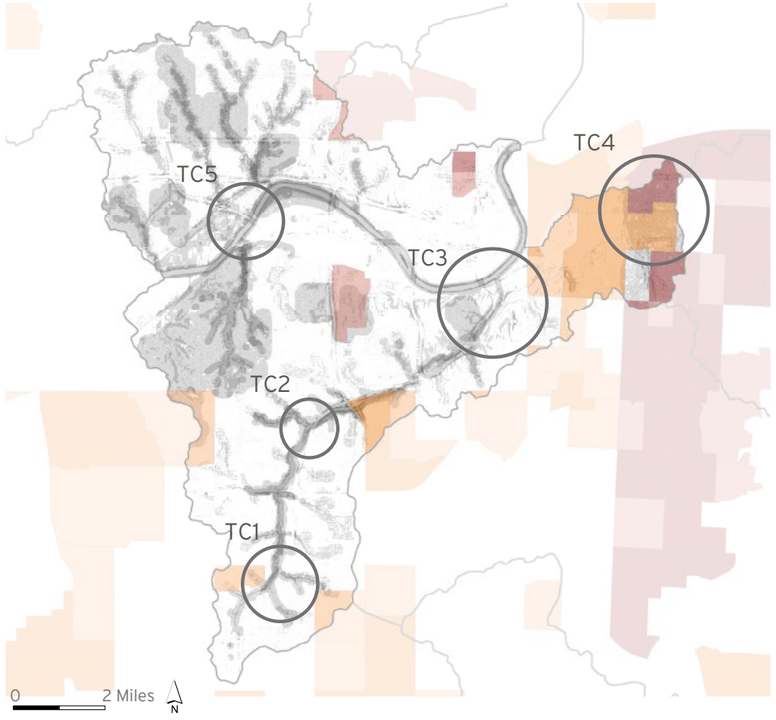
MetroGreen

- Planned
- Existing

Ecological Value

- Higher
- Minimum

Development Pressure



2010-2040 Population Gain per Sq. Mi.

- 0 - 500
- 501 - 1000
- 1001 - 9165

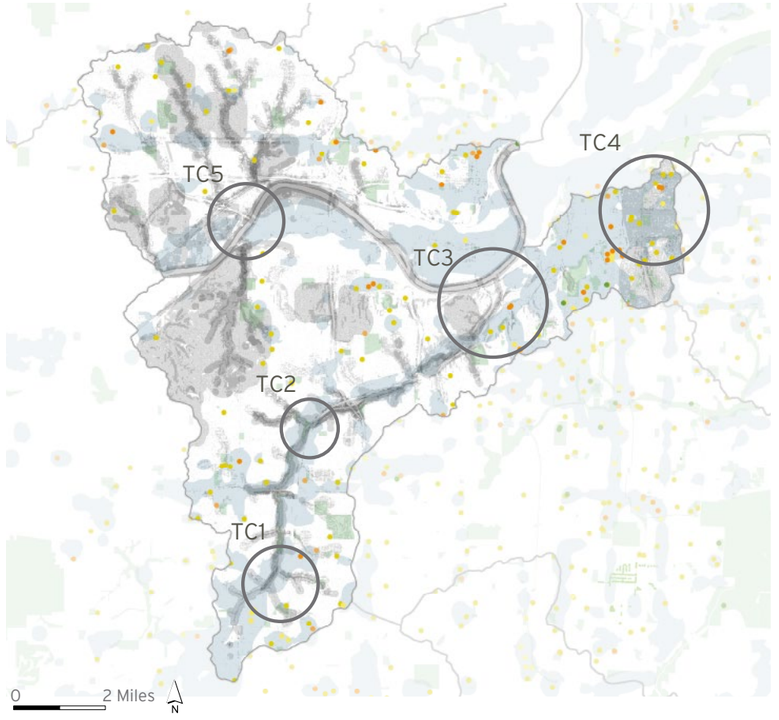
2010-2040 Population Loss per Sq. Mi.

- 0 - 500
- 501 - 1000
- 1001 - 4706

Ecological Value

- Higher
- Minimum

Culture Density & Projects

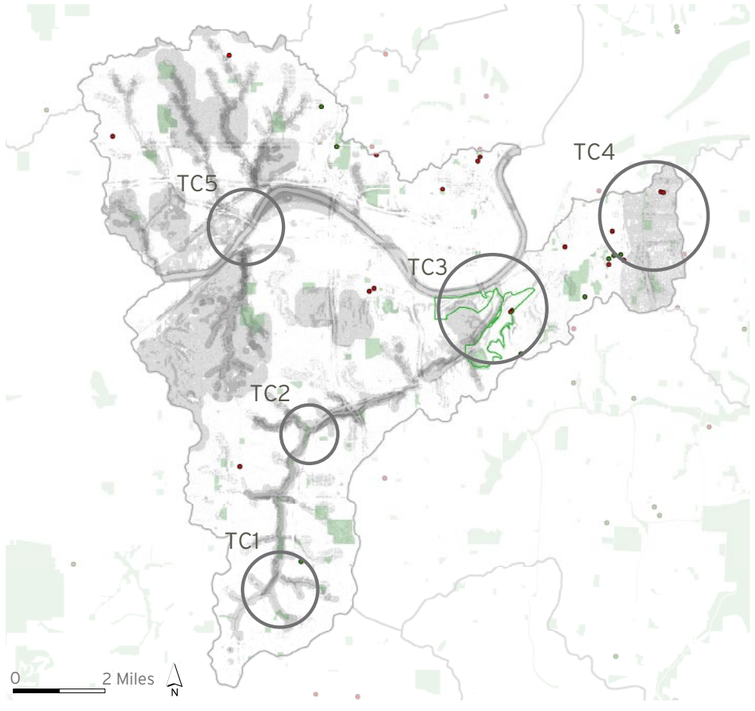


- Native Plant Iniative Locations
- Renew The Blue Locations
- Existing KCMO Green Infrastructure
- Hospitals
- Police
- Colleges
- Schools
- Activity Centers

Ecological Value

- Higher
- Minimum

Healthy Living



Ecological Value

- Higher
- Minimum

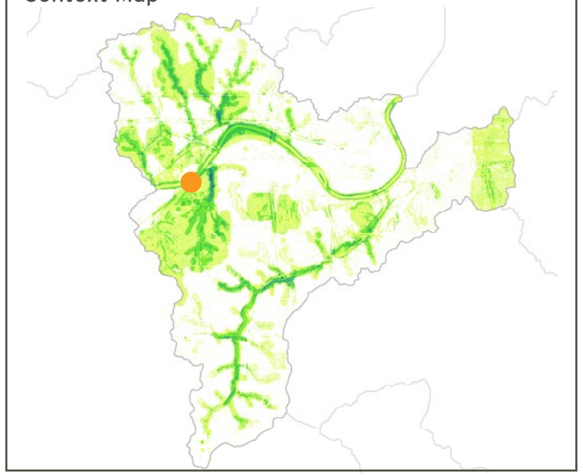
- Rosedale Master Plan Trails
- Hospitals
- Other Health Facilities

PROJECT SITE B

SUMMARY

Text summarizing project

Context Map



Site Map

- A Description
- B Description
- C Description
- D Description
- E Description
- F Description

PARTNERS

- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name

PLANNED & ONGOING PROJECTS

- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name
- Partner Name

REGIONAL CONNECTIONS

- Example
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- Example
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- Example
- Example
- Example

KEY ISSUES

- Example
- Example
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OPPORTUNITIES

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- Example

PROJECT TEMPLATE

As previously described, the template to the left would be used for the community and project scales as a way to dive deeper by identifying the partners, regional and local connections as well as the issues and opportunities the site provides. Community- and site-scale images are on the following page to provide understanding and inspiration for a network of green infrastructure systems.

COMMUNITY OR SITE SCALE EXAMPLES

The images on this page are keyed to the relevant opportunity areas in the Turkey Creek/Kansas River watershed.

Stream Restoration & Small Footprint Development

Conservation and Development

Sustainable Campus

Plaza, Open Space & Transit-oriented Development

BMPs & Transit-oriented Development

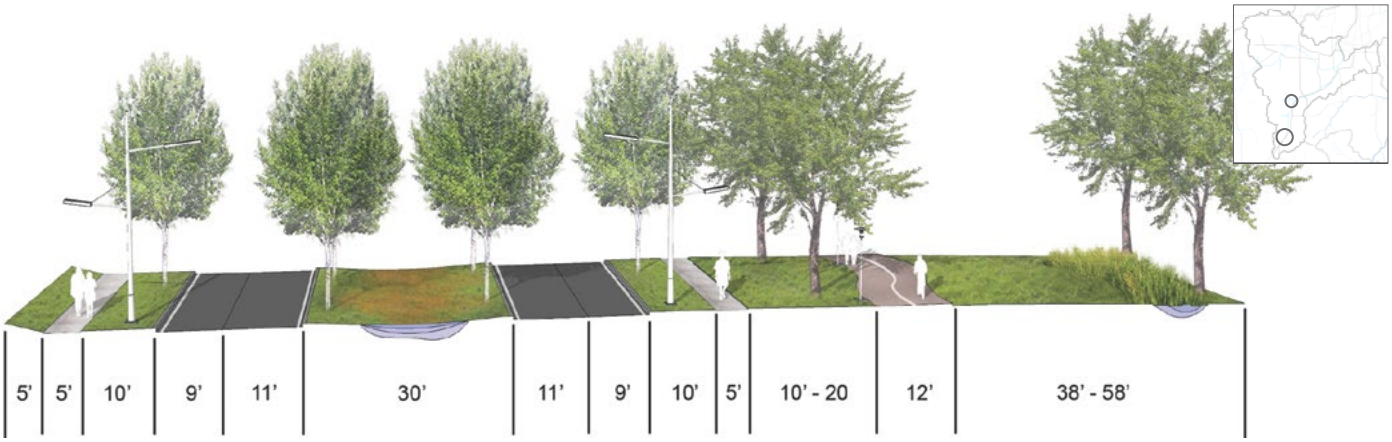
Transit-oriented Development

Trail Design

Trail Design

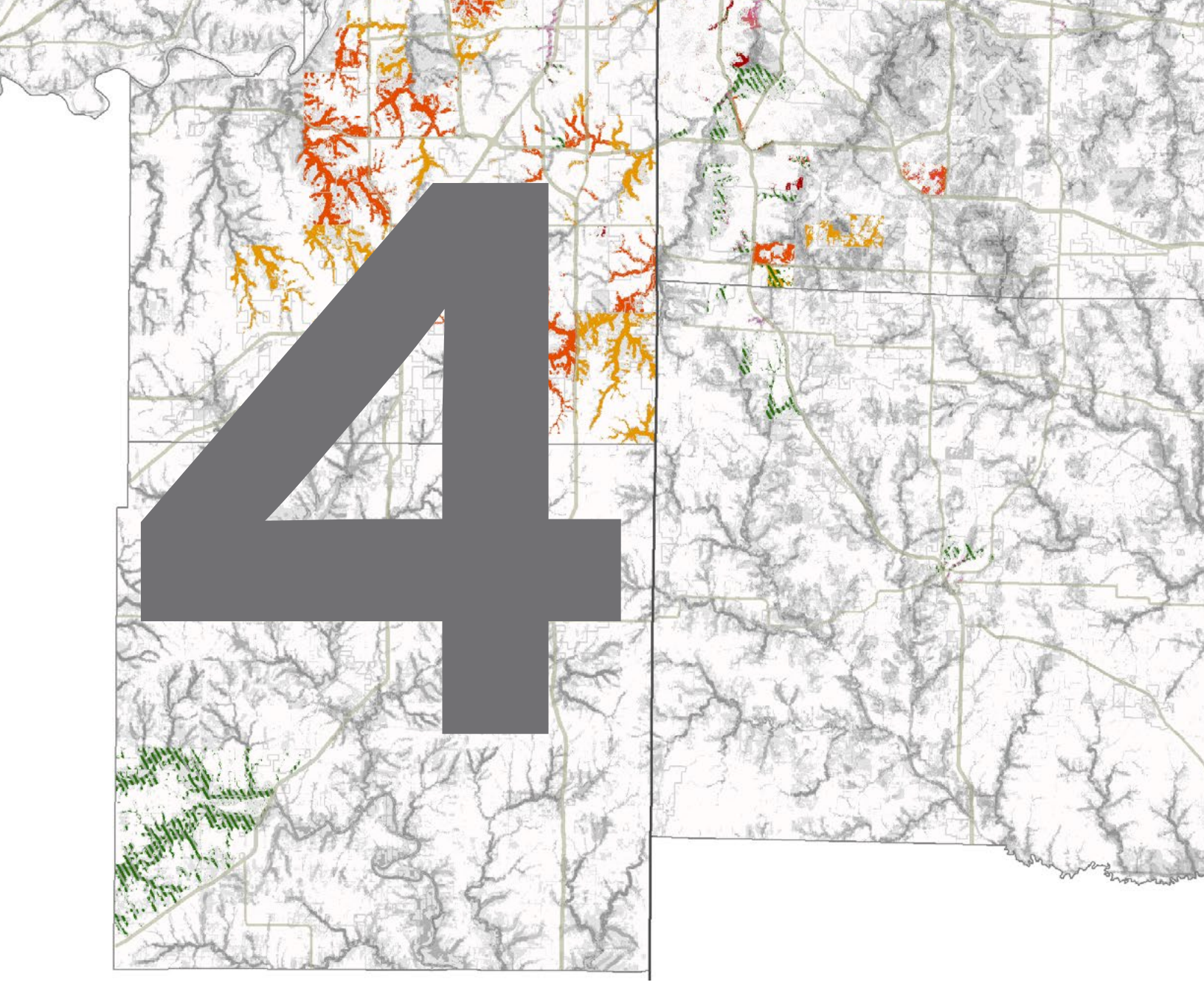
Park Design

Low-impact parking Design



BMPs & Roadways

PHASE 1 GREEN INFRASTRUCTURE FRAMEWORK



4

POLICY UNDERSTANDING AND RECOMMENDATIONS

Regional county and municipal governments have the power to take the lead in creating healthier communities by removing barriers to implementation and by demonstrating the benefits of green solutions to regional challenges.

Many jurisdictions have begun implementing green infrastructure policy and have already seen the benefits of successful projects. The following illustrates a handful of those successes, as well as opportunities to strengthen the regional policy landscape towards empowering widespread action.

SOLUTIONS IN OUR REGION

Learning from local implementation successes allows stakeholders to improve outcomes by building on existing lessons. The following are a few examples with wide applicability across political contexts and transect zones.

KANSAS CITY GREATER DOWNTOWN AREA PLAN

Applicable Lessons:

- Creating capacity for implementation during the planning process is critical to success.

Tools Used:

- Comprehensive plan.
- Plan implementation committee and guidelines.

The Kansas City 2010 Greater Downtown Area Plan is an example of the importance of building organizational capacity to implement goals into the comprehensive planning process. The plan identified clear, measurable goals and objectives, as well as a year-by-year timeline for achieving them.[1] The plan also prioritized the creation of an implementation committee to take ownership of the plan's goals and objectives.[1] Promoting sustainability was one of the primary goals identified, with continuing Kansas City's role as a leader in green infrastructure and designing to support transit identified as key objectives.[1] The result of this attention to implementation has been consistent progress towards the realization of those goals, as evidenced by the Middle Blue River Basin green infrastructure pilot projects and the success of the downtown streetcar.

MIDDLE BLUE RIVER BASIN GREEN SOLUTIONS PILOT PROJECT

Applicable Lessons:

- Green Infrastructure BMPs are a cost-effective solution to meeting stormwater management directives.
- Community engagement during the design process creates community buy-in and generates momentum.

Tools Used:

- Stormwater BMPs.
- Community engagement task force.

The Middle Blue River Basin Green Solutions Pilot project was an ambitious green infrastructure project constructed in Kansas City, MO in 2012.[2] The project is the result of a half decade of community engagement via the Wet Weather Community Panel, which has been the driving force behind the innovative inclusion of green infrastructure solutions to reduce sewer overflows.[2] A variety of green infrastructure solutions, including bioswales, rain gardens and permeable pavement were implemented.[2] The natural solutions became beautiful amenities and inspired residents to advocate for green infrastructure and green jobs in their neighborhoods.[2]

[1] City of Kansas City, Missouri. (2010). *Greater downtown area plan.* Kansas City, Missouri.
[2] Kansas City Water Services. (2013). *Kansas City's Overflow Control Program Middle Blue River Basin Green Solutions Pilot Project final report.* Kansas City, Missouri.

Photo of Lake Lenexa by Matias Causa

LENEXA'S RAIN TO RECREATION PROGRAM

Applicable Lessons:

- Successful green infrastructure prioritizes a long-term integrated watershed management approach over isolated projects.

Tools Used:

- Integrated, comprehensive planning.
- Green Infrastructure BMPs.
- Public outreach and education, including the annual WaterFest.
- Multiple stable funding sources including a one-eighth cent sales tax and a capital development charge.
- Watershed protection ordinances.

Since 1998, Lenexa's award-winning Rain to Recreation program has used an ecological systems approach to protect water quality, restore wetlands, and connect people to natural resources.[3, 4, 5] The costs of the Rain to Recreation approach are 25 percent less than the traditional stormwater infrastructure approach. For Lenexa, those savings amount to more than $25 million.[5] Lenexa has been a champion for green infrastructure policy within the region. The city's voter-supported one-eighth cent sales tax has generated $125 million for watershed restoration and conservation projects. Lenexa was one of the first cities in the region to: implement a stream buffer; initiate coordination between city departments to meet water quality goals; and collaborate with MARC and the American Public Works Association-Kansas City Chapter to develop regional BMP's for stormwater design and management.[3]

JOHNSON COUNTY'S SUNSET DRIVE OFFICE GREEN BUILDING DEMONSTRATION

Applicable Lessons:

- Use the momentum of active projects by applying green infrastructure solutions to improve project performance in multiple goal areas.

Tools Used:

- LEED certified green building design and construction.
- LEED implementation goals in county operations and construction.

The Johnson County, Kansas Sunset Drive Office Building is an outstanding regional example of the financial benefits local governments stand to gain from green design and construction practices. Johnson County took advantage of an immediate need to reduce leasing costs by constructing a new building, which saved the county more than $1.5 million in leasing expenses, and 50 percent on utilities.[6] The energy efficient LEED Gold-certified building features preservation of site habitat and on-site water capture and filtration of both stormwater runoff and grey water. The green features added less than two percent to the baseline project cost.[6]

[3] City of Lenexa, Kansas (2007). Rain to recreation project summary. Retrieved from http://www.nlc.org/Documents/Utility%20Navigation/About%20NLC/Awards/2007%20Lenexa%20Nomination.pdf

[4] City of Lenexa, Kansas (n.d.). Rain to Recreation. Retrieved from http://www.lenexa.com/raintorecreation/index.html

[5] Mid-America Regional Council (2008). Sustainable Success Stories. Lenexa, Kansas: rain to recreation program. Retrieved from http://www.marc.org/Government/Training-Institute/pdf/Sustainable-Success-Stories/LenexaRainRecreation.aspx

[6] Roberts, R. (2007, April 8). Saving green: Johnson county's environmentally friendly building also conserves taxpayers' money. Kansas City Business Journal. Retrieved from http://www.bizjournals.com/kansascity/stories/2007/04/09/focus10.html

LIBERTY'S TREE BOARD AND COMMUNITY FORESTRY PROGRAM

Applicable Lessons:

- Community engagement programs develop community buy-in, advocacy and volunteerism.
- Capital projects must be paired with long-term maintenance programs for green infrastructure amenities.

Tools Used:

- Community Tree Board.
- Community forestry maintenance and education program.

Liberty has maintained its Tree City USA status for 11 years, largely thanks to the efforts of the Liberty Tree Board and its Community Forestry Program.[2] Liberty has remained committed to trees due to the tremendous benefits they reap from their urban forests. These benefits amount to approximately $88,926 annually, including the removal of more than 383,000 pounds of air pollutants.[1, 2] The city has succeeded in increasing its tree canopy cover by eight percent between 1990 and 2012.[2]

Category→	Stormwater Mitigation	Carbon Removal		Pollution Removal						
Benefit→	Stormwater Intercepted	C Stored	C sequestered	O_3	SO_2	NO_2	CO	PM <10µ	PM <2.5µ	Total Pollution
Units→	(gal/acre/yr)	(lbs/acre/yr)	(lbs/acre/yr)	(lbs/acre/yr)						
Amount (units/ac/yr)→	14,443	51,555	4,237	59	10	4	3	30	4	109
Value ($/ac/yr)→	$129	$1,834	$151	$71	$1	$1	$2	$265	$187	$528

City of Liberty, Missouri. (2014). Tree management plan. Liberty, Missouri: Davey Resource Group.

OPEN SPACE PRESERVATION ACROSS THE REGION

Applicable Lessons:

- Development ordinances are a powerful tool for preserving open space as a community amenity.

Tools Used:

- Open space requirements in municipal development codes.

Most counties and municipalities within the region have implemented minimum open space or land dedication requirements within their development code. This practice has preserved open space and its multitude of benefits against development pressures as the region has grown and expanded. Communities have an opportunity to use and update existing open-space ordinance language to be more strategic about preservation of critical environmental systems.

[1] City of Liberty, Missouri. (2013). Liberty, Missouri community forest conservation assessment. Liberty, Missouri: Plan-It Geo.
[2] City of Liberty, Missouri. (2014). Tree management plan. Liberty, Missouri: Davey Resource Group.

POLICY RECOMMENDATIONS

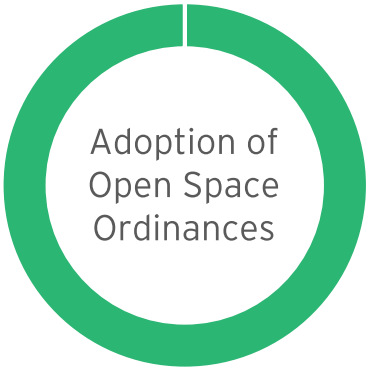
Communities within the region have begun implementing creative policies to improve the potential for green infrastructure solutions to regional and local challenges. However, those efforts can be strengthened to empower widespread action by incorporating new policies and adapting existing ones. The following policy recommendations are informed by the prioritized goals from the stakeholder workshop and organized per the context of the urban-to-rural transect to which they are most applicable.

CHALLENGE: BIODIVERSITY AND NATIVE SPECIES

Rapid development and agricultural encroachment on riparian corridors has reduced natural habitat for wildlife. Additionally, the region has faced challenges with several invas ive species, including the Emerald Ash Borer, which has posed a severe threat to the region's Ash trees, and Asian Bush Honeysuckle throughout the region's park lands.

Existing solutions:

- Many communities have education programs and publish lists of recommended plant species.
- Tree boards and municipal-led community forestry programs have proved valuable in ongoing maintenance programs.
- Kansas has a statewide, prohibited noxious weed regulation that lists a number of species invasive to the area.



Opportunities:

All Transect Zones

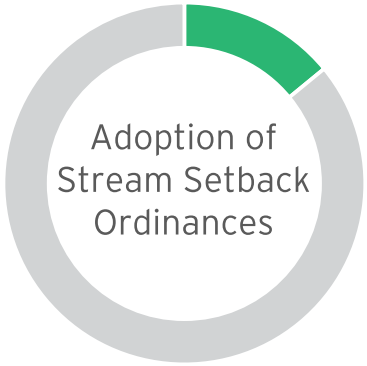
- Remove weed and landscape ordinance barriers to native plantings.
    - Local weed ordinances rely disproportionately on height to determine the presence of noxious vegetation. Incorporate height exceptions for maintained native grasses to accommodate the region's prairie ecology.
    - Incorporate prohibited invasive species lists into existing weed ordinances to address noxious weeds via an ecological rather than aesthetic framework.

Rural Transect Zone

- Encourage stream buffers and conservation easements to reduce agricultural encroachment on streams.

Urban Transect Zone

- Prioritize habitat connection opportunities in park acquisition decisions using green corridors and trail systems to provide migratory opportunities for local wildlife.



CHALLENGE: STORMWATER QUALITY

The National Pollutant Discharge Elimination System (NPDES) Phase II of the Clean Water Act has spurred many communities to address stormwater quality to reach compliance with the act.

Existing Solutions:

The Greater Kansas City region has been a national leader in using green infrastructure solutions to address stormwater quality and EPA compliance. Not only are these solutions more cost-effective than traditional 'gray' infrastructure, but they also address interrelated benefits, such as improved air quality, improved public health and access to beautiful, natural amenities.

Jurisdictions are increasingly:

- Adopting stream setback and other water protection ordinances.
- Adopting use of stormwater BMPs.

Opportunities:

All Transect zones

- Pursue broader regional adoption of stream setback ordinances for comprehensive protection of waterways from development pressure.
- Pursue active, watershed-resource conservation and restoration via design, implementation, and to support stream setbacks and achieve stated goals.
- Prioritize illicit discharge ordinances in jurisdictions with relatively high agricultural or industrial intensities.
- Develop partnerships and cross-jurisdictional watershed management programs to open opportunities for integrated, ecologically comprehensive planning and implementation.

Rural Transect Zone

- Use stream buffers and conservation easements to reduce agricultural encroachment on streams.

Urban Transect Zone

- Implement green and complete streetscape solutions to reduce impervious-surface runoff and reduce single-occupancy vehicle traffic.

CHALLENGE: CONNECTING PEOPLE TO NATURAL LANDSCAPES AND AMENITIES

Access to natural environments generates public health benefits in part by improving opportunities for active recreation. Yet stakeholders have voiced that access is unequal and that many people feel we are losing our connection to the natural environment.

Existing solutions:

- Virtually all jurisdictions within the region have implemented minimum open space or land dedication requirements within their development code. This practice has preserved open space and its multitude of benefits against development pressures as the region has grown and expanded.
- The MetroGreen trails plan is expanding and connecting the region's trails systems.
- Community parks and forestry programs educate and engage the public in outdoor recreation and citizen management of resources.

Opportunities:

Rural Transect Zone

- Adopt cluster development ordinances to preserve open space in areas undergoing new development.
- Incorporate agricultural and forest districts in city zoning codes to protect key lands at risk of development pressure.

Suburban Transect Zone

- Capitalize on historic district designation to recognize and preserve historic environmental assets, as well as to implement green infrastructure amenities within rehabilitation and streetscaping projects.
- Adopt cluster development ordinances to preserve open space in areas undergoing new development.
- Incorporate principles of traditional neighborhood development (TND) and new urbanism in city zoning codes for more efficient use of land resources and infrastructure to benefit walkability and livability.

Urban Transect Zone

- Conservation easements and transferrable development rights present opportunities to preserve open space in areas with significant development pressure.
- Capitalize on historic district designation to recognize and preserve historic environmental assets, as well as to implement green infrastructure amenities within rehabilitation and streetscaping projects.
- Incorporate principles of TND and new urbanism in city zoning codes for more efficient use of land resources and infrastructure to benefit walkability and livability.

CHALLENGE: IMPROVING AIR QUALITY

Air quality is critical to public health, especially for populations such as children and older adults who are vulnerable to respiratory illnesses caused by airborne particulate matter. Increased urbanization and dependence on private automobiles for travel present challenges for maintaining healthy air quality. Access to clean air is an environmental justice concern, and special consideration should be made for disadvantaged neighborhoods. Air quality can be addressed through two broad intersecting strategies: reductions in pollution emissions and capture of particulates. Trees and native landscaping play a key role in capturing particulate matter, while investments in active transportation reduce vehicle emissions.

Existing Solutions:

- Transit oriented development and complete streets have gained momentum in the region as a way to revitalize communities, improve opportunities for active transportation, and reduce air pollution associated with vehicular travel.
- Many communities have landscaping ordinances, including street tree minimums.
- Many communities have adopted the MARC Clean Air Action Plan.

Opportunities

All Transect Zones

- Coordination with state Departments of Transportation and transportation authorities to address and implement landscaping and buffer zones along highways is highly recommended, particularly in disadvantaged communities disproportionately impacted by highway-related air pollution.
- Incorporate LEED-rating minimums in municipal facility construction best practices to reduce building emissions.

Urban and Suburban Transect Zones

- Pursue broader regional adoption of urban forestry initiatives.
- Pursue broader regional adoption of tree preservation ordinances to preserve mature trees, which capture more particulate matter than young trees.
- Pursue broader regional adoption of MARC Clean Air Action Plan.
- Continue investment in pedestrian, bicycle and transit infrastructure.
- Adopt form-based zoning codes[1] and transit-oriented development to enhance and preserve the walkability of downtowns and neighborhoods.
- Coordination of parks and trail planning with regional activity centers.

[1]Form-based zoning codes as a land development regulation offers an alternative to euclidean zoning by addressing the form, mass and relationships of buildings rather than land use or parameters of intensity.

CHALLENGE: HEAT ISLAND ABATEMENT

Heat island effects refer to the to the elevated temperatures experienced in urban areas relative to their surrounding rural areas. Heat island effects negatively impact human health, increase energy consumption, and are harmful to wildlife. Maximizing vegetation and minimizing dark and paved surfaces can reduce heat island effects in urban and suburban areas.

Existing Solutions

- Early demonstration projects have made green roofs an attractive option for reducing energy costs.
- Transit oriented development and complete streets, which are gaining traction throughout the region, reduce paved surfaces associated with roadways and parking lots while improving opportunities for green infrastructure streetscaping.
- Many communities have landscaping ordinances, including street tree minimums.

Opportunities

Urban and Suburban Transect Zones

- Adopt tree canopy ordinances to increase vegetation and shading.
- Pursue broader regional adoption of urban forestry initiatives.
- Explore the use of incentives to encourage the use of green roofs in new construction.
- Employ education programs targeted towards developers and property managers regarding best practices for the construction and maintenance of green roofs.

CHALLENGE: COORDINATION

The benefits and costs associated with environmental health are distributed across ecological systems that are not bound by political boundaries. Coordination across the region and across geographies connected by ecological systems is a key challenge.

Existing Solutions

- MARC has coordinated several initiatives at the regional scale related to green infrastructure, including the Solar Ready and Complete Streets initiatives.

Opportunities:

All Transect Zones

- Pursue partnerships and planning efforts based on watershed geography.
- Explore options for department reorganization and improved communication channels within jurisdictions to meet green infrastructure goals.

CONCLUSIONS & NEXT STEPS

Through the analysis, policy research and stakeholder feedback process, three key value propositions emerged for the uses of the Green Infrastructure Framework:

1. Provide guidance for inclusion of green infrastructure systems in guidelines or recommendations in planning and zoning updates.
2. Provide regional coordination of integrated watershed management.
3. Model processes for systems-based planning, design and implementation for neighborhood-scale solutions.

While the Greater Kansas City region is rich in data and planning, it suffers from the common regional affliction of jurisdictional and departmental silos. One of the most valuable roles a Green Infrastructure Framework can play is to foster strategic connections between transportation planning, environmental planning and community development throughout the region. A regional entity such as Mid-America Regional Council could serve as the coordinating agency to convene cross-jurisdictional partnerships for coordination. The Green Infrastructure Framework could include guidelines or recommendations on integrated solutions for each transect typology, making it easier to include in comprehensive planning and zoning code updates or development master plans. As the Framework is developed, Opportunity Areas from the Playbook could also serve to provide land use recommendations that encourage implementation of green infrastructure solutions that provide multiple benefits.

Several tools that have been created specifically for our region have been implemented with varying levels of success. The Best Management Practices manual is widely adopted, however to increase its efficacy it should be used for all development projects, not just new development, and a more comprehensive application of treatment trains would be implemented. As the Framework is developed, the Playbook will serve to model a variety of processes for systems-based planning, design and implementation for neighborhood-scale solutions.

Many jurisdictions have adopted stream setback ordinances. The next step for these communities is to manage the land and restore native habitat within the buffer zones in order to achieve higher water quality goals. The publication of this report could inform a renewed regional campaign to encourage communities along stream corridors that have not yet adopted setback ordinances to do so. One of the primary vehicles to unlock potential of coordinated development processes across multiple development sites and land management jurisdictions is integrated watershed management. There are a number of organizations in the region that seem capable of playing this role, but determining capacity and ability to convene and garner consensus requires a careful decision-making process. Mid-America Regional Council is well-suited to facilitate this process.

One of the big ideas that emerged from the stakeholder workshop was the desire to meet regularly to share successes and challenges of multiple-benefit green infrastructure solutions, and to have an accessible way to share lessons and receive advice and education on processes and methodologies. Another sentiment that has been echoed many times is that our region has no time to lose. We must act now to preserve our natural resources and enhance the health of our communities. Many public, nonprofit and private organizations in the region are acting now. Connecting their efforts to each other and to the most up-to-date information would maximize the benefits of their work and increase their capacity to do more.

NEXT STEPS

As phase one wraps up, the next steps of work to create the complete Green Infrastructure Framework come into view. The overarching purpose of the Framework is to increase momentum and advance coordination of green infrastructure systems in the region. Therefore, the adaptive process to develop the Green Infrastructure Framework will both inform advancement and be informed by the advancement of regional initiatives that mutually increase the health of natural systems and human systems. The next steps of Framework development include:

- Iterative refinement and expansion of Atlas and Playbook throughout phases.
- Survey and mapping of planned/funded projects and partners.
- Additional ecological, social, health and transportation research and refined analysis.
- Online communications site.
- Regional transect typology mapping.
- Policy and incentive refinement.
- Development of best practices for neighborhood-scale, integrated green infrastructure systems.
- Defining adoption the Green Infrastructure Framework.
- Development of key components for adoption or integration (i.e. guidelines, policy, curricula).
- Dynamic online tool for mapping and identifying projects based on perspective and interest areas.