

D R A F T

**NOMINATION OF
MAGNEY SNIVELY AREA
TO THE
DULUTH NATURAL AREAS PROGRAM**

April 2003

Nominated by:

City of Duluth in cooperation with The Nature Conservancy

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NOMINATION IN BRIEF

- What:** A nomination of land, referred to as "Magney Snively," for inclusion into the Duluth Natural Area Program (DNAP) in accordance with the Guidelines as directed by ordinance under Article XXIX of Chapter 2 of the Duluth City Code, 1959, as amended. This area is being nominated under the Significant Native Plant Communities Area, Special Species Area, and Geological Landforms Area as described in the DNAP Guidelines under Article IV, Sections A, B, and E.
- Who:** The City of Duluth is nominating the Magney Snively area with technical support from The Nature Conservancy.
- Where:** The Magney Snively nomination includes approximately 1,800 acres in west Duluth. Almost all of the lands nominated include available parcels owned by the City of Duluth, St. Louis County, and The Nature Conservancy (Map 1, 2a, and 2b).
- Why:** Significant Native Plant Communities - Magney Snively is a highly functional viable ecosystem, an extremely rare occurrence in an urban area. Altogether there are eleven distinct, high quality occurrences of different plant communities native to the Duluth area.
Special Species - There are two state-listed species of special concern within the nominated area.
Geological Landforms - The bedrock in the area contains excellent outcrops of the world-famous Midcontinent Rift System, a geologic feature formed 1.1 billion years ago in Precambrian times

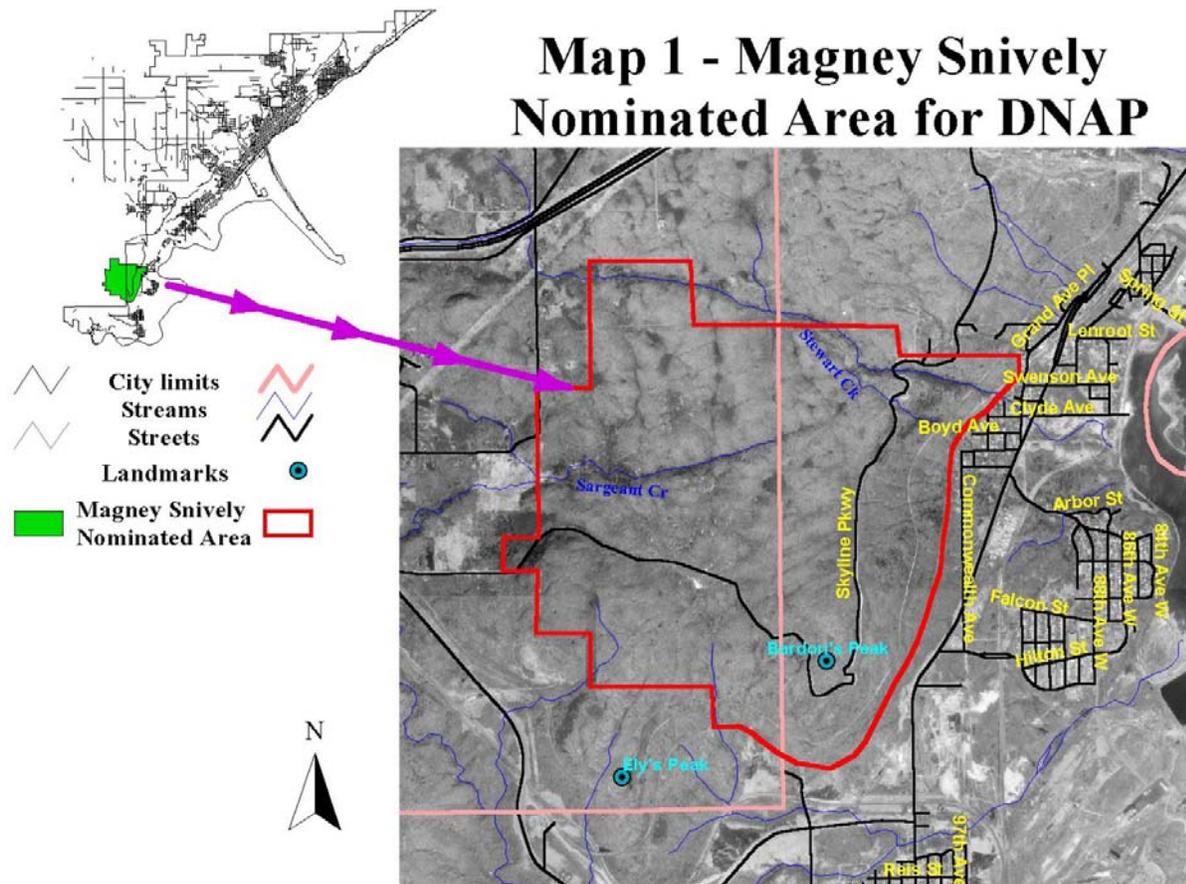
ABOUT THE NOMINATORS

The City of Duluth is nominating Magney Snively for inclusion in the Duluth Natural Areas Program (DNAP). Mayor Gary Doty and various City Councilors requested City staff to review this area for its potential qualification into the DNAP. A team comprised of each of the affected city departments was convened by the City Planning Department to assemble the nomination and draw on the City's Memorandum of Agreement with The Nature Conservancy to provide technical assistance. City staff and others have provided steering and technical review of this nomination. These people include Kyle Deming - Planning, Kelly Fleissner - Forestry, Timothy Howard - Administration, Dick Larson - Public Works, Mark McShane - Administration, and Carl Seehus - Parks and Recreation. Professional titles and education degrees for these people are provided in Appendix B.

The Nature Conservancy (TNC) is an international non-profit organization that works to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The Northeast Minnesota Office opened in 1998 and has been involved in several significant conservation projects since then including the acquisition of the headwaters area of the St. Louis River in the Seven Beavers Lake area north of Duluth. TNC also assisted in protecting Hawk Ridge. TNC partnered with the City of Duluth to develop the Duluth Natural Areas Program, for which this nomination is being prepared. This nomination was prepared by Meredith Cornett, Ph.D., Tom Duffus, M.F.S., John Green, Ph.D. and Bill Majewski - Planning Consultant. Professional profiles for these people are provided in Appendix B.

BACKGROUND

The Magney Snively nomination includes approximately 1,800 acres in southwestern Duluth. Map 1 shows the location and extent of the area.



The nominated area consists of approximately 1,742 acres of City-owned lands and 60 acres of lands owned by The Nature Conservancy. Magney Snively is a highly functional viable ecosystem, an extremely rare occurrence in an urban area. The lands nominated include all available parcels owned by the City of Duluth and The Nature Conservancy that fall within the Magney Snively ecological landscape boundary delineated by the nominators. The integrity of the landscape depends on the condition of each of its pieces. In other words, the whole is greater than the sum of its parts. Below is some background on the three science criteria significant to this nomination.

1. Significant Native Plant Communities - Altogether there are eleven distinct, high quality occurrences of different plant communities native to the Duluth area. One example of an especially significant native plant community within

this complex of forests and wetlands is the rich maple-basswood forest, rare in the City of Duluth and throughout northeastern Minnesota.

One of the most significant tracts of intact habitat of its type in northern Minnesota, Magney Snively possesses several unique features. First, Magney Snively is unusual in the area because it has the largest known forested tract with Sugar Maple – Basswood (Bluebead Lily) Forest in this area. It is a complex landscape with a matrix of Sugar Maple-Basswood (Bluebead Lily) Forest containing smaller patches of black ash or alder swamps, rock outcrops, and rock outcrop woodlands.

As a large forested tract along a well-known migration route (Eckert 1994), Magney Snively provides important stopover and nesting habitat for migratory songbirds and raptors (hawks and eagles). It is also an important area for sensitive nesting birds such as raptors and neotropical migrants.

2. Special Species – There are two state-listed species of special concern within the nominated area, Spring-beauty (*Claytonia caroliniana*) and Moschatel (*Adoxa moschatel*).
3. Geological Landforms – The “type locality” of the great rock mass known as the Duluth Complex includes the nominated area. The bedrock in this area also contains excellent outcrops of the world-famous Midcontinent Rift System, a geologic feature formed 1.1 billion years ago in Precambrian times.

Maintaining the ecological integrity of the native plant communities of the Magney Snively area and protecting the area’s special species and geologic landforms of the Magney Snively ecosystems are the primary goals of this nomination. At the time of nomination, each of the area’s natural features is in good condition. In this highly functional natural area, the goal of maintaining the area’s integrity can be reached with relatively little management intervention. As described in the management plan (submitted simultaneously with this nomination packet), a range of management activities may be consistent with achieving the primary goal of this nomination. Details of the ways management activities may help the participating landowners to reach the ecological goals for Magney Snively are available in the management plan.

ELIGIBILITY

Ownership

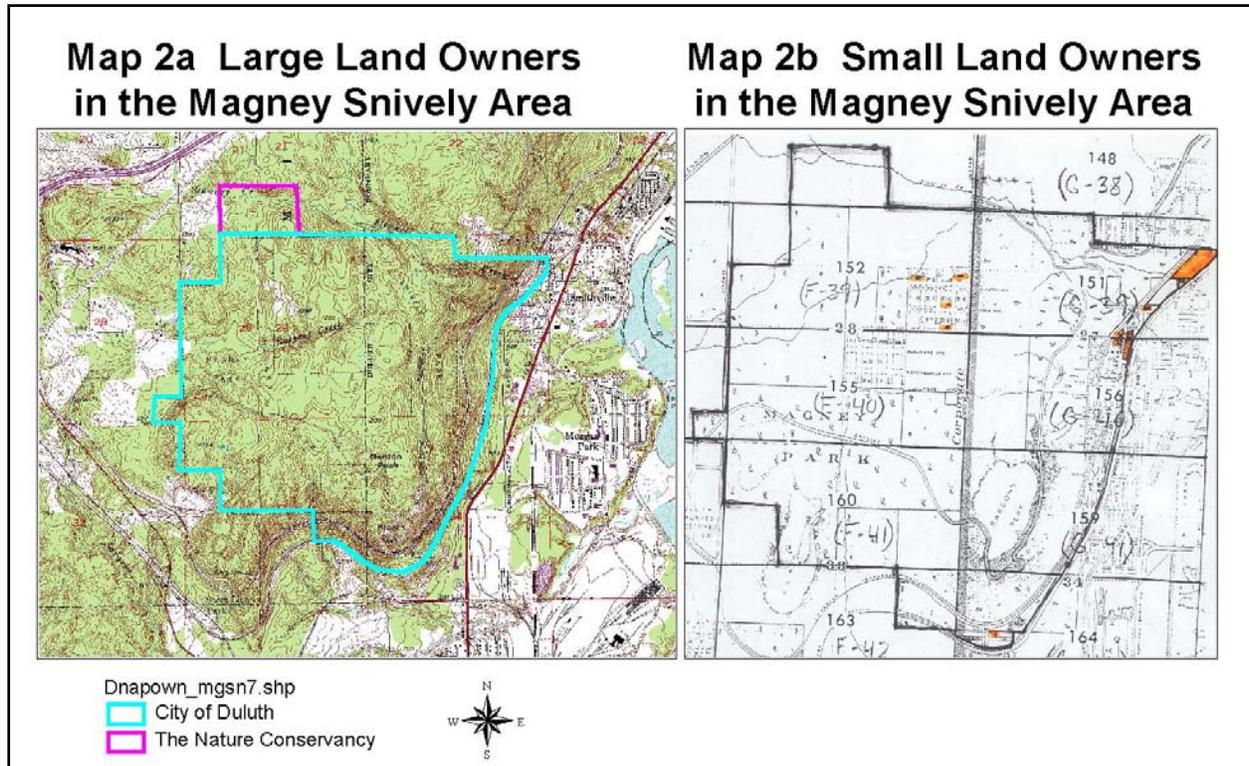
According to the DNAP guidelines and ordinance, the lands of interest to be included in the DNAP are eligible for the program because they are

1. City-owned property; and/or,
2. Owned by other public or private owners who desire to have their property enrolled in the DNAP.

Details of land ownership are given in ownership criteria below.

The DNAP guidelines require the nomination sponsor to submit reasonable evidence of the current condition of title(s) to the tract(s) as part of the nomination. In addition, if any of the tract(s) are privately owned or owned by entities other than Duluth, the nomination shall include a statement of their intent to support the nomination and their intent to work with the City 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.

The properties located within the proposed boundary are titled to twelve different parties: City of Duluth, State of Minnesota/St. Louis County, The Nature Conservancy, Minnesota Power and eight private individuals. Map 2a and 2b show the ownership distribution (the boundary lines on the maps are approximate). Appendix C includes a table listing all of the parcels and their tax payer or fee owner.



- 1.) The City of Duluth owns a large share of the area. These lands (117 parcels) will be enrolled in the DNAP.
- 2.) The State/County owns 108 parcels designated as tax forfeit. The majority of these lands are located on the steep hillside south of Stewart Creek to the Gary-New Duluth neighborhood. The concept of the nomination of the area was discussed in general with the St. Louis County Land Department staff during the early stages of this project. A letter of cooperation is being solicited from the County.
- 3.) Minnesota Power owns four parcels (about 3.5 blocks) on the easterly boundary of the area on the steep hillside between the Munger State Trail and the old DW & P RR in the vicinity of Stewart Creek as shown on Map 2b. A letter of cooperation, sale or exchange is being prepared.
- 4.) The Nature Conservancy owns 60 acres on the northwest corner of the proposed area as shown on Map 2a. The Nature Conservancy has committed to including these lands in the designation.
- 5.) Eight other private owners hold single or multiple small lots scattered around the site within the isolated platted sections. These are highlighted on Map 2b. Letters have been sent to all parties and at least five responses have been received indicating a willingness to donate or sell land for the program.

Discussion of Site Characteristics and Issues

The area within the City of Duluth is zoned 'S'- Suburban which requires 5 acres to secure a building permit. The stream courses are protected by the Water Resource Management Ordinance (Chapter 51 of the City Code) as a Natural Environment Development Shoreland in addition to either Floodway or Flood Fringe District restrictions on Stewart Creek. Spirit Mountain Recreation Area forms a portion of the north edge of the proposed natural area in addition to privately owned land located north of Skyline Parkway near the Stewart Creek crossing. The east edge is bounded by the Munger State Trail between Beaudry Street in upper Smithville and the area just south of the Lund Maintenance garage on Commonwealth Ave. The south boundary is roughly the center of Section 33, Township 49, Range 15.

Approximately one-half of the nominated area is within the southeast corner of Midway Township and is part of Magney Park. Magney Park has been owned by the City of Duluth since 1921 and is located entirely within Midway Township. The Midway Township Comprehensive Plan designates the Magney Snively nomination area as open space. The Comprehensive Plan states that the "...open space plays various vital ecological roles relative to water supply, water quality, wildlife habitat, and stormwater

storage". The DNAP designation of this area is in keeping with the Township's Plan for the area.

Snively Park, located in the northeast corner of the area was purchased between 1924 and 1943. In addition, Skyline Parkway crosses the park and is subject to a low level of maintenance of its gravel surface. From the Stewart Creek parking lot west the parkway is closed to vehicular traffic in the winter and used by snowmobiles. The Magney Snively cross country ski trails developed several years ago are also located throughout the area. These trails interconnect with the Spirit Mountain trail system to the north. Snowmobile trails also connect from the above parking lot north along the west boundary of Spirit Mountain Recreation Area. In addition, the Superior Hiking Trail Association is in the process of developing a rustic footpath through the southern and eastern part of the area below Skyline Parkway from west of Bardon Peak to just north of Stewart Creek.

Ulland Bros. operates a stone quarry and crushing pit on the southwest corner of the nominated DNAP area. There is another private landowner to the east of Ulland Bros. with holdings of 120 acres. Much of this land is on the lower elevations along the hillside in the Ely Peak area. Several other small private land parcels are found on the west, northwest, and north corner of the site between the Lindahl and Ugstadt Roads.

Portions of two State designated trout streams (Stewart and Sargeants Creek) are within the nominated area (Map 1). Stewart Creek's headwaters are found near I-35 and the Lindahl Road intersection and flow through the 60 acres owned by The Nature Conservancy. Sargeants' Creek headwaters begin in the north central portion of the nominated area and flow approximately one mile to the western edge of the nominated area.

Science Criteria

Magney Snively is being nominated under the Significant Native Plant Communities Area, Special Species Area, and Geological Landforms Area of the science criteria, as stated under Article IV, Sections A, B, and E of the DNAP Guidelines.

A. Significant Native Plant Communities

1. General Criteria

Magney Snively contains more than one relatively undisturbed and viable native plant communities representative of the Duluth area. Descriptions for each of these communities is provided under 3. d) below.

2. Specific Criteria

Under the Specific Criteria a nomination is only required to meet one of the criteria listed in the DNAP Guidelines under Article IV, A2. Magney Snively is exemplary in that it meets all of the criteria. They include:

- 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

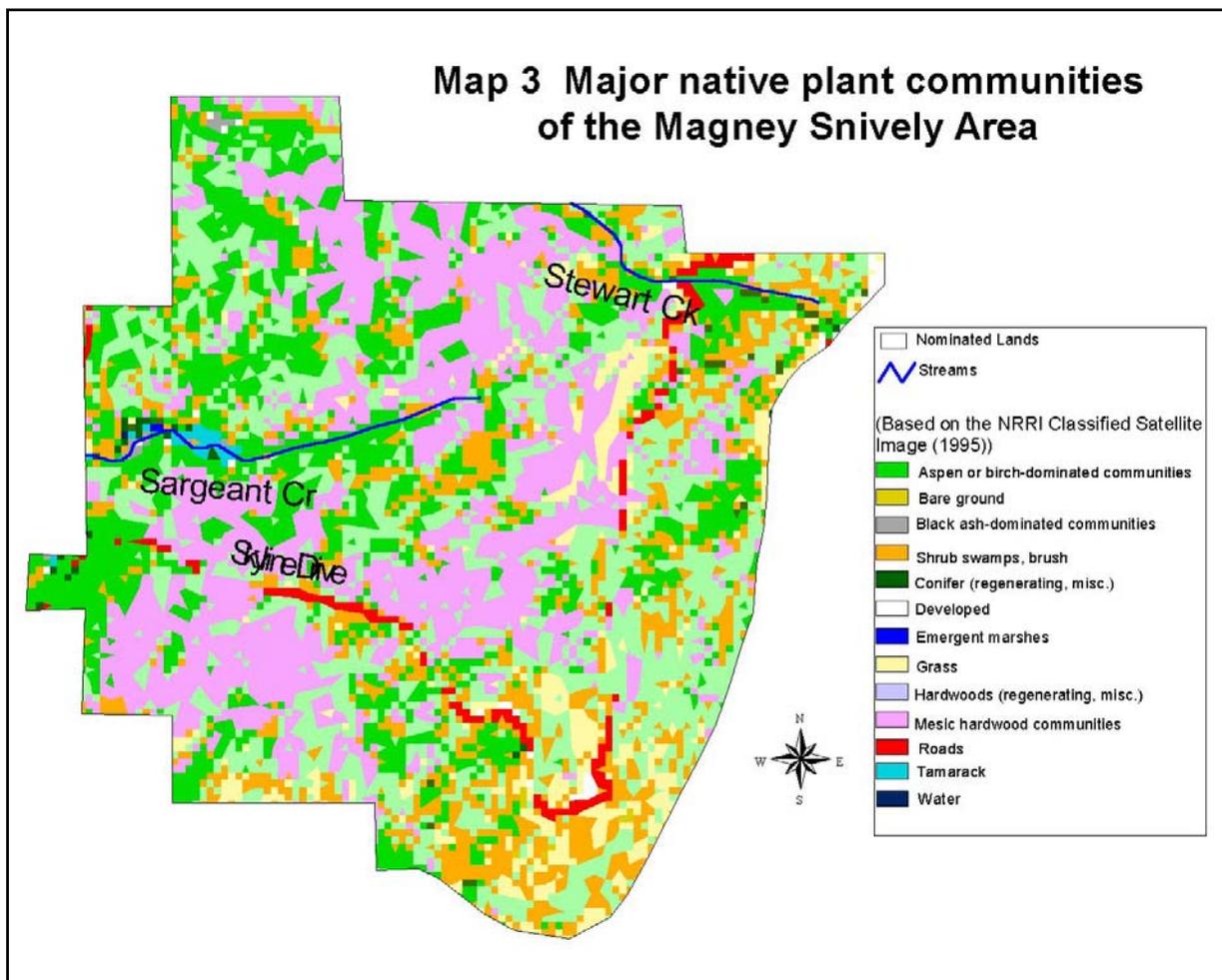
3. Description of Area

a) Legal description

See ownership criteria above

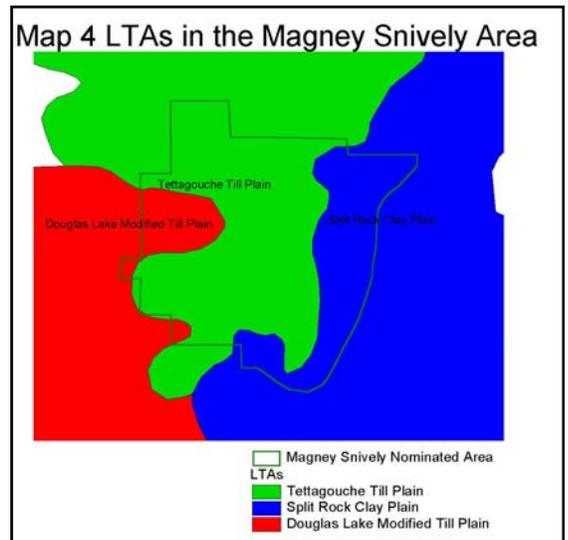
b) Map of the tract including all relevant features at the site.

Map 3 shows the approximate areas of the plant communities discussed below.



c) Significance to and rarity within the Land Type Association

Lands nominated in the Magney Snively area are mostly within the Tettegouche Till Plain Land Type Association (LTA) (Map 4). The forest in the Magney Snively area contains examples of Sugar Maple – Basswood (Bluebead Lily) Forest that is at the northern edge of its range, one of only a few forests of this type remaining within the LTA. The canopy of the Sugar Maple – Basswood (Bluebead Lily) Forest is dominated by four species: sugar maple, yellow birch, basswood, and red oak. The subcanopy includes ironwood, a species that is more common in LTAs farther to the South.



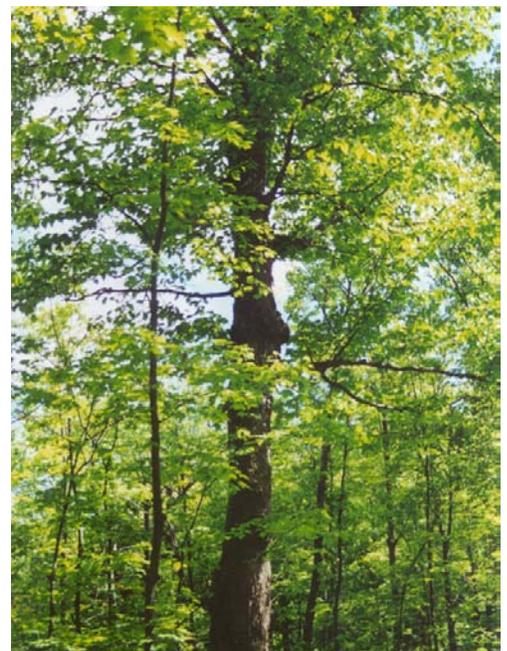
The Tettegouche Till Plain LTA contains multiple examples of another hardwood forest community type, the Sugar Maple Forest (North Shore). This plant community is distinguished from the one present in the Magney Snively area by the composition of its canopy, which is dominated by sugar maple and with yellow birch sporadically as a co-dominant. Basswood, red oak, and ironwood are generally absent from this more northern type. (Reschke 1999).

Of the northern hardwood forests in northeastern Minnesota, between 50% and 70% would be expected to be in an advanced successional state under a natural disturbance regime (i.e., without human intervention). Currently, only about 5% of the remaining northern hardwoods in the region are actually considered to be forests in late stages of succession. (White et al. 2002). Magney Snively contains several examples of forests in late stages of succession.

d) Composition and structure of the native plant community

The Magney Snively landscape comprises a complex of several types of native plant communities listed below. Map 3 shows the approximate extent for several of these plant communities. It is not exact, but a detailed land cover layer was used to best present the specific communities by grouping some of the categories.

- Sugar Maple - Basswood (Bluebead Lily) Forest
- Aspen - Birch Woodland
- Paper Birch - Sugar Maple Forest (North Shore)
- Red Oak - Sugar Maple - Basswood (Bluebead Lily) Forest



Yellow Birch – Magney Snively Park
Desotelle July 2001

- Black Ash - Basswood Forest
- Black Ash - Conifer Swamp (Northeast)
- Alder Swamp
- Northern Bulrush - Arrowhead Marsh
- Northern Bedrock Outcrop
- Northern Bedrock Shrublands
- Dry Mafic Cliff (Northern)

Mesic hardwood communities (corresponds to Map 3 category)

Sugar Maple – Basswood (Bluebead Lily) Forest - Mesic hardwood forests dominated by sugar maple with lesser amounts of basswood. Yellow birch and red oak are also canopy components. Ironwood occurs in the subcanopy. Characteristic understory species include bluebead lily (*Clintonia borealis*) and long-beech fern (*Thelypteris phegopteris*), as well as pale bellwort (*Uvularia sessilifolia*). (MDNR 2002). Mountain maple (*Acer spicatum*) is the dominant shrub in this area. A small amount of Canada yew is present, a rare find in Minnesota and throughout the Great Lakes given increased browsing pressures by white-tailed deer. The ground layer has an especially rich array of flora, including a diverse mixture of spring ephemeral wildflowers (flowering plants that bloom in the spring before the trees have leaves and die back before the canopy trees leaf out). Wildflowers in the ground layer include downy yellow violet, wild ginger, wild leek, bluebead lily, twisted-stalk, wood anemone, enchanter's nightshade, Solomon's-seal, large-flowered-trillium, and sweet cicely (Coffin and Engstrom 1986).

Aspen or birch- dominated communities (corresponds to Map 3 category)

Aspen – Birch Woodland – This is a dry-mesic hardwood forest typically dominated by quaking aspen or paper birch. This is a broad type that may encompass dry-mesic aspen-birch forests and red oak woodlands on shallow soils on exposed bedrock ridges. In addition to quaking aspen in the canopy, subcanopy, and seedling layers, the presence of yarrow (*Achillea millefolium*) and fireweed (*Epilobium angustifolium*) are indicative of this type. (MDNR 2002).

Paper Birch - Sugar Maple Forest (North Shore) – This is a mesic hardwood forest type with sugar maple and paper birch (or quaking aspen) as co-dominants. Sometimes white spruce or balsam fir occurs in the canopy. Sugar maple often dominates the understory or subcanopy, whereas older paper birch or aspen are more important in the canopy. This type appears to be succeeding towards Sugar Maple Forest (North Shore). (MDNR 2002).

Mesic hardwood communities (corresponds to Map 3 category)

Red Oak – Sugar Maple – Basswood (Bluebead Lily) Forest – This is a dry-mesic to mesic hardwood forest type with sugar maple, basswood, and red oak as important canopy components. Paper birch and red maple are often present in the canopy with yellow birch and quaking aspen as rare canopy components. Seedlings of

balsam fir occur in somewhat more than one-half the stands. Red oak stands and aspen-birch-sugar maple stands in the North Shore Highlands fall under this plant community type. Stands may be relatively open, especially on bedrock ridges. Balsam fir and juneberry (*Amelanchier* spp.) are often present in the understory of these stands. (MDNR 2002).

Black ash dominated communities (corresponds to Map 3 category)

Black Ash – Basswood Forest – This is a rich wet-mesic hardwood forest dominated by black ash, basswood and often sugar maple. Red maple, red oak, yellow birch, balsam poplar, conifers, northern white cedar, and white spruce are much less frequent canopy components. Wood nettle (*Laportea canadensis*) and long beech-fern (*Thelypteris phegopteris*) are good indicators of this type. To date, the only location in northeastern Minnesota and Duluth where this type has been recorded is Magney Snively Park. The forest at this site includes yellow birch and red oak in the canopy, making it more diverse than many occurrences of black ash communities. (MDNR, 2002)

Black Ash – Conifer Swamp (Northeast) –

This is a wet to very wet hardwood and mixed swamp forest with the canopy heavily dominated by black ash (other hardwoods are not important canopy species). Conifers, especially balsam fir or white cedar, are typically present in the understory and may be also be present in the canopy. Mountain maple (*Acer spicatum*) is an important component of a well-developed shrub layer. Characteristic understory species include: oak fern (*Gymnocarpium dryopteris*), long beech-fern (*Thelypteris phegopteris*), starflower (*Trientalis borealis*), goldthread (*Coptis trifolia*), bluebead lily (*Clintonia borealis*), nodding trillium (*Trillium cernuum*), and seedlings of white cedar and balsam fir. (MDNR 2002).



Hardwood and mixed swamp forest – Magney Snively Park - July 2001 - Desotelle Consulting, PLC

Shrub swamps, brush (corresponds to Map 3 category)

Alder Swamp – This is an alder dominated shrub swamp with an understory of shade tolerant species such as dwarf raspberry (*Rubus pubescens*), bunchberry (*Cornus canadensis*), sedges (e.g., *Carex disperma*), and canada mayflower (*Maianthemum canadensis*). (MDNR 2002).

Emergent Marshes (corresponds to Map 3 category)

Northern Bulrush – Arrowhead Marsh – These are inland and estuarine wetlands on mineral substrates dominated by bulrushes such as river bulrush (*Scirpus fluviatilis*)

and soft stem bulrush (*Scirpus validus*) and often with pondweeds (*Potamogeton* spp.). (MDNR 2002). At Magney Snively, these occur as very small, open marshes.

Bare Ground (corresponds to Map 3 category)

Northern Bedrock Outcrops – These are open xeric (dry) communities on exposed bedrock with little or no shrub or tree cover. Crustose lichens are the predominant cover; foliose species including reindeer moss (*Cladina* spp.) are often common. Vascular plants are uncommon and are restricted to crevices and shallow soil accumulations; outcrop specialist plant species are often present. Deeper soil surrounding bedrock exposures supports woodland or forest. Small-scale (< 6 acres) communities often occur in small openings in woodland or forest, on steep slopes, ridge tops, or summits, and as a component of cliffs where horizontal to sloping bedrock atop the cliff is exposed. (MDNR 2002).



Ely's Peak – Nov 2002 - Desotelle Consulting. PLC

Northern Bedrock Shrublands – These are shrub-dominated xeric to dry-mesic communities on a matrix of exposed bedrock and deeper soil. Lichens are dominant on exposed bedrock. Woody plants are dominant in deeper soil, generally comprising 25-75% cover overall. Vascular plants are uncommon and are restricted to crevices and shallow soil accumulation; outcrop specialists plant species are often present. Scattered small, often open-grown trees are also present. Evidence of fire is often present. This type occurs as small to moderate-scale patches (0.5 to 25 acres). It occurs on ridge tops, slopes, summits, and occasionally as a component of cliffs where a large amount of horizontal to sloping bedrock atop the cliff is exposed. (MDNR 2002).

Dry Mafic Cliff (Northern) - Circumneutral to moderately alkaline xeric cliffs composed of diabase, basalt, gabbro, diorite, andesite, anorthosite, greenstone, or sandstones derived from these rock types. (MDNR 2002). This is a new MDNR plant community type and the final descriptions of the native plants are being worked on. In general, there are lichens and some mosses as well as vascular plants in crevices.

e) Ecological significance and quality of the native plant communities

Many of the individual plant communities of Magney Snively are of high ecological quality according to the MDNR's Element Occurrence (EO) Ranking guidelines. Nonetheless, it is important to reemphasize that the quality of any one community must be considered in the context of the larger landscape that constitutes this nomination. Each plant community is part of a complex mosaic of native plant communities in a large, intact landscape. With all of its pieces in place, this

landscape itself is of the highest ecological significance and quality to be found in any urban area.

The Minnesota County Biological Survey (MCBS) ranks plant communities on a scale of A through D, A being highest. MCBS has performed surveys in this area from 1999 to 2002. Although the MCBS has not yet completed EO evaluation forms for plant communities in Northeast Minnesota from these surveys, the following communities are expected to be ranked as high quality occurrences in the Magney Snively area (C. Reschke, pers. comm., 2002).

Suggested Plant Community Rankings

Black ash dominated communities (Expected EO Rank: A)

To date, the black ash forests have not been evaluated to determine their status as old growth. However, they share characteristics of old growth forests (e.g. large size and old age of some of the trees, diameter class distributions, a diversity of native ground flora, significant amounts of regenerating canopy trees, etc.) with black ash stands evaluated to the North of the nominated area (Carol Reschke, pers. comm. 2002).

Sugar Maple – Basswood (Bluebead Lily) Forest (Expected EO Rank: A)

Several examples of these forests have been highlighted as ecologically significant by ecologists at Magney Snively (Flaccus and Ohmann (1964); Coffin and Engstrom (1986); Reschke (1999)). Some of this work has included old growth evaluations in accordance with standards of the MDNR. Although of great ecological significance, some selective logging of white pine and white spruce has taken place in a few of these communities in the past. Even with these disturbances, Flaccus and Ohmann (1964) described these communities as some of the best examples of northern hardwoods in northern Minnesota.

Rock outcrop communities (Expected EO Rank: A and/or A/B)

The rock outcrop communities at Magney Snively are closely associated with the area's unique geological landforms (see Geological Landform Area part of this nomination). The examples at Magney Snively are likely to receive a high rank because of the native diversity they represent, their relatively undisturbed condition, and a low presence of non-native plants.

f) Rarity of the native plant community occurrence in the Land Type Association

This is discussed under c) above.

g) Size and viability of the plant communities

The viability of the plant communities at Magney Snively is high. Landscape context is a key attribute to consider when evaluating the viability of a plant community. The plant communities at Magney Snively are currently set within the context of a large contiguous tract of habitat. The context is a diverse mosaic of wetlands, uplands

and rock outcrop communities. Overall, the larger landscape is healthy, contributing strongly to the viability of the community. The ecological processes that maintain the communities and the landscape mosaic are intact (Reschke, 1999).

h) Proximity of the tract to other designated tracts

Thus far, the Magney Snively forest is not adjacent to other nominated tracts, although there is potential for such linkages in the future. The nominated tract(s) do, however, contain the headwaters of Sargent Creek, the mouth of which is located at the eastern end of North Bay, another tract nominated to the DNAP program. North Bay is one of the best examples of a sheltered bay habitat within the DNAP area. Its viability is likely linked to the condition of its headwaters, which in turn depends upon the health of the surrounding forest communities.

i) Amount of buffer

The mosaic of plant communities included in this nomination is viable without designating an additional buffer area per se. A large, continuous tract of forest habitat conveys a number of ecological benefits. For example, large blocks of forest contain important habitat for species that need forest interior, particularly migratory wood warblers. Research has shown that wide forest patches (deep interior) reduce predation (by edge species such as raccoons, cats, crows, and blue jays) and parasitism (by cowbirds) on vulnerable ground nesting passerine birds. If maintained in its current relatively unfragmented state, with few or no additions to the current trail and road system, this forested ecosystem will continue to support species that depend upon interior forest habitat.

It should be noted that currently Magney Snively is part of a larger, intact forested landscape. In general, the larger the forested tract, the more resilient a natural area will be to disturbances. Contiguous forest land also conveys a number of other benefits, such as corridors for wildlife movement. Although it is difficult to quantify this relationship, the landscape context of the current Magney Snively nomination should be considered when making further nominations in the area (e.g., additional lands to the southwest).

j) Animals that may use the tract for all or parts of their life cycle

As one of the largest remaining forested tracts in the area, Magney Snively provides habitat for a number of animals. Perhaps most significantly, the forest communities in this area provide stopover and nesting habitat for migratory song birds and raptors (hawks and eagles). The least flycatcher, great crested flycatcher, red-eyed vireo, black-throated green warbler, ovenbird, and rose-breasted grosbeak are examples of the common birds of the Magney Snively forest. Wood thrush and scarlet tanager also occur at Magney Snively, but are uncommon.

The oak component in this forest makes a special contribution as a source of food and cover for many wildlife species. Over 180 species of birds and mammals are

known to use oaks as a food source. Traditional game species that make use of oaks include black bear and deer. Small mammals, woodpeckers, and passerine birds are examples of nongame wildlife that take full advantage of the food and shelter that oaks provide. Eastern cottontails, eastern chipmunks, gray squirrels, white-footed mouse, and raccoons have been documented by the MCBS as ubiquitous across all oak forest types. (Pfanmuller 1991).

In addition, porcupines have been observed in the forests of Magney Snively (Meredith Cornett, personal observation, 2002). Coyotes have been sighted close to Magney Snively at the base of Spirit Mountain (Bill Majewski, personal observation, 2003). Coyotes have large territories, and likely are making use of Magney Snively's native habitats as well. Beaver are also active in the Stewart Creek area, a natural process for this stream.

The vernal pools of the ash swamps and the rich maple-basswood forest provide breeding habitat for a number of amphibians, including chorus frogs, spring peepers, tree frogs, and blue-spotted salamanders.

Two designated trout streams, Stewart Creek and Sargent Creek (and their tributaries), run through the nomination area. Sargent Creek originates near the center of the nominated lands. Stewart Creek was surveyed for brook trout most recently in August 1998. The survey indicated that the stream has a naturally reproducing brook trout population, a valuable resource in Minnesota. Trout streams of this quality are uncommon in urban areas within the state. The viability of the trout population depends on maintaining the stream in good condition. The condition of the stream is strongly influenced by the condition of the surrounding uplands. Protecting the Magney Snively forest through the DNAP is consistent with maintaining a healthy trout population in this area.

B. Special Species Area

1. General Criteria

The Magney Snively area contains habitat supporting a viable population of at least two plant species of special concern, Spring-beauty (*Claytonia caroliniana*) and Moschatel (*Adoxa moschatel*).

2. Description of Area

a) Legal description (see ownership information above)

b) Map of the tract including all relevant features at the site and habitat needs.
The DNAP guidelines recommend that large tracts nominated to the program include a list of the special species only rather than a map in order to protect them.

c) Documentation of the species of special concern
A search of the most recently updated (August, 2002) database of the MDNR Natural Heritage Program database verified that the nominated lands contain habitat that supports viable populations of two species of special concern:

- Spring-beauty (*Claytonia caroliniana*)
- Moschatel (*Adoxa moschatel*)

In addition to the two species of special concern mentioned above, a population of white baneberry (*Actea pachypoda*) is also present on the nominated property. White baneberry is not a state-listed rare species in Minnesota, but it is being tracked by the MCBS to determine whether it warrants special protection through future listing.

d) Documentation that the population of each of the species on the tract constitutes a viable and sustainable population thereof.

- Spring-Beauty. A population of 100 to 200 plants was documented in June, 2000 by Carol Reschke, DNR Botanist/Ecologist. For this species, which generally occurs in small patches within the appropriate habitat, the size of the population is considered to be healthy. One of the key factors in evaluating the health of a given plant population is proportion of reproducing individuals. Most of the plants observed in June, 2000 were in fruit, suggesting that this is an extremely good example of a reproducing population.
- Moschatel. A healthy population was documented in 1988 by Kurt Rusterholz (MDNR Forest Ecologist). In 2000, Carol Reschke (MDNR Plant Ecologist/Botanist) estimated the size of the population to be 2000 to 2200 plants. The span of observations suggests that this is a healthy, reproducing population of this species. Moreover, a large proportion of individuals have been observed both flowering and fruiting. The larger population consists of several scattered patches with as many as 50 to 800 plants each occurring in dense clusters. Each of these populations occurs in association with a feature of mature to old growth northern hardwood



Adoxa moschatel from
MDNR Natural Heritage Program

forest such as a large tip-up mound, the bark litter at the base of a mature sugar maple, or a large standing dead sugar maple.

- White baneberry. Several scattered individuals have been observed in both 1982 by Barbara Coffin and Dan Engstrom and in 2000 by Carol Reschke, all MDNR Botanist/Ecologists. This species generally occurs as scattered individuals throughout a tract rather than in concentrated clusters. The span of observations suggests that this is a viable, reproducing population.



Actea pachypoda by
Chris Dunham

E. Geological Landform Area

1. General Criteria

The geology of the Magney Snively lands fully meet the criterion of "containing undisturbed geological landforms or rock formations that clearly depict the natural processes instrumental in the formation of the geology of Duluth". Excellent outcrops of the bedrock formed as part of the Midcontinent Rift System are scattered throughout the tracts. See Map 5 for a distribution of these features.

2. Specific Criteria

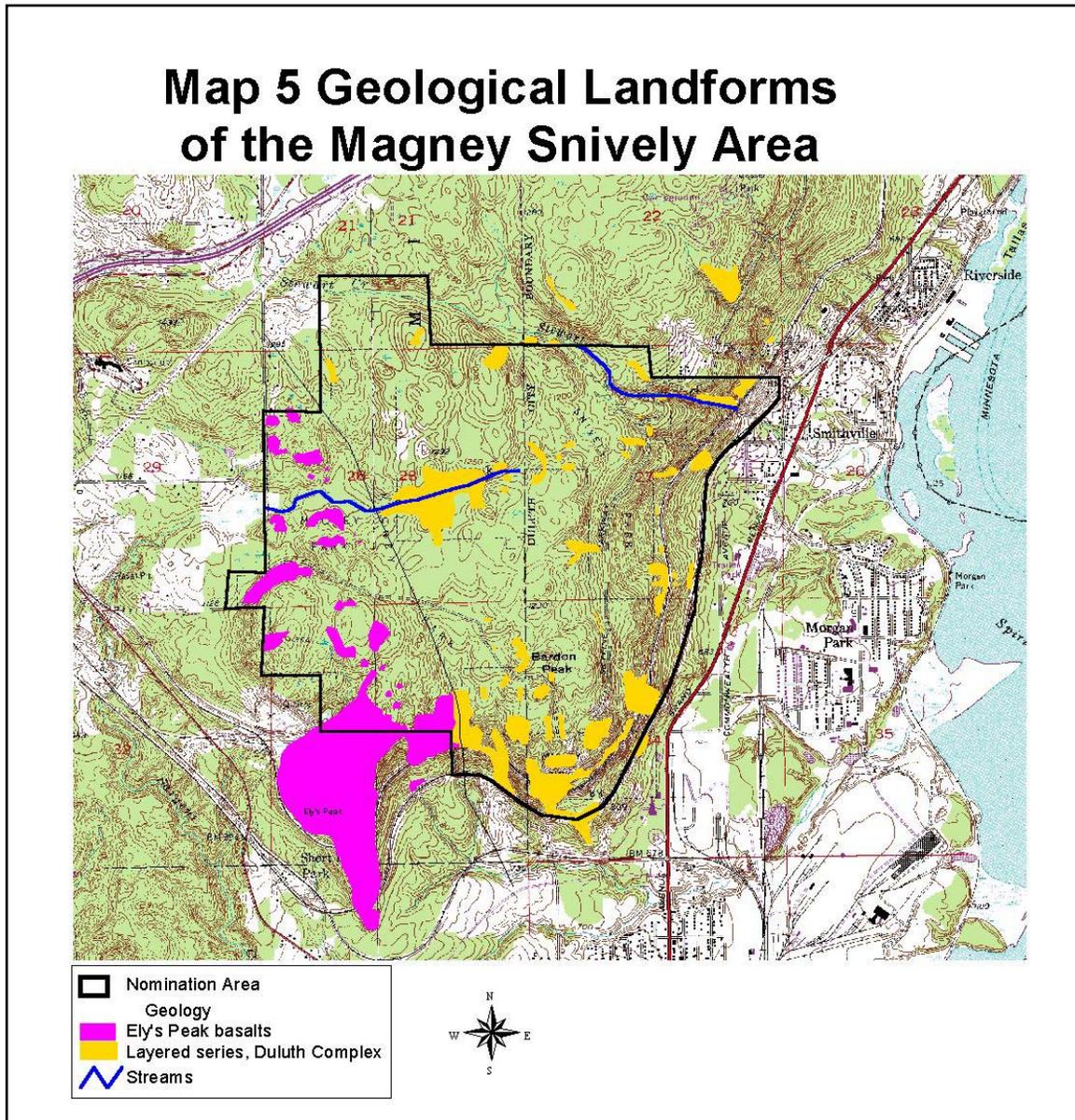
Geological landforms in the Magney Snively nominated area include evidence for the Midcontinent Rift. This meets criterion 2. b) in the DNAP Guidelines for Geological Landform Areas. The Geological Landform for the Magney Snively area is described below.

The Midcontinent Rift System began forming approximately 1,109 million years ago and lasted for about 20 million years. During this time a great rift in the Earth's crust, stretching from what is now Detroit, up through eastern Lake Superior and through Duluth to today's Kansas. Immense volumes of hot magma, generated beneath the crust, poured out onto the surface as hundreds of great lava flows along the rift system; much of this magma solidified beneath the surface as intrusions of gabbro and related rocks known as the Duluth (Gabbro) Complex. In the Duluth area these intrusions are known as the Duluth Complex.

The uplands at the southwest end of Duluth (Ely's Peak, Bardon Peak, and Magney Snively area) are high ground basically because they are underlain by igneous rocks that are relatively resistant to erosion. As indicated on Map 5, these rocks belong to

two major formations: the Ely's Peak basalts on the west and the "Layered Series" of the Duluth [Gabbro] Complex on the east. Both of these formations have been well studied in several aspects, including structure and geochemistry (Miller et al., 2002; Kilburg, 1972), and are part of the world-famous Midcontinent Rift System.

Map 5 Geological Landforms of the Magney Snively Area



The Ely's Peak basalts are a sequence of basaltic lava flows, originally horizontal, that have become tilted gently (about 10-20 degrees) to the east. They represent the first igneous activity associated with the beginning of Midcontinent rifting. The Duluth Complex rocks consist of olivine gabbro and troctolite (a plagioclase-olivine rock) that formed by accumulation of crystals on the floor of a great magma chamber. The accumulation process over time produced a layered structure and a parallel fabric called foliation in these rocks. This Duluth Complex magma intruded into (and over) the pre-

existing lava flows. In the billion years or so since these events, slow uplift and erosion have now exposed these rocks to our view; the Ice Age glaciers left a hard, smooth and polished surface for study. These rocks are best exposed in this area, lending the local names to the more extensive formations. Many hundreds of geologists from around the world have visited some of these outcrops. Although not a specific criterion for inclusion in the DNAP, the fact that these rock exposures in Magney Snively constitute a large part of the "type locality" of the Duluth Complex is further reason to protect this area from destructive development. F. F. Grout, in 1918, was the first to name this important rock mass on the basis of the outcrops in the City of Duluth.

Appendix A

Resources Used

City of Duluth. 2002. Duluth Natural Areas Program Ordinance. Article XXIX. Chapter 2. Duluth City Code. 1959 as amended.

City of Duluth. 2002. Duluth Natural Areas Program Guidelines.

Coffin, B. and D. Engstrom. 1986. Magney hardwoods: Description and status of the site. (Unpubl. Report, Minnesota Department of Natural Resources).

Eckert, K. R. 1994. A birder's guide to Minnesota. 3rd Ed. Williams Publications, Inc., Plymouth, Minnesota. 238 pp.

Flaccus, E. and L. Ohman. 1964. Old-growth northern hardwood forests in northeastern Minnesota. *Ecology* 45(3): 448-459.

Killburg, J.K. 1972. Petrology, structure, and correlation of the Upper Precambrian Ely's Peak basalts. M.S. dissertation, University of Minnesota, 97 p.

Miller, J. D. Jr., J. C. Green, M. J. Severson, V. W. Chandler, and D. M. Peterson. 2001. Geologic map of the Duluth complex and related rocks, northeastern Minnesota. Minn. Geol. Survey, Miscell. Map Series M-119.

Miller, J. D. Jr. et al. 2002. Geology and mineral potential of the Duluth complex and related rocks of northeastern Minnesota. Minn. Geol. Survey Rept. of Investigations 58, 207 p. and CD.

Minnesota Department of Natural Resources. 1995. Maple-basswood element occurrence ranking guidelines.

Minnesota Department of Natural Resources. 2002. Native Plant Communities of Northern Superior Uplands Section of Northeastern Minnesota, Version 2.0.

Pfannmuller, L. A. 1991. Significance of oaks and oak forest communities for non-game wildlife. Proceedings of The Oak Resource in the Upper Midwest Conference.

Reschke, C. 1999. Summary of old-growth forest evaluation in Spirit Mountain Recreation Area, Magney Snively Forest, Duluth MN. Minnesota County Biological Survey, Minnesota Department of Natural Resources, Biological Report Series No. 66.

Taylor, R. B. 1964. Geology of the Duluth Gabbro Complex near Duluth, Minnesota. Minn. Geol. Survey Bulletin 44, 63 pp., with map.

White, M. A., G.E. Host, and T. N. Brown. 2001. Northeast landscape range of natural variation analysis: Methods, data, and analysis. Unpublished report produced by the Natural Resources Research Institute for the Minnesota Forest Resources Council (2002 draft revision of sugar maple model).

Appendix B

Qualifications of Nominators

Tom Duffus, Program Director, The Nature Conservancy

Education

1986 Master of Forest Science, Yale School of Forestry and Environmental Studies
1982 Bachelor of Science, Environmental Studies/Geology, St. Lawrence University

Work Experience

Mr. Duffus' work experience includes The Nature Conservancy as Program Director of the Northeast Minnesota Office, Director of Conservation Programs, and Director of Land Protection. He also served as the Associate Director of the Adirondack Land Trust, Inc., a private Land Conservation Consultant, and a Regulatory Analyst for SAIC, Inc.

William C. Majewski, St. Louis River Citizens Action Committee

Education

1964 Bachelor of Science degree, Urban and Regional Planning, University of Wisconsin-Madison

Work Experience

Mr. Majewski has 38 years of planning experience with the State of Wisconsin as a Research Assistant, the City of Duluth as Senior Planner, Assistant Director and Economic Developer, and as a Senior Planner and Planning Director with a local consulting firm. He has considerable experience with tax forfeit land administration and coordinating city, county and state lands.

Meredith W. Cornett, Conservation Ecologist, The Nature Conservancy

Education

2000 Ph.D. in Forestry (Forest Ecology), University of Minnesota. *St. Paul, MN.*
1996 M.S. in Forestry (Forest Ecology), University of Minnesota. *St. Paul, MN.*
1990 B.A. in Biology, Oberlin College. *Oberlin, OH*
1991 Center for Human Potential. *El Coyol, Costa Rica. 1991.*
Peace Corps Training Program in forestry, Spanish, and cross-cultural skills.
1989 School for Field Studies. *Queensland, Australia. Fall semester 1989.*
Fall semester abroad with classes in ecology and natural resource management and independent study of freshwater snail ecology.

Work Experience

Dr. Cornett's work experience includes The Nature Conservancy as a Conservation Ecologist, Minnesota DNR, Division of Forestry in a position of Minnesota Community Forest Ecologist, University of Minnesota as a Research Assistant, Peace Corps as Community Forestry Specialist in the Republic of Panama, and as an Intern at the Center for Plant Conservation in Jamaica Plain, Mass.

John C. Green, Professor Emeritus, Department of Geological Sciences, University of Minnesota, Duluth

Education

1953 Dartmouth College, B.A., Geology, 1953
1953-54 University of Oslo (no degree; Fulbright student)
1960 Harvard University, Ph.D., Geology

Work Experience

Dr. Green has over 40 years of experience working in the field of geology and is widely regarded as a leading authority on the geology of northern Minnesota. He served on the faculty of the University of Minnesota, Duluth for over 40 years. In addition, Dr. Green has contributed his expertise to institutions such as the Minnesota Geological Survey and the Minnesota Department of Natural Resources over the years on an intermittent basis. He has also taught on the staff of the Wasatch-Uinta Geology Field Camp for several summers between 1971 and 1986.

Technical review provided by:

- Kyle Deming, City Planner, Department of Planning and Development, City of Duluth
- Kelly Fleissner, City Forester, Department of Public Works and Utilities, City of Duluth (B.S. in Forest Resource Management, Certified Arborist)
- Janet Green, Ornithologist
- Timothy Howard, Project Administrator, Department of Administrative Services, City of Duluth (B.S. in Forest Resources)
- Dick Larson, Director of Public Works and Utilities, City of Duluth
- Mark McShane, Director of Administrative Services and Property Manager, City of Duluth (B.S. in Biology, Certified Property Manager)
- Carol Reschke, Plant Ecologist/Botanist, Minnesota County Biological Survey, Minnesota Department of Natural Resources
- Carl Seehus, Director, Department of Parks and Recreation, City of Duluth
- Diane Desotelle, Desotelle Consulting, PLC

Appendix C

MAGNEY SNIVELY /DULUTH NATURAL AREAS PROGRAM Master Land Ownership List

<u>T-R-Sec</u>	<u>Owner</u>	<u>Plat/Parcel #</u>
<u>T49-R15-Sec 21</u>	TNC	450-0010-03780
(S½)	TNC	03815
<u>T49-R15-Sec 27</u>		
<u>Lands of Duluth</u>		
	City of Duluth	10-2746-00650
	City of Duluth	00660
	City of Duluth	00680
	City of Duluth	00690
	City of Duluth	00700
	City of Duluth	00710
	City of Duluth	00720
	City of Duluth	00730
	City of Duluth	00740
	State	00750
	State	00760
	City of Duluth	00770
	State	00780
	State	00790
	City of Duluth	00850
	City of Duluth	00860
	City of Duluth	00870
	City of Duluth	00880
	City of Duluth	00890
	City of Duluth	00900
	City of Duluth	00910
	City of Duluth	00920
	City of Duluth	00930
	City of Duluth	00940
	City of Duluth	01000
	City of Duluth (DW&P)	01010
	City of Duluth (DW&P)	01020
	City of Duluth (DW&P)	01050
	City of Duluth	01070
	City of Duluth (DW&P)	01140

Morgan Park
1st Addn.

MP&L	10-3310-07480
State	07630
State	07800
State	08030
State	08280
State	08350
State	08420
State	08550
State	08720
State	08960
State	09250
State	09600
State	09960
State	10290
MP&L	10550
State	10630
State	10730
State	10850
State	10910
State	10940
State	10970
State	11030
State	11120
State	11240
State	11360

(Also see Sec. 34)

<u>Spirit Lake Addn.</u>	Gerald & Evelyn Moscatelli	10-4060-00010
	State	00020
	State	00030
	State	00040
	State	00050
	State	00090
	State	00100
	State	00110
	State	00120
	James & Julie Levang	00670
	Archie Rivall	00870
	State	00880
	City of Duluth	00890

	City of Duluth(DW&P)	00900
<u>Spirit Lake Addn.</u>	City of Duluth	00920
	City of Duluth	00930
	City of Duluth (DW&P)	00990
	City of Duluth	01000
	City of Duluth (DW&P)	01060
	State	01110
	State	01140
	State	01170
	State	01190
	State	01240
	State	01250
	State	01260
	State	01270
	State	01310
	State	01320
	State	01330
	State	01340
	State	01350
	State	02200
	MP&L	02230
	State	02280
	State	02300
	State	02310
	MP&L	02360
	City of Duluth (DW&P)	02400
<u>T49-R15-Sec 28</u>		
<u>Lands of Duluth</u>	City of Duluth	450-010-03880
(N½)	City of Duluth	03890
	City of Duluth	03900
	City of Duluth	03910
	City of Duluth	03990
<u>Lands of Duluth</u>	City of Duluth	450-0010-04010
(S½)	City of Duluth	04050
	City of Duluth	04060
	City of Duluth	04080
	City of Duluth	04100
<u>Homecroft Acres</u>	City of Duluth	450-0030-00010
	City of Duluth	00050
	City of Duluth	00060
	City of Duluth	00070

	City of Duluth	00090
<u>Homecroft Acres</u>	City of Duluth	00100
	City of Duluth	00110
	City of Duluth	00120
	City of Duluth	00130
<u>Mesaba Heights</u>	City of Duluth	450-0060-00010
<u>2nd Division</u>	City of Duluth	00110
	City of Duluth	00130
	David & Elaine Bills	00210
	David & Elaine Bills	00220
	City of Duluth	00230
	City of Duluth	00290
	City of Duluth	00570
	City of Duluth	00850
	Walter J. Petrusic	00880
	City of Duluth	00900
	City of Duluth	01130
	City of Duluth	01450
	Bruce J. Tonkin	01620
	City of Duluth	01630
	City of Duluth	01720
	City of Duluth	02090
	City of Duluth	02410
	City of Duluth	02730
	City of Duluth	03050
	Joyce Locks	03210
	City of Duluth	03230
	City of Duluth	03370
	State	03550
	City of Duluth	03570
<u>Pittsburgh Addn.</u>	City of Duluth	450-110-00100
<u>No. 2</u>	City of Duluth	00330
	City of Duluth	00650
	City of Duluth	00970
	City of Duluth	01290
	City of Duluth	01610
	City of Duluth	01930
	City of Duluth	02250
	City of Duluth	02570
	City of Duluth	02850
	City of Duluth	03130
	City of Duluth	03410

T49-R15- Sec 29

City of Duluth 450-0010-04370

T49-R15- Sec 33

(N½)

City of Duluth 450-0010-05090
 City of Duluth 05110
 City of Duluth 05120
 City of Duluth 05130
 City of Duluth 05140
 City of Duluth 05170

(S½)

City of Duluth 450-0010-05230

T49-R15- Sec 34

Lands of Duluth

City of Duluth 10-2746-01170
 City of Duluth 01180
 City of Duluth 01190
 City of Duluth 01200
 City of Duluth 01210(exp tool hse)
 City of Duluth (DW&P) 01390
 City of Duluth (DW&P) 01410

Morgan Park
1st Addn.

State 10-3310-03580
 State 03590
 State 03760

Pittsburgh Addn.

City of Duluth 10-3800-00010
 City of Duluth 00060
 City of Duluth 00070
 Martha D. Young 00170
 City of Duluth 00180
 City of Duluth 00250
 City of Duluth 00300
 City of Duluth 00310
 City of Duluth 00320
 State 00390
 State 00400
 City of Duluth 00410
 City of Duluth 00460
 City of Duluth 00470
 City of Duluth 00480
 City of Duluth 00490
 State 00520
 City of Duluth 00530
 City of Duluth 00610

<u>Springfield Addn.</u>	State	10-4100-00010
	State	00060
	State	00070
	State	00080
	State	00090
	State	00100
	State	00110
	State	00120
	State	00130
	State	00180
	State	00190
	State	00200
	State	00240
	State	00250
	City of Duluth (DW&P)	00300
	City of Duluth (DW&P)	00310
	State	00520
	State	00630
	City of Duluth (DW&P)	00710
	State	00720
	State	00730
	State	00740
	State	00750
	State	00760
	State	00770
	State	00780
	State	00790
	State	00890
	State	00900
	State	00910
	State	00940
	State	00950
	State	00960
	State	00970
	State	00980
	State	00990
	State	01020
	State	01090
	State	01100
	State	01110
	State	01120
	State	01130
	State	01140
	State	01150
	State	01160
	State	01170

<u>Springfield Addn.</u>	State	01180
	State	01190
	State	01200
	State	01230
	State	01420