

## **APPENDIX A-1 – ESA INFORMATION**

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**Section 1: Description of Environmentally Sensitive Resources and Rationale for Protection**

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## Section 1: Description of Environmentally Sensitive Resources and Rationale for Protection

All vegetative community types are defined in Minnesota's Native Vegetation - A Key to Natural Communities, MN-DNR, Natural Heritage Program. Transition vegetative communities may appear in more than one category.

### 1. Native Prairies

For the purpose of this Code, Central Minnesota remnant native prairie communities include mesic (moist) oak savannah, xeric (dry) oak savannah, mesic prairie, dry prairie, wet brush prairie, wet meadows, wet prairies, and rock outcrops.

The protection of remnant prairie tracts is of vital importance to the City of St. Cloud. In Minnesota, less than 1% of the original prairie remains. Undisturbed prairie is one of the rarest ecological community types. Hundreds of grass and wildflower species comprise a native prairie. The least disturbed prairies contain the most diverse plant and animal species.

Small unique remnant native prairies occur in and near the City of St. Cloud. Many of these are rare and fragile.

Prairies of all types are so rare that attempts to preserve them are recommended for all sites. Areas of concern may be small prairie remnants on already partially developed sites. All of the above should be managed as prairie and preserved and enhanced if possible.

### 2. Forests and Woodlands

For the purpose of this Code, forest and woodland communities include oak forest, lowland hardwood forest, floodplain forest, aspen woodland, aspen forest, oak woodland, oak savannah and tamarack swamp.

The protection of forests and woodlands is important to the City of St. Cloud. These vegetative communities often occur on steep slopes, unstable soils and poor soils where they stabilize the soil and prevent erosion, control runoff and promote the percolation of rainwater. In uplands and in lowlands, forests and woodlands aid in the control of flooding, prevent sedimentation in and cool streams for fish reproduction, decrease temperature and provide shade from solar radiation, provide wind protection, improve air quality and provide habitat and food sources for numerous forest, woodland and savannah plant and animal species. Large unfragmented tracts of forests and woodland are especially important for interior forest species and for wildlife corridors.

### 3. Sensitive Geological and Hydrogeological Features

Included in this category are rock outcrops, steep slopes, unstable and sensitive soils, high groundwater table, etc.

***Sensitive Geological Areas*** - Sensitive geological areas consist of materials or structures that are easily modified by human activity, where such modification may result in 1) a loss of scientific or historic significance or value, or 2) an increase in environmental or geologic hazards. Examples would include removal of covering material from granite bedrock permitting easier contamination of ground water or use of private sewage systems in areas where thin sediment lies above granite bedrock.

***Sensitive Hydrological Areas*** - Sensitive hydrological areas include areas where changes in land use which result in changes in the ratio of infiltration to runoff can easily increase the amount or frequency of flooding. Such flood intensification may occur near or at the site of the landscape alteration or may affect the larger streams in the region, including the Sauk and Mississippi Rivers. Also included are areas where ground water is easily contaminated or where changes in the water table (the level of the top of the ground water) can cause side effects like surface subsidence and damage to foundations or utilities.

***Rock Outcrops*** - Rock outcrops in the inventory were rated solely on the plant species invading their surfaces. As crucial for development and planning purposes is their hydrogeological significance. Rock outcrops in central Minnesota are visible "flags" that signal an underlying bedrock system. In the 1990's, there was a growing awareness that fractures and faults in the crystalline basement rocks have influenced erosion deposition and fluid migration patterns in overlaying sediments and sedimentary rocks. There are linkages between bedrock and overburden patterns. These links are borne out by patterns in vegetation, human economic development and human environmental impact. In addition, the geology and topography influence current movement of surface and groundwater. All these affect biotic communities. To help guide development and stewardship, any property with outcrops should be carefully evaluated hydrogeologically.

#### **4. Rare Species Sites**

Rare species sites include state and federally listed endangered, threatened and rare species and species of special concern. Each species contains its own unique genetic pool which can prove beneficial to us in a number of ways. Over the past two centuries, loss of habitat has become the single most important factor threatening the survival of species. Because oak savannahs, prairies and prairie wetlands have suffered the greatest alteration of all Minnesota habitats, their indigenous species are under the greatest threat. The future of Minnesota's endangered species depends upon adequate habitat preservation.

#### **5. Riparian Corridors (River and Stream Corridors)**

Riparian corridors are vegetated zones (often forested) along the edge of a river, river segment or stream. They include floodplains, shorelands, and may include floodplain forest, lowland hardwood forest, tamarack swamp, willow swamp, cattail marsh, mixed emergent marsh, oak woodland and wet prairie. These zones act as buffers that provide and help sustain resource values for the river or stream. These values can be fit into one of four functional categories:

1. Water quality
2. Wildlife
3. Aesthetics and recreation
4. Flood control

How wide a riparian corridor should be will depend on the functional value one is interested in conserving. As a general rule, the wider the buffer, the better. However, this is often not practical due to social, economic and political factors.

#### **6. Wetlands**

For the purpose of this Code, included in this category are: cattail marsh, willow swamp, wet meadow, wet prairie, mixed emergent marsh, tamarack swamp, floodplain forest and lowland hardwood forest.

Wetlands are essential habitat for many fish and wildlife species. They serve as storage areas for excess water during flooding. Wetlands act as a filter for sediments and nutrients as water travels through them before reaching lakes, rivers and streams. Wetlands also function as ground water recharge areas. They are often used for public recreation, and some types have commercial value.

Wetland means land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (as defined by the Wetland Conservation Act Rules Chapter 8420; 8420.0110 subpart 52).

Wetland Type means a wetland type classified according to Wetlands of the United States, United States Fish and Wildlife Service Circular 39 as summarized in 8420.0110 subpart 54.

Since wetlands within Minnesota are protected by the Wetland Conservation Act (WCA), and Section 404 of the Clean Water Act, development within those areas would have to follow WCA Rules 8420 as well as working within the confines of this Ordinance.

## **7. Wildlife Corridors**

This category includes riparian corridors, flightways, migration routes, nursery and nesting habitats, roosting sites, and other wildlife habitat. Functions of such corridors include: 1) places where plants and animals can live and reproduce; 2) places where animals can move from one place to another in relative safety to find food, water, or mates, either on a daily or seasonal basis.

Corridors for animals and plants are important for the following reasons:

1. To avoid excessive inbreeding, small populations of a species in one habitat island need to have some contact with a population of the same species in another habitat island.
2. Species loss from a habitat island is less likely when that island is connected to a similar habitat island, i.e. maintaining corridors between areas of similar habitat helps sustain species diversity.

## Section 2: Best Management Practices

### Native Prairies

- Prescribed burning at appropriate times. Rotational burning should occur at two to ten year intervals, depending upon prairie type and condition. A healthier, more diverse prairie and the protection of prairie animals results from burning only a portion of a prairie each year. Fire promotes the growth of grasses and reduces weeds and tree species. A year of no burn promotes flowers and provides overwintering for butterfly and insect larvae and pupae. Burning in spring, after cool season exotics have grown and before warm season native prairie species have emerged, promotes the native species. Late summer and fall burning, after dormancy of prairie species, is more effective in controlling brush. Burning regimes should vary over time so that tracts are eventually burned at varying times of the year and varying intensities.

In conjunction with burning, or if burning is not suitable, the following measures may be options:

- Controlled (managed rotational) grazing at appropriate times. Overgrazing can result in the loss of prairie species and diminish the quality of the prairie. Grazing should begin mid to late June. Plants should not be grazed below six inches. Rotational grazing allows for prairie flowers and seed production in non-grazed areas.
- Mowing and removal of plant material at appropriate times (once a year). Mowing for haying (once in a year, every two to several years) should follow the end of nesting time for ground nesting birds (about July 15) and allow flower and seed production of prairie species in late summer and fall. To discourage cool season exotic species and encourage warm season native species, mowing can occur two times a year: spring, after cool season species have emerged, but before warm season native species; and fall after dormancy of native species.
- Removal of exotics (through cutting, spot treatments of herbicide, and stump cut treatment with herbicide) to remove nuisance species such as Siberian Elm, Buckthorn and Honeysuckle.
- Removal of trees. Non-natives, such as Siberian Elm, have been mentioned. Sometimes native trees, such as box elder, green ash, and aspen need to be removed also. This can be done by cutting, girdling and cut stump treatment as appropriate to species.
- Physical disturbance of the soil should be avoided, including compaction due to use by vehicles, heavy foot traffic, as well as plowing, cultivating, and scraping.
- Maintain solar radiation during the growing season.
- Maintain natural hydrology (zero change in runoff), especially for wet prairies and meadows.
- Enhancement by seeding or planting native species from local seed sources, if appropriate.
- Recommended buffers. High priority sites should have no development. Recommended buffers for all prairie is 100 feet. Very little is known about the requirements of prairies and prairie remnants to maintain viability and diversity of species.

The above was based on U.S. Department of Agriculture, Soil Conservation Service Program Aids Numbers 1452, 1405, 1453 and 1410 (1988 and 1990), as well as recommendations from Ellen Fuge, Natural Area Management Specialist from the MN-DNR and Fred Bengtson, Assistant Area Wildlife Manager from the MN-DNR.

## Forests and Woodlands

- Forest or woodland tracts of 40 acres or more should be considered for forest preserves (or reserves), particularly examples of high quality forest ecosystems or rare forest communities. If different forest communities exist within the city, such as oak forest, maple basswood forest, tamarack swamp, floodplain forest, a good example (the best?) of each community type should be preserved.
- Oak savannah tracts of 10 acres or more should be considered for oak savannah preserves. Oak savannah is a very rare natural community.
- Wooded floodplains, wooded streams corridors, wooded slopes, and wooded environmentally fragile areas should be considered for preservation.
- Trees that provide buffers, such as those separating housing from busy roads or commercial areas, and trees aesthetically important to the community should be considered for preservation.
- Particularly large or historic trees should be considered for preservation.
- Within smaller tracts of wooded areas being developed, measures to minimize tree loss and woodland degradation should be considered. Guidelines might include:
  - Placing roads and structures so that the development does not fragment the forest or woodland or sever connections to adjacent wooded or environmentally sensitive areas. Development along the periphery is preferred.
  - Clustering development near the edge of a woodland or in existing clearings is another possibility to maximize the amount of woodland, including native understory, that is preserved as development takes place. Innovative site designs which accomplish this same goal should be encouraged.
  - Placing roads, driveways, the "footprint" of structures and construction activity, etc., to minimize removal and death of the largest and most valuable trees. Both size and species of trees need to be considered. Some native tree species are more uncommon and/or more difficult to replace.
  - Requiring tree protection measures during construction. In general trees need to be protected from compaction, taking away or piling of dirt, materials, etc., and physical damage to bark or root systems. (See Appendix E, References, regarding tree protection during construction.)
  - In order to prevent the spread of oak wilt, avoiding construction activities involving oak trees during those months when oak wilt is most likely to spread (April through July).
  - Retaining natural "duff" (decaying vegetative matter) under trees and groups of trees. The duff layer cools soil temperature, provides mulch, nutrients and moisture to keep trees healthy.
  - Maintaining natural understory, including native shrub and herb layers. Native vegetation harbors more plant and animal species diversity and might allow for the natural regeneration of trees and related species and the sustainability of the forest.
  - Control of exotic species, especially buckthorn, should be encouraged.
  - Tree replacement with the same or similar species should be considered in cases where trees of significant size or number must be removed.

The above was based on information from the MN-DNR Forestry Division and Natural Heritage and Non-Game Research Program, the City of Burnsville (MN) Woodland Protection Ordinance and consultations with Dennis Ludivig, City of St. Cloud Forester, Tim Edgeton, Sherburne County Forester, and Jeff Haws, MN-DNR Forester.

## Rare Species

Best Management Practices will vary with species. See appropriate management and protection guidelines from appropriate state and federal agencies including: MN-DNR County Biological Survey data sheets and maps. Any development projects proposed in the vicinity of a rare feature identified on the map should trigger an inquiry to MN-DNR Natural Heritage Program.

## Riparian Corridors

Plans for avoiding fragmentation of corridors need to be made prior to major alteration of the vegetation on the property or land to be developed.

The following recommended widths have been identified:

(Source: [A Citizen's Guide to Conserving Riparian Forests](#); by Susan C. Peterson and Kenneth D. Kimball.)

- To protect water quality - 25' to 100'

Within this range is an appropriate buffer footage to prevent erosion and sedimentation run-off, provide streambank stability, assimilate pollutants, and shade the stream adequately as a mechanism to control water temperature and light levels.

- To provide an adequate buffer needed by plants and wildlife - 100' to 600'

This width is quite variable as it accommodates numerous wildlife species and plant communities.

Examples:

- Most of the streamside flora occur within 100' of the water interface zone.
- Reptiles/amphibians - 100' to 200'
- Small mammals - 0' to 200'
- Larger mammals and raptors - 0' to 400'

To adapt to wildlife needs, the following is worth considering: a "string and beads" type of pattern. The "beads" are wider areas which represent unique habitat or a special location, such as a bald eagle nesting site. The "string" is an attempt to prevent fragmentation of the travel corridors used by various species. These must be maintained in order for the corridor to remain viable.

- To meet local aesthetic objectives - 25' to 800'

The corridor width varies with the vegetation type, degree of understory and whether the management objective is visual or noise control. For rivers with outstanding recreational resource values, corridor buffer widths of 500 feet to one-quarter mile are recommended.

- Flood control

Riparian forests within floodplains deserve special recognition. Floodplain regulations are useful for preserving riparian corridors from development. But to protect the riparian forest within the floodplain, one must also develop the rationale for water quality and wildlife protection.

- Waters designated as DNR Protected Waters and designated as Trout Streams and their tributaries. (Source: DNR Division of Waters)

For all waters falling in this category, a minimum impact zone of 200 feet from the ordinary high water level, as established by the DNR Division of Waters, is recommended. Clearcutting is discouraged anywhere in this area. From 200 feet to 100 feet, selective cutting is the preferred harvest method.

## Rock Outcrops

In order to steward the hydrological and geological functions provided here, an impact zone of at least 100 feet (or a greater distance) from the outcrop is recommended. The distance from the outcrop needs to provide a minimum of 10-12-15 feet of unconsolidated material. On-site evaluation by the Environment and Development Team can help identify the specifics for the outcrop in question.

The plant communities found on rock outcrop areas are often unique as they are species specially adapted to survive under any of the following conditions: a) little soil that may contain chemicals produced by the bedrock substrate; b) great fluctuations in temperature; c) extreme droughts. In the St. Cloud Natural Areas Inventory conducted by SEH, the three rock outcrop communities identified in Stearns County (sites 104, 116, 118) and the one in Sherburne County (site 119) appear to be unique compared to rock outcrop communities in other areas of the state. To steward these special plant communities, fire is a recommended management tool. Planned periodic burns help prevent invasion by various tree species from the adjacent landscape. Two species to watch out for are eastern red cedar and red oak. Selective cutting of any invading tree species is also an appropriate management tool.

The above was prepared in consultation with the Earth Sciences Department, St. Cloud State University.

### **Wetland Protection Strategies**

The following standards recommended for protecting wetlands were developed in consultation with Stearns County Environmental Services Wetlands Specialists:

- Delineation by a qualified wetland delineator be completed for the site and should include proper documentation as described in Army Corps of Engineers Public Notice 96-01078-SDE. This delineation should be completed and its accuracy verified by the county and Army Corps of Engineers prior to the final plat approval.
- The wetland boundary should be surveyed and shown on the final plat. The delineation report should be filed together with a Notice of Restriction so that future buyers, through the abstract, are put on notice that their lot contains jurisdictional wetlands.
- Wetland boundaries and the implications of owning wetland areas should be made clear to all individual homeowners. This could be accomplished through subdivision agreements between the City of St. Cloud and the owner/developer.
- Within the wetland boundary, the following activities should be restricted: Chemical applications (herbicides, pesticides, fertilizers).
- Within the wetland boundary, the following activities should be prohibited: vegetative removal and cutting (except for exotic and invasive species), filling, grading, drainage, deposition of soil, location of actual structures.
- The Wetland Conservation Act deminimus exemption should not be allowed for individual lot owners upon approval of the development.

In order for the above standards to be met, the following methods may be used:

- Cluster development pattern; mix of housing types
- Dedication of easements to protect wetlands
- Modifications of project design to ensure continued water supply to the wetland and free flow of water
- Minimize soil compaction (compaction decreases infiltration and promotes run-off)
- Using buffers in conjunction with other structural and non-structural best management practices as pretreatment when handling storm water discharge with high flow rates or high concentrations



- The MPCA's best management practices should be followed to avoid erosion and sedimentation during the construction phase. Buffer zones should be protected by silt fencing during construction, and the fence should remain in place until the vegetation is established. During the first two years, the owner/developer should replant any buffer vegetation that does not survive.
- Creation or restoration of an area wetland
- Development of a plan to guide actions involving the creation of a new wetland or the restoration of damaged or degraded wetlands

Factors to consider when determining the width of the vegetative buffer zone adjacent to the protected wetland boundary:

- Slope: as slope increases, width of the buffer increases.
- The use of a meandering buffer strip to maintain a natural appearance is encouraged but not required in areas of flat topography.
- Depth to groundwater: as depth increases, buffer width can be reduced.
- Soil type: as percolation rate increases, width of buffer can be reduced.
- Type of vegetative cover, i.e. its ability to hold soil and slow run-off
- Buffer width should not fall below 20 feet.

## Section 3: Tools for Protection

Source: Natural Areas: Protecting a Vital Community Asset, A Sourcebook for Minnesota Local Governments and Citizens, Laurie Allmann, Minnesota Department of Natural Resources, 1997.

TOOL	APPLICABILITY FOR LOCAL GOVERNMENTS	RESOURCES AND REFERENCES
<p><b><i>Perpetual Conservation Easement</i></b> A legally binding agreement between a landowner and a qualifying government agency or nonprofit organization, in which the landowner voluntarily agrees to specified terms that permanently limit the use and development of a given property for the purpose of protecting agricultural, open space, cultural, or environmental values. The easement may be sold by the landowner, or donated (in which case there may be significant income tax benefits). An easement runs with the land's title and is binding on all future owners.</p>	<ul style="list-style-type: none"> <li>⇒ To provide a greater degree of protection for high quality natural features found within existing parks and on other public lands.</li> <li>⇒ To establish development buffers on and around the perimeter of environmentally sensitive sites.</li> <li>⇒ To promote volunteer landowner conservation measures while keeping land in private ownership and on the tax rolls.</li> <li>⇒ To ensure permanent protection of required open space in subdivisions and other developments.</li> </ul>	<ul style="list-style-type: none"> <li>⇒ The Minnesota Land Trust (MLT) is a private, nonprofit organization that specializes in establishing conservation easements with willing public and private landowners. Contact MLT at (612) 522-3743.</li> <li>⇒ Easements were used in conjunction with protection of a city-owned natural area known as "Coon Hill" in Red Wing, MN. Contact Brian Peterson, Community Development Director at (612) 385-3617.</li> <li>⇒ The DNR Local Grants Program (described under Outright Purchase) also funds perpetual easements.</li> </ul>
<p><b><i>Locally-Enacted Preservation Overlay Zone</i></b> Often referred to by different names, a Preservation Overlay Zone is a geographic area demarcated within a city, township, or county, the boundaries of which are based on concentrations of highly valued natural features as identified through a planning process involving extensive background studies. A combination of conservation tools may be utilized to protect natural features within the zone, including (but not limited to) acquisition of land by a public agency, restrictions on utilities and transportation development, encouragement of "best management practices" in use of chemicals/pesticides, reduce housing densities, and other land use controls. Compliance may be voluntary or mandatory.</p>	<ul style="list-style-type: none"> <li>⇒ Preservation Overlay Zones are appropriate for communities that retain quality natural features such as undeveloped watersheds, forest or other native plant communities, or geographic features, such as bluffs, that occur over areas of divided ownership.</li> <li>⇒ The process of identifying and ranking natural features to determine reasonable boundaries for the zone will require the services of professional ecologists as part of the planning process. Ecologists should also be consulted as to the determination of appropriate controls to effectively minimize threats to the integrity of natural features within the zone.</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Lake Elmo, MN has established an open space/agricultural preservation and development overlay district that includes environmental analysis among its parameters. For more information, contact Ann Terwedo, City Planner at (612) 777-5510.</li> <li>⇒ "Conservation Corridors" have been incorporated into numerous county and city planning efforts in Wisconsin. For more information, contact Jay Tappen, Senior Planner, West Central WI Regional Planning Commission at (715) 836-2918.</li> </ul>

TOOL	APPLICABILITY FOR LOCAL GOVERNMENTS	RESOURCES AND REFERENCES
<p><b><i>Transfer of Development Rights (TDR)</i></b>                      In the TDR program, two zones are established in a given geographic area, a “sending” (preservation) zone and a “receiving” zone. Landowners with property in the sending zone may sell their (unused) development rights on the open market to land developers and brokers, who then use the purchased rights to increase their allowable building density in the receiving zone.</p>	<p>⇒ To work effectively, TDR programs require: (1) a high demand for housing or other development in the receiving zone, (2) capability of the administering government unit to set up and oversee the program on an ongoing basis, (3) residents in receiving zone amenable to higher density.                      ⇒ Appropriate for large-scale efforts where keeping land in private ownership is considered desirable.</p>	<p>⇒ Although now used in Maryland and a number of other states, Minnesota state statutes, as generally interpreted, do not allow for TDR programs - a situation that may be shortly remedied. For an update on the status and availability of TDR programs in Minnesota, contact The Land Stewardship Project at (612) 653-0618.</p>
<p><b><i>Purchase of Development Rights (PDR)</i></b>                      A PDR program typically involves the purchase of development rights by a local government unit or nonprofit organization in order to accomplish protection of natural features, open space, or agricultural values. PDR programs are generally applied as part of a formal program with specific criteria used to select acquisitions. A PDR program may be viewed as a systematic use of conservation easements.</p>	<p>⇒ PDR programs require: (1) the capability of the administering government unit to set up and oversee the program on an ongoing basis, (2) a funding mechanism to finance the acquisition of development rights. A PDR program may or may not be set up to require willing participation of the seller. Willing participation of the seller is considered preferable, in that it makes the program more effective.                      ⇒ Appropriate for large-scale efforts where keeping land in private ownership is considered</p>	<p>⇒ The Land Stewardship Project (LSP) is spearheading a conservation project in the east Metro area and is involved in the use and development of tools including PDR. For more information, contact LSP at (612) 653-0618.</p>
<p><b><i>Registry Programs</i></b>                      Registry programs are a way to acknowledge and encourage the voluntary protection of natural features by private citizens. Landowners make a non-binding agreement to protect their land by enrolling in a registry. In turn, they are provided with information and technical assistance regarding appropriate conservation practices for their particular site.</p>	<p>⇒ Local governments may either start their own registry program (if they have qualified natural resource staff) or may instead educate citizens about the availability of registry programs offered by other government agencies or private, nonprofit conservation organizations.</p>	<p>⇒ The MN Chapter of The Nature Conservancy administers a registry program. Contact Lisa Mueller, Land Protection Specialist at (612) 331-0733.                      ⇒ “Friends of the Minnesota Valley” administers a Heritage Registry for landowners in the Lower Minnesota River Valley.</p>
<p><b><i>Special Designation</i></b>                      High quality natural areas may qualify for special designation under a state or federal</p>	<p>⇒ Special designation may increase legal protection and potential for financial support for acquisition and</p>	<p>⇒ If a natural area has historic or cultural significance, call the State Historic Preservation Office at (612)</p>

TOOL	APPLICABILITY FOR LOCAL GOVERNMENTS	RESOURCES AND REFERENCES
<p>program, such as the National Register of Historic Places or the state Scientific Natural Areas Program, administered by the Department of Natural Resources. Special designation generally requires public access to land.</p>	<p>management of selected sites.</p> <p>⇒ With sites appropriate for special designation, an outside agency may be interested in acquiring the property and managing it for protection of its natural features. This allows the local community to benefit from protection of a site without being obligated for the cost of acquisition or management.</p> <p>⇒ Appropriate options only for natural areas with features of state/national significance.</p>	<p>296-5434.</p> <p>⇒ To find out whether a natural area might qualify for designation as a state Scientific and Natural Area, call (612) 297-2357.</p>
<p><b><i>Outright Purchase</i></b>                      Also known as “fee simple acquisition,” the outright purchase of land gives a local government unit full control over all rights to a property. Local governments may choose to exercise the power of eminent domain or to operate under a “willing seller” policy for acquisition of natural areas.</p>	<p>⇒ Outright purchase by a unit of government requires: (1) the determination that the land serves a public purpose. Natural areas can be said to serve public purposes (e.g. flood control, enhancement of air and water quality) even when public access to a site is not feasible, desirable, or practical, (2) provision of necessary funding to finance the purchase. Acquisition may be financed through general revenue funds, bond referenda, lend-lease programs, special taxation, government grants, trust funds, and matching programs. Cost of acquisition may be reduced by use of “bargain sale,” in which the seller agrees to sell at below market value (the difference is recognized by the IRS as a charitable contribution for the seller’s income tax purposes), (3) financial and staffing resources to provide for site management and maintenance.</p>	<p>⇒ Washington County, MN used a lease-purchase arrangement to finance an acquisition of park land in the St. Croix Valley. For more information, contact Dave Engstrom, County Commissioner at (612) 430-6215.</p> <p>⇒ The Minnesota Department of Natural Resources administers a matching grant program to assist local governments with acquisition of natural and scenic areas. For more information about the Natural and Scenic Area Grant Program, contact Tom Kranz, Local Grants Program at (612) 297-3168.</p> <p>⇒ The Trust for Public Land (TPL) is a nonprofit land conservation organization that applies its expertise in negotiation, public finance, and law to help local governments acquire public open space. For more information, contact TPL at (612) 338-8494.</p>

Information provided in Appendices is for informational and reference purposes only. Such information is subject to change.

## **Section 4: Qualifications of Scientific Members**

To serve as a scientific member for the Environment and Development Team, one or more of the following qualifications must be satisfied:

1. Professional degree in one of these areas: Hydrology, geology, botany, wildlife biology, ecology, or natural history
2. Documented training in the area of natural resources with demonstrated field experience
3. Knowledgeable and trained in applying methodologies associated with stewarding natural communities

## Section 5: References

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- Allmann, Laurie. Natural Areas: Protecting a Vital Community Asset: A Sourcebook for Minnesota Local Governments and Citizens. Natural Heritage and Nongame Research Program, Minnesota Department of Natural Resources, St. Paul, 1997.
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## Section 6: Resources

The St. Cloud Natural Areas Inventory, completed by Short, Elliott and Hendrickson, Inc. (SEH) in March 1996.

Map developed from the St. Cloud Natural Areas Inventory Report, showing the location of high, medium and low priority natural areas and rare species sites (1996).

The U.S. Fish and Wildlife Service's National Wetlands Inventory (1982).

Minnesota County Biological Survey (Department of Natural Resources) information for Sherburne County (1989-1990), and Benton and Stearns Counties (1995-1997). Data available through the Natural Heritage Information System, Natural Heritage and Nongame Research Program, Minnesota DNR, St. Paul.

The Minnesota Geological Survey Geologic Atlas (1995).

The Report on the Geology of the Neighborhood around Quarry Park (1994).

The USDA Soil Survey.

A Citizen's Guide to Conserving Riparian Forests.

Floodplains, Shoreland, and Scenic River Ordinances.

Aerial photos of the St. Cloud area.

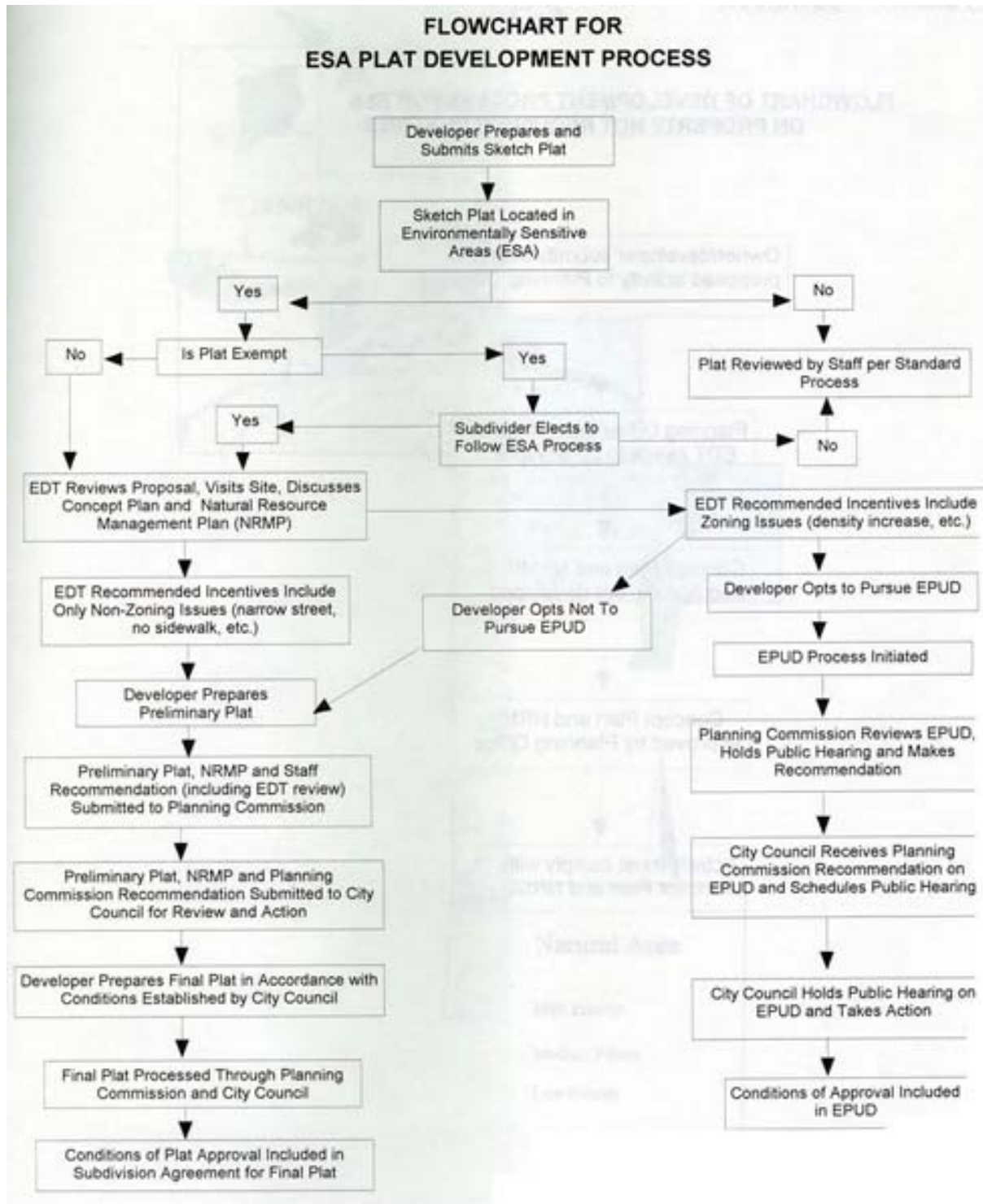
SCSU Earth Science Dept. work on Sensitive Geological and Hydrological Areas.

USGS topographic maps.

Field notes of scientists who conducted the St. Cloud Natural Areas Inventory and Planning Framework.



## Section 7: Development Process - Flowchart



**FLOWCHART OF DEVELOPMENT PROCESS FOR ESA  
ON PROPERTY NOT REQUIRING PLATTING**

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**Owner/developer submits details of  
proposed activity to Planning Office**

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**Planning Office determines if  
EDT needs to be activated**

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**Concept Plan and NRMP, if  
appropriate, are developed**

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**Concept Plan and NRMP  
approved by Planning Office**

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**Activity must comply with  
Concept Plan and NRMP**

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