

Chapter 3. Natural Features

The City of Zeeland is full of green spaces and waterways. There are some areas within the City that have larger, older trees. The existing streams, wetlands, and open spaces add serenity and beauty. Preserving these features along with protecting water quality, providing habitats for plants and wildlife, and creating spaces where people can commune with nature are important in creating a balanced quality of life for residents.

Hydrology

Streams & Drains

The City of Zeeland is heavily influenced by several local creeks and drains. The largest drains are the Boone Drain and the Bosch and Hulst Drain (also referred to locally as the Black River) which both empty into the Macatawa River. The Macatawa River is the most significant waterway in the area, and is located southwest of the City, as shown on Map 1. Historically, the drains were built to drain swampy land for farming in the Holland and Zeeland areas. In the far western portion of the City, bridges have been built over drains, impacting the street network and neighborhood accessibility. A County drain may be an open ditch, stream, underground pipe, retention pond, or swale that conveys stormwater. An essential component of the development review process is to incorporate any County drain into the design of the development to ensure adequate stormwater management, erosion control, and water quality.

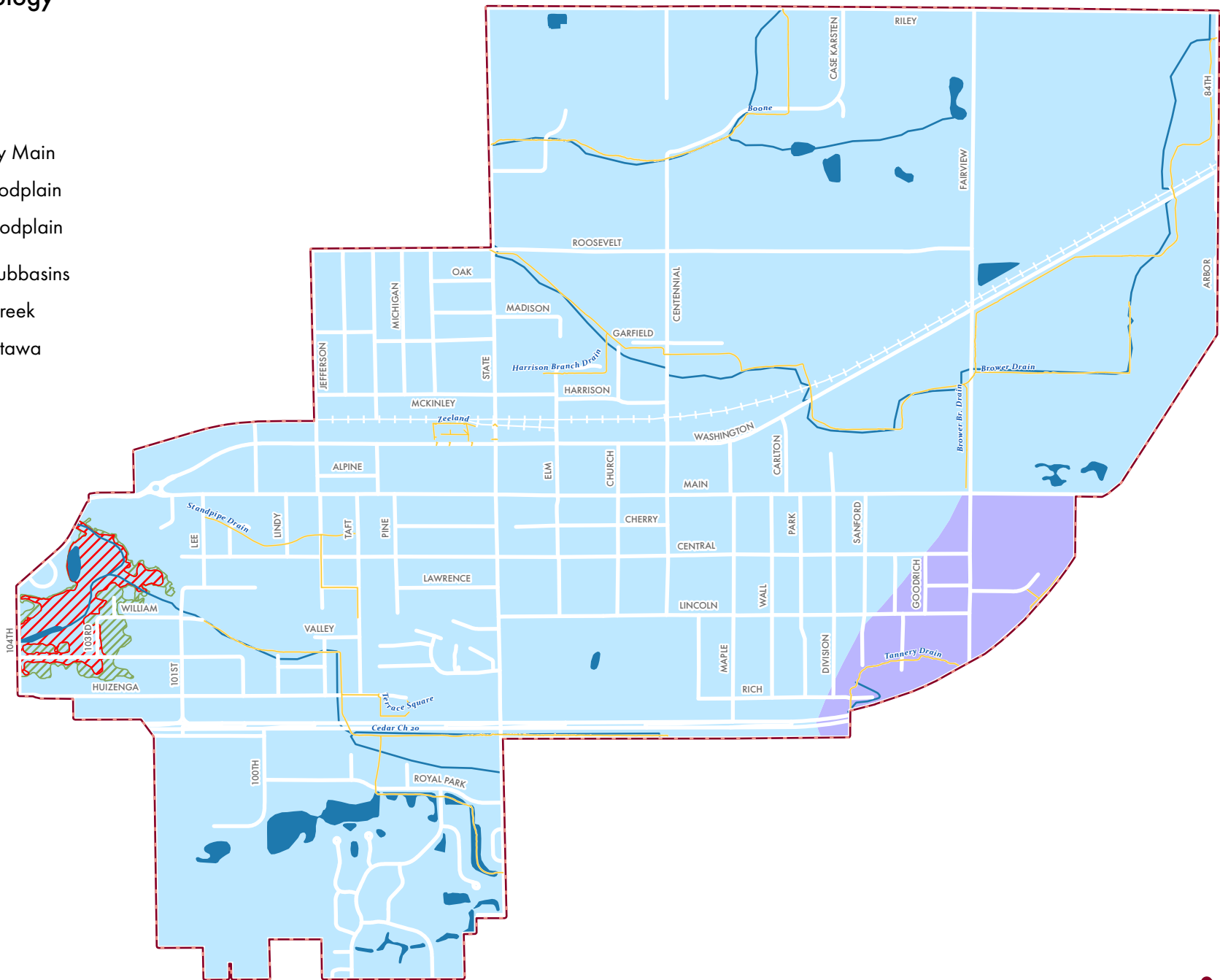
A series of man-made ponds and former gravel pits are south of Business Loop I-196 and provide water views to residents in the Rest Haven/Royal Park neighborhood and Huizenga Park. Zeeland is also located close to Lake Macatawa and Lake Michigan which allows residents to live in close proximity their magnificent shorelines and recreational opportunities.

Map 1: Hydrology

- Lakes
- Streams
- Storm Gravity Main
- 100-year floodplain
- 500-year floodplain

Major Watershed Subbasins

- Noordelos Creek
- Upper Macatawa



Huizenga Park Pond and the Black River that flows under the Paw Paw Foot Bridge are popular fishing destinations. The water features support numerous small pan fish species. The parks are also home to a variety of bird, insect, and small mammal species.

Watershed

Nearly all the City of Zeeland is located within the Macatawa Watershed, as shown on Map 1. The Macatawa River flows west through Zeeland Township and south of the City of Zeeland, where it is joined by several large tributaries from the south in short succession, including Peters Creek, the South Branch of the Macatawa River, and the North Branch of the Macatawa River. The main branch continues to flow through the southern part of Holland Township, where it is joined by Noordelos Creek, the largest tributary from the north. The City is home to two watershed subbasins: the Upper Macatawa River and the Noordelos Creek.

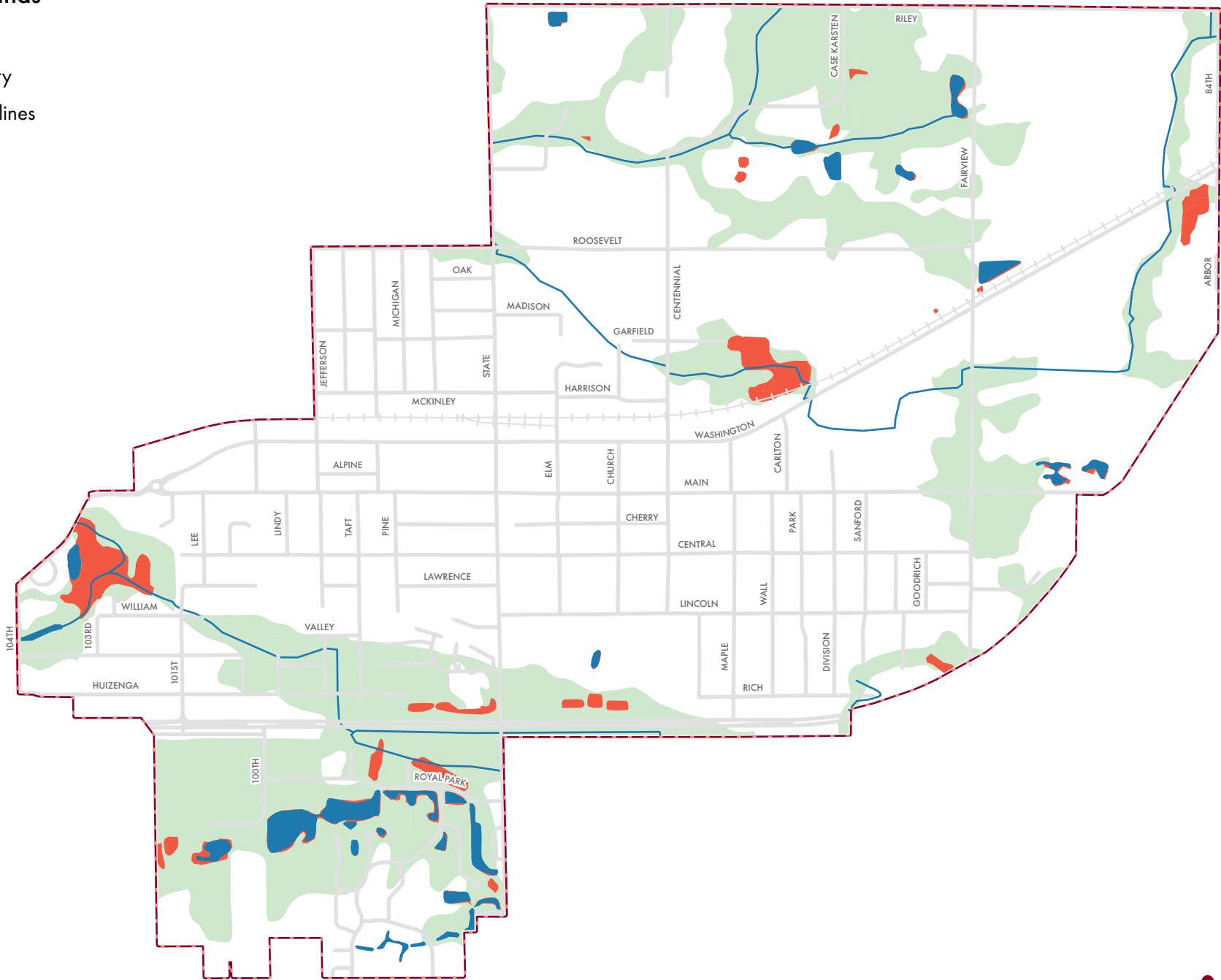
Wetlands

Map 2 identifies wetlands areas and hydric soils, which also support wetland vegetation, within the City of Zeeland. Many areas with hydric soils are along streams and drains. There are a notable amount of wetland and hydric soil areas within the community. Michigan's wetland statute, Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, defines a wetland as "land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh." The definition applies to public and private lands regardless of zoning or ownership.

Any development review in the City should take into account wetlands on or near the site. Wetlands and areas with hydric soils are also an important habitat for some of Michigan's unique flora and fauna. These locations can also support stormwater and/or flood management within the City. As these areas have soils where water may pool after precipitation events, using the natural systems may help manage the water within the City's limits.

Map 2: Wetlands

- City Boundary
- Street Centerlines
- Lakes
- Streams
- Wetlands
- Hydric Soil



Soils

HYDRIC SOILS

As shown on Map 3, soils within the City consist primarily of hydric soils and non-hydric soils containing hydric inclusions. Hydric soils develop under conditions of prolonged saturation, flooding, or ponding during the growing season, resulting in anaerobic (oxygen-deficient) conditions in the upper soil profile. These soils are commonly associated with wetlands and support wetland vegetation. Within the City, hydric soils are generally concentrated along the Macatawa River basin, adjacent to drainage features, and in the southern portion of the community.

NON-HYDRIC SOILS

Non-hydric soils with hydric inclusions are found throughout much of the City. This soil classification includes small areas of hydric soils that are too small to be mapped separately but are present within larger areas of non-hydric soils. Development on hydric soils is subject to significant constraints, particularly for building foundations and septic systems. However, where adequate drainage is provided development may be permitted.

SOILS & DRAINAGE

Given the extent of wetland areas within the City, identifying locations with soil drainage limitations is important. Soil drainage characteristics vary considerably and influence how quickly water infiltrates the soil. Drainage rates directly affect runoff volume and the formation and persistence of wetlands. In areas with poor drainage, water tends to accumulate on the soil surface, creating conditions that can limit development potential and agricultural productivity.

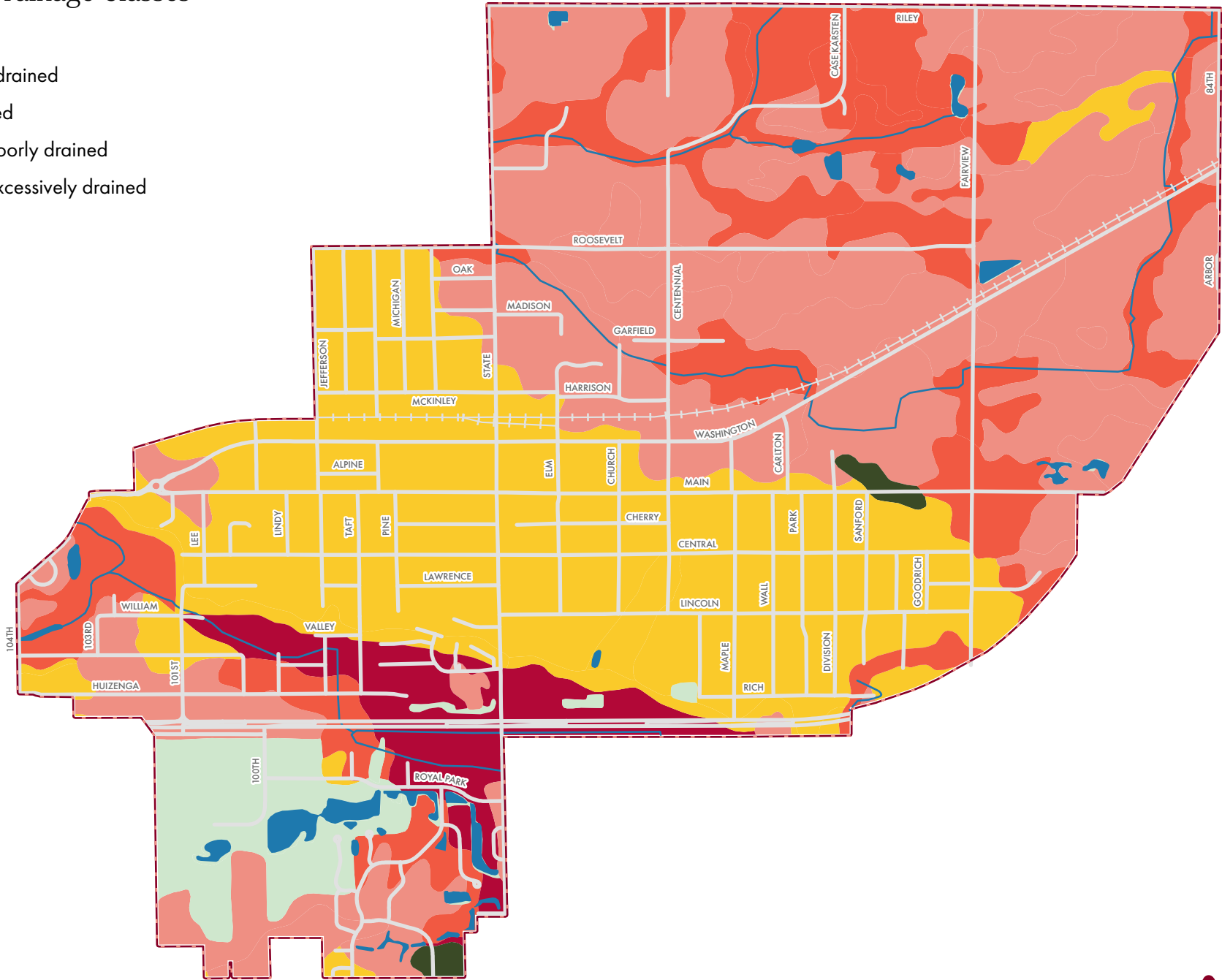
The distribution of soil drainage classes is shown on Map 3. A comparison of Map 3 and Map 2 reveals a correlation between the locations of hydric soils and areas classified as “Very Poorly Drained” and “Poorly Drained,” reflecting the wet conditions commonly associated with these soil types.

The classes that are found in the City of Zeeland are as follows:

Very poorly drained. Water is removed from the soil slowly, and water remains at or very near the surface during much of the growing season.

Map 3: Soil Drainage Classes

- Very poorly drained
- Poorly drained
- Somewhat poorly drained
- Somewhat excessively drained
- Well drained
- No data



Unless the soil is artificially drained, many crops cannot be grown. The soils are commonly level or depressed and ponding frequently occurs.

Poorly drained. Water is removed slowly, and the soil remains wet for long periods. Unless the soil is artificially drained, many crops cannot be grown.

Somewhat poorly drained. Water is removed slowly, and the soil is wet at a shallow depth for significant periods during the growing season. Wetness markedly restricts the growth of many agricultural crops unless drainage is provided.

Well drained. Water is removed from the soil readily but not rapidly. Water is available to plants throughout most of the growing season in humid regions. Wetness does not affect growth for significant periods during most growing seasons.

Somewhat excessively drained. Water is removed from the soil rapidly. The soils are commonly coarse-textured.

No data. There is no soil drainage data for this area.

Topography

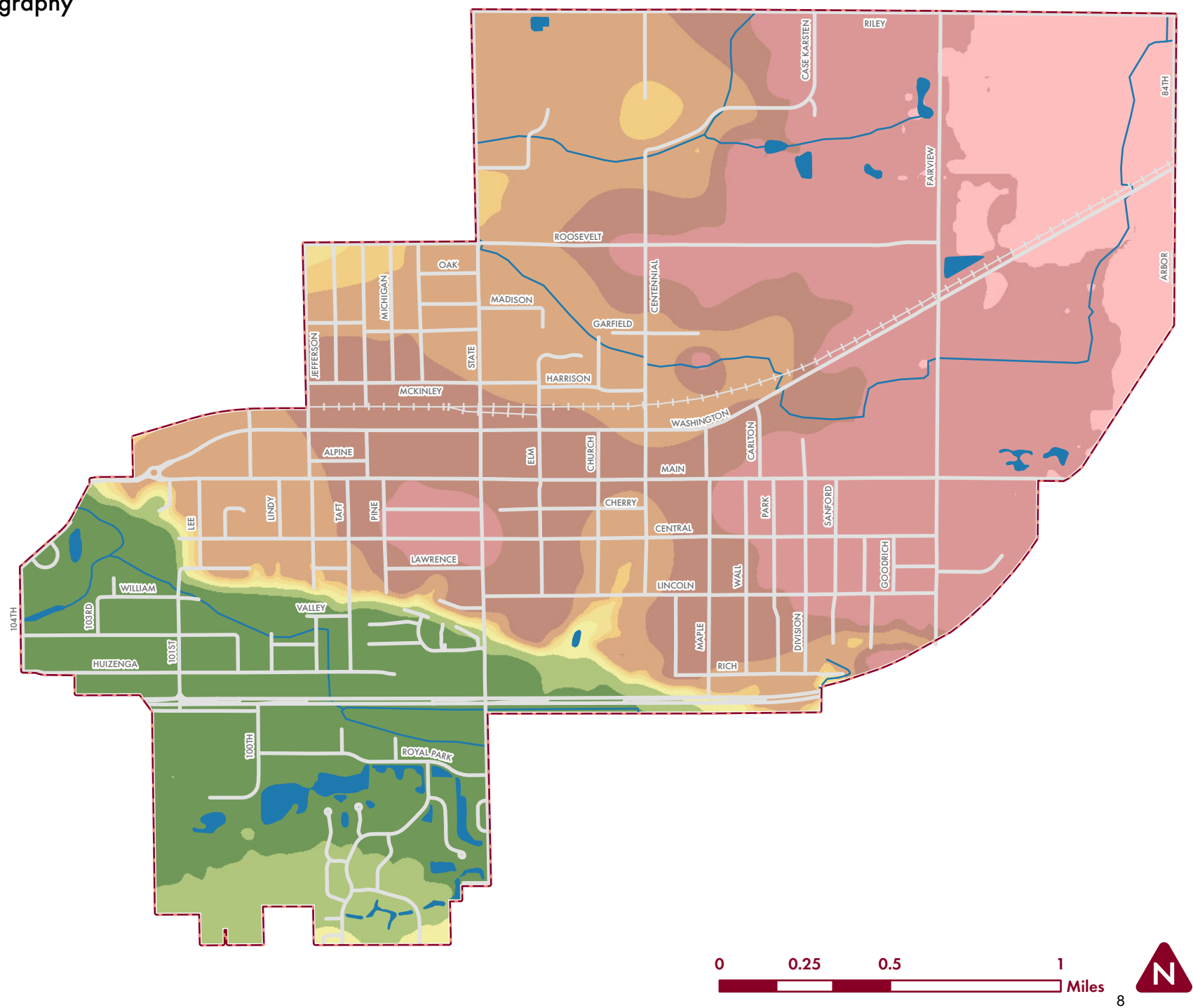
The topography of the City varies between a flat landscape and gently rolling hills. As shown in Map 4, the southern portion of the City is lower in elevation and is essentially flat. The central and northern part of the City has more grade changes and is at a higher elevation. There is a stark ridge line within the City that is located just north of Chicago Drive/Business I-196. This is a key landmark, and has a sense of setting neighborhoods apart in this area of the City. Other grade changes are sometimes associated with rivers and drains, including the Macatawa ridge running northwest from the City of Zeeland into Olive Township.

Climate

Lake Michigan has a strong influence on the local climate year round. Westerly winds combined with water temperature create “lake effect” weather events like snow falls, rain storms, relatively warmer breezes in the winter and cooling breezes in the summer. The summers are warm and partly cloudy, and the winters are freezing, windy, and mostly cloudy. Over the course of the year, the temperature typically varies, from 19

Map 4: Topography

- Topo
- Elevation (in feet)
- 1 - 617
 - 618 - 629
 - 630 - 635
 - 636 - 638
 - 639 - 640
 - 641 - 643
 - 644 - 649
 - 650 - 660
 - 661 - 681



degrees Fahrenheit to 82 degrees Fahrenheit and is rarely below 5 degrees or above 89 degrees.

Vegetation Cover

The City of Zeeland is a mature residential community. Many streets and yards contain mature vegetation like large deciduous and coniferous trees and large shrub masses. Lawrence Street Parks and Huizenga and Paw Paw Foot Bridge have well established shade trees and naturalized areas. The North Side Parkway trail runs through 1.2 miles of wooded areas, wetlands, and the waterway along the Boone Drain.