

1 **Chapter Three**

2

3 **Environmental Resources**

4

5 **Overview**

6

7 An important part of Northfield’s future vision is the preservation and enhancement of the

8 community’s environmental resources. Three of the land use principles in chapter 4 developed

9 during the Comprehensive Plan public meetings reinforce the City’s commitment to

10 environmental stewardship:

- 11 • The natural environment will be protected, enhanced and better integrated in the
- 12 community.
- 13
- 14 • Environmentally-sensitive and sustainable practices will be integrated into new
- 15 developments and redeveloped areas.
- 16 • Rural character of certain areas of the community will be protected.

17

18 **Environmental Resources Goal**

19

20 A goal is a policy statement that states a desired outcome in general terms. The goal for

21 environmental resources is provided below. The goal was developed by considering key

22 findings related to environmental resources, and integrating public input generated as part of the

23 Plan update.

24

25 *The natural environment will be protected, enhanced and better integrated in the*

26 *community.*

27

28 **Key Findings**

29 Northfield’s character reflects a number of unique environmental qualities. This chapter of the

30 Comprehensive Plan will identify many of those features and establish goals and policies for the

31 preservation, protection and enhancement of Northfield’s natural environment. Recently, the

32 City has completed key documents that provide direction on the identification, enhancement, and

33 protection of the area’s natural resources. These documents are the Natural Resources Inventory

34 (NRI), completed in 2005, the Greater Northfield Greenway Corridor System plan, completed in

35 2007, and the Surface Water Management Plan, completed in 2007. These documents will be

36 referenced throughout this chapter.

37 **I. Environmentally Significant Areas**

38 The general topography along with the soils, bedrock, water features and other natural

39 communities are a defining element of the overall community (**Map X**). These areas are

40 described below. Each environmentally significant area should be evaluated to determine

41 whether the area should be protected, restored, or allowed to be altered.

42

43 **A. General Topography**

44 The Cannon River Valley is the dominant topographical element in Northfield. The river forms
45 the low point of the community, but various high points are spread alongside the length of the
46 river and certain hillsides and tributaries of the Cannon River feature steep slopes. Numerous
47 wetlands of various types are located within many of the stream valleys, the Cannon River
48 Valley and elsewhere.

49 **B. Bedrock**

50 According to the Bedrock Geologic Map and Bedrock Topographic Map of Dakota County
51 (Minnesota Geological Survey, 1990) and the Rice County Water Resource Management Plan,
52 the geomorphology of the uppermost geologic formation is a thin layer of quarternary deposits
53 and, in many places, exposed bedrock. The current landscape results largely from glacial
54 activity. The bedrock formations consist mainly of St. Peter Sandstone, Prairie Du Chien Group
55 and Jordan Sandstone.

56 Depth to the bedrock varies from 800 feet above sea level to bedrock exposure. Areas where the
57 bedrock is shallow or exposed provide an increased potential for pollutants to reach the
58 groundwater supply. As the City looks at infiltration practices in stormwater management, care
59 should be taken to locate these features away from shallow bedrock areas that could increase the
60 risk of groundwater contamination.

61 **C. Soils**

62 The US Department of Agriculture and Rice County prepared the *Rice County Soil Survey* in
63 1975. Utilizing this survey, Carleton College developed a report called *Northfield Land Use*
64 *Suitability*, which was used during the preparation of the 1977 Northfield Comprehensive Plan.
65 The report generally analyzed the suitability of land for urban development, rural development
66 (which relies on septic tanks), and agricultural use within Northfield and an area that includes
67 today's urban expansion boundary.

68 Northfield is surrounded by agricultural land. Agricultural soils maintain a generally moderate
69 to high level of productivity except for the western and northwestern extremes where agricultural
70 lands are found to have very high productivity levels based on corn suitability ratings.
71 Conservation farming practices should be encouraged in the city's growth areas as a means of
72 reducing soil loss from agricultural fields.

73
74 The agricultural lands surrounding Northfield may eventually develop. Soil types found in
75 valleys and low areas following streams and the Cannon River, as well as areas with steeper
76 slopes have a limited building suitability. Steep slopes have been identified on Map X, however,
77 detailed topographic surveys should be completed as part of the development plan to determine
78 the actual location of these areas. Development will mean soils will be highly susceptible to
79 erosion and sedimentation during construction periods. Best Management Practices (BMPs)
80 should be used and erosion and sediment regulations enforced to control soil loss.

81
82 **D. Groundwater**

83 Aquifers provide the groundwater for the city and surrounding areas. The main aquifers within
84 or near the city are the St. Peter Aquifer, the Prairie Du Chien-Jordan Aquifer, the St. Lawrence-
85 Franconia Aquifer, and the Mt. Simon-Hinkley Aquifer. Within the city, five ground water wells

86 provide the source for potable water needs. Groundwater resource data for areas within the city
87 are available in the Rice County Water Resource Management Plan, as well as the Dakota
88 County and Rice County Geological Atlas.

89

90 ***E. Watersheds***

91 Northfield is part of the Cannon River Watershed. This watershed can be subdivided into four
92 subwatersheds within the city that feed the Cannon. These subwatersheds include Spring Creek,
93 Rice Creek (locally known as Spring Brook), the Lincoln Waterway, and Heath Creek. The
94 City's Surface Water Management Plan describes these districts in more detail. The Cannon
95 River and Rice Creek are waterways protected by the Minnesota Department of Natural
96 Resources (DNR). A further discussion of these waterways is detailed below.

97 ***(1) Cannon River***

98 The Cannon River, one of the most significant identity elements of Northfield, originates in Rice
99 County at Shields Lake and flows through the heart of Northfield's downtown en route to the
100 Mississippi River.

101 Many tributaries in Northfield flow into the Cannon River providing surface (rain) water
102 drainage for much of the community as well as some of the agricultural uses in surrounding
103 townships.

104 In 1980, the Cannon River was added to Minnesota's State Wild & Scenic Rivers Program. This
105 program was established by the State in 1973 in order to protect rivers with outstanding natural,
106 scenic, geographic, historic, cultural, and recreational values. Only six rivers have had segments
107 designated as 'wild, scenic, or recreational' under the program. Each of the six designated river
108 segments in Minnesota has a management plan outlining the rules and goals for that waterway.
109 These rules work with local zoning ordinances to protect the rivers from factors that undermine
110 the wild, scenic, and recreational qualities for which they were designated; factors such as
111 pollution, erosion, over-development, and degradation.

112 Segments of the Cannon River fall under both "scenic" and "recreational" classifications.
113 Through Northfield, the river is designated as "recreational", a designation given to those rivers
114 that may have undergone some impoundment or diversion in the past and may have adjacent
115 lands that are considerably developed, but are still capable of being managed in accordance with
116 the act. This means that bordering lands may have already been developed for a full range of
117 agricultural or other land uses, and may also be readily accessible by pre-existing roads or
118 railroads.

119 ***(2) Rice Creek (Spring Brook)***

120 One of the more notable Cannon River tributaries is Rice Creek, located in the southwest portion
121 of the community. Rice Creek is one of the last remaining cold water native trout streams in the
122 state of Minnesota and the only one in Rice County. Cool, clean, spring-fed water within this
123 creek provides the necessary habitat for the survival and breeding of Brook Trout, the native
124 trout species in Minnesota. In fact, the DNR has re-stocked Brook Trout in other streams
125 throughout the state using fish eggs originating from Rice Creek. Thus far, Rice Creek has been
126 able to maintain the necessary habitat and water conditions for the survival of trout. The primary
127 threats to this habitat come from existing agricultural practices or future development and

128 include surface water runoff containing excessive sediment, pesticides, or fertilizers, and an
129 increase to the speed, volume, or temperature of runoff water.

130
131 In 1997 the Cannon River Watershed Partnership began working with a committee composed of
132 local landowners, representatives of various governmental jurisdictions, fishing enthusiasts, and
133 the DNR to learn about Rice Creek and its watershed, and to discuss ways to preserve and
134 protect it. The Committee created a vision for the watershed and Rice Creek entitled
135 “Description of the Spring Brook Watershed in 2050.”

136
137 The Surface Water Management Plan has identified three specific strategies for future
138 regulations the City could adopt to protect and enhance the Rice Creek watershed. These
139 strategies include more stringent rate and quality controls for any development project within the
140 watershed. To achieve this, runoff from developed sites should be kept to a minimum and
141 infiltration should be required to a greater degree than other watersheds within the city. The City
142 will also work with Bridgewater Township and other regulatory agencies to develop a trout
143 stream management plan.

144 *F. Natural Communities*

145 A Natural Resources Inventory was completed in 2005. The NRI revealed that natural
146 communities, as well as a number of semi-natural areas that provide connectivity between the
147 natural communities, are primarily concentrated along the river and stream corridors. Several
148 important and unique natural features in the community were identified in an inventory in the
149 NRI:

- 150
- 151 • Rich fen (a type of wetland) at Hauberg Woods
 - 152 • High quality floodplain forests along the Cannon River
 - 153 • Good quality maple-basswood and oak forests along the stream corridors, especially
154 Heath Creek
 - 155 • Rice Creek (this site is of regional significance as it is the only trout stream in Rice
156 County, and is an uncommon resource type in southern Minnesota)
 - 157 • Limestone cliffs along Heath Creek
 - 158 • Numerous scenic overlooks along the stream corridors and in some outlying areas
 - 159 • Cannon River (designated as a state Wild and Scenic River)
 - 160 • Open space areas on the campuses of St. Olaf and Carleton Colleges, which have high
161 ecological value due both to their overall size and the significant efforts the colleges are
162 making to restore and manage existing native habitat. The Carleton Arboretum provides
163 areas of open space, native species and wetland restoration for both educational purposes
164 and recreational enjoyment for students and Northfield residents. St. Olaf College also
165 maintains a nature preserve containing open spaces, wetlands and natural habitat.
- 166

167 The NRI also described the quality of the various identified natural features. The “Qualitative
168 Rank” and “Restoration Potential” described in the NRI should be taken into account when
169 determining whether the resource should be protected, restored, or allowed to be altered.

170 **II. Additional Environmental Issues**

171

172 **A. Resource Conservation**

173 The City makes use of many resources to enhance the quality of life including the use of non-
174 renewable fossil fuels. Conserving these resources to minimize the impact on the
175 environment and provide for sustainability has become a goal of the City. A task force has
176 been established to assess opportunities for local development of energy efficiency and clean
177 energy projects that will protect the community from future energy price and supply
178 instability, enhance local economic development, and provide local, regional and global
179 environmental benefits. The task force will also assess the efficacy of creating a municipal
180 electric utility or special energy district in achieving energy opportunities. Finally, the task
181 force will recommend citywide target greenhouse gas emission reductions to fulfill Milestone
182 2 of the City's commitment to the Cities for Climate Protection Campaign (CCPC) and
183 develop an action plan to meet these targets.

184

185 **B. Reduction of Waste Materials**

186 The City has a number of programs to encourage the reduction of waste materials. Normal
187 curbside pickup of refuse is supplemented with curbside recycling. The following materials
188 are currently accepted for recycling curbside: aluminum cans, brown paper bags, glass bottles
189 and jars, newspapers, small-mouth plastic bottles and jugs, tin and steel cans. Catalogs,
190 magazines, phones books, cardboard boxes and mixed-use paper can be dropped off at
191 recycling containers located in the parking lots of two of Northfield's major grocery stores.
192 Households that produce less than 14 gallons of garbage or refuse per week may also qualify
193 for a reduced garbage/recycling fee.

194

195 The City and Waste Management, a licensed refuse collector, also sponsor Annual Clean-Up
196 Days two weekend days per year. Waste Management provides dumpsters in Babcock Park
197 located at Woodley Street and Highway 3. City residents may unload debris from their
198 households free of charge at the site. Disposal of electronic appliances are taken, but do
199 require an additional disposal fee.

200

201 Yard waste (leaves, grass clippings and garden/flower waste) is collected curbside seasonally
202 (spring and fall) if waste is contained in specially-marked biodegradable paper bags.
203 Northfield residents also have the option of disposing of yard wastes, including brush,
204 branches and shrubbery at the City's compost site. Finished compost is also available for
205 pickup at the site. The compost site is located between Northfield and Dundas on Armstrong
206 Road, just south of Sechler Park.

207

208 **C. Hazardous Materials**

209 Minimizing the contamination of the environment, whether its water, soil or air pollution, is a
210 priority. Practices within the community can have both a local and regional affect on the
211 environment. Locally there are a number of facilities that store and use hazardous materials
212 that have the potential to pollute the environment. Federal and state regulations require these
213 facilities to address storage and handling of these materials and develop a plan of action in
214 the unlikely event that these harmful substances are released to the environment. The City,

215 along with the other required authorities, should be notified in the event of a regulated release
216 that could potentially be harmful.

217
218 Much of the City's solid waste products are taken to the Rice County landfill. The landfill is
219 permitted to accept certain waste products such as household refuse, furniture, empty dried
220 paint cans, and new construction materials. The landfill does not accept any hazardous
221 wastes. If these materials are mixed with the acceptable materials in the general collection
222 refuse, they have the potential to contaminate the landfill. There is also the potential that
223 these materials are disposed of in an illegal matter such as dumping in the storm sewer
224 system. As part of the City's NPDES MS4 permit, the City will develop an education
225 program on the proper disposal of household hazardous materials.

226
227 **D. Air Quality**

228 The City values the quality of the air in and around the community. In general, the City
229 controls and directs those activities that would subject the citizens of the community to
230 unacceptable air pollutants. The City has adopted by reference the Minnesota Pollution
231 Control Agency's (MPCA) regulations and standards relating to air quality.

232
233 **E. Noise Pollution**

234 The City currently has several ordinances in place that address various noise disturbances.
235 These disturbances include animals, parties or large assemblies, and other noise producing
236 activities in residential or commercial areas. These ordinances should be evaluated to
237 determine if minimize noise impacts are being achieved.

238
239 **III. Current Protection Programs**

240 **A. Environmental Quality Commission**

241 The City maintains a citizen advisory board called the Environmental Quality Commission. This
242 volunteer board advises the City Council on the creation of appropriate policies, programs, and
243 regulations for the protection and preservation of the community's natural resources. In
244 addition, the City maintains ordinances and codes designed to protect natural resource areas as
245 identified in the NRI and Surface Water Management Plan. Finally, land use along the Cannon
246 River is regulated by the Minnesota Wild and Scenic Rivers program, which is implemented
247 through local zoning and state law.

248 **B. Wellhead Protection**

249 The City's wellhead protection program is intended to prevent contamination of public drinking
250 water supplies by identifying water supply recharge areas and implementing management
251 practices for potential pollution sources within those areas. The City expects to update the
252 program's policies in the near future.

253
254
255
256 **C. NPDES MS4 Permit**

257 The MPCA implemented the national Pollutant Discharge Elimination System (NPDES) Phase II
258 Stormwater Program in March 2003. Phase II requires (as amended in 2006) municipal separate
259 storm sewer systems (MS4s) in urban areas with a population over 10,000 to obtain an NPDES
260 permit. Permits for construction sites greater than one acre are also required as part of the Phase
261 II requirements. The City submitted its Notice of Intent (NOI) and Stormwater Pollution
262 Prevention Plan (SWPPP) in conformance with the MPCA guidelines in the spring of 2007.
263 More information about the permit can be found in the City's Surface Water Management Plan.
264

265 ***D. Organic Pest Management Policy***

266 The City acknowledges the potential health risks associated with exposure to pesticides and is
267 committed to phasing out the use of pesticides on City owned land through the implementation
268 of an Organic Pest Management Policy for Turf & Non-Aquatic Landscape ("OPM Policy").
269 Organic Pest Management (OPM) is a problem-solving strategy that prioritizes a natural, organic
270 approach to turf grass and landscape management without the use of toxic pesticides. It mandates
271 the use of natural, organic cultural practices that promote healthy soil and plant life as a
272 preventative measure against the onset of turf and landscape pest problems. OPM responds to
273 site-specific conditions by integrating cultural, biological and mechanical practices that foster
274 cycling of resources and promote ecological balance and conserve biodiversity. Implementation
275 of the OPM Policy is intended to augment and guide the existing turf and landscape management
276 practices on property under the City's control and to set an example for residents of
277 environmentally sustainable turf and landscape practices.
278

279 ***E. Other Protection Programs***

280
281 The City currently has a tree preservation policy, which will be updated in the near future. Also,
282 the City will investigate the possibility of adopting Leadership in Energy and Environmental
283 Design (LEED) standards for environmentally sustainable construction. The Greater Northfield
284 Greenway Corridor System Plan preserves a corridor for trail connections and recreation, and
285 also serves as a stream buffer to filter pollutants and preserve wildlife habitat.
286

287 ***IV. Collaboration Opportunities***

288 Many organizations have an interest in preserving the environment and maintaining an
289 abundance of open space. The opportunity to work with many special interest groups, private
290 philanthropists, the development community, and other regulatory agencies should be explored
291 when seeking solutions to environmental protection. There are a number of state and local
292 agencies that regulate many of the environmental features within Northfield. The Surface Water
293 Management Plan has a list of these agencies. The University of Minnesota Extension Service
294 and the Cannon River Watershed Partnership are good sources for technical and educational
295 materials. The DNR and other governmental agencies such as the Minnesota Pollution Control
296 Agency and the Rice County Soil and Water Conservation District also offer good technical
297 and/or financial resources.

298 299 ***V. Objectives and Strategies***

300

301 Outlined below are ___ objectives and ___ strategies. The objectives indicate a specific policy
302 direction and help organize strategies. Strategies are detailed actions necessary to initiate or
303 complete an objective such as a program, policy or a project.
304

305 **Objective 1.**

306 **Protect and enhance Environmentally Significant Areas**

- 307
- 308 1.1 As the City looks at infiltration practices in stormwater management, care should be taken to
309 locate these features away from shallow bedrock areas that could increase the risk of
310 groundwater contamination.
- 311 1.2 Maintain standards and regulations to control development on steep slopes (generally those
312 over 12%), to control soil erosion and sedimentation and to minimize the removal of natural
313 vegetation.
- 314 1.3 Protect and enhance the quality of groundwater
- 315 1.4 Protect and enhance the quality of surface waters including the Cannon River and its creek
316 tributaries. The Surface Water Management Plan identifies current strategies and should be
317 updated periodically to remain current with regulations and acceptable practices.
- 318 1.5 Preserve sufficient natural open space as identified in the park master plan in order to provide
319 habitat for wildlife and provide scenic and recreational qualities for the community.
- 320 1.6 Encourage planting of original vegetation and habitat (such as native species, trees and
321 grasses with deep root structures) within buffer areas along streams and waterways as
322 identified in the Greater Northfield Greenway Corridor System Plan and the Natural
323 Resources Inventory.
- 324 1.7 Protect significant trees and woodland, and promote reforestation and tree-planting programs
325 within the City.
- 326 1.8 1.8 The NRI should be consulted when development is proposed to verify the presence of
327 any significant natural resources. The quality of the resource should be taken into account to
328 determine whether the resource should be protected, restored, or allowed to be altered.
329

330 **Objective 2.**

331 **Conserve energy in public and private sector development efforts**

- 332
- 333 2.1 Encourage the use of energy conservation technologies and techniques, and promote the
334 exploration and innovation of new methods to conserve energy.
- 335 2.2 The City will strive to build or renovate city-owned buildings to meet LEED standards.
336

337 **Objective 3.**

338 **Promote the reduction of solid waste generated**

- 339
- 340 3.1 Promote programs to reduce the amount of solid waste generated in the City, and to increase
341 the use of recyclable, reusable or biodegradable materials.
342

343 **Objective 4.**

344 **Minimize the negative consequences of hazardous materials.**

345 4.1 The City will review its use of hazardous materials and substitute safer alternatives wherever
346 possible.

347 4.2 Educate Northfield businesses and residents on the storage, use and disposal of hazardous
348 materials.

349

350 **Objective 5.**

351 **Work toward the goal of maintaining or improving air quality in the community**

352 5.1 City will evaluate its current ordinances and policies that affect air quality to see if
353 improvements can be made.

354 5.2 Educate the businesses and residents on alternatives that can provide better air quality, such
355 as encouraging the planting of perennials and groundcover, reducing lawn size, which leads
356 to less frequency of use of gasoline-powered lawn mowers.

357

358 **Objective 6.**

359 **Minimize negative noise impacts within the community.**

360 6.1 City will review ordinances and policies related to noise to see if improvements can be
361 made.

362

363 **Objective 7.**

364 **Increase the density of the community's urban forest.**

365 7.1 The City will develop a forestry policy that addresses protection or replacement of significant
366 trees on developing lands and standards for tree species and location within and near public
367 right-of-way and easements.