3. Ecological Land Cover Classification and Natural Resource Inventory Outcomes

The ELC classification and the NRI have provided an updated source of data for the Kansas City region that can be used by cities and counties within the metropolitan region for planning of community growth and development while also planning for resource conservation. The results of this study and the use of the outcomes of this project, primarily the Ecological Land Cover maps (including individual maps of the numerous natural resources, parks, green spaces, and infrastructure systems) are presented in this section.

3.1 ELC/NRI Results

The distribution of ecological land cover is illustrated in Figure 3-1 below, the Ecological Land Cover Map, and is summarized in Table 3-1 on the following page.

In general, the data show that the region’s undeveloped land is dominated by land used for agricultural purposes, a reflection of the region’s history, and for human dwellings and businesses. About 75% of the region’s land area is dedicated to crops (cultivated land), non-native pastures and hay meadows (cultural grassland), and residences and businesses (developed land). Land utilized for agriculture is well distributed in the region; however, a significant amount dominates the land cover in Cass, Platte, and Ray Counties in Missouri, and Leavenworth County in Kansas. While agricultural lands make up most of the ecological land cover in the region, and urban or developed lands also occupy much of the land in the core urban areas, 22 percent of the area, or approximately 538,000 acres (840 square miles), have been identified as areas that may retain natural or near-natural ecological conditions and present opportunities for conservation and restoration.
<table>
<thead>
<tr>
<th>Ecological Classification</th>
<th>Jackson MO</th>
<th>Clay MO</th>
<th>Cass MO</th>
<th>Platte MO</th>
<th>Ray MO</th>
<th>Wyandotte KS</th>
<th>Leavenworth KS</th>
<th>Johnson KS</th>
<th>Total Acres</th>
<th>Percent of Total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Water</td>
<td>8,730</td>
<td>7,702</td>
<td>6,463</td>
<td>5,677</td>
<td>5,413</td>
<td>1,125</td>
<td>2,240</td>
<td>2,147</td>
<td>39,497</td>
<td>1.61%</td>
</tr>
<tr>
<td>Lowland Hardwood Forest &amp; Woodland</td>
<td>22,866</td>
<td>6%</td>
<td>6,039</td>
<td>13,375</td>
<td>10,845</td>
<td>5,753</td>
<td>1,618</td>
<td>8,766</td>
<td>5,870</td>
<td>75,132</td>
</tr>
<tr>
<td>Marsh/Wet Herbaceous Vegetation</td>
<td>2,175</td>
<td>1%</td>
<td>4,978</td>
<td>2,333</td>
<td>8,955</td>
<td>6,870</td>
<td>3,469</td>
<td>8,305</td>
<td>4,562</td>
<td>41,647</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>15,294</td>
<td>4%</td>
<td>17,078</td>
<td>25,737</td>
<td>27,034</td>
<td>37,211</td>
<td>16,164</td>
<td>67,927</td>
<td>11,643</td>
<td>218,088</td>
</tr>
<tr>
<td>Mixed Evergreen-Deciduous</td>
<td>4,705.5</td>
<td>1%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5,138</td>
<td>10,211</td>
</tr>
<tr>
<td>Deciduous Woodland/Immature Forest</td>
<td>31,953</td>
<td>8%</td>
<td>9,351</td>
<td>19,591</td>
<td>11,156</td>
<td>19,947</td>
<td>687.5</td>
<td>5,714</td>
<td>10,9010</td>
<td>109,309</td>
</tr>
<tr>
<td>Grassland</td>
<td>900</td>
<td>0%</td>
<td>7,868.0</td>
<td>2%</td>
<td>0</td>
<td>0</td>
<td>1,825</td>
<td>19,527</td>
<td>13,985</td>
<td>44,105</td>
</tr>
<tr>
<td>Urban Forest</td>
<td>43,382.5</td>
<td>11%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>9,776</td>
<td>53,148</td>
</tr>
<tr>
<td>Cultural Grassland</td>
<td>60,407</td>
<td>15%</td>
<td>94,332</td>
<td>36%</td>
<td>188,165</td>
<td>42%</td>
<td>82,698</td>
<td>30%</td>
<td>70,183</td>
<td>673,425</td>
</tr>
<tr>
<td>Agriculture</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>13,619</td>
<td>13,619</td>
</tr>
<tr>
<td>Cultivated Land</td>
<td>78,107</td>
<td>20%</td>
<td>47,878</td>
<td>18%</td>
<td>128,874</td>
<td>29%</td>
<td>104,227</td>
<td>38%</td>
<td>88,460</td>
<td>673,813</td>
</tr>
<tr>
<td>Developed Land</td>
<td>125,037</td>
<td>32%</td>
<td>75,594</td>
<td>29%</td>
<td>56,733</td>
<td>13%</td>
<td>26,778</td>
<td>10%</td>
<td>55,529</td>
<td>501,613</td>
</tr>
<tr>
<td>Unclassified</td>
<td>268.5</td>
<td>0%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>2,696</td>
<td>2,964.50</td>
</tr>
<tr>
<td>Total Acreage</td>
<td>393,826</td>
<td>100%</td>
<td>262,953</td>
<td>100%</td>
<td>449,506</td>
<td>100%</td>
<td>277,371</td>
<td>100%</td>
<td>294,671</td>
<td>2,456,572</td>
</tr>
</tbody>
</table>
Many opportunities for conservation exist for ecological land cover areas as defined in Section 2 and in Table 3-1, including deciduous mature and immature woodland/forest, lowland hardwood forest with herbaceous vegetation, mixed evergreen and deciduous woodland, and, particularly characteristic of this area, native grasslands, marshes, and aquatic systems that contain wetland vegetation. Many of these areas are currently located in rural or semi-rural areas along river and stream corridors, near open water, and in non-forested upland areas. These features present opportunities not only for parkland and recreational use, but also for promoting the conservation of important ecological systems that both represent our environmental heritage and provide valuable resource benefits to our communities.

Review of the ELC map indicates that several natural communities exist throughout the region. The current data shows numerous areas in Leavenworth and Johnson Counties in Kansas that have large tracts of native communities. Wyandotte County, Kansas, while largely developed for urban utilization, also contains several large tracts of deciduous forest. While the Missouri counties (Platte, Ray, Clay, Jackson, and Cass) show large areas dominated by land used for agriculture and/or urban development, the original classification of the data from the USGS GAP, may not reflect many areas and tracts that contain native vegetation that provide opportunities for conservation because the data collected several years ago. In fact, the Missouri GAP data don’t list native grasslands when, in fact, many areas of native prairies exist within the four counties that are of high enough quality to be considered for conservation and restoration. An example of how this data may be used is provided in the next section. By county, conservation areas may include the following:

1. Cass County, Missouri: The land cover data show that most of the county is in cultivated or cultural grasslands (71 percent). The data show, however, that 16 percent of the land cover is lowland hardwood and upland deciduous forest, with another 7,868 acres, or 2 percent of the land area, in native grassland. These resources may be considered for conservation, particularly near many of the growing communities and along stream and rivers in the county.
2. Clay County, Missouri: The ecological land cover data indicates that 14 percent or more of the land may have conservation value, particularly large areas of lowland hardwood and upland deciduous forests. The data show that the majority of the county is either developed or in cultural grassland, but areas of native grassland probably exist throughout the county that may be considered for conservation.

3. Jackson County, Missouri: The data show that extensive areas of this county are developed. However, large areas of forested land covering 18 percent of the county provide many conservation opportunities, some of which have already been undertaken by the County in their planning process. The data also show large amounts of urban forest that are valued by citizens of the county in parkland and in border areas, and 2,175 acres of wetland vegetation that can be considered in the planning process.

4. Johnson County, Kansas: Many opportunities for conservation of woodlands and prairies exist throughout Johnson County, especially in the fringes of suburban development. An estimated 19 percent of the land cover in Johnson County is listed as lowland hardwood and upland forests and native grasslands. Many of these areas are near streams and rivers that drain the county and present opportunities for parkland, buffer areas, and environmental quality.

5. Leavenworth County, Kansas: The ecological land cover data show that Leavenworth County has extensive areas with native vegetation that can be considered for conservation through the planning processes as this county grows in population. The data indicate that 38 percent of the land area in Leavenworth County, or 52,099 acres of land are mapped as lowland hardwood forest, deciduous forest (mature and immature), marsh/wetland vegetation, and as native grassland. In particular, 23 percent of the land is shown as deciduous forest, a resource that provides opportunities for maintaining environmental quality, water quality, stream buffers, and parkland throughout the county.

6. Platte County, Missouri: Twenty-one percent of Platte County is identified as lowland hardwood, deciduous (mature and immature) forest, and marsh/wetland vegetation. The nature of the land cover in the county would suggest, however, that many areas of native prairie also exist and should also be considered for conservation. Many of these areas (woodland forest and prairie) may be along the Missouri River and its tributaries that are in Platte County.

7. Ray County, Missouri: Ray County is dominantly rural (only 2 percent developed land) with 78 percent of the land cover listed as cultural grassland and cultivated land. Nineteen percent of the land cover, however, is identified as forested or marsh/wetland vegetation. Like the other Missouri counties in the Kansas City metropolitan region, the rural, undeveloped nature of the county suggests that many areas of native prairie exist, and together with forested land, there are many opportunities to conserve these native areas and utilize them for enhanced environmental quality, parkland and recreation, and wildlife/game management.

8. Wyandotte County, Kansas: The majority of Wyandotte County is developed land (56 percent), and 19 percent is identified as cultural grassland or cultivated. This smallest of the metropolitan area counties (with 99, 620 acres total land area) also contains nearly 24,000 acres of land identified as woodland/forest (19 percent), marsh/wetland vegetation (3 percent), and native grassland (2 percent) with conservation opportunities particularly in the western and northwestern portions of the county along streams that drain to the Missouri River.

Regionally, conservation opportunities often extend beyond county and community boundaries, suggesting that to optimally conserve resources and provide enhance environmental quality,
local governments and conservations groups may seek to work together in formulating long term plans that include conservation and restoration measures within watersheds in the Kansas City area.

3.2 Ecological Land Cover Conservation

The importance and value of conserving natural resources and the ecological systems that remain in the Kansas City region is vital to the future success of our communities. One of the most important aspects of ecological conservation is protecting our natural resources, including native vegetation and wildlife. Protected habitat assures that plant and animal species will continue to live in their native habitats and persist in the Kansas City region. Conservation of native vegetation and animal species also protects our environment and communities from unwanted invasive vegetation.

Conserving natural resources is not limited to retaining spaces where native plant and animal communities can thrive. Conserving the existing ecological land cover provides substantial value and benefits for quality and protection of land planning and utilization. Such benefits include:

- Development of buffer regions around and between communities in order to provide natural breaks in land use. Buffers may include parks, riparian and native area green corridors, conservation areas, and residential conservation development.

- Utilization for parks and green space which serve recreational and education purposes. Parks can incorporate native landscape features, including aquatic, geological, and vegetation features that can provide a living monument to the original ecosystems of the Kansas City region. Within the parks, pathways and open areas can allow residents to observe vegetation and wildlife.

- Improving land value by increasing aesthetic and land use desirability. Properties adjacent to conservation areas hold higher value because of their desirability for working, playing, and living near.

- Providing buffers for stormwater management and flood prevention. Opening areas up to provide natural attenuation of stormwater allows the natural hydrologic cycle to be more balanced, lessening the risk of damaging floods while preserving the flow and aquatic wildlife of streams and rivers.

- Improving environmental quality by filtering pollutants from waters and air. By conserving native vegetation, a natural filtering system that captures sediments and pollutants before they enter streams, thereby improving water quality. Similarly, conservation of vegetation provides traps of airborne particulates and pollutants while also reducing the volume of noise.

- Reducing water and energy consumption. Conservation of native vegetation reduces water consumption in multiple ways, including:
  - Native vegetation increases infiltration of stormwater where it is then stored in the soil, minimizing the need to continually water open areas.
Native vegetation is adapted to Kansas City’s climate, and requires less water to sustain a healthy plant community.

Native vegetation reduces evapotranspiration because its use of water is more efficient than non-native vegetation.

Conservation areas also reduce energy consumption by lowering the ambient temperature of surrounding areas and requiring less maintenance.

Of these benefits, the last three may provide the most distinct and important values to our communities in terms of protection of property and our environment, reduction in maintenance costs, and sustaining the quality and quantity of water.

3.3 Establishing Regional Conservation Priorities

The ecological land cover map produced and described in this technical report will be used in combination with previous inventories, AES field data, feedback from local experts, analyses (e.g., stream buffer requirements), connectivity information, public lands, and other information from local agencies, to produce a map of conservation priorities in the Kansas City region. The ecological land cover map reflects priorities to some degree. For example, all forest communities classified as Deciduous Forests in Jackson and Johnson Counties are likely to be more mature than those classified as Deciduous Woodland/Immature Forests due to their origination on native forest soils as opposed to the latter’s more recent origination on grassland soils. Furthermore, these immature woods are likely to be of lower ecological quality as they occur on soils not suitable for forest growth.

AES learned that previous inventories, which identified high quality sites, have become outdated. This is to be expected in a rapidly developing region. For example, the Missouri Natural Resources Inventory work completed in the 1970’s and 1980’s now contains sites, which have been developed, or have deteriorated due to incompatible land use or neglect.

The results of the NRI are available for conservation planning throughout the Kansas City metropolitan area. The information, including data for use in GIS, includes maps that show conservation elements for the entire metro area and for each county. GIS layers that show the various natural resource features of each county have been developed to clearly show where natural resources and various ecological features exist in relation to urban and agricultural areas, as well as to current Kansas City green corridor features. Other layers show existing parks and trails to demonstrate how these areas can be maximized for planning decisions regarding buffer areas, park development, and other conservation measures, as well as for determining how communities can develop around these areas.

Figure 3-2, on the following page, demonstrates an example of how using the database and GIS can illustrate the ecological features of a county in conjunction with community boundaries, roadways, parks, and Kansas City MetroGreen corridors that can be used for planning purposes. Using these features, planners can map the locations of valuable conservation areas and prioritize their conservation based on their proximity to other features such as parks, MetroGreen corridors, and surrounding geographical features, including roads and surrounding communities. Planners can utilize this information to maximize existing natural resources in the planning process, including how natural resources can be used for stormwater management,
Figure 3-2
Example Natural Resource Conservation Planning Map
(Johnson County, KS)
where future or existing parks can be planned, and how development can take place with conservation of native vegetation, aquatic features, and soils to retain the Kansas City region’s native heritage.

3.4 Public Outreach and Education

This program includes public outreach to provide an outlet for the Kansas City Natural Resources Inventory information and database. The public outreach program consists of educational sessions to describe the data collection and compilation process, including development and utilization of the GIS program for communities throughout the region to use in the planning process. In addition, presentation of brochures and posters will enable public agencies to view and utilize the NRI information as an integral component of their community planning process. The public outreach program includes the following:

1. **GIS Tutorial**: A tutorial that provides users information about the data compiled for this project access to the GIS features that can and should be explored for its full utility and application for planning processes.

2. **Informational Brochures**: Brochures and supporting text on the topics of stormwater management, big rivers conservation, greenways and parks, and community planning. These brochures can be used by MARC and local communities for explaining the ELC and NRI process and use.

3. **Power Point Program**: A power point presentation summarizing the natural resource inventory work can be reviewed that presents ideas on how interested parties can become involved in protection, restoration, and stewardship of these resources.

4. **Case Studies**: Project-specific examples of conservation, stormwater management, restoration, and management activities in the Kansas City region include a brief summaries of the work involved and cost for various projects, and will demonstrate how conservation measures are already working within the region. These case studies will be presented during public meetings and education opportunities to demonstrate how conservation measures are already working.

5. **Meetings**: AES and PBA will assist MARC in meetings for stakeholders in the Kansas City region. The intent is to summarize the results of this project and to seek input from experts, interested parties, and others. All outreach materials will be presented and provided at these meetings.