DULUTH NATURAL AREAS PROGRAM GUIDELINES WITH APPENDICES

GUIDELINES FOR THE PERMANENT PROTECTION OF ECOLOGICALLY SIGNIFICANT LANDS IN DULUTH, MINNESOTA

Approved by the Environmental Advisory Council, June 5, 2002
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ARTICLE I - PURPOSE

The City of Duluth is the owner of a substantial number of tracts of real estate, both inside and outside the City, some of which are of potentially special or unique ecological or environmental significance[a]. These properties should be considered for permanent protection of their ecological significance. In addition, there are properties of similar value to the community owned by other entities who may desire their properties be similarly protected and who are willing to convey the property interests necessary to implement these protections. Therefore, the City Council approved the establishment of the Duluth Natural Areas Program (Program or DNAP) under Article XXIX of Chapter 2 of the Duluth City Code, 1959, as amended. The process for designation of such property and implementation of the necessary protections is set forth in said Article XXIX.

The purpose of the Program Guidelines is to implement the provisions of Article XXIX of Chapter 2 of the Duluth City Code, 1959, as amended. It is the purpose of that ordinance to protect and preserve the natural heritage of the City of Duluth and the surrounding area. This includes plant and animal communities, habitat for special species, natural water features, important bird habitat areas, and geologic landforms. The City is committed to preserving in perpetuity those City-owned lands as determined in accordance with the criteria established under these Program Guidelines and to offer the opportunity for the voluntary preservation of similar lands owned by others. In addition to the ecological benefits mentioned above, the Program will secure the legacy of Duluth's natural places, maintain and enhance the quality of life for the inhabitants of the area, and promote tourism through the preservation of important natural places.

These guidelines address the following:

- Establish a process for nomination and implementation of the Program.
- Establish criteria to define City-owned and other lands significant to the City's natural heritage.
- Establish a venue for the City to convey or acquire interests in property meeting Program criteria voluntarily offered by private and public owners to serve as another means of assuring that the City's significant natural heritage is protected.

ARTICLE II – DESIGNATION PROCESS

The process for designating property for inclusion in the Program and determining the protections to be applied to the property so designated is set forth in Section 2-155 of the Duluth City Code, 1959, as amended.

A - PROGRAM ADMINISTRATOR; POWERS AND DUTIES

The Program Administrator is the Director of the Department of Planning and Development for the City, or his/her designee. The Program Administrator shall have the powers and duties to:

[a] Other properties which are otherwise of specific and unique value to the community, such as open space and recreation parks, but without unique ecological significance are likely worthy of protection for the public interest but are beyond the scope of the DNAP.

1. Provide such staff and assistance as is reasonably necessary to the Environmental Advisory Council, the Planning Commission and the City Council to assist those bodies in performing their functions in the implementation of the Program.
2. Establish and implement a formal written procedure for consulting with the City's Department of Parks and Recreation, Administrative Services, and Public Works and Utilities where the property proposed for designation, the designation itself, or the implementation of a management plan for such property would affect another City department or Commission, with any other such department or Commission, regarding the designation of such property or the establishment of such a management plan. Input from this procedure shall be provided to the Environmental Advisory Council, the Planning Commission and the City Council as would be appropriate to such body's deliberations regarding the designation of such property and the establishment of a management plan therefore.
3. Promote the Program, by providing educational materials to the public and conducting informational meetings.
4. Identify, investigate and pursue, in conjunction with other public and private entities other sources of funding to fund the Program and to maximize private participation where feasible.
5. Maintain an inventory of all property included in the Program and the restrictions placed thereon.
6. Monitor and take all action necessary to enforce the protections and limitations described in the management plans for the tracts in the Program.

B - ENVIRONMENTAL ADVISORY COUNCIL POWERS AND DUTIES

Subject to the provisions of the Article XXV of Chapter 2 of the City Code, the Environmental Advisory Council shall have the powers and duties to:

1. Evaluate each tract nominated for designation under the Program and make a recommendation to the Planning Commission regarding whether such tract should be designated in the Program.
2. For each tract provisionally designated by the City Council for inclusion in the Program, make a recommendation to the Planning Commission regarding content of the proposed Management Plan for said tract.
3. Periodically review the program's current eligibility criteria and the management plan guidelines and recommend to the Planning Commission and the City Council any changes needed to maintain the Program's consistency with its purpose herein and the City Comprehensive Plan, or to improve the administration, implementation and effectiveness of the program.

C - PLANNING COMMISSION POWERS AND DUTIES

The Planning Commission shall have the following powers and duties with regard to the administration of the Program:

1. Upon the recommendation of the Environmental Advisory Council for the designation of any tract under the Program, the Planning Commission, in accordance with their standard operating procedures, shall evaluate each such nomination based on the Program criteria established under these Program Guidelines. The Planning Commission will take into account the relationship of the Program to the Comprehensive Plan for the City and make a recommendation to the City Council regarding whether such tract should be designated under the Program.
2. For each tract provisionally designated by the City Council for inclusion in the Program, make a recommendation to the City Council regarding the proposed Management Plan for said tract.
3. Review any recommendations of the Environmental Advisory Council for modifications to the Program Guidelines and make recommendations to the City Council.

ARTICLE III - ELIGIBLE LANDS

The nomination package for a tract shall consist of a descriptive report of the science criteria for which the tract qualifies and a summary of ownership status. The following tracts that meet the criteria set forth in the Program Guidelines shall be eligible for inclusion in the Program:

A. City-owned property located within the boundaries of the City.
B. City-owned property located outside the boundaries of the City.
C. Property located within the boundaries of the City which is owned by other persons or entities, whether public or private, where such owner desires to have their property enrolled in the Program and where the owner is willing to convey the necessary property interests to the City or other qualified party (e.g. state, nonprofit, etc.) to accomplish those ends.
D. Property located outside of the boundaries of the City which is owned by other persons or entities, whether public or private, which is so located and which exhibits such characteristics as to have a substantial impact on nearby properties enrolled in the Program where such owner desires to have their property enrolled in the Program and where the owner is willing to convey the necessary property interests to the City or other party (i.e. state, nonprofit, etc.) to accomplish those ends.

ARTICLE IV - SCIENCE CRITERIA

To accomplish the purpose of the Program, the goal is to designate the best remaining examples of viable natural areas representative of the Duluth area, including Significant Native Plant Communities Areas, Special Species Areas, Natural Water Features, Important Bird Congregation Areas, and Geologic Landform Areas. In addition to the scientific eligibility criteria, the tract(s) nominated for the program must be reviewed for ownership issues.

A - SIGNIFICANT NATIVE PLANT COMMUNITIES AREA CRITERIA

1. – General Criteria

A tract containing one or more relatively undisturbed and viable native plant communities representative of the Duluth area as defined and described in Appendix A is eligible for designation under the Program. Appendix A lists the native plant communities presently

known to exist, and with potential to exist, in the Duluth area. For detailed descriptions of the plant communities in Appendix A, see the sources listed in Appendix F. Note, some of the sources in Appendix F are subject to change, and therefore, it is recommended that the nominator contact the Minnesota Department of Natural Resources (MNDNR) for the latest information or check out the website.

2. - Specific Criteria

A tract qualifies as a Significant Native Plant Community Area if any of the following criteria are met:

a) A plant community on the tract is listed as a "natural community" by the Natural Heritage and Nongame Research Program
b) A plant community existing on the tract is large enough to be self-sustaining and viable without adjacent buffers, or has some potential to be self-sustaining with adjacent buffers included in the area nominated
c) The plant community is declining or rare, but is viable within the eligible area of the Program
d) There are other significant natural features representative of the area, including native animal habitat and populations, worth considering

3. - Description of Area

To be considered for designation as a Duluth Natural Area under the Significant Native Plant Community criteria, a written description of the tract and conditions existing thereon must be prepared by a qualified professional (see definition – Appendix E) using the MNDNR Natural Heritage and Nongame Research Program's database, the U.S. National Vegetation Classification System, and/or any necessary field data to document information to justify such designation, the results of which are set forth in a comprehensive written report. Below are the elements to be included in the written report:

a) A legal description of the tract under consideration including current ownership status
b) A map of the tract including all relevant features at the site
c) Significance to the Land Type Association (see definition – Appendix E) within the eligible area of the Program
d) Composition and structure of the native plant community
e) Ecological significance and quality of the native plant community based on the Natural Heritage and Nongame Research Program element occurrence ranking criteria
f) Rarity of the native plant community occurrence in the Land Type Association
g) Size of the area(s) occupied by the subject community(ies) and its ability to remain viable with appropriate land management techniques
h) Proximity of the tract to other designated tracts or other publicly owned or controlled natural areas and the extent to which the tract in question is connected, physically or ecologically, to such designated tracts or areas
i) Amount of buffer, if any, that positively influences the natural processes of the native plant community
j) Animals that may use the tract for all or parts of their life cycle

B - SPECIAL SPECIES AREA CRITERIA

1. – General Criteria

A tract that contains habitat supporting a viable population of one or more endangered species, threatened species, or species of special concern of plant or animal is eligible for designation under the Program. An "Endangered Species," "Threatened Species," and "Species of Special Concern of Plant or Animal" is designated as such by the MNDNR by way of duly authorized regulations. These designations are updated periodically, and are hereby adopted by reference. The Duluth area listing as of August 1, 2001 is attached to these Guidelines as Appendix B.

2. – Description of Area

To be considered for designation as a Duluth Natural Area under the Special Species Area criteria, a written description of the tract and conditions existing thereon must be prepared by a qualified professional (see definition – Appendix E) documenting the following information to justify such designation, the results of which are set forth in a comprehensive written report. Below are the elements to be included in the written report:

a) A legal description of the tract under consideration including current ownership status
b) A map of the tract including all relevant features at the site and habitat needs (*Note: For large areas list the special species only, but <u>do not locate them on a map</u>. If the site is very small, list the special species as endangered, threatened, or species of special concern only, but do not identify the specific type of species.*) *This will help to protect special species from degradation*
c) Documentation of one or more endangered species, threatened species, or species of special concern of plant or animal existing on the tract
d) Documentation that the population of the endangered species, threatened species, or species of special concern of plant or animal on the tract constitutes a viable and sustainable population thereof

C - NATURAL WATER FEATURE AREA CRITERIA

Note: Implementation of the Natural Water Features section of the guidelines is dependent upon the completion of a citywide assessment of natural water features as described in Appendix C. The provisions of the guidelines pertaining to Natural Water Feature areas shall be deemed to be executory and shall not take effect unless and until a study meeting the criteria in Appendix C has been completed and is approved by the Duluth City Council after recommendations by the Environmental Advisory Council and City Planning Commission.

1. – Specific Criteria

A tract that contains a high quality water feature(s) representative of the watersheds flowing through the City of Duluth, including the St. Louis River estuary, may be nominated for designation under the Program if it meets condition 1, or <u>both</u> condition 1 <u>and</u> 2 below:

a) It includes a viable, high quality example of a representative aquatic system (see Appendix C for describing and classifying aquatic systems and assessing their quality) characterized by:
    i. Native fish, macroinvertebrate, and plant assemblages
    ii. Hydrologic function is within its range of natural variation

iii. Water chemistry (including nutrients, temperature, pH, turbidity, etc.), is within its natural range of variation
iv. Physical habitat (including substrate, woody debris, riparian structure, etc.), is within its natural range of variation

b) It includes lands and waters that are critical to supporting the ecological function of systems identified in 1 above, such as:
   i. Wetlands, natural water storage areas and floodplains that are critical to sustaining the natural hydrologic, sediment, and nutrient processing functions required by representative aquatic systems
   ii. Groundwater recharge or discharge zones that are critical to the hydrologic function of the representative aquatic systems

2. – Description of Area

To be considered for designation as a Duluth Natural Area under the Natural Water Feature criteria, a written description of the tract and conditions existing thereon must be prepared by a qualified professional (see definition – Appendix E) documenting the following information to justify such designation, the results of which are set forth in a comprehensive written report. Below are the elements to be included in the written report (see Appendix C for more details on classification, assessments, methodology, etc. that shall be included in the report.):

a) A legal description of the tract under consideration including current ownership
b) A map of the tract including all relevant features at the site
c) Description of watershed (catchment) context and the role of the water feature in the watershed (catchment)
d) Documentation of the type of aquatic system(s) represented within the site, and an assessment of how common the system is throughout the nominated tract
e) Documentation of the condition of the aquatic system, based on a range of natural variation analysis of biotic assemblages, hydrologic function, water chemistry, and physical habitat
f) Documentation of the sensitivity of the site's aquatic features to changes in land use and land management in the surrounding landscape
g) Prediction of the site's future condition under different scenarios (e.g., development within current zoning ordinances, protection through DNAP or other programs, etc.)
h) Documentation of the relationship of the site's ecological and hydrologic function to that of other aquatic systems, species and native plant communities

D - IMPORTANT BIRD CONGREGATION AREA CRITERIA

1. – General Criteria

A tract that contains areas that holds large concentrations of birds during one or more seasons either for breeding, wintering or migration is eligible for designation under the Program. Additional information on Important Bird Congregation areas is provided in Appendix D.

2. – Specific Criteria

A nominated tract qualifies as an Important Bird Congregation Area if there are congregations of waterfowl, seabirds, colonial waterbirds, shorebirds, raptors, wading birds, or migratory landbirds as described by the numerical criteria in Appendix D.

3. – Description of Area

To be considered for designation as a Duluth Natural Area under the Important Bird Congregation Area criteria, a written description of the tract and conditions existing thereon must be prepared by a qualified professional (see definition – Appendix E) documenting the following information to justify such designation, the results of which are set forth in a comprehensive written report. Below are the elements to be included in the written report:

a) A legal description of the tract being considered including current ownership status
b) A map of the tract including all relevant features at the site including habitat needs
c) Documentation that the requisite number of birds of the types specified regularly use the tract in the manner described above

E - GEOLOGICAL LANDFORM AREA CRITERIA

1. – General Criteria

A tract that contains substantially undisturbed geological landform or rock formations that clearly depict the natural processes instrumental in the formation of the geology of Duluth is eligible for designation under the Program.

2. – Specific Criteria

Geological landforms may include evidence for:

a) The Penokean Orogeny (mountain building episode), about 1.85 billion years ago
b) The Midcontinent Rift, including volcanism, intrusion and crystallization of plutonic rocks such as the Duluth (Gabbro) Complex, and deposition of sediments, about 1.1 billion years ago
c) The Great Ice Age Glaciation: erosion and deposition of glacial sediments, over the last 2 million years
d) Post Glacial changes in lake levels in the Lake Superior basin and natural development of the present landscape

For detailed descriptions of the geological landforms above, see the publication *Geology on Display: Geology and Scenery of Minnesota's North Shore State Parks* by John C. Green (1996), as well as other descriptive, credible sources.

3. – Description of Area

To be considered for designation as a Duluth Natural Area under the Geological Landform Area criteria, a written description of the tract and conditions existing thereon must be prepared by a qualified professional (see definition – Appendix E) documenting the following information to justify such designation, the results of which are set forth in a comprehensive written report. Below are the elements to be included in the written report:

a) A legal description of the tract being considered including current ownership status
b) A map of the tract including all relevant features at the site
c) Documentation that one or more of the landforms described above exist on the tract in a substantially undisturbed state

ARTICLE V - OWNERSHIP CRITERIA

A – GENERAL

The long-term efficacy of the Program depends on assurance of land ownership or other form of permanent protection and management rights. The focus of the Program is City-owned real estate. However, such tracts can have complicated title histories. In order to foresee and resolve potential title complications, the following steps shall be taken as part of the nomination process.

B – PROCESS

1. The nomination sponsor shall submit reasonable evidence of the current condition of title(s) to the tract(s) as part of the nomination. This may include a copy of the deed, abstract, or a letter from the County Land Department stating the title condition. If any of the tract(s) are privately owned or owned by entities other than Duluth, the nomination shall include a declaration from the landowner that it is aware of and supports the nomination. In addition, the landowner shall include a description of its intent to convey its fee title to the conveyor's interest or conservation easement over the property to the City of Duluth or other qualified party.
2. The Environmental Advisory Council shall make a request to the City Attorney for a preliminary assessment of the title and other issues and costs associated with any necessary real estate transactions for said tract(s).
3. The Environmental Advisory Council will review the nomination and make a recommendation to the Planning Commission.
4. The Planning Commission will review the nomination and make a recommendation to the City Council.
5. If the City Council approves the nomination to the Program based on the science criteria and the costs, the nomination shall be contingent on the completion of all real estate transactions and the adoption of a management plan.
6. The Program designation is final when the real estate transactions are complete and the management plan approved.

ARTICLE VI - MANAGEMENT PLANS

A – GENERAL REQUIREMENT

After a nominated tract is provisionally designated by the City Council pursuant to the Program, a Management Plan must be written by a qualified natural resource manager and approved by the City Council after review and comment by the Environmental Advisory Council and the Planning Commission. Such proposed Management Plans may be submitted simultaneously with nominations. For the purpose of the Program, "Management Plan" shall mean a plan for how property should be cared for on the ground, and how and to what extent the tract may be used to protect the resources for which the property was designated a "Duluth Natural Area." The nominator will work with City staff to identify appropriate funds necessary to implement the plan for a 5-year budget cycle, propose future sources of funds, and identify parties responsible for implementation of the plan. In addition, the plan shall set forth in reasonable detail the nature of

on-going costs anticipated to implement the Management Plan beyond the first 5 years. Since a certain level of proposed sources of funds are dependent on contingencies not within the control of the City, such as grants or donations from third parties, the plan shall set forth what funding sources would be used to pay for the costs of implementing the Management Plan if such contingencies are not met.

Management Plans for tracts designated for inclusion in the Program shall be developed and provided by or in cooperation with the nomination sponsor and shall be written by a qualified professional (see definition – Appendix E). A Management Plan shall be submitted pursuant to Section 2-155 (a) of the City Code.

In general, all Management Plans shall include a map and text describing the designated natural area and relevant general, resource, and human use management issues. The Management Plan shall address all of the issues set forth below if and to the extent that they are relevant to the site and criteria pursuant to which the Area was designated. In addition, the Management Plan should not deviate from the guidelines in any substantive manner without expressed justifications being set forth in writing. Management Plans may be amended from time to time in accordance with Section 2-155 (d) of the City Code.

B – SPECIFIC CONTENT

1. - General Management Section

This section shall provide an overview of the designated tract(s) and the relevant management issues. The Management Plan shall:

a) Emphasize natural feature preservation over resource use
b) Be designed to preserve the natural features for which the area was designated while allowing natural processes and changes to occur and for continued or modified historic uses consistent with maintenance and protection of the natural features
c) Include a detailed resource inventory of the area (map and text)
d) Provide for management that, in so far as possible, perpetuates or re-establishes natural processes and limits human or other activities that may have a negative impact on natural features
e) Promote stewardship on the part of users, local residents and city staff consistent with the protection and preservation of natural features for which the area was designated
f) Provide for notification of adjacent landowners and interested parties of the designation and attempts to engage them in a positive manner to carry out the management plan
g) Indicate that the tract is designated as a “Duluth Natural Area” with prominent signage pursuant to Article XXIX of Chapter 2 of the Duluth City Code, 1959, as amended
h) Cite the management rights, obligations and/or interests held by the City of Duluth necessary to carry out the purpose of the DNAP designation

2. - Resource Management Section

Resource issues to be addressed include but are not limited to:

a) Land use activities considered most natural and appropriate to the total environment of the area and the purposes for which the area was designated
b) Consideration of existing or necessary structures or unnatural objects, including those

having historical cultural value, those necessary for resource protection (such as culverts), and those potentially detrimental to the purposes for which the area was designated

c) Management limitations appropriate to the property and natural features, including:
    i. Limitations on management of vegetation, such as cutting of grass, brush, or other vegetation, thinning of trees, removal of dead wood and windfalls, opening of scenic vistas, planting, etc.
    ii. Prohibitions on land uses as may be appropriate, such as mineral extraction, timber harvesting, filling of wetlands, habitat conversion, collection of plant, animal, historical, or geological specimens
    iii. Prohibitions on intentional introduction of exotic plants, animals, or other objects, including live seeds or disease organisms
    iv. Management of existing non-native invasive species
    v. Monitoring needed to evaluate progress toward management goals and necessary future adjustments to the Management Plan

3. - Human Use Management Section

The Program does not endeavor to limit historical human uses that are consistent with maintenance of a designated area and the features for which it was designated. Human use should be allowed to the extent the resource can tolerate it without damage to significant resources. Human use issues to be addressed include, but are not limited to:

a) Description of current human uses including recreational activities and facilities
b) Description of current human uses including recreational activities and facilities
c) Description of any current land use conflicts
d) Description of potential uses consistent with the Program and maintenance of the features on the designated property
e) Recommendations for resolving conflicts
f) Specific recommendations for management to foster consistent uses
g) Specify structures, fences, gates, trails, culverts, bridges, and other structures necessary to foster consistent uses and protect natural features
h) Boundary and rule signage, to clearly indicate appropriate uses and restrictions for the tract(s)

ARTICLE VI - GUIDANCE FOR RESOURCE ALLOCATION

Eligible tracts that qualify in more than one of the science criteria categories (Significant Native Plant Communities Areas, Special Species Areas, Natural Water Feature, Important Bird Congregation Areas, and Geologic Landform Areas) shall be given a high priority for tract conveyance designated under the Program and implementation of the Management Plan. Allocation of resources available for program implementation and other expenditures among the various potential uses of those resources shall be determined by the City Council with recommendations from the Program Administrator.

APPENDIX A - Native Plant Communities in and adjacent to the Duluth Natural Areas Program (DNAP) April 2002

The native plant communities contained in the list below is listed according to the Minnesota Department of Natural Resources, Division of Ecological Services/Division of Forestry's new Minnesota's Native Plant Community Classification, version 2.0. This publication will soon be available on the MDNR Web site at http://www.dnr.state.mn.us/ecological_services/pubsheritage.html.

This list is a comprehensive listing of native plant communities believed to exist in and adjacent to the DNAP, but does not claim to be whole and conclusive. The list is to help inform professionals and guide decision-makers for the nomination process as to what MDNR professionals have noted in the areas during inventories. This list is subject to amendments, as more information becomes available.

DNR Code	Plant Community Name Definitely in DNAP
MRn1a	Northern Palustrine Emergent Marsh
MRn94a	Estuarine marsh (Lake Superior)
	(Not in, but used in North Bay nomination)
WMn1a	Northern Sedge Meadow
CPn79a	Northern Alder Swamp
WMn82b	Willow-Dogwood Shrub Swamp
CPn79c	Estuary Sandbar Willow - Alder Shrubland
FFn67	Northern Floodplain Forest
FFn6b	Northern Riparian Terrace Forest
MHn62b	Wet-mesic Black Ash - Sugar Maple Forest
WFn31c	Very Wet Black Ash Swamp
WFn71c	Wet Black Ash Swamp
CTn1b	Northern Dry Circumneutral Cliff
CTn2b	Northern Mesic Circumneutral Cliff
CTn4a	Northern Open Talus
CTn5a	Exposed Lake Superior Circumneutral Cliff
LSn4a	Great Lakes Sand Beach
LSn4b	Great Lakes Beachgrass Dune
LSn4c	Great Lakes Juniper Dune Shrubland
LSn4e	Lake Superior Dry Cobble/Gravel Shore Shrubland
LSn4f	Lake Superior Wet Cobble Shore Shrubland

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DNR Code	Plant Community Name Definitely in DNAP
LSn5a	Lake Superior Dry Bedrock Shore
ROn1a	Northern Rock Outcrop
RSn1b	Clay/Mud Slumping River Slope
FDn3 or MHn1	Dry-mesic Red Oak / Juneberry / Blueberry Woodland
FDn2d	Poor Dry-mesic Bedrock Aspen-Birch-Fir Woodland
FDn2f	Poor Dry-mesic Great Lakes Pine Woodland
FDn2g	Poor Dry-mesic North Shore Conifer Woodland
FDn3b	Dry-mesic Red Pine - White Pine Woodland
FDn4b	Mesic Upland White Cedar Forest
FDn4c	Mesic Aspen - Birch - Fir Forest
FDn4d	Mesic North Shore Aspen - Birch - Fir Forest
FDn4e	Moist Aspen - Birch - Fir Forest
MHn51a	North Shore Paper Birch – Sugar Maple Forest
MHn5b	Northern Rich Maple-Basswood Forest
MHn61a	Mesic White Spruce - Pine / Paper Birch Forest
MHn61d	Wet-mesic Quaking Aspen / Black Ash Forest
(MHn44c)	Aspen - Birch - Red Maple Forest

DNR Code	Plant Community Name Possible in Duluth, but not currently in Natural Heritage Information System or St. Louis River habitat plan map for DNAP area (but nearby in Jay Cooke or WI)
RSn1a	Clay/Mud River Beach
APn4	NORTHERN POOR FEN (class)
CPn77a	Northern White Cedar Swamp
WFn111a	Wet-mesic White Cedar Forest

APPENDIX B - Endangered, Threatened, and Special Concern Species Documented in the Duluth Area (including Jay Cooke State Park), January, 2002

A complete and up-to-date listing of Minnesota's endangered, threatened, and special concern species can be found at the DNR website: http://www.dnr.state.mn.us/ecological_services/nhnrp/endlist.pdf or direct from the Minnesota Department of Natural Resources main headquarters.

Below is the list of species documented in the Duluth area as of August 2001. This appendix should be updated on an annual basis.

Alphabetical Index by Scientific Name
Key = Scientific name, common name, status (E, T, or SC)
E = endangered T = threatened SC = special concern
(Note: If the species is on the federal list, it is noted in parenthesis.)

Vascular plants
Adoxa moschatellina, moschatel, SC
Allium schoenoprasum var. *sibiricum*, wild chives, T
Ammophila breviligulata, beach grass, T
Botrychium pallidum, pale moonwort, E
Botrychium rugulosum, St. Lawrence grapefern, T
Botrychium simplex, least moonwort, SC
Calamagrostis lacustris, marsh reedgrass, SC
Caltha natans, floating marsh-marigold, E
Carex pallescens, pale sedge, E
Claytonia caroliniana, carolina spring-beauty, SC
Deschampsia flexuosa, slender hairgrass, SC
Eleocharis nitida, neat spike-rush, T
Euphrasia hudsoniana, Hudson Bay eyebright, SC
Hudsonia tomentosa, beach-heather, SC
Listera auriculata, auricled twayblade, E
Polygonum viviparum, alpine bistort, SC
Sparganium glomeratum, clustered bur-reed, SC
Tsuga canadensis, eastern hemlock, SC
Torreyochloa pallida, torrey's manna-grass, SC

Fish
Acipenser fulvescens, lake sturgeon, SC
Coregonus kiyi, kiyi, SC
Coregonus zenithicus, shortjaw cisco, SC (Closest location is in Lake Superior off Stony Point)

Birds
Falco peregrinus, peregrine falcon, T (Federal Status, E)

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Sterna hirundo, common tern, T
Charadrius melodus, piping plover, E (Federal Status, T)

Tiger beetles
Cicindela hirticollis rhodensis, a species of tiger beetle, SC

Reptiles
Emydoidea blandingii, blanding's turtle, T

Mammals
Canis Lupus, gray wolf, SC (Federal Status, T)

APPENDIX C - Evaluation of Natural Water Feature Areas

Introduction

Given the limited information available about the natural water features within the eligible lands for inclusion in the DNAP, a classification and assessment of existing aquatic resources is necessary for the City of Duluth (refer below to description of assessment). The goal of the water feature assessment is to provide the nominated tract with descriptions of each distinct natural water feature. Descriptions include the extent to which past and present land use activities have compromised key ecological processes and natural characteristics.

As the area of concern is quite large, the classification and assessment must determine the following:

- Dominant characteristics and processes for each feature; and
- How past and present management activities have affected the dominant characteristics and processes.

The methodology used by Bohle (2002) in a recent project in the Manitou, Caribou and East Branch Baptism River Watersheds, based on strategies used by the Washington Forest Practices Board (1997), is recommended as a protocol A city-wide stream network assessment should be should be conducted prior to the nomination of any Natural Water Feature Area to the DNAP.

Assessing Individual Natural Water Feature Areas Nominated to the DNAP

In order to assess the condition of aquatic systems, several criteria must be considered:

1) Type of geomorphic map unit (GMU) as determined by the citywide stream network assessment.
2) Rarity of the GMU (e.g., percentage area occupied by the GMU as compared with other GMUs, to be determined during the citywide stream network assessment).
3) Sensitivity of the GMU (as determined during the citywide stream network assessment). Sensitivity is defined as the threat of change in channel morphology in response to changes in input factors. Although the exact nature of channel change is different for each GMU, the sensitivity ratings reflect the likelihood for either significant long-term impacts (High) or very minor, short-term impacts (Low). Ratings of low, moderate, and high are assigned based on the following general definitions:

   Low: Little or no change in overall channel morphology anticipated
   Moderate: minor changes to channel attributes such as substrate size, width, and pool depth. A large persistent source could trigger a high response.
   High: Significant, readily detected changes in channel morphology with a change in an important factor.
4) Potential for nominated feature to contribute to maintenance of important downstream natural water features.
5) Overall condition of GMU within the nominated tract (Poor, Fair, Good, Excellent), a composite ranking based on the citywide condition of each key ecological factor for that GMU.
6) Condition of nominated Natural Water Feature Areas based on attributes relevant to that GMU. Note that these attributes, and the range within which they should fall, vary greatly among GMUs. A table of attributes and their range of variation is one of

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the important products that will be generated by the citywide assessment. An example of the kinds of attributes that may be documented for an individual nomination is displayed in Table 1. However, the attributes and a definition of their condition will need to be defined for each GMU during the citywide assessment.

City-Wide Assessment Methods

The process uses historic aerial photos, USGS topographic maps, geology and soil maps, National Wetland Inventory Maps, as well as a stream/wetland classification system and field observations to predict and verify key processes that maintain the quality of each Natural Water Feature Area. During the citywide assessment, the stream network will be partitioned into segments based on readily obtainable attributes such as gradient and confinement.

Following a review of existing information and fieldwork, segments will then be grouped into categories with shared attributes and processes. These groups are called geomorphic map units (GMUs) and are analogous to native plant communities. Unifying attributes are those affecting how channels respond to changes in inputs of material such as coarse and fine sediment, wood, and water (e.g., timing or duration of peak flows, volume or particle size of sediment, quantity and/or distribution of large woody debris (LWD) and other roughness elements). Field observations gathered during the citywide assessment also produce rough estimates about the range in variation of specific channel attributes for each GMU.

In addition, the sensitivity of each GMU is expressed based on the extent to which past disturbances have altered these characteristics and the likelihood that channel characteristics may change in the future. Using the GMU map from the assessment and an understanding of the dominant physical processes within each unit, the DNAP will then be able to evaluate the extent to which nominated features will contribute to the integrity of unique aquatic features both within and downstream of the proposed site.

Note that the class, distribution, and condition of aquatic systems is strongly linked to the integrity/ viability of the native plant communities within which each system is embedded. The aquatic systems must therefore be considered in concert with their upland context and the condition of each sub basin. What follows is a general description of the criteria that could be used to evaluate any nominated water feature using the products and information generated from this type of assessment.

REFERENCES

Bohle, T. 2002. Stream channel assessments of the Caribou, Manitou, and East Branch of the Baptism Watersheds. (Unpubl. Report prepared for The Nature Conservancy of Minnesota).
Montgomery, D.R. and J.M. Buffington. 1993. Channel Classification, Prediction of Channel Response, and Assessment of Channel Condition, Washington Dept. of Natural Resources Report TFW-SH10-93-002., Olympia, WA 86p.
Washington Forest Practices Board, 1997. Standard Methodology for Conducting Watershed Analysis, Version 4.0: Washington Forest Practices Board Manual (under Chapter 222-22 WAC).

APPENDIX C

Table 1. Example of the types of attributes that may be documented for a nominated Natural Water Feature Area

Attribute Category	Specific Attribute	Description
Reach Descriptors	Geomorphic Unit (GMU)	As determined by city-wide assessment
	Segment	Specific segment as defined by stream and position
	Length of Nominated Segment(s)	To be measured in the field at the time of nomination or obtained from city-wide assessment
Channel Dimensions	Slope	To be measured in the field at the time of nomination
	Bank Full Width	To be measured in the field at the time of nomination
	Bank Full Depth	To be measured in the field at the time of nomination
	Width/Depth Ratio	To be measured in the field at the time of nomination
Channel Bed	Morphology	e.g., pool riffle, forced pool riffle, planebed, step, cascade
	Bar forms	e.g., point, forced, medial, lateral
	Surface Fines	e.g., based on at least one particle count of 100 particles on a representative bar
Banks	Texture	e.g., boulder, cobble, gravel, sand, silt, cohesive, noncohesive
	Geology	e.g., alluvial, colluvial, bedrock, till
	Protection	e.g., boulder, roots, riprap, large woody debris, bedrock, till
Valley Bottom	Confinement	e.g., unconfined, moderately confined, totally confined
	Entrenchment	e.g., calculated as : width of valley floor @ elevation equal to twice the max. bankfull depth divided by the average bankfull width
Pools	Pools/Channel Width	To be measured in the field at the time of nomination
	Pool Former	e.g., free, large woody debris, large woody debris-forced, banks forced
Large Woody Debris	Pieces/Channel Width	To be measured in the field at the time of nomination
	Function(s)	e.g., pool scour, bank stability, bar stability, sediment trap, step former
	Mean diameter	To be measured in the field at the time of nomination
	Source	e.g., slope, upstream, bank
Riparian Vegetation	Vegetation (Right Bank/Left Bank)	e.g., native plant community
	% Exposed Bank (Right Bank/Left Bank)	To be measured in the field at the time of nomination

* Note that the important attributes and their ranges of variation will vary greatly among GMUs. A separate attribute table must be completed for each GMU, and may look quite different from one to another. Each nominated Natural Water Feature Area will be assessed within the context of the criteria set for the GMU it represents.

APPENDIX D - Important Bird Congregation Areas

Definition
The definition of an Important Bird Congregation Area is derived from the Important Bird Areas Program currently managed by the following:

- United States by the American Bird Conservancy - www.abcbirds.org/iba/aboutiba.htm
- Canada by Bird Studies Canada - www.bsc-eoc.org/iba/ibacriteria.cfm?lang=en
- Internationally by BirdLife International - www.birdlife.net/sites/whatareibas.cfm

The purpose of the Important Bird Areas Program at all scales, from global to state, is to identify sites that provide essential habitat for one or more species of breeding or non-breeding birds. These sites contain vulnerable, threatened or endangered species, endemic species, species representative of a biome, or concentrations of seabirds, waterfowl, raptors, shorebirds, waders, or migratory landbirds.

How large are Important Bird Areas?
There are no absolute limits (minimum or maximum) on the size of an Important Bird Area. While Important Bird Areas are usually smaller areas, the site should be large enough to supply all or most of the requirements of the species during the season for which it is important. The sites are usually discrete and distinguishable in character, habitat, or ornithological importance from surrounding areas. The site boundaries can be natural (rivers, watersheds) or manmade (roads, property boundaries).

Important Bird Congregation Areas for Duluth Natural Areas Program
The Important Bird Areas for the Duluth Natural Areas Program is Category 4 in the national programs (see internet links above). Category 4 is defined as:

> *The congregatory species category covers sites that are important because they hold large concentrations of birds during one or more seasons, either breeding, wintering or migratory season. Marine, lacustrine, terrestrial, and sites over which raptors concentrate are included.*

Sites can qualify for single species or under the general congregatory thresholds, at the national or state levels as follows:

> *The site regularly holds greater than 1% of the population of a congregatory species (waterfowl or non-waterfowl). Population refers to the national, regional, or flyway population for the Duluth Natural Areas Program.*

Nomination Criteria
The General Thresholds for Congregatory Species at the National or Regional Scale were used to develop the criteria to nominate a site for the Duluth Natural Areas Program. A nominated tract qualifies as an Important Bird Congregation Area if one or more of the following criteria are met:

Congregations of Waterfowl

The site consists of a limited and defined geographical area used by 1,000 – 10,000 waterfowl during a limited and defined time period of the year on an annually reoccurring basis.

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Congregations of Shorebirds or Colonial Waterbirds

The site consists of a limited and defined geographical area used by 500 – 5,000 shorebirds or colonial waterbirds during a limited and defined time period of the year on an annually reoccurring basis.

Congregations of Shorebirds

The site consists of a limited and defined geographical area regularly used as a migratory stopover or wintering site by 50 – 500 shorebirds during a limited and defined time period of the year on an annually reoccurring basis.

Congregations of Raptors

The site is a natural funnel or regularly used funnel/route for raptors during migration. Concentrations of 5,000 – 10,000 refer to seasonal totals rather than those occurring over a brief period of time. The funnel is created by landforms that provide updrafts used by migrating raptors or by water/land margins that are barriers or linear migration paths.

Congregations of Wading Birds

The site consists of a limited and defined geographical area regularly used by 100 – 500 wading birds (herons, egrets, cranes, etc.) during a limited and defined time period of the year on an annually reoccurring basis.

Congregations of Migratory Landbirds

The site is a regular migratory stopover or migratory corridor for migratory landbirds (other than raptors). Sites should contain exceptional numbers and/or diversity of migratory landbirds. Concentrations refer to seasonal totals. No absolute thresholds have been set, owing to the scarcity of quantitative data. Other evidence (number of species, landform configuration) will be partly used to identify these sites.

APPENDIX E – Definitions

Buffer - A buffer under this Program is in essence an environmental greenway that may provide any or all of the following functions:

- *Habitat* for plants and animals;
- *Corridor* for the movement of plants and animals to other native plant communities;
- *Barrier* to prevent movement (e.g. exotics)
- *Filter* for trapping sediment, toxins, or nutrients.

Community – Unique combinations of plants and soils defined by characteristic trees, shrubs and forbs; elevation and soil moisture (example: Sugar Maple-Basswood Forest).

Endangered, threatened, or special concern species - According to Minnesota State Statute 84.0895, a species is designated as endangered, threatened, or of special concern as follows:
Subd. 3. Designation.
(a) The commissioner shall adopt rules under chapter 14, to designate species of wild animal or plant as:
(1) endangered, if the species is threatened with extinction throughout all or a significant portion of its range;
(2) threatened, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range; or
(3) species of special concern, if although the species is not endangered or threatened, it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.
(b) The range of the species in this state is a factor in determining its status as endangered, threatened, or of special concern. A designation by the secretary of the interior that a species is threatened or endangered is a prima facie showing under this section.
(c) The commissioner shall reevaluate the designated species list every three years after it is first adopted and make appropriate changes. The review must consider the need for further protection of species on the species of special concern list. Species may be withdrawn from designation in the same manner that species are designated.

APPENDIX E

Ecological Classification System

The Ecological Classification System (ECS) is part of a nationwide mapping initiative developed to improve our ability to manage all natural resources on a sustainable basis. The ECS is a method to identify, describe, and map units of land with different capabilities to support natural resources. This is done by integrating climatic, geologic, hydrologic, topographic, soil, and vegetation data.

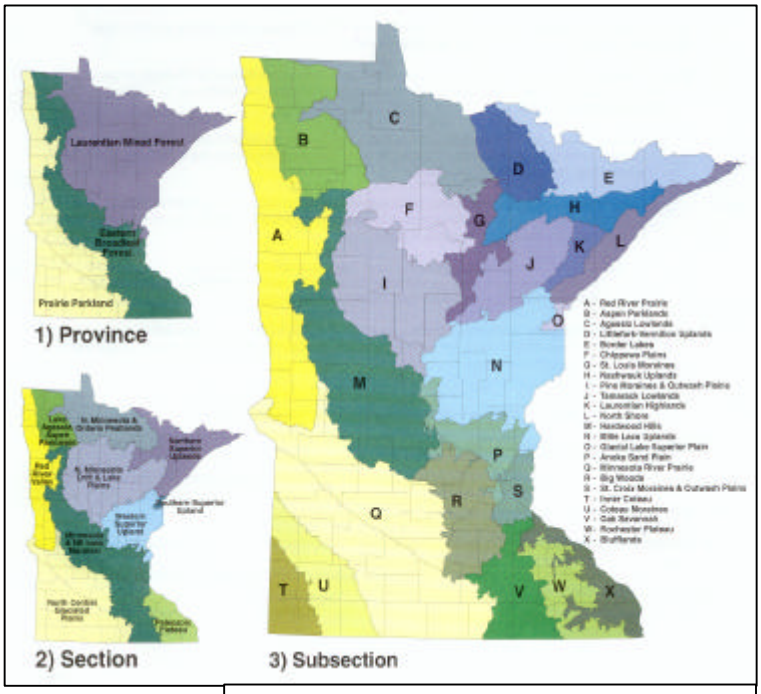

Figure 1 –Compiled by MN DNR, University of MN, and USDA Forest Service. 1996.

The classification and mapping is divided into six hierarchical levels of detail as follows:

1. Province – Largest units representing the major climate zones in North America, each covering several states (Figure 1).
2. Section – Divisions with provinces that often cross state lines. Sections are defined by the origin of glacial deposits, regional elevation, distribution of plants and regional climate (Figure 1).
3. Subsection – County-sized areas within sections that are defined by glacial land-forming processes, bedrock formations, local climate, topographic relief, and the distribution of plants (Figure 1).
4. Land Type Association (LTA) – Landscapes within subsections, characterized by glacial formations, bedrock types, topographic roughness, lake and stream patterns, depth to ground water table and soil material. The City of Duluth contains portions of four LTAs known as the Split Rock Till Plain, Tettegouche Till Plain, Highland Moraine and the Douglas Lake-Modified Till Plain (Figure 2). Descriptions for these LTAs are given below.
5. Land Type – The individual elements of Land Type Associations, defined by recurring patterns of uplands and wetlands, soil types, plant communities, and fire history.
6. Community – Unique combinations of plants and soils within Land Types, defined by characteristic trees, shrubs and forbs; elevation and soil moisture.

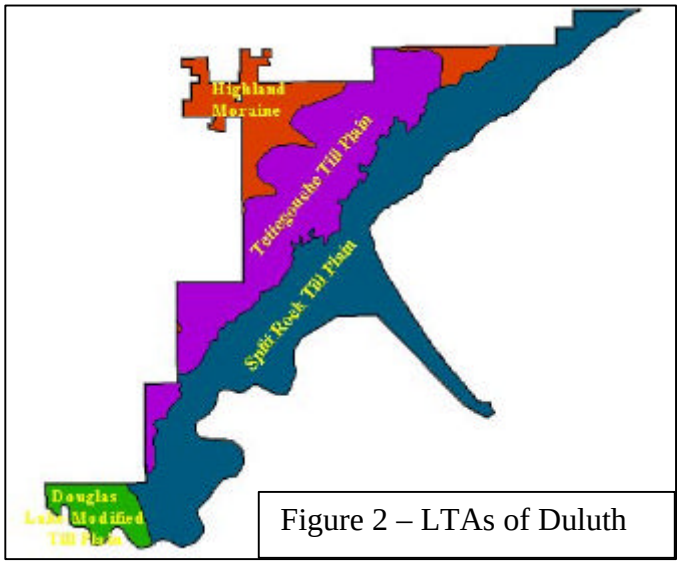

Figure 2 – LTAs of Duluth

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Land Type Associations of Duluth Area

The City of Duluth contains portions of four LTAs known as the Split Rock Till Plain, Tettegouche Till Plain, Highland Moraine and the Douglas Lake-Modified Till Plain Descriptions for these LTAs are given below.

Douglas Lake-Modified Till Plain - The Douglas Lake-Modified Till Plain encompasses the deep-water portion of the Glacial Lake Duluth basin. The landscape has been deeply eroded by post glacial lake streams. . Uplands occupy 92%, wetlands occupy 7%, and lakes occupy 1% of the LTA (MN DNR, 1998). Ninety percent of the LTA has soils with clay texture. Hardpans are usually absent from the subsoil. The remaining areas have silt (4%), sand (3%), and miscellaneous (3%) textures (NRCS, 1994).

Split Rock Till Plain – The Split Rock Till Plain is a complex containing a Superior lobe (clayey) till plain and clayey lake sediments from Glacial Lake Duluth. The terrain is rolling but it slopes toward Lake Superior. Inclusions of steep bedrock controlled hills are present. Included in this LTA is a very narrow strip of land directly adjacent to Lake Superior that has a climate modified by the lake. Uplands occupy 88%, wetlands occupy 8%, and lakes occupy 4% of the LTA (MN DNR, 1998). There are 1.48 miles of streams per square mile. Streams are deeply incised due to the clayey material.

Tettegouche Till Plain – The Tettegouche Till Plain is a rolling till plain formed by the Superior Lobe glacier. Soil materials are relatively thick over bedrock. Long linear features oriented northwest to southeast (flutes) were formed by the glacier. Uplands occupy 79%, wetlands occupy 20%, and lakes occupy 1% of the LTA (MN DNR, 1998). This landscape has a unique combination of elevation, terrain, soil, and lake-modified climate that support forest communities dominated by sugar maple. These communities are present because: a) terrain features such as prominent bedrock controlled hills and long sloping hillsides provide warmer micro-climates by draining cold air; b) soils with layers that retard soil drainage within the rooting zone provides additional moisture during the growing season; c) Lake Superior moderates minimum air temperatures in winter to reduce severity of damage to branches; and d) early snow cover and overall thicker snow accumulations (due to lake-induced snow belt) reduce frost damage to sugar maple roots.

Highland Moraine – The Highland Moraine is a rolling to hummocky end moraine formed by the Superior lobe. Outcropping of North Shore Volcanic bedrock is present in 5 to 10% of the LTA. The soil parent material is loamy. Uplands occupy 68%, wetlands occupy 29%, and lakes occupy 3% of the LTA (MN DNR, 1998). There are 0.74 miles of streams per square mile.

Natural Heritage and Non-game Research Program – This State of Minnesota program collects, manages, and interprets information about non-game animals, native plants, and plant communities to promote the wise stewardship of these resources.

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Qualified Professional - A person with an advanced degree or equivalent demonstrated experience in the field corresponding to the science criteria for which an area is nominated. In cases where more than one area is being used, expertise for each area from qualified professionals will be necessary.

Qualified Natural Resource Manager - A person with an advanced degree and work experience directly related to the science criteria for which an area is nominated or direct experience in managing similar areas for the purposes of maintaining the resources for which an area is nominated.

Significant – Notable or valuable resource as it pertains to the natural heritage of the City of Duluth and surrounding area.

Viable - An ecological system has integrity (i.e. is viable) when all of its "key ecological factors" remain intact and functioning within their natural ranges of variation. Key ecological factors include critical patterns of biological structure and composition; and critical ecological processes, environmental regimes, and other environmental constraints that "drive" or give shape to these patterns and their natural variation over space and time. These ecological systems with integrity resist change in their structure and composition in the face of external stressors (e.g., exotic species, fragmentation of surrounding landscape), or are resilient (able to recover) upon experiencing occasional severe stress. Excerpt from the Ecological Systems Viability Workgroup with slight modification. Conserving The Integrity Of Ecological Systems: A Proposed Conservation Area Planning Framework (DRAFT). The Nature Conservancy. 2001.

APPENDIX F -Information Sources

Natural Heritage and Nongame Research Program - The MDNR Natural Heritage and Nongame Research Program's database is held by the City of Duluth under a limited license agreement that must be renewed every two years and has very strict use guidelines that must be followed. The data may be used by the City with the understanding that the data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present. In addition, there may be inaccuracies in the data, of which the MDNR is not aware and shall not be held responsible for. Permission to use the data does not imply endorsement or approval by the MDNR of any interpretations or products derived from the data. New, relevant data may not yet be in the database and should be verified.

Center for Watershed Protection, Inc. 1998. Rapid Watershed Planning Handbook. 8391 Main Street, Ellicott City, Maryland 21043. Phone: 410-461-8323. Website: http://www.cwp.org.

Coleman, Jean et. al. 1998. Protecting Your Community's Natural Resources: A Land Protection Toolbox for Local Government. State of Minnesota.

Faber-Langendoen, D., editor. 2001. Plant Communities of the Midwest – Classification in an Ecological Context. Association for Biodiversity Information, Arlington, VA 22209. ISBN 0-9711053-0-8. The Adobe Acrobat file is provided on the internet at http://www.abi.org/publications/midwest/. The bound volume is available at cost by sending requests to Heritage Data Services, Database Project Specialist, Association for Biodiversity Information, 1101 Wilson Blvd, 15th floor, Arlington, VA 22209.
This document provides the following:

- Introduces the U.S. National Vegetation Classification (USNVC).
- Explains the process used to define the 588 Midwest community types (associations).
- Provides an extensive appendix giving a detailed description of each association, using a standard one-page format that includes a vegetation and environmental summary, conservation status, and range-wide distribution. Each description also includes a crosswalk or synonymy to Midwest Heritage Program classification types (where those states use an independent state classification) and to other related types.
- Places the associations in an ecological context by organizing them into ecological groups.

Green, John C. 1996. Geology on Display: Geology and Scenery of Minnesota's North Shore State Parks. State of Minnesota, Department of Natural Resources.
This document provides an outline of the geological events that have produced the landscape we see today – mostly related to a time of continent-scale rifting and volcanism 1.1 billion years ago and the much more recent Great Ice Age and its aftermath.

Miller, James D., John C. Green, Mark J. Severson, Val W. Chandler, and Dean M. Peterson. 2001. Geologic Map of the Duluth Complex and Related Rocks Northeastern Minnesota. Minnesota Geological Survey Miscellaneous Map M-119.

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Minnesota Department of Natural Resources, Division of Ecological Services/Division of Forestry. 2002 (in press). Minnesota's Native Plant Community Classification, version 2.0. MDNR website where publications can be requested (after they are published) is: http://www.dnr.state.mn.us/ecological_services/pubsheritage.html.

Minnesota Department of Natural Resources, Natural Heritage Program. 1993. Minnesota's Native Vegetation: A Key to Natural Communities, version 1.5. MN DNR, Section of Wildlife, St. Paul, MN.

United States Geological Survey. 1998. Ground Water and Surface Water: A Single Resource.