IV.   Natural Resource Inventory Methodology

Geographic Context
The approach used to inventory natural resources in the City of Afton stressed an evaluation of the physical and ecological characteristics of the project area from a landscape perspective. To facilitate discussion of natural resources within the project area, the City was subdivided into thiry separate landscape units, with each landscape unit delineated on the basis of geomorphic features, biological features, and to a lessor degree, past and existing land use. Landscape units are establised with the idea that natural resource management generally is carried out over multiple natural communities that often encompass numerous parcels. This approach is used because most plant and animal communities are not independent, but rather depend on interaction with other plant and animal communties. While we have evaluated individual natural communities as part of this project, our evaluation is based on the landscape unit.

Identification of Natural Areas
Existing natural resource data pertinent to the project was collected from the DNR County Biological Survey Rare Features Database, Phase II Forest Inventory, Fisheries Surveys, Belwin Foundation and Afton State Park. In addition, City residents volunteered information on natural resources, especially with respect to wildlife sightings.   Stereo pairs of infrared aerial photos were used to delineate boundaries of natural communities on mylar overlays. Upon field verification, these boundaries were then digitized onto GIS, Digital Ortho Quad Base Maps.

Field Inventory of Natural Communities
Ground surveys were conducted for identified natural areas. Within each area, dominant tree, shrub and ground cover grasses and forbs were identified, as well as populations of "problem" species such as European buckthorn, Tartarian honeysuckle, or purple loosestrife. Where suitable habitat for threatened and endangered species was found, an informal search for those species was conducted as part of the natural community inventory.

Natural Community Disturbance Indicators were evaluated as well. Information on disturbance indicators including invasive and/or exotic species, as well as impacts from urban development, grazing practices, logging, stormwater runoff, erosion, sedimentation and other land use practices were noted

Finally, the field inventory identified sites of critical concern from a natural resources perspective. Critical sites might include major gullies, major exotic species infestations, or natural communities, which if restored, could provide major benefits to the citizens of Afton and the surrounding areas.

Classification and Qualitative Ranking of Natural Communities
All natural communities were classified in accordance with *Minnesota's Native Vegetation, A Key to Natural Communities* (MN DNR Biological Report NO. 20, 1993).
The communities were then assigned a qualitative ranking (EO rank) in accordance with *Element Occurrence Ranking Guidelines* (MN DNR Natural Heritage Program). This ranking system (which ranges from A to D), is based primarily on species composition and diversity, ecological structure and disturbance indicators. A natural community that exists in pre-settlement condition would be given an "A", while a severely degraded natural community would be given a "D". One criterion that was not used for this project is minimum size standard.

Minnesota Land Cover Classification System (MLCC)

This system was developed by the MN DNR as a way to map all land cover types in the state; the hierarchical system can be applied at varying degrees of detail, depending on the level of specificity desired. Using this system provides compatibility between this report and similar planning efforts around the state and metro area, by establishing a uniform set of definitions and categories for cover types. The system encompasses the DNR Natural Heritage Program natural community classifications but differs in that it does not provide a qualitative assessment. It does, however, include non-native communities and human created cover types that are omitted from the Natural Heritage system. All of the sites surveyed were assigned the appropriate MLCC code; the cover types codes used in this project are summarized below. For portions of the City within the Valley Creek Watershed (hydrologic boundaries), MLCCS mapping was completed to a level 4/5as part of a combined mapping and inventory effort with this project.

Stewardship Recommendations

This section summarizes any significant problems or assets that a site or reach contains, and may include management ideas for a site. It includes a discussion of any Critical Concern sites noted during the field inventory. Examples of the types of information included here include stream water quality impacts, erosion problems, exotic species infestations, or potentially high quality communities that could be significantly enhanced with minor restoration efforts.

Landscape Unit Rankings

Landscape Unit Rankings provide an ideal geographic unit for carrying out land use planning efforts as well as natural resource management efforts. Each management unit was ranked using the following criteria.

Ecological Ranking

Value	Criteria
High	Several natural communities with EO rank of BC or higher - good diversity of different natural communities and/or locally unique/rare natural community.
Moderate	At least one natural community with EO rank of BC or higher - moderate diversity of natural communities. Natural communities present are not locally unique or rare.
Low	All natural communities with EO rank of C or lower - large proportion of site consist of human created environments (e.g., agricultural land) - low diversity of natural communities.

Wildlife Habitat Ranking

Value	Criteria
High	High diversity of good quality natural communities within local or regional corridors (e.g.) Mississippi River Flyway) and/or sites containing critical or unusual habitat (e.g., native prairie, waterfowl feeding areas). Observations and records indicate high abundance and diversity of species.

Moderate   Good diversity of natural communities within local corridors. Habitat most suitable for Habitat-generalist-type species (e.g., deer and raccoons). Observations and records indicate good abundance of wildlife.

Low   Low diversity and quality of natural communities with poor connectivity to other wildlife habitat areas. Generally, areas of intensive agricultural or urban land use.

Rare Features Ranking

The following criteria were used in conjunction with Minnesota County Biological Survey Data on rare species, to determine Threatened and Endangered Species Potential for a site.

Value	Criteria
High	Documented endangered species and/or natural communities within site boundaries.
Moderate	Documented endangered species and/or natural communication adjacent to site - high potential for endangered species to be present on site due to good quality habitat.
Low	No documented endangered species and/or natural communities within site boundaries - low potential for occurrence of endangered species.