Natural resource protection is an important component of Scandia's vision, goals, and policies. Protecting natural resources does not, however, preclude development or other land activities. The presence of important natural features, resources, or systems will shape the way that development occurs, but does not change the preferred type of development or activity as shown the future land use map. The Natural Resource Priority Overlay shows areas where important natural features are located so that Scandia can make appropriate decisions on how to fulfill the vision shown on the future land use map while minimizing the risk to priority natural resources.

As shown on the overlay map, natural features are present in most of the City. Some areas, however, have multiple natural features or particularly high quality features and show a higher priority level. The Overlay shows a gradient of priorities for natural features ranging from a score of 4 to a score of 38. The method for computing the score is described below.

How was the overlay created?

Step 1 The Comprehensive Plan Committee identified eight natural features that should shape the way that land is used or developed:

1. Rivers and streams
2. Lakes
3. Wetlands
4. Groundwater
5. Significant natural areas/habitat
6. Existing and potential corridors
7. Steep slopes
8. Soils

Step 2 Key measurable characteristics for each natural feature were identified based on input from public meetings, focus groups, and Comprehensive Plan Committee discussions. Example: Four characteristics of lakes were identified: water quality, potential benefit of restoration, shoreland area, and slopes and bluffs near lakes.

Step 3 A point system was used to identify high priority areas using the matrix developed in Step 1. Example: Lakes with higher water quality received more points than those with average or low water quality.

Step 4 A map was created for each natural feature showing high priority areas (more points) and lower priority areas (less points).

Step 5 All the maps were layered on top of one another. A composite point score was calculated for each location by adding up the scores for each natural resource present. In this way, the Comprehensive Plan Committee determined which places have the highest priority for natural resource protection overall. Example: A location that is near a high quality lake, in a wetland and that offers high quality wildlife habitat combines all the points from each natural feature and is rated higher than an area that is near a lake but is not a wetland or a habitat area.

The following pages include the detailed matrix for each natural feature and the individual priority maps for each feature.

Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking			
1. Surface Water – Rivers and streams		**A. Type of streams**	**B. Tributary streams to the St. Croix River**	**C. Shoreland area adjacent to the St. Croix River**	**D. Slopes and bluffs near rivers and streams**
	Most Important	Land areas within 300' of DNR designated trout streams	Land areas within 100' of tributary streams to St. Croix River	Land areas within 100' of St. Croix River	Area with greater than 18% slope within 300' of river or stream
	Important	Land areas within 300' of perennial non-trout streams	Land areas between 100' and 200' of tributary streams to St. Croix River	Land areas between 100' and 200' of St. Croix River	Area with 12% to less than 18% slope within 300' of river or stream
	Of Concern	Land areas within 300' of intermittent non-trout streams	Land areas between 200' and 300' of tributary streams to St. Croix River	Land areas between 200' and 300' of St. Croix River	Area with 10 % to less than 12% slope within 300' of river or stream
	Ecological Rationale/	Land uses near streams have an impact on stream water quality and in particular on the cool temperature required for trout habitat. Vegetation near trout streams should provide shade and runoff should infiltrate rather than runoff into the stream.	The closer structures are to the water, the more impact runoff has on the water, the more distant structures are the more runoff will infiltrate before going into the water.	The closer structures are to the water, the more impact runoff has on the water, the more distant structures are the more runoff will infiltrate before going into the water.	Runoff carries pollutants, sediments, increased volume and heat into rivers and streams and decreases water quality. If not vegetated or if disturbed, sloped areas near water cause higher velocity and more polluted runoff.
	Data Source	DNR Trout Streams – From DNR Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L260000240202 TROUT_FLAG > 0	EOR Inc. shapefile spring_survey_streams.shp from field survey 2007	Spatial Analyst derived distance from St Croix River feature in DNR Lakes layer from Data Deli. http://deli.dnr.state.mn.us/metadata.html?id=L260000062101	Slope derived using Spatial Analyst from DNR 30m Digital Elevation Model from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L390005620606

Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking			
2. Surface Water – Lakes		**A. Lakes with existing high water quality**	**B. Priority lakes to restore to high quality**	**C. Shoreland area adjacent to lakes**	**D. Slopes and bluffs near lakes**
	Most Important	Lakes with a water quality rating of A or B	Lakes classified as Recreational Development (RD) lakes with a water quality rating of B, C, or D	Land areas within 300' of ordinary high water level (OHWL)	Area with greater than 18% slope within 1000' of a lake
	Important			Land areas between 300' and 600' of ordinary high water level (OHWL)	Area with 12% to less than 18% slope within 1000' of a lake
	Of Concern			Land areas between 600' and 1000' of ordinary high water level (OHWL)	Area with 10 % to less than 12% slope within 1000' of a lake
	Ecological Rationale	Maintaining high water quality and preventing degradation is important ecologically and economically.	Priority given to lakes with recreational use and value (2 RD lakes also rated C or D quality.)	The closer structures are to the water, the more impact runoff has on the water, the more distant structures are the more runoff will infiltrate before going into the water.	Runoff carries pollutants, sediments, increased volume and heat into rivers and streams and decreases water quality. If not vegetated or if disturbed, sloped areas near water cause higher velocity and more polluted runoff.
	Data Source	EOR, Inc. water quality assessment rating for lakes.	DNR Public Waters Inventory basin delineations shapefile from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L390002020201	Spatial Analyst derived distance from DNR 24k lake polygons from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L260000062101	Slope derived using Spatial Analyst from DNR 30m Digital Elevation Model from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L390005620606 and within distance of 24k lake polygons http://deli.dnr.state.mn.us/metadata.html?id=L260000062101

Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking		
3. Wetlands		**A. Wetland quality**	**B. Relationship to wetland complex**	**C. Wetland buffer area**
	Most Important	High quality, native vegetation; high wetland functionality (M_34X = AB or B)	Part of an integrated wetland complex – one or more adjacent wetland areas	Land within 200 feet of a high quality (AB or B rating) wetland
	Important	Medium quality, native vegetation; some invasive species; medium wetland functionality (M_34X = BC or C)	In near proximity to wetland complex – wetland areas within 500' of another wetland	Land within 100 feet of a medium quality (BC or C rating) wetland
	Of Concern	More invasive species; low wetland functionality (M_34X = CD or D)	Isolated wetland – wetland area not within 500' of another wetland	Land within 50 feet of wetlands with CD or D rating
	Ecological Rationale	Wetlands with high level of functionally and few invasive species are more valuable as green infrastructure for stormwater management, groundwater infiltration, and habitat protection.	Wetlands that are part of a complex are generally more valuable as natural resource corridors and habitat than isolated wetlands.	Land adjacent to a wetland provides buffering benefits from stormwater and to sustain plant and animal habitat. Recommended buffer widths for protecting wetland functions range from 50 to 200 feet depending on sensitivity and quality.
	Data Source	MLCCS data from MetroGIS http://www.datafinder.org/metadata/mndnr_lulc_mlccspy3.htm and CMSCWD wetland assessment shapefile cmwd_mnram_11oct06.shp		

4. Groundwater		**A. Sensitivity to pollution**	**B. Groundwater sensitive resources**
	Most Important	Very high and high sensitivity	Seepage swamps
	Important		
	Of Concern		
	Ecological Rationale	Managing groundwater quality requires attending to those areas where groundwater is sensitive to polluting land uses or activities.	Seepage swamps demonstrate places where groundwater is close to ground level and is exposed to risk from land uses or land activities.
	Data Source	MGS sensitivity of the Prairie du Chien Aquifer to pollution, from MetroGIS http://www.datafinder.org/metadata/wash_pduchein_sens.htm	MLCCS data from MetroGIS http://www.datafinder.org/metadata/mndnr_lulc_mlccspy3.htm Queried for seepage wetland types in field C_TEXT.

Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking		
5. Ecologically Significant Sites/ High Quality Natural Areas		**A. Sites of Biodiversity Significance from the County Biological Survey**	**B. Regionally Significant Ecological Areas**	**C. High quality natural areas**
	Most Important	CBS sites classified as "outstanding" or "high"	RSEA sites with an ecological score of "outstanding"	MLCCS natural areas with a quality ranking of "high"
	Important	CBS sites classified as "moderate"	RSEA sites with an ecological score of "high"	MLCCS natural areas with a quality ranking of "medium"
	Of Concern	CBS sites classified as "below" (A classification of "below" still indicates meaningful significance)	RSEA sites with an ecological score of "moderate"	MLCCS natural areas with a quality ranking of "low"
	Ecological Rationale	The CBS identifies high quality, unique plant communities and remnants.	Regionally significant sites include habitat or plant communities that are unusual within the region, and important in order to maintain biological diversity.	The MLCCS identifies the quality of every type of land cover.
	Data Source	DNR Sites of Biodiversity Significance from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L250000170201	DNR Regionally Significant Ecological Areas from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L390002900201	MLCCS data from MetroGIS http://www.datafinder.org/metadata/mndnr_lulc_mlccspy3.htm Queried quality in field M_34X. High quality are "AB" or "B"; Medium quality are "BC" or "C"; Low quality are "CD" or "D".

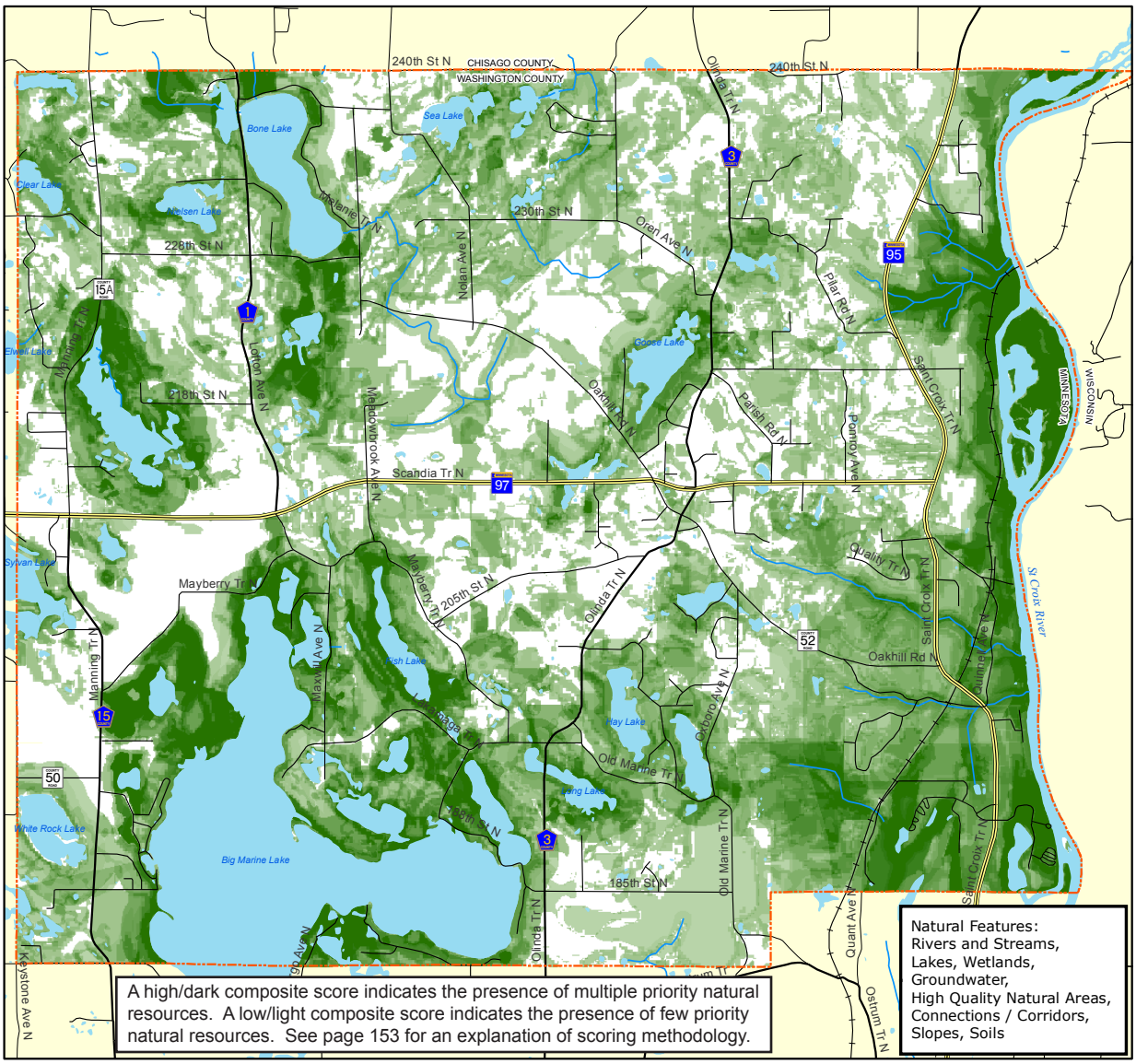
Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking	
6. Connections/ Corridors		**A. Connections among natural resource complexes**	**B. Parks, trails, and protected areas**
	Most Important	High quality natural area, lake, river, stream, or wetland within 1/8 mile (660') of another such feature	Existing parks and protected trail corridors (Trail corridors outside road ROWs)
	Important	High quality natural area, lake, river, stream, or wetland 1/8 to ¼ mile of another such feature	Areas protected by a conservation easement, not a park or trail.
	Of Concern	High quality natural area, lake, river, stream, or wetland ¼ to ½ mile of another such feature	
	Ecological Rationale	Natural features that are close in proximity are more likely to serve as corridors for animal and plant habitat, and more likely to have core habitat features	Parks, and trails provide opportunities for human connectivity. Conservation easements provide visual connectivity.
	Data Source	MLCCS data from MetroGIS http://www.datafinder.org/metadata/mndnr_lulc_mlccspy3.htm ; CMSCWD wetland assessment shapefile cmwd_mnram_11oct06.shp, EOR, Inc. water quality assessment rating for lakes, Stream connections from MetroGIS Stream Network http://www.datafinder.org/metadata/stream_net_l.htm	Park and trail information from 2006 Park, Trails, Recreation, and Open Space Plan. Conservation easements include a variety of easement programs including NPS, Mn Land Trust, Agricultural, RIM.

7. Slopes		**A. Steepness**
	Most Important	Has 100 feet or more of contiguous slope greater than 18%
	Important	Has 100 feet or more of contiguous slope greater than 12%
	Of Concern	
	Ecological Rationale	The steepness of slopes is a strong indicator of risk to waterbodies and adjacent natural areas if vegetation is disturbed, and is more likely to be visually prominent and contribute to rural character.
	Data Source	Slope derived using Spatial Analyst from DNR 30m Digital Elevation Model from Data Deli http://deli.dnr.state.mn.us/metadata.html?id=L390005620606

Natural Feature	Priority Ranking	Characteristics for Use in Priority Ranking			
8. Soils		**A. High-quality agricultural soils**	**B. Erodible soils**	**C. Soils with limitations for septic systems**	**D. Shallow depth to bedrock**
	Most Important	Prime Agricultural Soils	Highly erosive soils	Soil map units with "very limited" ratings in at least two of the three fields, with the third optionally being "moderately limited"	Less than 100 feet to bedrock
	Important	Other Farmland Soils	Moderate to highly erosive soils	Soil map units with "very limited" ratings in two of the three fields, with the third being "slightly limited" (in all cases Mounds)	
	Of Concern	Pasture	Low to moderately erosive soils	Soil map units with "moderately limited" ratings in at least two of the three fields, with the third optionally being "very limited"	
	Ecological Rationale	Certain soils and ground cover serves as an asset to agricultural practices and rural character.	Soil that is more prone to erosion is less suitable for development and poses a higher risk to water quality if vegetation is disturbed.	Soils poorly suited for septic systems will limit development opportunities.	Soils serve as a filter for groundwater recharge.
	Data Source	MetroGIS prime ag soils derived from NRCS SSURGO data http://www.datafinder.org/metadata/prime_ag_soil_a.htm	NRCS – erodibility not identified in Washington County soils data, layer not created.	NRCS Washington County soils survey. Three data fields were used – septic ratings for Trench (drainfields, pressure beds), At Grade, and Mounds.	MGS data available from LMIC data clearinghouse http://www.lmic.state.mn.us/chouse/metadata/dpthbdrk.html

Map 32 - Natural Resource Priorities : Composite

City of Scandia 2008-2030 Comprehensive Plan



Natural Resource Priorities: Composite

Roads
- State Highway
- County Highway
- City Road
- Other Road

- City Boundary
- Open Water
- Streams

Composite Score
- High : 41
- Low : 0

N
W E
S

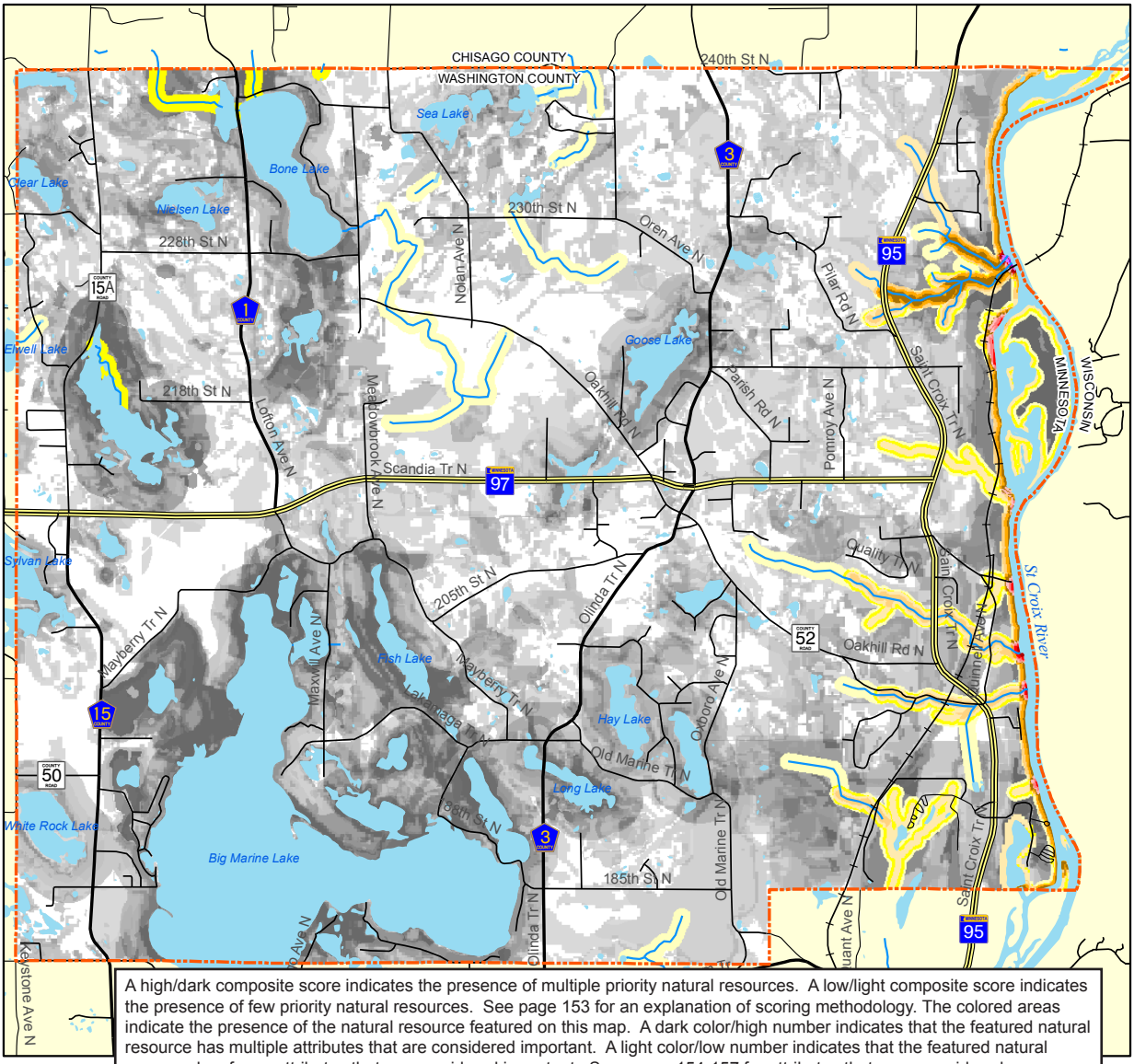
0 0.5 1
Miles

Data Sources:MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

June 21, 2008

Map 33 - Natural Resource Priorities : Rivers and Streams

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Rivers and Streams

- City Boundary
- Open Water
- Streams

Roads
- State Highway
- County Highway
- City Road
- Other Road

Composite Score
- High : 38
- Low : 0

Rivers and Streams Score
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

N W E S

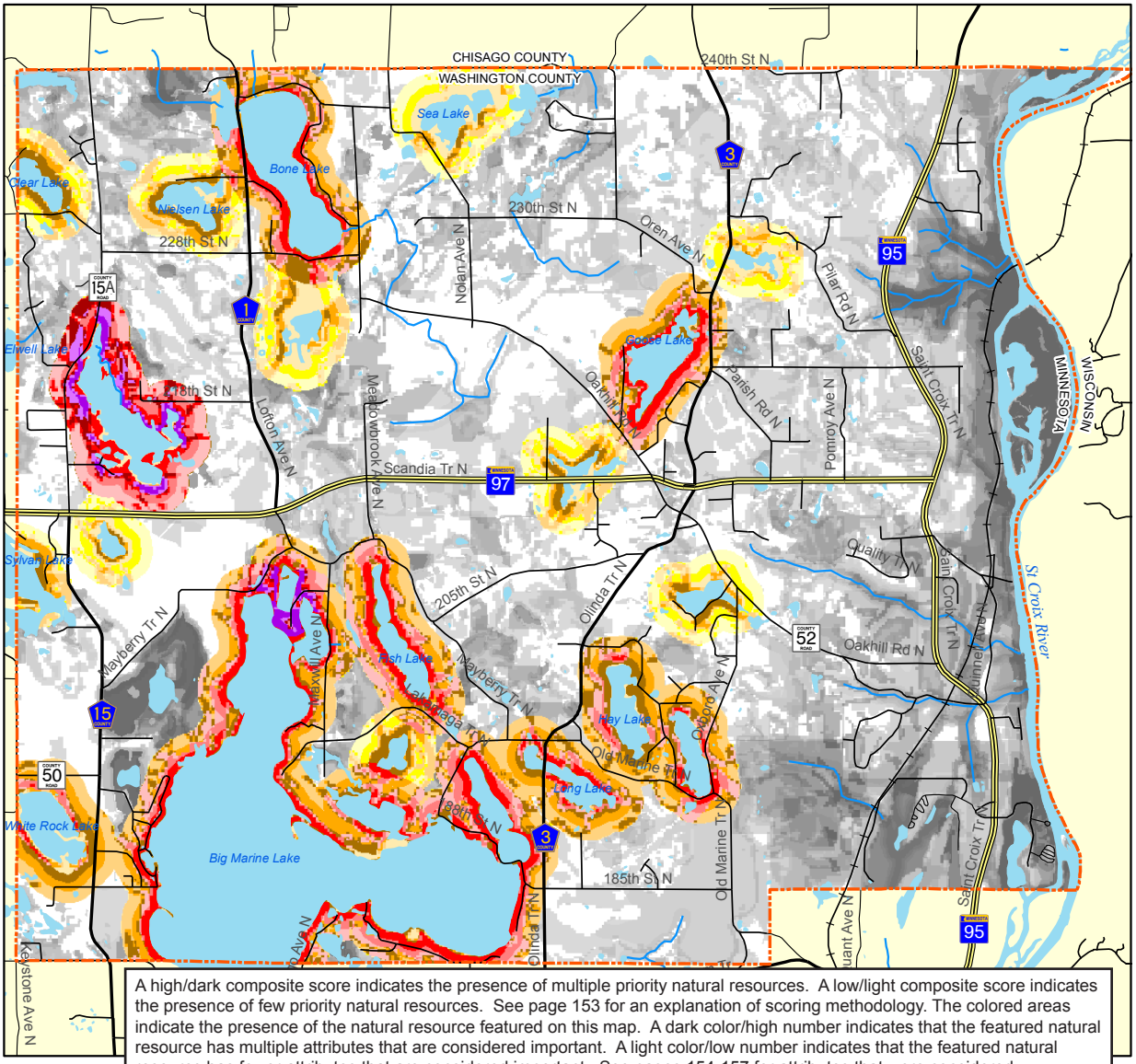
0 0.5 1
Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 34 - Natural Resource Priorities : Lakes

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Lakes

- City Boundary
- Roads
  - State Highway
  - County Highway
  - City Road
  - Other Road
- Open Water
- Streams

Composite Score

High : 38

Low : 0

Lakes Score

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

N W E S

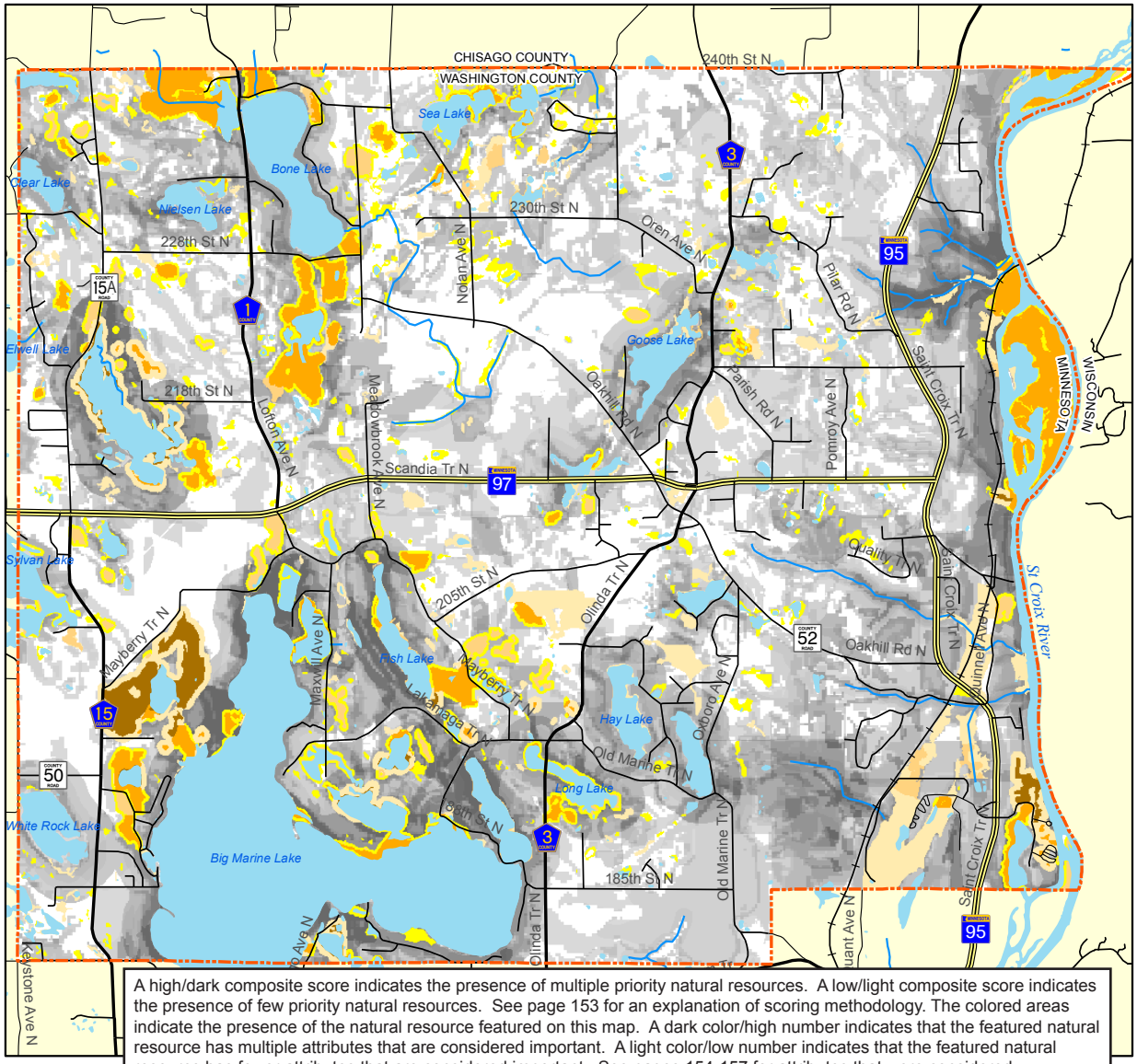
0 0.5 1 Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 35 - Natural Resource Priorities : Wetlands

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Wetlands

City Boundary

Roads
- State Highway
- County Highway
- City Road
- Other Road

Open Water

Streams

Composite Score
- High : 38
- Low : 0

Wetlands Score
- 1
- 2
- 3
- 4
- 5
- 6

N W E S

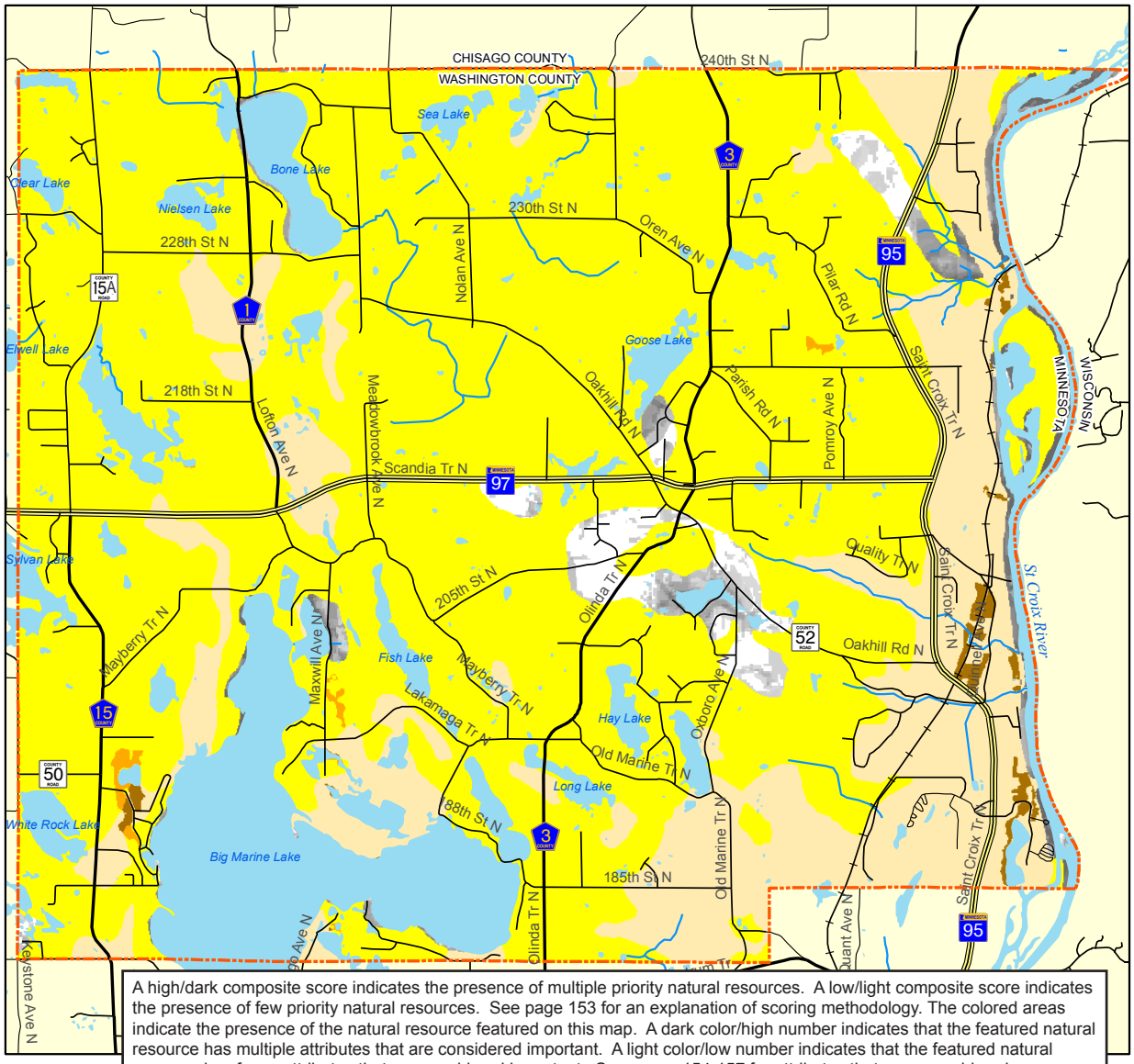
0 0.5 1
Miles

Data Sources:MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 36 - Natural Resource Priorities : Groundwater

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Groundwater

- City Boundary
- Roads
  - State Highway
  - County Highway
  - City Road
  - Other Road
- Open Water
- Streams

Composite Score

High : 38

Low : 0

Groundwater Score

1
2
3
4
5
6

N
W E
S

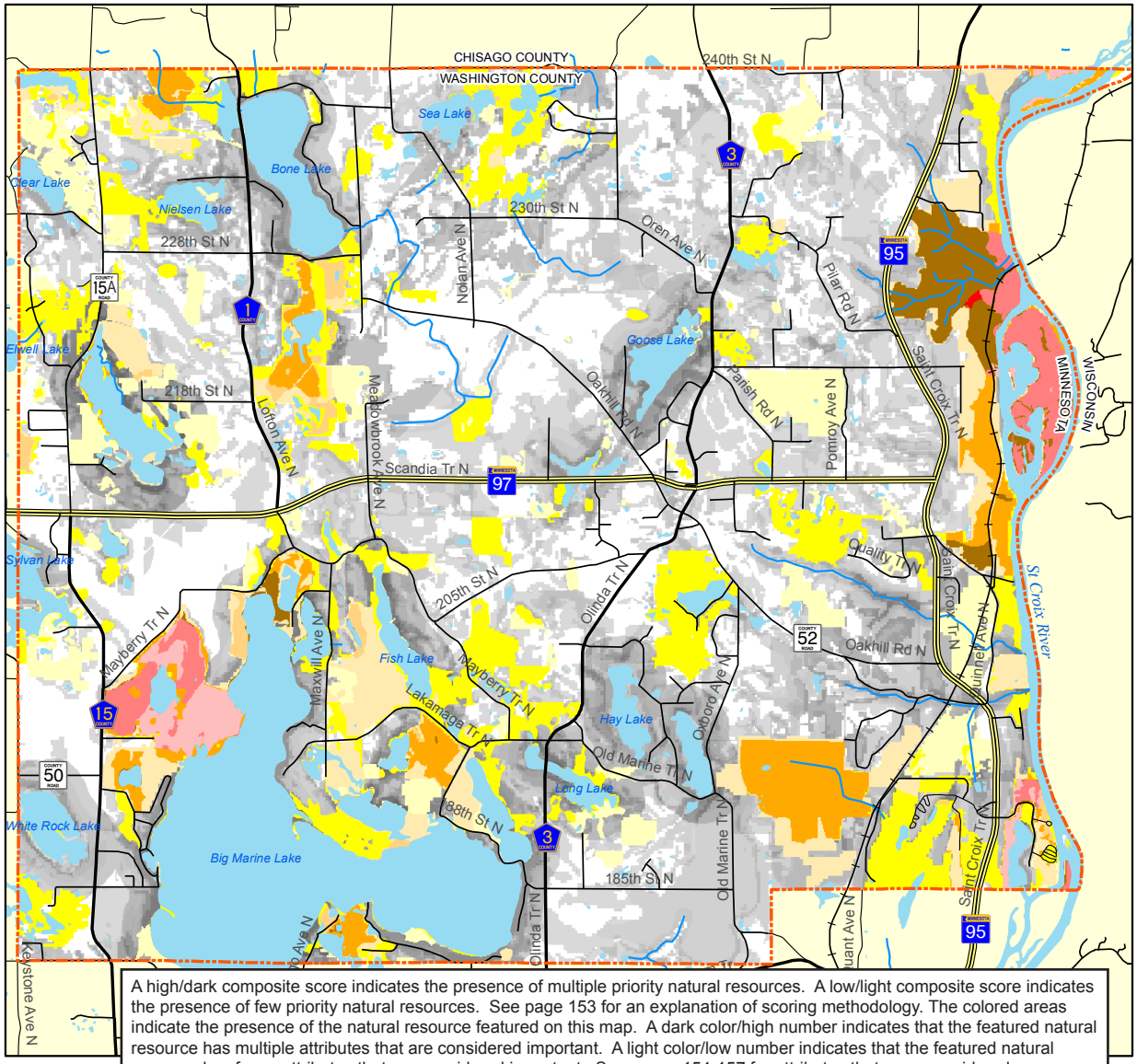
0 0.5 1
Miles

Data Sources:MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 37 - Natural Resource Priorities : Ecology / High Quality Areas

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Ecology / High Quality Areas

City Boundary

Roads

State Highway

County Highway

City Road

Other Road

Open Water

Streams

Composite Score

High : 38

Low : 0

Ecology Score

1, 2, 3, 4, 5, 6, 7, 8, 9

N W E S

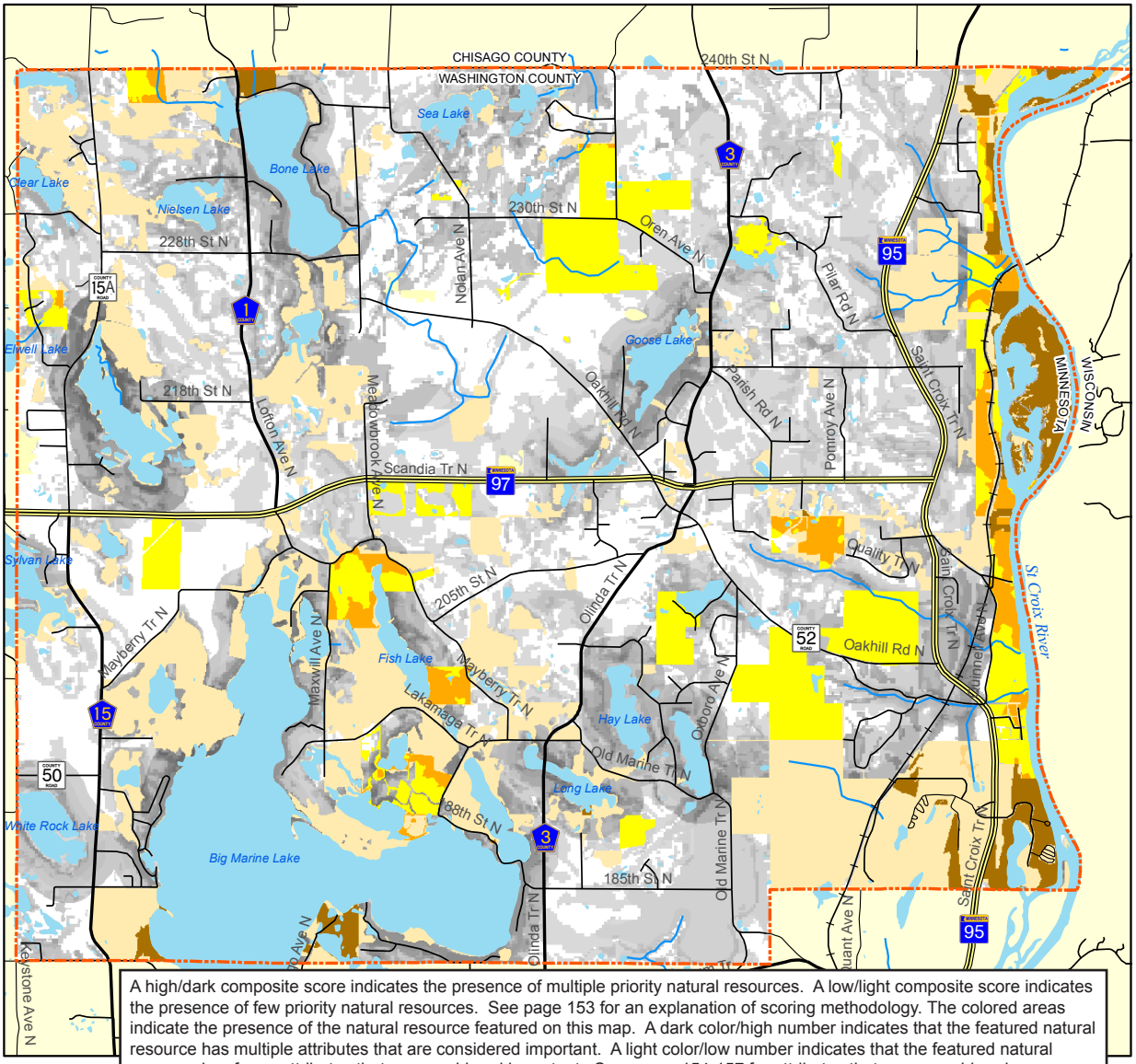
0 0.5 1 Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 38 - Natural Resource Priorities : Corridors and Connections

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Corridors and Connections

- City Boundary
- Open Water
- Streams

Roads
- State Highway
- County Highway
- City Road
- Other Road

Composite Score
- High : 38
- Low : 0

Corridors Score
- 1
- 2
- 3
- 4
- 5
- 6

N W E S

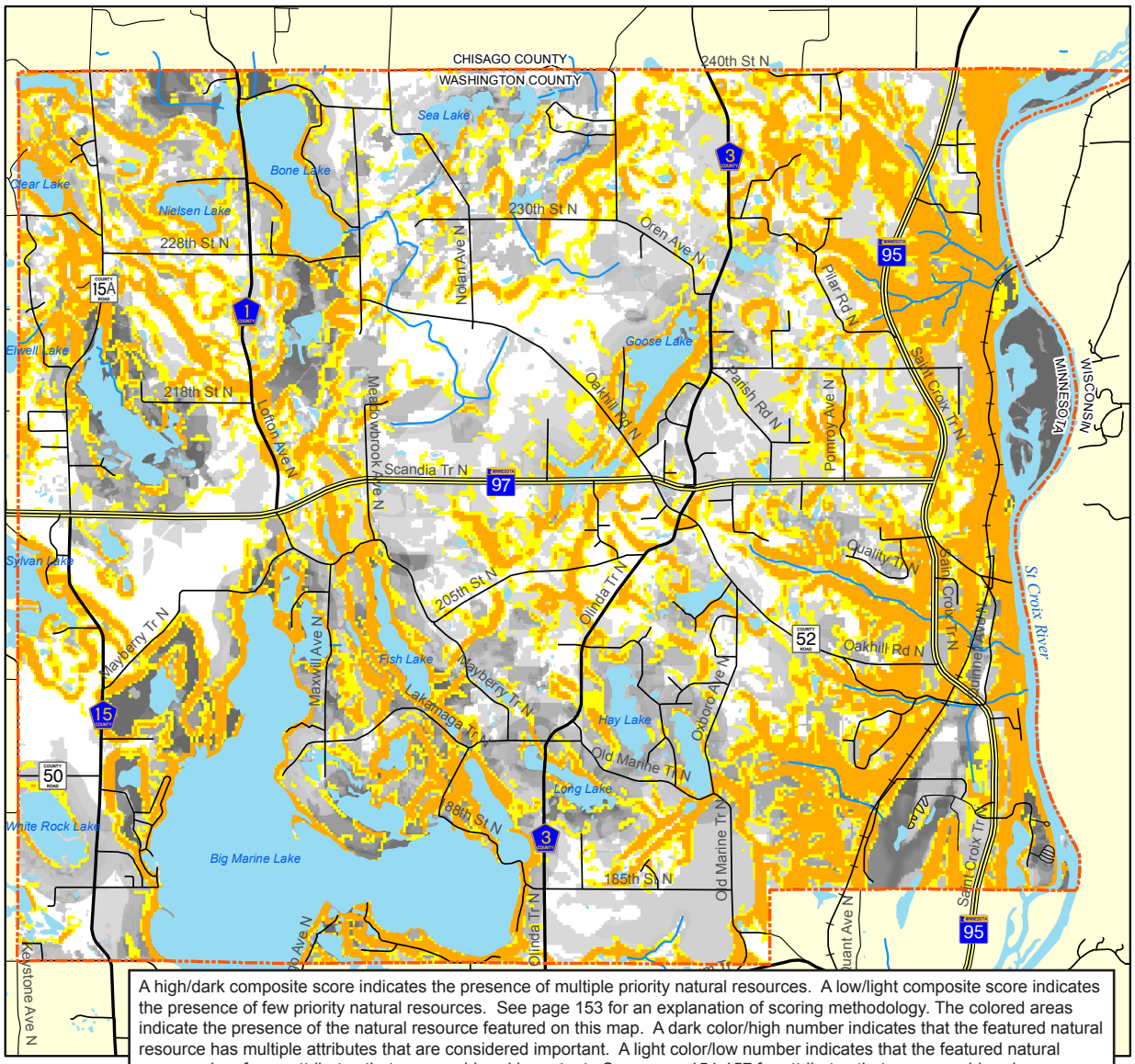
0 0.5 1
Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 39 - Natural Resource Priorities : Steep Slopes

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Steep Slopes

City Boundary

Roads

State Highway

County Highway

City Road

Other Road

Open Water

Streams

Composite Score

High : 38

Low : 0

Slopes Score

2

3

N
W E
S

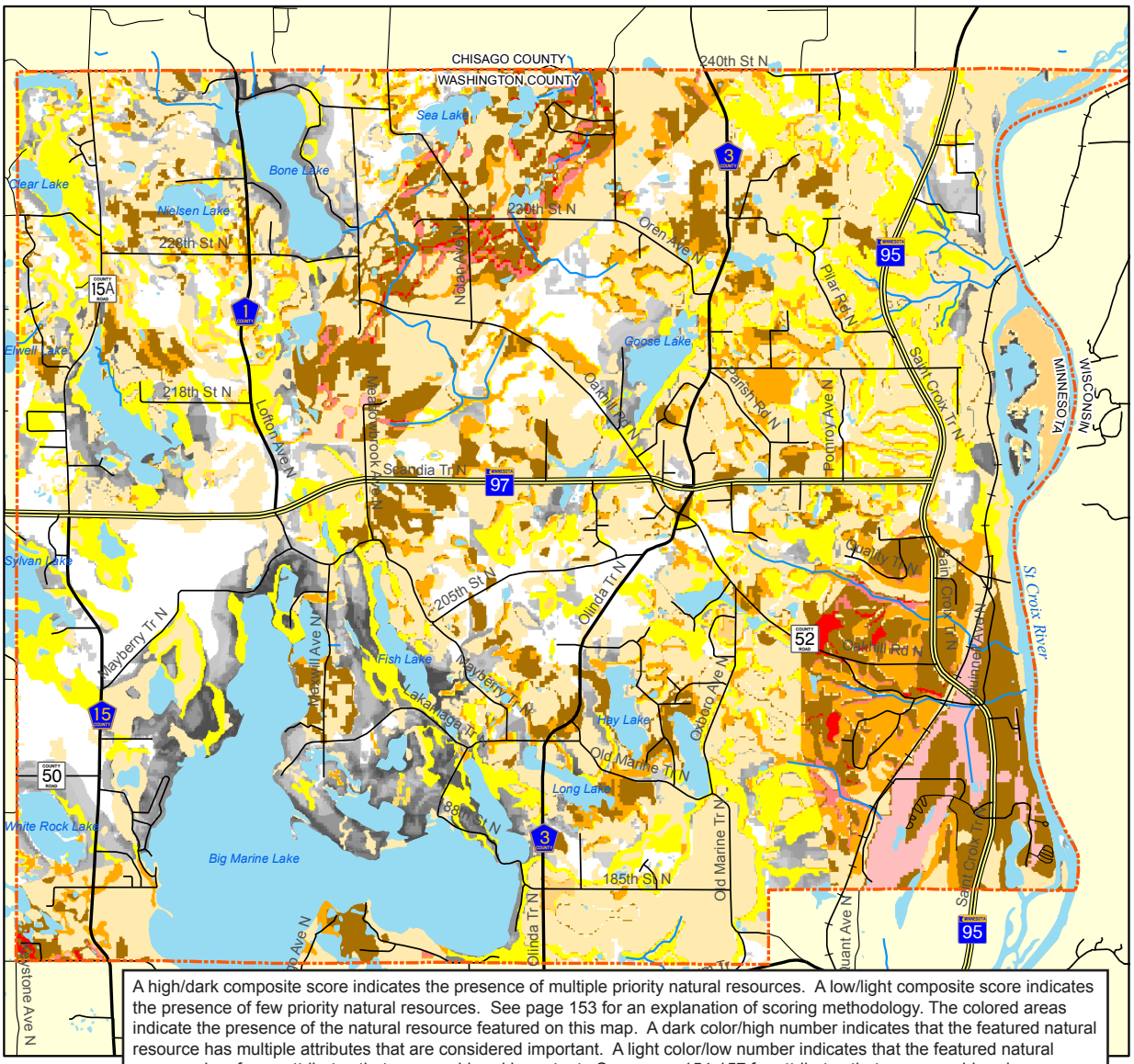
0 0.5 1
Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

May 31, 2008

Map 40 - Natural Resource Priorities : Soils

City of Scandia 2008-2030 Comprehensive Plan



A high/dark composite score indicates the presence of multiple priority natural resources. A low/light composite score indicates the presence of few priority natural resources. See page 153 for an explanation of scoring methodology. The colored areas indicate the presence of the natural resource featured on this map. A dark color/high number indicates that the featured natural resource has multiple attributes that are considered important. A light color/low number indicates that the featured natural resource has fewer attributes that are considered important. See pages 154-157 for attributes that were considered.

Natural Resource Priorities: Soils

- City Boundary
- Roads
  - State Highway
  - County Highway
  - City Road
  - Other Road
- Open Water
- Streams
- Composite Score
  - High : 40
  - Low : 0

Soils Score

1, 2, 3, 4, 5, 6, 7, 8, 9

N W E S

0 0.5 1 Miles

Data Sources: MN DNR, Metropolitan Council, EOR Inc, UMRBA, MGS CMWD, CR Planning

June 21, 2008