3. Existing Physical Conditions

Existing Conditions

The existing conditions map (Figure 3.0) shows the general relationship of both Benzonia and Platte Township to the County. Benzonia includes the Village of Beulah and the Village of Benzonia. Benzonia Township contains much of the commercial areas in Benzie County. Platte Township is comprised primarily of state and federal lands and is heavily forested. The two townships are in stark contrast to each other in terms of land use. Also shown on this map is forest cover from the latest U.S. Geological Survey (USGS) shapefile dataset.

Natural Features

HYDROLOGY

Benzie County and its Townships are well known for their incredible natural resources, and in particular the lakes and waterways. Michigan residents are fortunate to be surrounded by one of the most unique lake systems on the planet and home to over 20% of the world's freshwater. In addition to lakes, other components of an areas hydrology include the watersheds and their associated rivers, streams and wetlands. It is critical to have a good understanding of a region's hydrologic conditions when considering current and future land use planning decisions, as increased development and resulting land use changes have a significant impact on both water quality and water quantity. Land use plans (and resulting planning and zoning activities) must consider the impacts of potential land use changes on water resources if protection of water quality is to be achieved.

BENZONIA TOWNSHIP

Lakes:

Large portions of both Crystal Lake and (Big) Platte Lake are in the Township boundaries. A small portion of Rush Lake is included in the northwest corner of the Township. In all, about 6.1 square miles of lakes are found in the township borders.

Crystal Lake at 9,854 acres is the ninth largest lake in Michigan. As the name implies it's waters are crystal clear and the bottom is generally sandy. It is a unique inland lake due to the infamous and well documented 'Tragedy of Crystal Lake', that accidentally drew the lake down about 20 feet creating a beautiful sandy coastline around the entire lake that forever changed the development pattern in Benzie County. It's importance to planning is that prime and much desired real estate was created that now includes a majority of dense residential and resort development around the lake shore. There are also along a few recreational and natural areas and relatively few locations for public access. These are highlighted in the Community Facilities section of this Chapter and the Park & Recreation Chapter. This uniquely created lakeside development pattern brings the challenge of balancing the dense development, the immense economic impacts of tax dollars and tourism money to the local economy, the competition for public access to the lake, with the environmental responsibility of protecting the lake and its ecosystems and surrounding natural habitats.

[1] *River Restoration in Northern Michigan*, http://www.northernmichiganstreams.org/

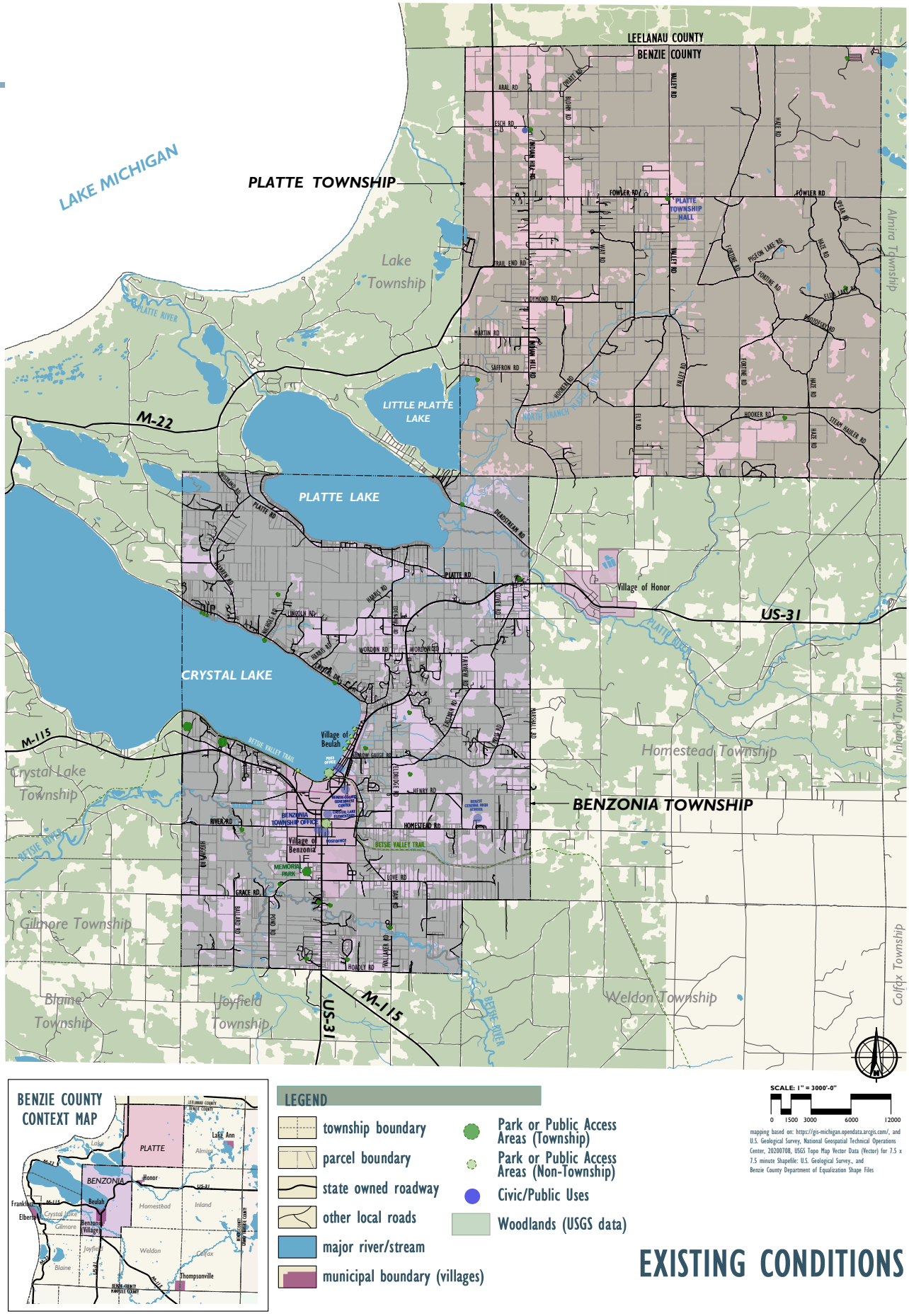


Figure 3.0 Existing Conditions Map for Both Townships

3. Existing Physical Conditions

Platte Township includes portions of Little Platte Lake and Otter Lake along its western boundary and Garey and Lime Lake on the eastern boundary. There a few smaller lakes scattered throughout the township, only about 0.2 square miles makes up the lakes found in Platte.

Rivers:

The Betsie and Platte River are found in Benzonia Township, these are two of Benzie County's largest and heavily used rivers. Other significant waterways include; Cold Creek a major tributary that flows from the southeastern portion of the township, through Beulah and into Crystal Lake. Rice Creek is located in the southwest portion of the township and flows near Pond Road into the Betsie River near Grace Road.

With its headwaters at Green Lake in Grand Traverse County, the Betsie River flows through Manistee County and then enters the Thompsonville area and Weldon Township. It then runs from the southeast to the west though Benzonia Township into Crystal Lake Township where it eventually flows into Betsie Lake in Frankfort and then Lake Michigan. The Betsie is well known for its fishing, in particular steel head and salmon. The Betsie River mainstream is 52 miles long and drains a surface area of 259 square miles. The largest tributaries are the Little Betsie and Dair Creek, both valuable for trout spawning habitat. There have been tremendous planning, protection and restoration efforts over the years regarding the Betsie River and its watershed[1].

The Platte River is recognized as one of Michigan's Blue Ribbon Trout Streams. The Platte is a relatively shallow and slow moving waterway, getting it's name from the French word for "level" or "flat". The Platte River Watershed covers 193 square miles and the river valley is 14 miles long, with a total of 90.5 miles of river and connecting streams[1].

A small portion of the Platte River is located in the far southwest corner of the Platte Township as it flows from Little Platte Lake to Big Platte Lake. The North Branch of the Platte River is the most significant waterway in the township and flows into Little Platte Lake along and near the vicinity of Hooker Road.

A variety of partners work on conservation-based projects in the

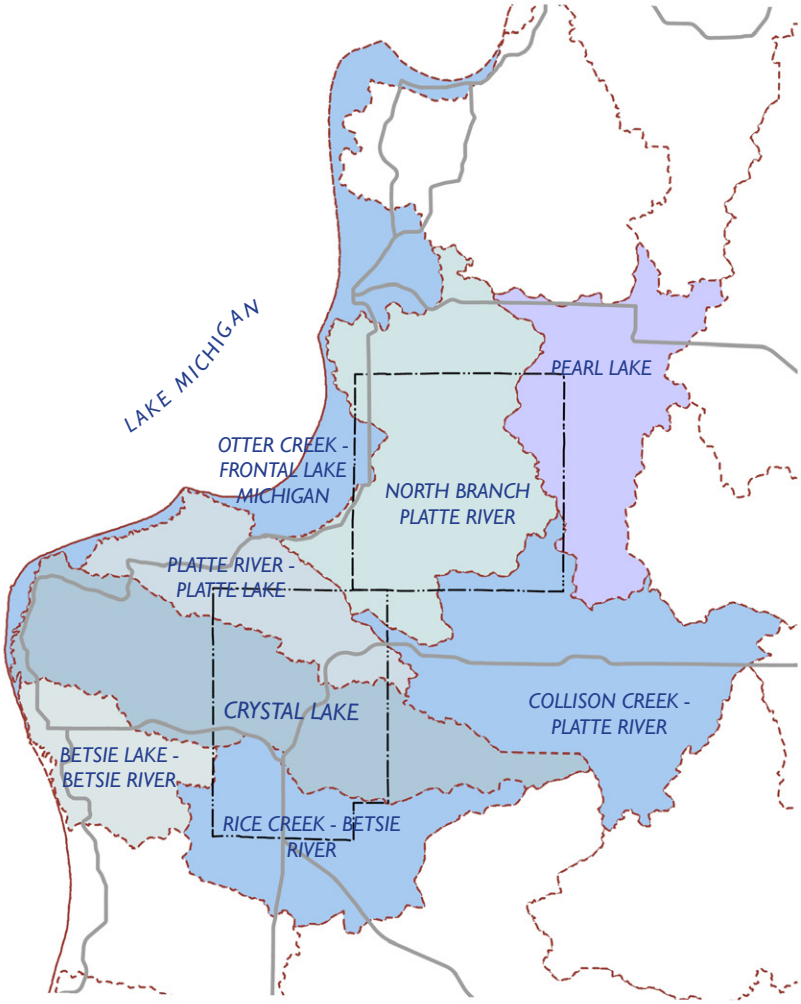
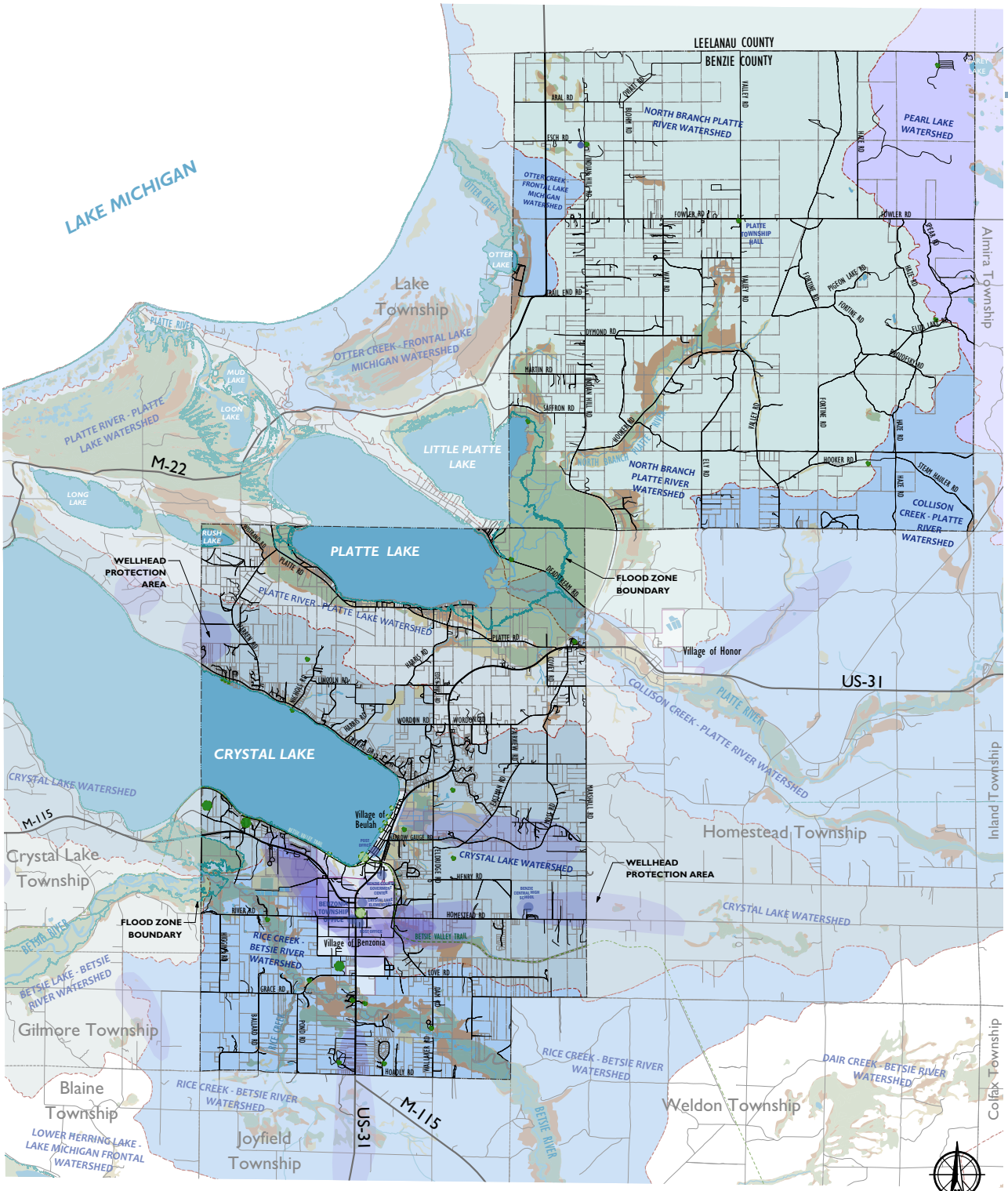


Figure 3.1 HUC-12 Watersheds Located in Benzonia & Platte Townships



LEGEND

- township boundary
- parcel boundary
- state owned roadway
- other local roads
- major river/stream
- municipal boundary (villages)
- Park or Public Access Areas (Township)
- Civic/Public Uses
- Wellhead Protection Area*
- SPHA (Special Flood Hazard Area)**
- Watershed Boundary
- 20 ft Contours (USGS)
- MDNR Wetlands (NWI/MIRIS/wetland soils)^
- MDNR Wetlands (NWI/MIRIS)^
- MDNR Wetlands (wetland soils)^

*WHPP was developed in response to 1986 amendments to the federal Safe Drinking Water Act (SDWA), Guidelines per Michigan Department of Environment, Great Lakes, and Energy (EGLE).
**Per FEMA, The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.
^Part 303 Wetlands Inventory/MI DNR GIS data layers

EXISTING HYDROLOGY/NATURAL FEATURES

Figure 3.2 Existing Hydrology Map for Both Townships

Betsie River west of the Homestead Dam

watershed, including Conservation Resource Alliance, Benzie Conservation District, Platte Lake Improvement Association, Natural Resources Conservation Service, Grand Traverse Band of Ottawa and Chippewa Indians, and other state, federal and private entities.

Watersheds:

There are a 8 watersheds that are located in Benzonia and Platte Townships. While the concept of watershed is often the same, how watersheds are delineated and described is slightly different, depending on the scale and data included. The 8 watersheds discussed here are HUC-12 delineated watershed. The Watershed Boundary Dataset (WBD) maps the full areal extent of surface water drainage for the U.S. using a hierarchical system of nesting hydrologic units at various scales, each with an assigned hydrologic unit code (HUC). HUCs are delineated and georeferenced to U.S. Geological Survey (USGS) 1:24,000 scale topographic base maps according to compilation criteria monitored by the national Subcommittee on Spatial Water Data.

A watershed is defined as the geographic area within the boundary of a drainage divide. Watershed boundaries follow the highest ridge line around the stream drainage area; the bottom of the watershed or the pour point is the lowest point of the land area where water flows out of the watershed. Hydrologic unit boundaries do not always surround a complete watershed but may delineate truncated portions of a larger watershed—for example, the mid-stem of a larger stream or river along with the tributaries in that area. Hydrologic units are generally synonymous with watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point. This distinction between watersheds and HUCs is important in the context of water resources data analysis and water quality monitoring, because the area contributing to the downstream outlet point in a single HUC may extend beyond its boundaries in an upstream direction to include a number of other sub-basin HUCs.

There are 6 HUC-12 watersheds located in Benzonia Township. The major watersheds (those that cover the most surface area) include; Crystal Lake, Platte River-Platte Lake and Rice Creek - Betsie River. Also included in the boundaries are small portions of the North Branch Platte River, Collison Creek - Platte River and Betsie Lake- Betsie River Watersheds.

The Crystal Lake Watershed Association is a nonprofit (501c3) organization of concerned citizens committed to protecting the beauty and water quality of Crystal Lake and its surrounding environment. It engages in monitoring, education, and advocacy on behalf of the broad community for whom Crystal Lake is a vital economic, recreational, and aesthetic resource.

GROUNDWATER

WELLHEAD PROTECTION AREAS (WHPA)

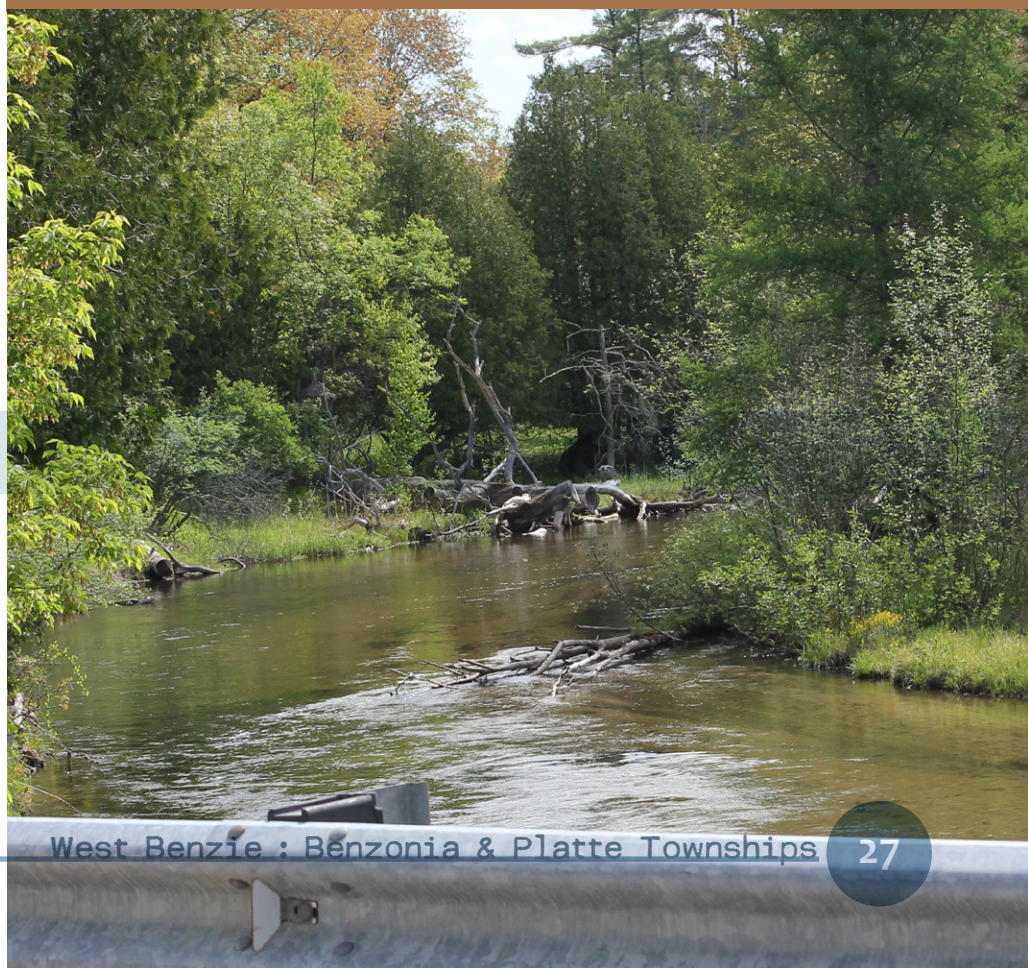
Delineation:

The federal SDWA defines a WHPA as "... the surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field." In simpler terms, it is that area which contributes ground water to a public water supply. Michigan's Wellhead Protection Program (WHPP) requires a hydrogeologic study to identify the contributing area, these areas are shown on the hydrology map (REFER to FIGURE 3.2).

Why These Areas Need Protecting:

A safe and reliable source of drinking water is essential for life. Because our water supply is limited, it needs to be properly protected and managed. Implementing a WHPP is a cost-effective way for communities to protect the health of their citizens and the natural resources of Michigan. In addition to protecting a communities groundwater and drinking water source, communities with a WHPP receive a higher level of environmental review in the state permitting process. In addition, permitting for underground and aboveground storage tanks, spillage of polluting materials, and discharging to groundwater include more stringent requirements within WHPAs. Consequently, communities that have designated WHPAs are able to better safeguard their groundwater from contamination. Financial assistance is also available for the development of management practices (e.g., planning and zoning) and the searching and plugging of abandoned wells within the WHPA. The state WHPP does not dictate what businesses can or cannot locate within the wellhead protection area, nor does it prevent the use or storage of hazardous materials in the wellhead protection area. It is the responsibility of the local unit of government to determine how to protect the water supply through planning, zoning, and proper management techniques. These techniques need to be developed by the community to fit specific needs.

Platte River near Deadstream Road



Potential Sources of Contamination

Land use associated with agricultural operations, commercial facilities, manufacturing and industrial facilities, institutional facilities, and utility companies may also be considered potential sources

of contamination. Abandoned wells left improperly sealed provide a direct conduit into the ground water system through which contaminants may migrate and should be considered potential sources of contamination.

Management

The goal of WHPA management is to provide mechanisms which will prevent existing and potential sources of contamination from reaching the public water supply well or well field. Communities are encouraged to develop management strategies which may be unique to their situation and specific to the contaminant source inventory developed for the WHPA. Management approaches may entail a broad range of activities including facility inspections, land-use regulations, operational policies, best management practices, public information and education. Management strategies should serve to generate support and attention to the WHPA for local, county, state, and federal regulatory activities. The strategies should attempt to minimize (eliminate if possible) land use activities which pose a significant threat to the PWSS, motivate landowners within the WHPA to take appropriate steps to reduce threats to the PWSS, and provide education to residents, businesses, and industries located within the WHPA to emphasize their role in making wellhead protection work.

FLOODPLAINS

Both townships have floodplains within the limits. Any stream, river or lake has a floodplain associated with it. The State of Michigan defines the 100-year floodplain as the land adjacent to a river, lake or stream that will be inundated by water during a flood which has a 1% chance of occurring of being exceeded in any given year. Almost everyone lives in a flood zone, a flood zone describes the risk of living in a particular area. FEMA (Federal Emergency Management Agency) breaks down flood zones into low, moderate and high risk. Moderate to low-risk flood areas are designated with the letters B, C, and X on FEMA flood maps. These are areas where the risk of being flooded is reduced, but not completely removed. High-risk flood areas begin with the letters A or V on FEMA flood maps. These areas face the highest risk of flooding. Someone that owns property in a high-risk zone and has a federally backed mortgage, is required to purchase flood insurance as a condition of that loan. All of the flood zone areas shown in the townships are designated as Zone A (area inundated by the Base Flood with no Base Flood Elevations determined). The flood zone boundary is shown on the map in Figure 3.2. It is located primarily in the wetland and low areas around the east end of Platte Lake and the wetland near the Outlet of Crystal Lake & Betsie River.

TOPOGRAPHY and SOILS

The topography of both townships is shown on the hillside elevation diagram (Figure3.3). A larger hard copy printout with 20ft contours on the hydrology map was provided to the WBJPC for reference. One of the highest elevations in Benzie County lies just to the east of Benzonia Township and east of Marshall Road, Champion Hill. This hill lies at the end of a major ridge that runs between Crystal and Platte Lakes. Benzonia township also has two areas with relatively low elevations where the Platte River runs into Platte Lake and also where Cold Creek runs into Crystal Lake. The low marsh lands on the east end of Crystal

[2] *Web Soil Survey, USDA Natural Resources Conservation Service, https://websoilsurvey.nrcs.usda.gov/app/*

Lake were once important farmlands for vegetable crops. In general Benzonia Township has a more varied topography around the lakes and rivers. Platte's topography, while still containing steep areas, is generally more level.

Soil data is available for the entire Benzie County through the National Soil Survey, The data can be found on the Web Soil Survey (WSS). The data and information is produced by the National Cooperative Soil Survey, and is operated by the USDA Natural Resources Conservation Service (NRCS).

The soil survey shows the predominate soil series in Benzonia Township is Benzonia Sands, which comprise about 15% of the total soils and Kaleva Sands comprise another 6%. Houghton Adrain mucks on 0-1% slopes also are a big portion of the soils and found in the low lying areas. Due to the lake and river topography in Benzonia Township there is a more varied soil make up than Platte Township. For instance, in Platte, two soil series dominate the Township - with Benzonia Sands making up nearly 40% of the soils and Kaleva Sand comprising another 20%.

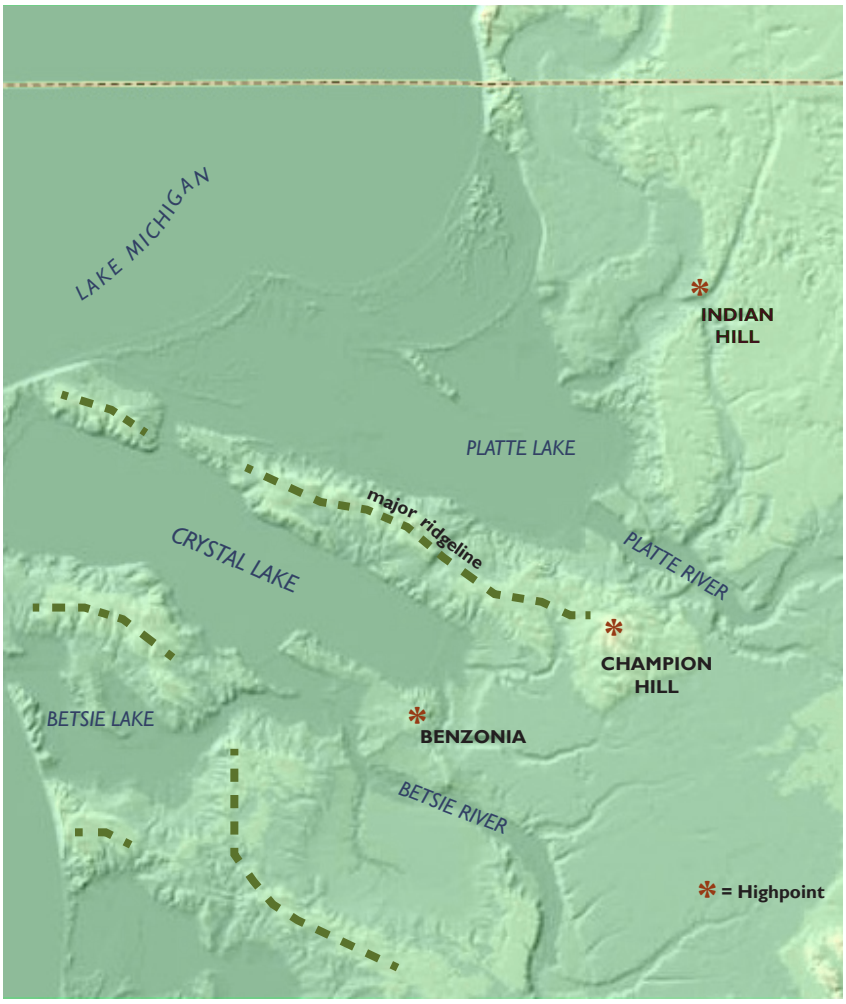


Figure 3.3 Hillside Elevation from 3DEP USGS National Map

Benzonia sands are typically found around lakes, out-wash plains and moraines. They are generally well drained and suitable for cropland and in particular for fruit trees such as cherries and apples, however they are susceptible to drought conditions. For building development, erosion and cut-bank caving is a concern on slopes, however due to drainage characteristics there is typically low site runoff. While they do drain well, the sands are classified as having poor filtering capacity in regards to septic absorption fields. Pockets of clay soils that do not perc have been notoriously found around the Benzonia/Beulah Area, making development challenging due to the difficulty of putting in septic systems in some areas.

VEGETATION & LANDCOVER

Understanding landcover and how it is changing over time is an important tool when making land use and planning decisions. For this plan, the data available through the Multi Resolution Land characteristics Consortium (MRLC) was reviewed along with USGA woodland cover data. The MRLC produces the

National Landcover Database (NLCD), a nationally standardized land cover and land change information product for the United States. Satellite imagery is used to document changes in various types of land cover. The MRLC is able to produce a report with a summary of data for the County.

Forests make up a dominant portion of both Township's land cover, the latest woodland cover data set from the USGS is shown on Figure 3.0. Upland forests comprise just over 20% of Benzie County. The report shows that about 12% of evergreen forests were lost in the County from 2001 to 2019. However, it is important to understand the type of forest and why it changed. For instance, the satellite data shows the loss was primarily from forested to shrub lands, which is typically due to timber harvesting. This does not necessarily mean the forest is being lost to development. In all, very little of Platte Township is developed. Benzie County as a whole indicated 3.12% of development and under 1% as impervious surfaces. Much of this areas in concentrated in the Villages and City of Frankfort. The MRLC report states that, " More development means more impervious surfaces, which translates into a greater risk for increased flooding and decreased water quality. Areas with impervious surface rates approaching or exceeding 12 percent to 15 percent will likely experience negative impacts to water quality." Overall, the total impervious areas in the County and Townships is relatively low.

Transportation

MOTORIZED

The major highways that traverse the Township's are US-31 (federal highway) and M-115 and M-22, both a part of Michigan's State Highway system. This along with the ADT (Average Daily Traffic) counts are shown in Figure 3.4. US-31 is the most traveled highway in the county, the highest level of traffic are consistently in the Village of Benzonia and then again north of Honor. Scenic Route M-22 has a much lower traffic rate compared to the other highways. The county roads are maintained by the Benzie County Road Commission (BCRC), while individual Villages (Beulah and Benzonia) are responsible for local roads in the Villages.

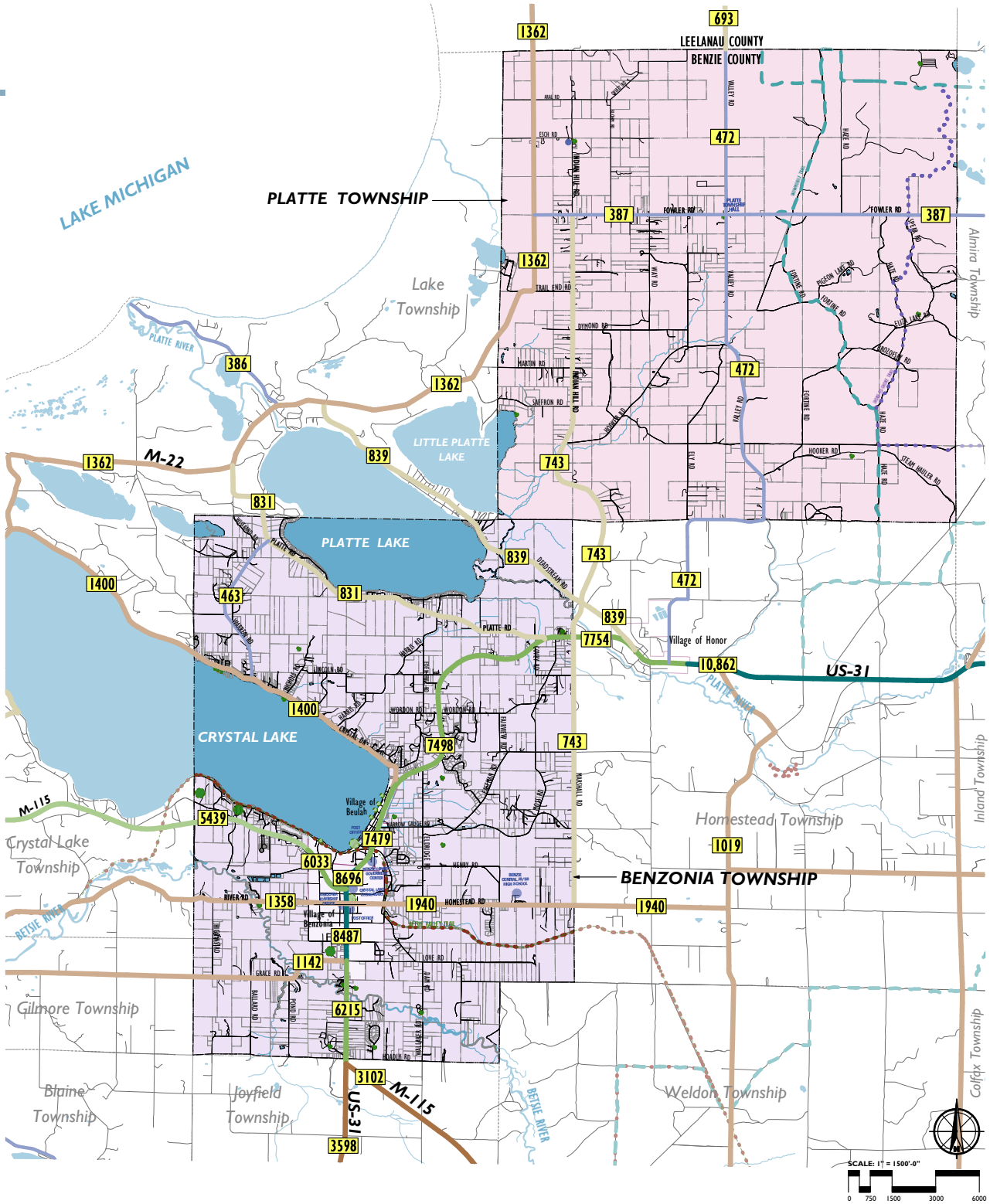
The Villages have arrival or 'gateway signage' indicating to motorist when they are entering the Village limits.

NON-MOTORIZED

These items include bicycle and pedestrian facilities such as sidewalks, trails and on-street bicycle facilities such as bike lanes, signed wide-outside lanes and shared shoulders. These facilities are important to community's transportation system as they provide alternative routes of transportation which can reduce traffic congestion, pollution and more important promote healthy lifestyles, which in turn enhance the quality of life within a community.

Until recently there were few sidewalk facilities in the communities. In 2020 MDOT completed a road improvement project in the Village of Benzonia that included 5 foot wide sidewalks on both sides of US-31. The Village of Beulah also recently completed a downtown streetscape improvement project which included sidewalk facility improvements. However, there are still many missing pedestrian connections in the areas of concentrated development in Benzonia Township.

There are also a number of trail facilities in the Townships, The Betsie Valley Trail traverses east/west through Benzonia Township. It is currently mostly a gravel trail in the township, with plans underway for



LEGEND

- Township Boundary
- Parcel Boundary
- State Owned Roadway
- Other Local Roads
- Major River/stream
- Park Or Public Access Areas In Township
- Park Or Public Access Areas In Village(s)
- Community Facility
- Betsie Valley Trail
- Snowmobile Trails (MDNR)
- Shore-to-Shore Trail (non-Motorized)
- 8000+ ADT
- 6000-8000 ADT
- 4000-6000 ADT
- 2000-4000 ADT
- 1000-2000 ADT
- 500-1000 ADT
- LESS THAN 500 ADT

ADT - AVERAGE DAILY TRAFFIC COUNT

(SOURCE: MDOT - 2020 DATA)

SCALE: 1" = 1500'-0"

0 750 1500 3000 6000

mapping based on: https://gis-michigan.opendata.arcgis.com/, and U.S. Geological Survey, National Geospatial Technical Operations Center, 20200708, USGS Topo Map Vector Data (Vector) for 7.5 x 7.5 minute Shapefile: U.S. Geological Survey., and Benzie County Department of Equalization Shape Files

EXISTING TRANSPORTATION

Figure 3.4 Existing Transportation Map for Both Townships

future paving. Platte Township has MDNR snowmobile trails and the Shore-to-Shore Trail which is utilized by equestrians, snowmobiles and ATVs. Platte Township has an ordinance that regulates where ATVs are permitted to ride.

PUBLIC TRANSPORTATION

The Benzie bus provides public transportation for township residents and has been in operation since 2007. It provides both fixed routed and a dial-a-ride system. The only fixed route stop is located in the Shopping Center in the Village of Benzonia.

Community Facilities, Safety & Emergency

For descriptions of community facilities refer to Parks and Recreation Chapter.

SAFETY & EMERGENCY SERVICES

Benzonia Township is home to the Station 5 Fire Department. The department provides fire and medical first responder coverage for Benzonia Township, including the Villages of Benzonia and Beulah, and Joyfield Township. They also assist the other 5 fire departments in Benzie County as well as the departments of Manistee County. The Station is volunteer/paid per call department with one full time employee, (the fire chief). In 2022 there are 20 members including the Chief and Captain as well as 18 firefighters. A medical first response truck provides first response EMS for the community. The department also has extrication tools (Jaws of Life). In 2021 there was a record breaking 532 calls for service. As of 2022 there are 5 trucks in service; Engine 1: Rosenbauer Pumper(2021), Engine 2: Class A CAF pumper (2009), Tanker (2006), Rescue (2012) and Medical Responder (2009).

Platte Township contracts with Homestead Township Fire Department to prvide fire and Emergency Services and with the City of Traverse City to provide HazMat Emergency services.

Utilities

WATER AND SEWER

There are no water or sewer services provided by the Townships. The Village of Benzonia has a municipal water system. The Village of Beulah has a municipal water and sewer system for residents. The lack of/and limited capacity of existing sewers has been a long recognized issue in the Beulah and Benzonia area as well as along the residential development along Crystal and Platte Lakes. This area along US-31 near the Villages serves as the main commercial corridor for the entire county and provides much needed dad-to-day shopping, commercial and office space (i.e. many of the jobs in the county) and denser residential development patterns. The lack of sewer and existing soil conditions limit development potential. The County, Township of Benzonia, Village of Beulah and the Village of Benzonia recently (2022) formed at partnership and Sewer Task force to fund a sewer feasibility study of for the US-31 and related area, which will also look at areas for potential sewer along the lake shores. The study is expected to be completed near the end of 2022 with the hope to secure funding to move forward with some form of sewer infrastructure to help alleviate the issue and provide a route for increase commercial and residential development along the US-31 corridor.

ELECTRICITY & NATURAL GAS

Electricity is provided by Consumers Energy, All facilities are overhead distribution systems (Check does Beulah have any underground?) Natural gas is provided in some areas by DTE Energy. Areas not served by DTE that use gas are required to use a propane tank service.

RESIDENTIAL SERVICES

Garbage pick up is not provided for Township residents by the Township. Service is available but must be organized and paid for by the home/business owner.

CABLE/INTERNET

Cable access is provided in the area of the Villages and in some other limited area (along Homestead Road) by Charter Communications. The lack of high-speed Internet is a known issue in the County. The problem was even more apparent with the COVID-19 lock downs that required students and workers to stay home for learning and work. Currently high speed/cable access and Internet is available in limited places. The areas around the Villages of Benzonia and Beulah that are served by Charter also have access to their high-speed Internet. Other Internet providers are Eclipse Communication and a few wireless options (typically through cellular or satellite plans).

Betsie Valley Trail at Case Road