CITY OF ALLEGAN
CITY COUNCIL & PLANNING COMMISSION JOINT MEETING
Monday, July 8, 2019 6:00PM
Griswold Auditorium - 401 Hubbard Street Lower Level
Allegan, Michigan

6:00 Call to Order

6:01 Presentation and discussion on the Planning Commission's proposed Marihuana Ordinance to regulate Marihuana businesses

6:45 Public Comment Period

6:55 Adjourn to regular meeting to begin at 7:00 pm

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Presentation and Discussion regarding an ordinance to regulate Marijuana businesses
DATE: July 8, 2019

Summary

It is requested that City Council receive a presentation from Nick Curcio, City Attorney, regarding the proposed ordinances to regulate Marijuana businesses in the City of Allegan and then have a discussion with the Planning Commission regarding the process they took to arrive at the proposed ordinance.

After the voters in the State of Michigan voted to legalize recreational marijuana in November of 2018, also referred to as adult marijuana, the City Council, passed an ordinance banning marijuana businesses and subsequently directing the planning Commission to study the marijuana businesses and come back to the City Council with a recommendation on how to move forward.

Over the past six months the Planning Commission has been studying this issue. During this time, they have reviewed published reports on the impact marijuana businesses have had on states where recreational marijuana has been legalized. These reports have been posted to the City's website. The Planning Commission also created a comparative use table where they compared current legal businesses that can operate in the City of Allegan with each of the potential marijuana businesses authorized by the State of Michigan in order to understand what zone districts these establishments should be located in. The Planning Commission also had countless open and frank discussions regarding the development of the proposed ordinances and its potential impact on the City of Allegan.

To this end, the Planning Commission developed the attached ordinance dealing with the regulation of marijuana businesses in the City of Allegan. This ordinance specifically deals with the location and operation of the marijuana businesses and is known as a zoning ordinance. The Planning Commission also provided input into the attached ordinance dealing with the licensing off marijuana businesses. The licensing of marijuana businesses is an administrative ordinance.

It should also be noted that on Wednesday July 3, 2019 the State of Michigan unveiled four new types of licenses not originally a part of the November 2018 statewide proposal. The proposed ordinances from Planning Commission do not address these four new license types since they were released after the Planning Commission finalized the proposed ordinances. However, city staff and the city attorney are reviewing these four new license types and will be present more information on these new licenses at the July 8, 2019 Joint City Council and Planning Commission Meeting.

The four new licenses include:

1. Marijuana Event Organizer – allows the license holder to apply for Temporary Marijuana Event Licenses from MRA.

2. Temporary Marijuana Event – this license allows a Marijuana Event Organizer to run and event – which has been approved by the local municipality – where the onsite sale or consumption of marijuana products, or both, are authorized at a specific location for a limited time. Licensed Retailers and Microbusinesses may participate. The Marijuana Event Organizer is required to hire security and ensure that all rules and requirements for onsite consumption of marijuana products are followed.

3. Designated Consumption Establishment – allows the license holder, with local approval, to operate a commercial space that is licensed by the MRA and authorized to permit adults 21 years of age and older to consume marijuana products on premises. A Designated Consumption Establishment license does not allow for sales or distribution of marijuana or marijuana, unless the license holder also possesses a Retailer or Microbusiness license.

4. Excess Marijuana Grower – allows a licensee who already holds five adult-use Class C Grower Licenses to expand their allowable marijuana plant count.

Recommendation

It is recommended that requested that City Council receive a presentation from Nick Curcio, City Attorney, regarding the proposed ordinances to regulate Marijuana businesses in the City of Allegan and then have a discussion with the Planning Commission regarding the process they took to arrive at the proposed ordinance.

Attachments

Comparative Use Table
Proposed Marijuana Zoning Ordinance
Proposed Marijuana Licensing Ordinance
Zoning Map of Proposed Locations

Marihuana Related Business	Similar Existing Land Use	Zoning Allowed for Similar Land Use
Growers	Warehousing, Light Manufacturing , Natural Resource Harvesting and Management	M-1
Processors	Manufacturing	M-1
Provisioning Centers	Pharmacy (General or Neighborhood Merchandise/Services)	C-1, C-2, C-3
Marihuana Retailer	General/Neighborhood Services	C-1, C-2, C-3
Marihuana Microbusiness	Micro-Brewery	M-1, C-1, C-2
Secure Transportaters	General Industrial	M-1
Safety Compliance Facilities	Research and Development	M-1, C-2

CITY OF ALLEGAN
ALLEGAN COUNTY, MICHIGAN

ORDINANCE NO. ____

AN ORDINANCE TO ADD A NEW SECTION 1707.33 TO ARTICLE XVII OF THE ALLEGAN CITY ZONING ORDINANCE, AND TO AMEND THE USE TABLE IN SECTION 402.01, TO REGULATE MARIJUANA BUSINESSES AS SPECIAL USES IN VARIOUS ZONING DISTRICTS AND TO PROVIDE PENALTIES FOR VIOLATIONS

The City of Allegan Ordains:

Section 1. Addition. A new Section 1707.33 is added to Article XVII of the Allegan City Zoning Ordinance to read as follows:

Sec. 1707.33. Marijuana Businesses.

A. *Definitions*. The following words and phrases have the meanings ascribed to them below when used in this section unless the context clearly indicates otherwise:

1. *Co-located marijuana business* means a marijuana business with 2 or more types of state operating licenses operating within a single location.
2. *Grower* means a person licensed as a grower under either the MMMFLA, the MRTMA, or both.
3. *LARA* means the department of licensing and regulatory affairs and any successor agency to the department.
4. *Marijuana* means, depending on the context, the same thing as "marihuana" as defined in the MMMFLA, the MRTMA, or both.
5. *Marijuana business* is a land use involving one or more licenses issued under the MMMFLA, the MRTMA, or both.
6. *Microbusiness* means a person licensed under the MRTMA to cultivate not more than 150 marijuana plants; process and package marijuana; and sell or otherwise transfer marijuana to individuals who are 21 years of age or older or to a marijuana safety compliance facility, but not to other marijuana establishments.
7. *MMMA* means the Michigan medical marihuana act, 2008 IL 1, as amended MCL 333.26424 *et seq.*
8. *MMMFLA* means the Michigan medical marihuana facilities licensing act, 2016 PA 281, as amended, MCL 333.27102 *et seq.*
9. *MRTMA* means the Michigan regulation and taxation of marihuana act, 2018 IL 1, as amended MCL 333.27951 *et seq.*
10. *Processor* means a person licensed as a processor under either the MMMFLA, the MRTMA, or both.
11. *Provisioning center facility* means a person licensed under the MMMFLA that purchases marijuana from a grower or processor and sells, supplies, or provides marijuana to registered qualifying patients, directly or through the patients' registered primary caregivers. Provisioning center includes any commercial property where marijuana is sold at retail to registered qualifying patients or registered primary caregivers. A noncommercial location

used by a primary caregiver to assist a qualifying patient connected to the caregiver through LARA's marijuana registration process in accordance with the MMMA is not a provisioning center for purposes of this section.

12. *Retailer* means a person licensed under the MRTMA to obtain marijuana from marijuana establishments and to sell or otherwise transfer marijuana to marijuana establishments and to individuals who are 21 years of age or older.
13. *Safety compliance business* means a person licensed as a safety compliance facility under the MMMFLA, the MRTMA, or both.
14. *Secure transporter* means a person licensed as a secured transporter under the MMMFLA, the MRTMA, or both.
15. *Stacked grower licenses* means two or more grower licenses issued to a single person to under the MMMFLA or MRTMA.
16. *State operating license* or *license* means a license that is issued under the MMMFLA or MRTMA to operate as a grower, processor, secure transporter, provisioning center, retailer, safety compliance facility, or microbusiness.

B. *Regulations and Conditions.* Marijuana businesses are permitted as special uses in the zoning districts indicated in the Table of Uses in Section 402.01, subject to the following regulations and conditions:

1. Marijuana businesses must comply with the MMMFLA, the MRTMA, and any applicable rules promulgated under either statute.
2. Co-located marijuana businesses and stacked grower licenses may be permitted, subject to the regulations in this section, the Table of Uses in Section 402.01, and any applicable rules promulgated by LARA.
3. No marijuana business may operate without first obtaining final authorization for each state operating license from the city clerk pursuant to Chapter 31 of the City Code.
4. Marijuana businesses (including both the building and surrounding site) shall be sufficiently designed in a manner to minimize light spillage, odor, and noise (including noise associated with truck traffic or other machinery), affecting adjacent properties.
5. Special use applicants must provide a plan for the storage and disposal of marijuana or chemicals associated with marijuana cultivation, so as to minimize the risk of theft or harm resulting from chemical exposure. At no time should byproducts be deposited into the ground.
6. No marijuana may be stored overnight outside of an enclosed building. By way of example and without limitation, it is unlawful to store marijuana overnight in an outdoor waste bin.
7. The outdoor storage of trash or rubbish shall be appropriately screened.
8. Signage for marijuana businesses will be approved pursuant to the generally applicable procedures and standards provided in Chapter 23 of the City Code, with the additional restriction that signage may not depict marijuana, marijuana-infused products, or marijuana-related paraphernalia.
9. The cultivation and processing of marijuana must be conducted in a manner that minimizes adverse impacts on the public sanitary sewer and natural environment. The applicant shall submit, for review and comment, all pertinent information relating to the applicant's proposed sewer discharges to the City sanitary sewer and any other proposed methods of byproduct disposal or reuse.

10. Marijuana businesses must control and eliminate odor as follows:
    a. The building must be equipped with an activated air scrubbing and carbon filtration system for odor control to ensure that air leaving the building through an exhaust vent first passes through an activated carbon filter and air scrubbing system.
    b. The filtration system must consist of one or more fans, activated carbon filters and be capable of scrubbing the air prior to leaving any building. At a minimum, the fan(s) must be sized for cubic feet per minute (CFM) equivalent to the volume of the building (length multiplied by width multiplied by height) divided by three. The filter(s) shall be rated for the applicable CFM.
    c. The air scrubbing and filtration system must be maintained in working order and must be in use at all times. The filters must be changed per manufacturers' recommendation to ensure optimal performance.
    d. Negative air pressure must be maintained inside the building.
    e. Doors and windows must remain closed, except for the minimum time length needed to allow people to ingress or egress the building.
    f. An alternative odor control system is permitted if the special use applicant submits a report by a mechanical engineer licensed in the state of Michigan sufficiently demonstrating that the alternative system will eliminate odor as well or better than the air scrubbing and carbon filtration system otherwise required.
11. For growers:
    a. Cultivation must occur within an enclosed building with exterior facades (not including windows) consisting of opaque materials typical of an industrial or commercial building. Windows shall be arranged in such a way that marijuana plants are not visible from the exterior of the building.
    b. The roof of the building may be constructed of a rigid transparent or translucent material designed to let in light, such as glass or rigid polycarbonate or fiberglass panels. Films or other non-rigid materials cannot be used to construct any component of the building's exterior structure.
12. For provisioning centers, retailers, and microbusinesses:
    a. Provisioning centers, retailers, and microbusinesses may not be open to customers between the hours of 9:00 p.m. and 9:00 a.m.
    b. Provisioning centers, retailers, and microbusinesses may not receive deliveries between the hours of 8:00 p.m. and 7:00 a.m.
    c. The exterior appearance of a provisioning center, retailer, or microbusiness must be compatible with surrounding businesses with respect to façade type, ground floor opacity, size and placement of signage, site layout, etc.
    d. The interior of the building must be arranged in a way such that neither marijuana, marijuana-infused products, nor paraphernalia are visible from the exterior of the building.
    e. The lot on which any provisioning center, retailer, or microbusiness is located must be at least 500 feet from a lot containing a public or private school providing education in kindergarten or any grade 1 through 12. The 500-foot buffer shall be computed by measuring a straight line from the nearest property line on the lot used as a K-12 school to the nearest property line of the lot used as a provisioning center, retailer, or

microbusiness. This buffering requirement modifies and supersedes the default requirements in Section 9 of the MRTMA.

13. Notwithstanding any other provision to the contrary, penalties for violations of this section shall be as follows:

    a. If at any time an authorized marijuana business violates this section, any condition imposed through a special use permit, or any other applicable city ordinance, the City Council may request that LARA revoke or refrain from renewing the business's state operating license. Additionally, the special use permit may be revoked pursuant to the generally applicable process provided in this zoning ordinance.

    b. It is unlawful to disobey, neglect, or refuse to comply with any provision of this section or any condition of a special use permit issued pursuant to this section. A violation is a municipal civil infraction subject to a fine of $500.

    c. The foregoing sanctions are in addition to the city's right to seek other appropriate and proper remedies, including actions in law or equity.

Section 2. Addition. The Table of Uses in Section 402.01 of the Allegan City Zoning Ordinance is amended to add the following use regulations for marijuana businesses:

	P = Permitted by Right S – Special Use * - See standards in Article XVII	R-1 Single Family Residential District – Low Density	R-2 Single Family Residential District – Med Density	R-3 Multiple Family Dwelling District	R-4 Mobile Home Residential District	PGL Public/Governmental Lands District	C-1 Central Business District	C-2 General Commercial District	C-3 Restricted Commercial District	M-1 Manufacturing District
*	Marijuana Growers, Processors, Secure Transporters, or Safety Compliance Facilities (Medical and Adult Use)									S
*	Marijuana Provisioning Center (Medical)						S	S		
*	Marijuana Retailer (Adult Use)						S	S		
*	Marijuana Microbusiness (Adult Use)						S	S		S

Section 3. Effective Date. This ordinance shall become effective 20 days after its adoption or upon its publication, whichever occurs later.

YEAS: _____

NAYS: _____

ABSTAIN: _____

ABSENT: _____

CERTIFICATION

As the duly appointed city clerk of the City of Allegan, Allegan County, Michigan, I certify this is a true and complete copy of an ordinance adopted by the Allegan City Council at its meeting of _____, 2019.

_____
Rachel McKenzie, Mayor

_____
Danielle Bird, City Clerk

PC Hearing: _____, 2019
Introduced: _____, 2019
Adopted: _____, 2019
Published: _____, 2019
Effective: _____, 2019

CITY OF ALLEGAN
ALLEGAN COUNTY, MICHIGAN

ORDINANCE NO. ____

AN ORDINANCE TO AMEND CHAPTER 31 OF THE ALLEGAN CITY CODE TO ALLOW MARIJUANA BUSINESSES OPERATED IN ACCORDANCE WITH STATE LAW AND THE CITY'S ZONING ORDINANCE

The City of Allegan ordains:

Section 1. Amendment. Chapter 31 of the Allegan City Code of Ordinances is hereby amended to read as follows:

Chapter 31
Marijuana Businesses

Sec. 31-1. Definitions.

The following words and phrases have the meanings ascribed to them when used in this chapter:

(a) *Co-located business* means a marijuana business with 2 or more types of state operating licenses operating within a single location.

(b) *Grower* means a person licensed as a grower under either the MMMFLA, the MRTMA, or both.

(c) *LARA* means the department of licensing and regulatory affairs and any successor agency to the department.

(d) *Location-specific step* means the portion of the application for a state operating license under the MMMFLA and the MRTMA that follows the prequalification step and pertains to the details of the proposed location.

(e) *Marijuana* means, depending on the context, the same thing as "marihuana" as defined in the MMMFLA, the MRTMA, or both.

(f) *Marijuana business* or *business* is a business involving one or more licenses issued under the MMMFLA, the MRTMA, or both.

(g) *Microbusiness* means a person licensed under the MRTMA to cultivate not more than 150 marijuana plants; process and package marijuana; and sell or otherwise transfer marijuana to individuals who are 21 years of age or older or to a marijuana safety compliance facility, but not to other marijuana establishments.

(h) *MMMA* means the Michigan medical marihuana act, 2008 IL 1, as amended MCL 333.26424 *et seq.*

(i) *MMMFLA* means the Michigan medical marihuana facilities licensing act, 2016 PA 281, as amended, MCL 333.27102 *et seq.*

(j) *MRTMA* means the Michigan regulation and taxation of marihuana act, 2018 IL 1, as amended MCL 333.27951 *et seq.*

(k) *Prequalification step* means the portion of the application for a state operating license under the MMMFLA or MRTMA pertaining to the applicant's financial background and the criminal history of the applicant and other associated persons.

(l) *Processor* means a person licensed as a processor under either the MMMFLA, the MRTMA, or both.

(m) *Provisioning center* means a person licensed under the MMMFLA that purchases marijuana from a grower or processor and sells, supplies, or provides marijuana to registered qualifying patients, directly or through the patients' registered primary caregivers. Provisioning center includes any commercial property where marijuana is sold at retail to registered qualifying patients or registered primary caregivers. A noncommercial location used by a primary caregiver to assist a qualifying patient connected to the caregiver through LARA's marijuana registration process in accordance with the MMMA is not a provisioning center for purposes of this section.

(n) *Retailer* means a person licensed under the MRTMA to obtain marijuana from marijuana establishments and to sell or otherwise transfer marijuana to marijuana establishments and to individuals who are 21 years of age or older.

(o) *Safety compliance business* means a person licensed as a safety compliance facility under the MMMFLA, the MRTMA, or both.

(p) *Secure transporter* means a person licensed as a secured transporter under the MMMFLA, the MRTMA, or both.

(q) *Stacked grower licenses* means two or more grower licenses issued to a single person to *under the MMMFLA or MRTMA.*

(r) *State operating license* or *license* means a license that is issued under the MMMFLA or MRTMA to operate as a grower, processor, secure transporter, provisioning center, retailer, safety compliance facility, or microbusiness.

Sec. 31-2. Authorization Required.

(a) The following marijuana businesses may be authorized to operate in the City of Allegan pursuant to this chapter: growers, microbusinesses, processors, provisioning centers, retailers, safety compliance facilities, and secure transporters.

(b) No marijuana business may operate in the City of Allegan without a final authorization granted by the City Clerk pursuant to Section 31-3. A proposed business is not eligible for a state operating license until the clerk grants final authorization.

Sec. 31-3. Application Process.

(a) *Submission.* A person may apply for authorization to operate a marijuana business within the City by submitting the following items to the Clerk. These items may be submitted to the Clerk before applying for requisite zoning approvals:

(1) A copy of official paperwork issued by LARA indicating that the applicant has successfully completed the prequalification step of the application for a state operating license.

(2) A signed statement from the applicant indicating:

(A) The current property owner of record for the proposed business location;

(B) If the current property owner is different than the applicant (e.g. where the

applicant has a lease, option, land contract, or other future interest in the property), the property owner's signature is required in addition to the applicant's. Only one application shall be submitted per property, unless the applications are for proposed co-located businesses;

(C) The address, tax identification number, and zoning designation of the proposed business location;

(D) The type or types of state operating licenses that the applicant is seeking at the proposed business location (*e.g.*, medical grower, adult-use grower, provisioning center, etc.); and

(E) If the proposed business involves stacked grower licenses, the number of licenses sought; and

(3) An advance of the annual administrative fee of $5,000 per license sought.

(b) *Conditional authorization.* The Clerk will accept and conditionally authorize any application that includes the required items listed above.

(c) *Final authorization*. The Clerk will grant final authorization for the business if the applicant:

(1) Obtains all required zoning approvals for the business within 12 months of receiving conditional authorization; and

(2) Obtains the requisite state operating license within 18 months of receiving conditional authorization.

(d) *Expiration of conditional authorization*. If the applicant for a conditionally authorized business fails to satisfy any of the deadlines established above, the conditional authorization will expire.

Sec. 31-4. Relocation of Businesses, Transfers of Licenses, and Expansion of Grow Operations.

(a) An existing business may be moved to a new location in the City, subject to applicable zoning regulations and required approvals by LARA.

(b) A license for an existing business may be transferred to a new licensee that intends to continue operating at the same location, subject to approval by LARA.

(c) No further City approvals are required for the relocations and license transfers described in this section.

(d) A licensee may expand growing operations by upgrading the class of the license (e.g., from class A to class B, or from class B to Class C), or by obtaining a stacked license. To do so, the licensee must submit a new application to the City satisfying the requirements in Section 31-3(a), which shall include payment of any additional annual administrative fee that will be owed due to the addition of stacked licenses. The application shall be conditionally approved upon receipt of all required materials.

Sec. 31-5. General Regulations

(a) *Submission of supplementary information to the City*. Applicants who have received conditional authorization and licensees operating in the City must provide the Clerk with copies of all documents submitted to LARA in connection with the license application, subsequent renewal applications, or investigations conducted by LARA. The documents

must be provided to the Clerk within 7 days of submission to LARA, and may be submitted by electronic media unless otherwise requested by the Clerk.

(b) *Compliance with applicable laws and regulations*. Marijuana businesses must be operated in compliance with the MMMFLA and/or MRTMA, as applicable, all applicable rules promulgated by LARA, all conditions of the business's state operating licenses, and all applicable ordinances and codes, including the City's zoning ordinance. Compliance with the foregoing does not create immunity from prosecution by federal authorities or other authorities of competent jurisdiction.

(c) *No consumption on premises*. No smoking, inhalation, or other consumption of marijuana shall take place on or within the premises of any marijuana business. It shall be a violation of this chapter to engage in such behavior, or for a person to knowingly allow such behavior to occur. Evidence of all of the following gives rise to a rebuttable presumption that a person allowed the consumption of marijuana on or within a premises in violation of this section:

(1) The person had control over the premises or the portion of the premises where the marihuana was consumed;

(2) The person knew or reasonably should have known that the marihuana was consumed; and

(3) The person failed to take corrective action.

(d) *Annual fee.* A licensee must pay a fee of $5,000, for each license used within the City in order to help defray administrative and enforcement costs. The holder of a stacked grower license must pay a separate fee in the amount of $5,000 for each license. The initial annual fee(s) must be paid to the Clerk when the application for approval is submitted. In each subsequent year, fees are due on the date on which the licensee submits an application to LARA for renewal of the state operating license.

Sec. 31-6. Violations and penalties.

(a) *Request for revocation of state operating license.* If at any time an authorized business violates this chapter or any other applicable ordinance, the City may request that LARA revoke or refrain from renewing the business's state operating license.

(b) *Civil infraction.* It is unlawful to disobey, neglect, or refuse to comply with any provision of this chapter. A violation of this chapter is a municipal civil infraction and a nuisance per se. Each day the violation continues shall be a separate offense. Notwithstanding any other provision of this ordinance to the contrary, violators shall be subject to a fine of up to $500.

(c) *Other remedies.* The foregoing sanctions are in addition to the City's right to seek other appropriate and proper remedies, including actions in law or equity.

Section 2. Publication and Effective Date. The City Clerk shall cause this ordinance to be published in a newspaper of general circulation in the City, and the ordinance shall be effective 20 days after enactment or upon publication, whichever is later.

YEAS: _____

NAYS: _____

ABSTAIN: _____

ABSENT: _____

CERTIFICATION

This is a true and complete copy of Ordinance No. ____ adopted at a regular meeting of the Allegan City Council held on _____, 2018.

_____

Rachel McKenzie, Mayor

_____

Danielle Bird, Clerk

Potential Locations for Marihuana Businesses

C-1

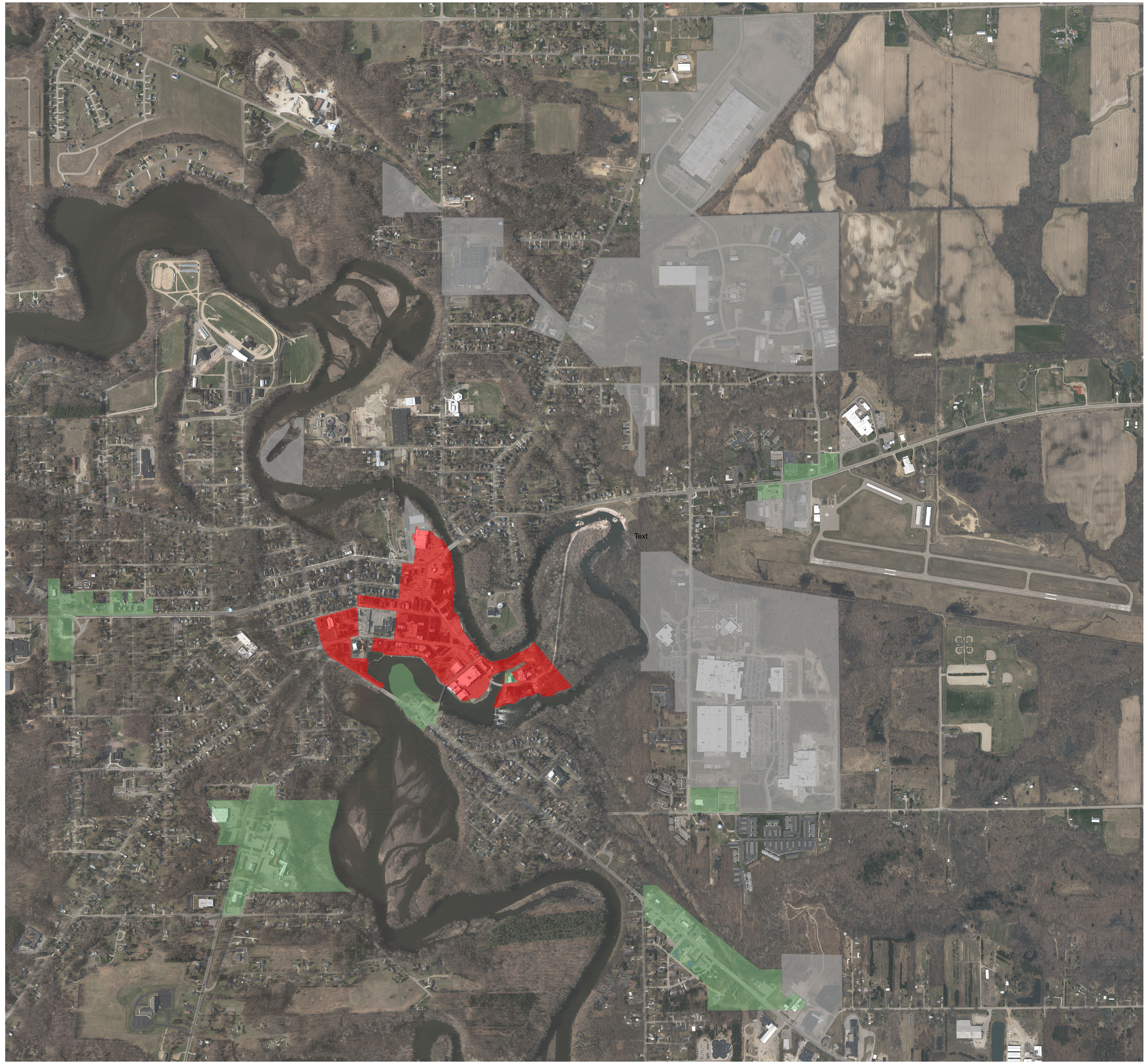
Marijuana Provisioning Center (Medical), Marijuana Retailer, and Microbusiness (Adult Use)

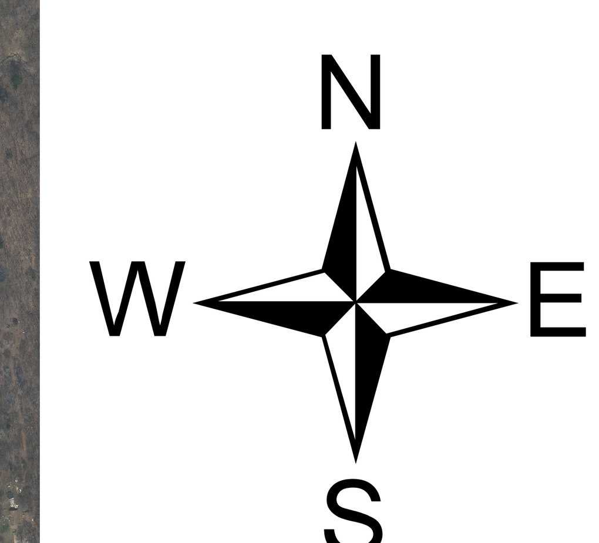
C-2

Marijuana Provisioning Center (Medical), Marijuana Retailer, and Microbusiness (Adult Use)

M-1

Marijuana Growers, Processors, Secure Transporters, Microbusinesses (Adult Use), or Safety Compliance Facilities (Medical and Adult Use)





CITY OF ALLEGAN
REGULAR CITY COUNCIL MEETING
Monday, July 8, 2019
Griswold Auditorium – 401 Hubbard Street Allegan, MI 49010

6:00 PM Joint meeting with Allegan City Council and the Planning Commission
7:00 PM Council Meeting (Action to be taken by Council on the following agenda items)
Note: Please be courteous and turn cell phones off during the meeting.

1. CALL TO ORDER

2. ROLL CALL (Excused Absences if Any)

3. PLEDGE OF ALLEGIANCE

4. MEETING PRAYER

5. APPROVAL OF MINUTES

5A.1 – Approval of the Regular Council Meeting Minutes for June 24, 2019.

6. APPROVAL OF AGENDA

6A.1 – Approval of the Regular Council Meeting Agenda for July 8, 2019.

7. PUBLIC COMMENT FOR ITEMS NOT ON THE AGENDA

8. FIRST READING OF ORDINANCE

9. SPECIAL PRESENTATIONS AND RECOGNITIONS BY THE MAYOR OR COUNCIL

10. PUBLIC HEARINGS & ADOPTION OF ORDINANCES

10A.1 – Public Hearing and adoption of Resolution 19.18 for the sale City Owned property located south of 239 Hubbard Street.

11. UNFINISHED BUSINESS & TABLED ITEMS

12. WRITTEN PETITIONS & REPORTS FROM SPECIAL COMMITTEES

13. REPORTS FROM BOARDS, COMMISSIONS & CITY OFFICES

13A. City Boards, Commissions and Area Agencies

13A.1 – Accept the Minutes for the Positively Allegan Corporation Meeting on June 26, 2019.

13A.2 - Accept the Minutes for the Historic District Commission Meeting on July 1, 2019

13B. Finance Department

13B.1 - Request to Approve Accounts Payable and Payroll for the Week Ending June 23, 2019.

13C. Police Department

13D. Public Utilities

13D.1 – Discussion on Odor Study and Potential Costs.

13E. Public Works

13F. City Manager & City Clerk

13F.1 – Discussion of Closing City Hall on July 25 & 26, 2019 for the move to the new City Hall Location of 231 Trowbridge St.

13F.2 – Recommendation to adopt Resolution 19.19 to endorse the Lower Kalamazoo River Greenway Plan.

13F.3 – Discussion on the future of the City Owned Dam and Power House along the Kalamazoo River.

14. BOARD APPOINTMENTS

15. COMMUNICATIONS FROM CITY MANAGER, COUNCIL & MAYOR

16. CLOSED SESSION

17. ADJOURNMENT

PLEASE NOTE

AUDIENCE PARTICIPATION:
In addition to addressing the Council during public hearings and under "Public Comment," members of the audience may address the Council, on items listed under agenda numbers 8-13; please limit your comments to five minutes or less per item. Please step up to the Podium and state your name and address.

The proposed process for items listed under agenda numbers 8-13 above shall be as follows:

1. Announcement of the agenda item by the Mayor.
2. Verbal report provided by staff.
3. Mayor asks councilmembers if they have any questions for staff to clarify the staff report.
4. Mayor opens/closes the floor to receive public comment (if a public hearing is required or if the mayor determines public comments is warranted).
5. Motion is made by a council member and seconded by another council member.
6. Mayor then calls on councilmembers to discuss the motion, if councilmembers which to discuss.
7. Mayor calls for a vote on the item after discussion has occurred.

Allegan City
Council Minutes
Allegan, MI
49010
June 24, 2019

1. CALL TO ORDER

Mayor McKenzie called the regular Allegan City Council Meeting to order at 7:11PM.

2. ROLL CALL

Present: Manning, Tripp, Ingalsbee, Andrus, Perrigo, Morgan, Mayor McKenzie

Absent: None

Others Present: City Manager Joel Dye, City Clerk Danielle Bird, Promotions Coordinator Parker Johnson, Community Development Coordinator Jordan Meagher, Sargent Dame, Director of Public Works Aaron Haskin, Public Utilities Director Doug Sweeris

3. PLEDGE OF ALLEGIANCE

4. MEETING PRAYER

Pastor Alan Carson of Merson Corners

5. APPROVAL OF MINUTES

5A.1 – Approval of the Regular Council Meeting Minutes for June 10, 2019.

Motion by Andrus, supported by Perrigo, to approve the Regular Council Meeting Minutes from June 10, 2019. Motion Passed 6-1, with Ingalsbee abstaining.

6. APPROVAL OF AGENDA

6A.1 – Approval of the Regular Council Meeting Agenda for June 24, 2019.

Motion by Morgan, supported by Andrus, to approve the Regular Council Agenda for June 24, 2019 with the addition of 13F.1 – Discussion of Closing the Alley between Hubbard and Trowbridge Streets behind the buildings located west of Locust Street and 13F.2 – Schedule a Public Hearing for July 8, 2019 for the potential sale of City owned property located south of 239 Hubbard Street. Motion Passed 7-0.

7. PUBLIC COMMENT FOR ITEMS NOT ON THE AGENDA

None

8. FIRST READING OF ORDINANCE

9. SPECIAL PRESENTATIONS AND RECOGNITIONS BY THE MAYOR OR COUNCIL

10. PUBLIC HEARING & ADOPTION OF ORDINANCES

10A.1 – Public Hearing and second reading on Ordinance 476 regarding the regulation of small wireless communication facilities located in public right of ways.

Mayor McKenzie opened the Public Hearing at 7:17 p.m. and closed the public hearing with no public comments.

Staff and Council discussed.

Motion by Andrus, supported by Tripp to adopt Ordinance 476 regarding the regulation of small wireless communication facilities located in public right of ways. Motion passed 7-0.

10A.2 – Public Hearing and second reading on Ordinance 477 regarding the regulation of discharging consumer fireworks with the city limit of the City of Allegan.

Mayor McKenzie opened the Public Hearing at 7:24 p.m.

Resident Cindy Thiel asked how it would work if the Holiday fell on a different day. She also asked about the fireworks on Bridgefest. City Manager Dye explained this is for residents and not the municipality.

Mayor McKenzie closed the public hearing at 7:27 p.m.

Motion by Perrigo, supported by Morgan to adopt Ordinance 477 regarding the regulation of discharging consumer fireworks with the city limit of the City of Allegan. Motion passed 6-1, with Manning voting no.

11. UNFINISHED BUSINESS & TABLED ITEMS

12. WRITTEN PETITIONS & REPORTS FROM SPECIAL COMMITTEES

12A.1 – Request from Joanie Townsend regarding odors generated from the Water Resource Recovery Facility.

The following residents spoke about the concerns at the Water Resource Recovery Facility; Joan Townsend, Joan Simmons and Nancy Stamm.

Public Utilities Director Doug Sweeris, Staff and Council discussed their concerns and decided that holding a neighborhood meeting in the near future.

12A.2 - Request from Allegan County Cruise In to be approved as a non-profit organization operating in the community for the purposes of obtaining charitable gaming licenses.

Motion by Morgan, supported by Ingalsbee to approve the charitable gaming license for the Allegan County Cruise In. Motion passed 7-0.

13. REPORTS FROM BOARDS, COMMISSION & CITY OFFICES

13A. City Boards, Commissions and Area Agencies

13A.1 – Accept the Minutes for the Downtown Development Authority on June 5, 2019.

City Manager Dye gave an update for the Downtown Development Authority on June 5, 2019.

13A.2 – Accept the Minutes for the Planning Commission on June 5, 2019.

City Manager Dye gave an update for the Planning Commission on June 5, 2019.

13B. Finance Department

13B.1 - Request to Approve Accounts Payable and Payroll for the Week Ending June 21, 2019

Motion by Tripp, supported by Morgan to approve Accounts Payable and Payroll for the Week Ending June 21, 2019. Motion Passed 7-0.

13B.2 – Request to Adopt Resolution 19.17 to authorize 4th Quarter Budget Adjustments for Fiscal Year 2018/19.

Motion by Perrigo, supported by Andrus to adopt Resolution 19.17 to authorize 4th Quarter Budget Adjustments for Fiscal Year 2018/19. Motion passed 6-1, with Manning voting no.

13B.3 - A request for services received from Bartz Rumery Agency, Inc. Allegan, MI for the 2019/20 City of Allegan Insurance Counseling Service Agreement in the amount of $4,500.00.

Motion by Ingalsbee, supported by Morgan to approve the services received from Bartz Rumery Agency, Inc. Allegan, MI for the 2019/20 City of Allegan Insurance Counseling Service Agreement in the amount of $4,500.00. Motion passed 7-0.

13B.4 – A request for services received from Berends Hendricks Stuit Insurance, Grandville, MI for the 2019/20 City of Allegan Municipal Liability Coverage in the amount of $125,379.00.

Motion by Morgan, supported by Ingalsbee to approve the request for services received from Berends Hendricks Stuit Insurance, Grandville, MI for the 2019/20 City of Allegan Municipal Liability Coverage in the amount of $125,379.00. Motion Passed 7-0.

13C. Police Department

13D. Public Utilities

13E. Public Works

13F. City Manager & City Clerk

13F.1 – Discussion of Closing the Alley between Hubbard and Trowbridge Streets behind the buildings located west of Locust Street.

City Staff and Council discussed the reasons for closing the Alley.

Motion by Manning, supported by Morgan to approve closing the Alley between Hubbard and Trowbridge Streets behind the buildings located west of Locust Street. Motion Passed 7-0.

13F.2 – Schedule a Public Hearing for July 8, 2019 for the potential sale of City owned property located south of 239 Hubbard Street.

Motion by Manning, supported by Morgan to schedule a Public Hearing for July 8, 2019 for the potential sale of City owned property located south of 239 Hubbard Street. Motion Passed 7-0.

14. BOARD APPOINTMENTS

15. COMMUNICATIONS FROM CITY MANAGER, COUNCIL & MAYOR

15A.1 – Comments from City Manager, Council and Mayor.

City Manager Dye – He sent out an email to Council to tour the New City Hall from 4:30 – 6:00 p.m. The 1st meeting in August will be at the New City Hall.

City Clerk Danielle Bird – Attended the MAMC conference in Kalamazoo last week.

Public Utilities Director Doug Sweeris – The project in the Russel/Robinson neighborhood has begun. Roads have been pulverized and the new sewer lines will be installed. Shaun has notifies all residents about potential new water lines.

Community Development Coordinator Jordan Meagher – Nothing

Promotions Coordinator Parker Johnson – Attendance for Rollin on the River is up. Next week is July 3 and Good Times at the Gazebo start next week as well.

Council Member Perrigo – Nothing

Council Member Andrus – There was a wonderful turn out at Rollin' on the River.

Council Member Ingalsbee – Nothing, she is still on California time.

Council Member Morgan – He can't attend the events due to work, but driving through town there is a lot of traffic.

Council Member Manning – Nothing

Mayor Pro tem Tripp – If you can, come on down for Rollin' on the River. He has been able to attend them all. The Splash Pad is a huge success.

Mayor McKenzie – Thanked everyone for coming out and looks forward to the next meeting.

16. CLOSED SESSION

17. ADJOURNMENT

Mayor McKenzie adjourned the meeting at 8:46PM.

Minutes respectfully submitted by,

Danielle Bird
City Clerk

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Public hearing and adoption of Resolution 19.18 for the sale of city owned property located immediately to the south of 239 Hubbard Street.
DATE: July 8, 2019

Summary
It is requested that City Council hold a public hearing and subsequently adopt Resolution 19.18 authorizing the sale of city owned property located immediately to the south of 239 Hubbard Street.

Earlier this year the City received a request from the new owner of 239 Hubbard Street, Candida Mervenne, looking to buy approximately the northern 20 feet of Lot parcel 51-305-042-00 for $1.00. This piece of land is located directly south of 239 Hubbard Street and it has historically been maintained by the owner of 239 Hubbard Street. Please see attached property survey and aerial photograph.

Due to the fact that this land has historically been maintained by the owner of 239 Hubbard Street and the fact there is no benefit to the city maintaining ownership over this piece of land, staff is okay with recommending the sale of approximately the northern 20 feet of Lot parcel 51-305-042-00 for $1.00.

As with all sales of city owned land, the City has published its intent to sell this property in the Allegan County News for three consecutive weeks.

Recommendation
It is recommended that City Council hold a public hearing and subsequently adopt Resolution 19.18 authorizing the sale of city owned property located immediately to the south of 239 Hubbard Street.

Attachments:

Resolution 19.18
Aerial Photo of 239 Hubbard Street
Survey of piece of land that is to be sold.

CITY COUNCIL
CITY OF ALLEGAN
Allegan County, Michigan

, supported by, moved adoption of the following resolution:

RESOLUTION NO. 19.18
RESOLUTION APPROVING AND AUTHORIZING SIGNING AND FULFILLMENT OF TERMS OF AGREEMENT FOR PURCHASE AND SALE OF REAL PROPERTY

WHEREAS,

A. The City received a proposal from Candida Mervenne ("Buyers") to purchase from the City a portion of real property, bearing tax parcel number 51-305-042-00 which is legally described as follows (the "Property"):

Approximately the northern 20 feet portion of the parcel in the City of Allegan, County of Allegan, State of Michigan, commonly known as Tax I.D. No. 51-305-042-00.

B. Pursuant to section 13.9 of the City Charter, the City published notice of a public hearing at least once a week for 3 consecutive weeks with the last notice not more than 7 days before the public hearing held on Monday, July 8, 2019, regarding the proposed sale of the Property to Buyers.

C. None of the Property is part of any park or cemetery.

NOW, THEREFORE, BE IT RESOLVED, BY A 5/7 VOTE OF THE CITY COUNCIL, AS FOLLOWS:

1. The Agreement for the Purchase and Sale of the Property in the form attached as Exhibit A is approved, subject to such changes as are agreed upon by the Mayor, City Manager and City Attorney (the "Agreement").

2. The Mayor and City Clerk are authorized and directed to sign Agreement on behalf of the City.

3. The City officers, staff and agents are authorized and directed to take all actions needed to fulfill the terms of the Agreement and to close on the transaction contemplated by the Agreement.

4. All resolutions and parts of resolutions are, to the extent of any conflict with this resolution, rescinded.

DATE:

YEAS:
NAYS:
ABSTAIN:
ABSENT:

RESOLUTION DECLARED: ADOPTED

_____
Danielle Bird, City Clerk

CERTIFICATION

As its Clerk, I certify that this is a true and complete copy of a resolution adopted by the City Council of the City of Allegan, Allegan County, Michigan, at its meeting of July 8, 2019.

_____
Danielle Bird, City Clerk

Exhibit A

REAL ESTATE PURCHASE AGREEMENT

This Real Estate Purchase Agreement between the City of Allegan, a Michigan municipal corporation, having an address of 112 Locust Street, Allegan, Michigan 49010 (the "Seller"), and Candida Mervenne, an unmarried individual with an address of 1848 Lincoln Street Allegan, MI 49010 (the "Buyer").

RECITALS

A. Seller owns a parcel along the riverfront to the Kalamazoo River that is used primarily as a municipal parking lot (the "Parent Parcel").

B. Buyer owns an adjoining parcel commonly known as 239 Hubbard Street.

C. Buyer and previous owners of 239 Hubbard Street have historically maintained an used a portion of the Parent Parcel, as described on the attached **Exhibit A** (the "Premises"), as greenspace for its building located at 239 Hubbard Street.

D. Buyer would like to acquire the Premises to ensure continued enjoyment of it.

E. Seller has no further use for the Premises and is amenable to selling it to Buyer, subject to the terms and conditions of this Agreement.

TERMS AND CONDITIONS

1. Purchase and Sale. The City agrees to sell the Premises to Buyer, and Buyer agrees to purchase the Premises from Seller, together with all easements, rights, hereditaments, and appurtenances, on the terms and conditions set forth below. If Buyer does not elect to terminate this Agreement during the Due Diligence Period or Approval Period, if one is elected as allowed below, this Agreement shall become binding on Buyer to purchase the Premises.

2. Purchase Price. At closing, Buyer shall pay Seller a purchase price for the Premises of $1.00 (the "Purchase Price").

3. Title Conveyed. Title to the Premises shall be conveyed at the closing by a quit claim deed in substantially the form attached as **Exhibit B** to this Agreement.

4. Title Insurance. Buyer shall be solely responsible for obtaining any title insurance or other assurance of title Buyer wishes to acquire.

5. Survey and Lot-Line Adjustment. Buyer shall acquire, at its expense, a ALTA/NSPS prepared by a licensed surveyor that describes and depicts a combined parcel consisting of the Premises and the adjoining parcel commonly known as 239 Hubbard Street (the "239 Hubbard Parcel"). The survey shall be attached as an exhibit to, and recorded with, the deed conveying the Premises to Buyer. By approving this agreement, the Seller's City Council approves the lot-line adjustments required in order to incorporate the Premises into the parcel known as 239 Hubbard Street.

6. Environmental Issues. Prior to the closing, Buyer may, at Buyer's expense, perform any inspections environmental site assessments and investigations of the Property that it deems appropriate. Notwithstanding anything to the contrary contained in this Agreement, except in the case of the negligence or willful misconduct of the City or its officers, commissions, employees, contractors or agents to the fullest extent permitted under applicable law, Buyer waives any and all claims, demands, suits and causes of action against the City and its officers, employees, contractors and agents, releases them for any loss, cost, damage, liability or expense Buyer suffers or incurs due to any entry onto the Property pursuant to this Agreement. This waiver shall survive the term or cancellation and/or termination of this Agreement.

7. Condition of Property. Buyer acknowledges and agrees that it is purchasing the Property in its "as is," "where is," "with all faults" condition without any warranties and representations by the City as to merchantability, suitability, habitability or fitness for any particular use. The City makes no representations or warranties of any kind whatsoever with respect to the condition of the Property and the City shall not be a warrantor or guarantor of any studies, tests, assessments, documentation or any information conducted or prepared by or gathered by any person concerning the Property. Buyer acknowledges and agrees that it is relying solely on its own inspections, examinations, tests, assessments, reports, studies and financial analysis of the Property in its determination of the condition of the Property. Buyer releases the City and its officers, commissioners, employees and agents from all claims and liability concerning the physical condition of the Property, which release shall survive the term or cancellation or termination of this Agreement.

8. Closing. The closing of the sale shall take place at a location to be agreed on by the parties, on or about July 9, 2019, or within 10 days after all conditions precedent under this Agreement are satisfied, whichever occurs first. Buyer shall prepare the documents for the closing and submit them to Seller for review at least 5 days before the closing. Buyer shall pay all real estate transfer taxes on the sale, if any, and prepare and file all recording and transfer affidavits. The parties do not anticipate using a title company to close this transaction. Rather, the Seller will simply sign and deliver the deed to Buyer, and Buyer shall take any other actions needed to complete and appropriately document the transfer of the Parcel.

9. Contingencies. The obligation of the parties to close the transactions contemplated by this Agreement shall be contingent on:

A. Buyer's satisfaction that the Premises is suitable for its purposes.

B. Seller's satisfaction with the survey obtained by Buyer.

If these contingencies are not satisfied at or before Closing, this Agreement shall terminate and neither party shall have any further liabilities or obligations under this Agreement.

10. Brokers. Each party represents and warrants that there are no brokers', finders' or similar fees in connection with this transaction.

11. Closing Costs. Buyer shall be responsible for the payment of applicable transfer taxes, costs for the recording the deed, and any other applicable closing costs.

12. Assignment. Neither party may assign any of that party's rights, duties or obligations under this Agreement without the prior written consent of the other party.

13. Default and Remedies.

A. If Seller fails to perform in accordance with this Agreement or if any representation or warranty of Seller in this Agreement is untrue when made or at Closing, Seller shall be in default. In the event of a default by Seller, Purchaser may, as its sole and exclusive remedies, elect to either enforce the terms of or terminate this Agreement.

B. In the event of a default under this Agreement by Purchaser, Seller may, as its sole and exclusive remedy, elect to terminate this Agreement.

14. Miscellaneous.

a. This is the entire agreement between the parties regarding its subject matter. It may not be modified or amended except in writing executed by both parties. The captions are for reference only and shall not affect the interpretation of this Agreement. More than one copy of this Agreement may be signed, but all constitute but one agreement.

b. Any notices shall be made in writing to the address as first written above or to such other addresses as indicated by notice and shall be made by personal delivery or by United States certified mail, with return receipt requested and postage prepaid.

c. This Agreement shall be binding upon the parties and their subrogees, successors, and permitted assigns.

The parties have signed this Agreement as of the dates stated below.

CITY OF ALLEGAN

By:_____
Rachel McKenzie, Mayor

By:_____
Danielle Bird, Clerk

Date signed: _____

CANDIDA MERVENNE

By:_____
Candida Mervenne

Date signed: _____

PURCHASE AGREEMENT EXHIBIT A

The following described premises located in the City of Allegan, County of Allegan, State of Michigan:

Part of Lot 297, Original Plat of the Village (now City) of Allegan, being part of the Southwest 1/4 of Section 28, Town 2 North, Range 13 West, Allegan Township, Allegan County, Michigan, as recorded in Liber 7 of Plats, Page 344, described as: Commencing at the Northeast corner of said Lot; thence S06°47'43"W 50.50 feet along the East line of said Lot to the Point of Beginning; thence continuing along said East line 19.80 feet; thence N86°04'14"W 25.03 feet to the West line of the East 1/2 of said Lot; thence N06°47'43"E 21.02 feet along the West line of the East 1/2 of said Lot; thence S83°16'05"E 25.00 feet along the South line of the North 50.50 feet of the East 1/2 of said Lot to the Point of Beginning. Contains 510 square feet. Subject to easements, restrictions and rights-of-way of record.

PURCHASE AGREEMENT EXHIBIT B
PROPOSED FORM OF DEED

[See attached]

QUIT CLAIM DEED

THE GRANTOR: City of Allegan, a Michigan municipal corporation,

WHOSE ADDRESS IS: 112 Locust Street, Allegan, MI 49010,

QUIT CLAIMS TO
THE GRANTEE: Candida Mervenne, an unmarried individual,

WHOSE ADDRESS IS: 1848 Lincoln Street Allegan, MI 49010

the following described premises located in the City of Allegan, County of Allegan, State of Michigan:

> Part of Lot 297, Original Plat of the Village (now City) of Allegan, being part of the Southwest 1/4 of Section 28, Town 2 North, Range 13 West, Allegan Township, Allegan County, Michigan, as recorded in Liber 7 of Plats, Page 344, described as: Commencing at the Northeast corner of said Lot; thence S06°47'43"W 50.50 feet along the East line of said Lot to the Point of Beginning; thence continuing along said East line 19.80 feet; thence N86°04'14"W 25.03 feet to the West line of the East 1/2 of said Lot; thence N06°47'43"E 21.02 feet along the West line of the East 1/2 of said Lot; thence S83°16'05"E 25.00 feet along the South line of the North 50.50 feet of the East 1/2 of said Lot to the Point of Beginning. Contains 510 square feet. Subject to easements, restrictions and rights-of-way of record.

Together with all improvements, appurtenances, tenements and hereditaments thereto (the "Property") for the sum of $1.00, the receipt of which is acknowledged.

The premises may be located within the vicinity of farmland or a farm operation. Generally accepted agricultural and management practices which may generate noise, dust, odors, and other associated conditions may be used and are protected by the Michigan right to farm act.

The Grantor grants to the Grantee the right to make all divisions under section 108 of the land division act, Act No. 288 of the Public Acts of 1967.

This transfer is exempt from all transfer taxes under MCL 207.505(h) and MCL 207.526(h) because the Grantor is a municipality.

Grantor gives this Deed and agrees to the terms and conditions contained herein:

Dated this _____ day of _____, 2019.

City of Allegan

By:_____
Rachel McKenzie, Mayor

By:_____
Danielle Bird, City Clerk

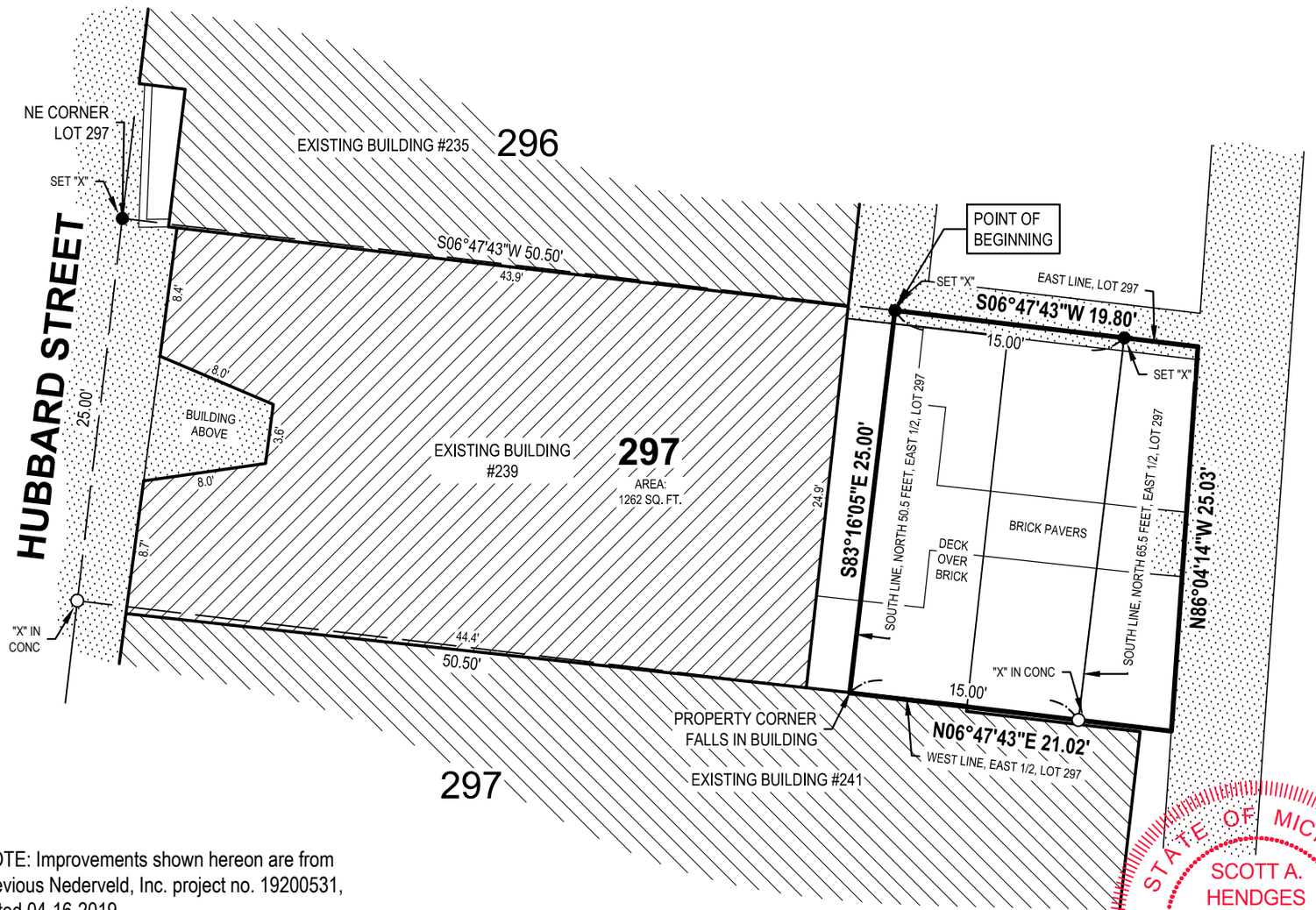
STATE OF MICHIGAN)
) ss.
COUNTY OF ALLEGAN)

On this _____ day of _____, 2019, before me, a Notary Public, in and for said County, personally appeared Rachel McKenzie, Acting Mayor, and Danielle Bird, City Clerk, on behalf of the City of Allegan, who executed this Quit Claim Deed and acknowledged that they have executed it on behalf of the City of Allegan in their official capacities.

_____
_____, Notary Public
_____ County, State of Michigan
My Commission Expires: _____

Drafted By:
Nicholas Curcio (P75824)
CURCIO LAW FIRM PLC
3547 Alpine Avenue, NW #103
Grand Rapids, MI 49544

When Recorded Return To Grantee



NOTE: Improvements shown hereon are from previous Nederveld, Inc. project no. 19200531, dated 04-16-2019.

We hereby certify that we have examined the premises herein described, that the improvements are located entirely thereon as shown and that they do not encroach except as shown hereon.

This survey was made from the legal description shown above. The description should be compared with the Abstract of Title or Title Policy for accuracy, easements and exceptions.

PARENT PARCEL DESCRIPTION

Lot 297 of the Original Plat of the Village (now City) of Allegan according to the recorded plat thereof as recorded in Liber 7 of Plats, Page 344.

PARCEL TO BE AQUIRED DESCRIPTION

Part of Lot 297, Original Plat of the Village (now City) of Allegan, being part of the Southwest 1/4 of Section 28, Town 2 North, Range 13 West, Allegan Township, Allegan County, Michigan, as recorded in Liber 7 of Plats, Page 344, described as: Commencing at the Northeast corner of said Lot; thence S06°47'43"W 50.50 feet along the East line of said Lot to the Point of Beginning; thence continuing along said East line 19.80 feet; thence N86°04'14"W 25.03 feet to the West line of the East 1/2 of said Lot; thence N06°47'43"E 21.02 feet along the West line of the East 1/2 of said Lot; thence S83°16'05"E 25.00 feet along the South line of the North 50.50 feet of the East 1/2 of said Lot to the Point of Beginning. Contains 510 square feet. Subject to easements, restrictions and rights-of-way of record.

LEGEND

- Iron - Set
- Iron - Found
- Concrete
- Existing Building

STATE OF MICHIGAN
SCOTT A. HENDGES
PROFESSIONAL SURVEYOR
NO. 47953
LICENSED PROFESSIONAL SURVEYOR

By Scott A. Hendges Licensed Professional Surveyor No. 47953

SCALE: 1" = 10' 0' 5' 10'

NORTH

Five Star Real Estate Lakeshore
Ken Baron
76 South River Avenue
Holland, MI 49423

Candida Mervenne
239 Hubbard Street

DRAWN BY: WBB DATE: 05-24-2019
REV. BY: WBB REV. DATE: 6/4/19
REV.: Extended acquisition to sidewalk

PRJ #: 19200531DMP.1

1 OF 1

NEDERVELD
www.nederveld.com • 800.222.1868
Holland
347 Hoover Blvd.
Holland, MI 49423
Ann Arbor, Chicago, Columbus, Grand Rapids, Indianapolis, St. Louis

19200531DMP.dwg WB 6/5/2019 14:13

POSITIVELY ALLEGAN CORPORATION MEETING

Griswold Auditorium
401 Hubbard Street, Allegan, MI 49010
Wednesday, June 26, 2019 6:00 p.m.

Agenda

I. Call to Order

- **i.** The meeting was called to order at 6:02pm

II. Attendance

Present: D. Adams, M. Cantwell, M. Liggett, R. McKenzie E. Quinones-Walker

Absent: A. Adams, M. Bouwman, S. Neldon

Others Present: Ryan Deery, J. Dye, T. Gorby, Kathy Nealand, P. Johnson,

III. Minutes of the Previous Meeting

No Quorum

IV. Old Business

A. Bridgefest Debrief

- **i.** Overall, best Bridgefest yet since its return.
- **ii.** Final budget was presented.
- **iii.** The ADL loved being a part of the event and wish to continue this partnership and expand offerings. Asked for better wayfinding.
- **iv.** The Maker's Mart, organized by the Sassy Olive, also saw success and wish to partner again. Vendors are already signed up for next year. Asked for better wayfinding.
- **v.** Community Tents, represented by Rev. Kathy Nealand, was appreciative and said location was better than last year. Asked about shorter timeframe.
- **vi.** New ideas such as 3 on 3 basketball, cornhole, and amusement rides were discussed.
- **vii.** Bridgefest returns on Saturday, June 13, 2020.

V. New Business

A. Rollin' On The River

- **i.** Rollin' on the River is a profiting event.
- **ii.** Discussion of beverage regulation for bandmembers.
- **iii.** Discussion of beverage selection differentiation.
- **iv.** In need of beer garden volunteers.

B. July 3 Jubilee

- **i.** Went over event itinerary.
- **ii.** Rachel volunteered to operate the seatbelt convincer from 6-8pm.
- **iii.** Fireworks at 10:15pm!

C. Good Times at the Gazebo

- **i.** 31st year of event, 2nd year of City responsibility.
- **ii.** Someone from the City will be present at each event to introduce acts on stage, based on feedback from last summer.

D. Festival of Beers

- **i.** Discussion on the upcoming Saturday, September 21 event.
- **ii.** Six Allegan County breweries confirmed to participate – seeking out a cider mill.
- **iii.** Positively Allegan is working closely with Tantrick Brewing Company for organization.
- **iv.** Volunteers!

VI. Adjournment

- **i.** The meeting adjourned at 7:13pm. The next meeting will be held on July 24, 2019, at 6:00pm.

Respectfully Submitted,
Parker Johnson
Promotions Coordinator

HISTORIC DISTRICT COMMISSION
Griswold Auditorium
401 Hubbard Street
Allegan MI 49010
July 1, 2019

I. Call to Order by Mike Morton at 7:00pm

II. Attendance

PRESENT:	Mike Morton, Traci Perrigo, Rob Way, Cassandra Seelhoff
ABSENT:	Brad Burke, Eddie Quinones-Walker, Jill Bentley
TARDY:	None
STAFF:	Jordan Meagher- Community Development Coordinator, Lori Castello- PCI

III. Approval of the Previous Meeting Minutes

Traci Perrigo, supported by Cassandra Seelhoff, made a motion to approve the minutes from the June 3, 2019 meeting. Motion carried 4-0.

IV. Public Comment

None.

V. Applications

1. 529 Trowbridge Street

Tony Calderona, owner of 529 Trowbridge, had previously requested at the June 3rd meeting to repair/restore his front porch by replacing the concrete structures on which his porch's support columns set with full wooden columns or with columns of a different material that closely resemble the current ones. He had returned to this meeting with a possible option, but the columns he was proposing were missing an extra ring at the base that can be seen on the home's current ones.

After some discussion, the Historic District Commission agreed that the proposed columns would still be appropriate for the repair.

Traci Perrigo, supported by Rob Way, made a motion to approve the repair using the proposed columns that resemble the current ones based on Secretary of Interior Standards 1, 3, 5, 6, and 7. Motion carried 4-0.

RESULT:	**Approved (UNANIMOUS)**
MOVER:	Traci Perrigo
SECONDER:	Rob Way
YEAS:	Morton, Perrigo, Seelhoff, Way

2. 403 N Cedar Street

Fred Jordan, owner of 403 N Cedar, had submitted a request to perform a front porch repair/alteration project. The plan would be to raise the slope of the porch roof by 4-6 inches to improve runoff, replace the rubber roof with the addition of rounded gutters, and expand the roof to cover the entire porch. A portion of the porch is uncovered by roofing, so the plan would be to expand the roof to cover this area by following the floor area of the current porch. The applicant had also requested to repair a set of stairs on the side of the house, along with replacing a side door with a new 9 Lite door.

After some discussion, the Historic District Commission agreed that all of the presented repairs would comply should be approved.

Traci Perrigo, supported by Rob Way, made a motion to approve the application as presented, allowing for raising of the back side of the porch roof by 4-6 inches, replacement of the rubber roof with the addition of rounded gutters, an expansion of the roof to cover the uncovered porch floor area, and replace the side steps and door as presented based on the Secretary of Interior Standards 1, 2, 5, 6, 7, and 8. Motion carried 4-0.

RESULT:	**Approved (UNANIMOUS)**
MOVER:	Traci Perrigo
SECONDER:	Rob Way
YEAS:	Morton, Perrigo, Seelhoff, Way

3. 123 Delano Street

The applicant had requested to put a clear, water proof stain on a fence around the property, as well as re-roof a gazebo that sits on the parcel. The gazebo does not have historical significance, and the newly placed roof would match the materials and color of the house.

Rob Way, supported by Traci Perrigo, made a motion to approve the fence staining and gazebo roof replacement as presented based on Secretary of Interior Standards 1, 2, 6, 8, 9, and 10. Motion carried 4-0.

RESULT:	**Approved (UNANIMOUS)**
MOVER:	Rob Way
SECONDER:	Traci Perrigo
YEAS:	Morton, Perrigo, Seelhoff, Way

VI. Staff Approvals

VII. Other Business

X. Staff/Commission Comment

XI. Adjournment

Meeting was adjourned at 7:38 pm.

Respectfully Submitted

Jordan Meagher
Community Development Coordinator

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Approval of Accounts Payable and Payroll
DATE: July 8, 2019

Summary

It is requested that City Council approve accounts payable in the amount of $391,261.15 and payroll in the amount of $142,851.23 for a total disbursement of $534,112.38.

Attached is the accounts payable and payroll summary sheet.

Recommendation

It is recommended that City Council approve accounts payable in the amount of $391,261.15 and payroll in the amount of $142,851.23 for a total disbursement of $534,112.38.

Attachment

Accounts Payable and Payroll Summary Sheet

Disbursement Report
July 9, 2019

June 21, 2019 thru July 03, 2019
Accounts Payable by Fund

General Fund	$	68,394.65
Major Streets	$	1,106.49
Local Streets	$	3,760.58
Grants	$	230,366.32
DDA	$	-
PA	$	5,155.99
Sewer	$	64,924.97
Water	$	13,164.17
Motor Vehicle Pool	$	4,387.98
Trust & Agency	$	-
Total A/P by Fund	**$**	**391,261.15**

Regular Check Run	$	158,753.45
Off-Cycle Check Runs	$	232,507.70
Total Checks	**$**	**391,261.15**

Payroll Check Remittances	$	1,471.56
Payroll EFT Remittances	$	38,344.73
Total Checks	**$**	**39,816.29**
Payroll - June 25, 2019 (for WE 06/23/2019)	$	103,034.94
Total Payroll	**$**	**142,851.23**

Total Disbursements	**$**	**534,112.38**

Manual Check Report
7/9/2019

Ck#	Vendor	Description	Amount	Date
72362	Alliance Beverage Dist	Beverages	$331.60	06/25/19
72363	Universal Film Exchange	Film	$1,749.78	06/26/19
72364	Milbocker and Sons	Contract	$230,366.32	06/26/19
72365	Allegan Co Clerks Office	Notary	$10.00	06/27/19
72366	Michael Davis	Park Refund - Flooded	$50.00	06/27/19
	Total Manual Checks		**$232,507.70**	
72361	MISDU	Child Support	$1,471.56	06/25/19
	Total Payroll Checks	****Included in Payroll Total**	**$1,471.56**	

EFT Payment Report
7/9/2019

Ck#	Vendor	Description	Amount	Date
614	JH 457	Retirement	$2,659.53	06/25/19
615	IRS	Federal WH Tax	$21,351.88	06/25/19
616	MERS	MERS	$284.67	06/25/19
617	MPP	Retirement	$6,540.68	06/25/19
618	STATE	MI Dept of Treasury	$7,507.97	06/25/19
	Total EFT Payments		**$38,344.73**	
	Total Manual Checks		**$272,323.99**	

Check Register
7/9/2019

Check #	Vendor Name	Total Amount	# Invoices
72367	ALLEGAN CO INFORMATION	495	1
72368	ALLEGAN CO SHERIFF DEPARTM	1,208.00	2
72369	ANDY'S ACE HARDWARE	923.7	1
72370	B & B W/W CONSULTANTS, INC.	40	1
72371	BARTZ/RUMERY AGENCY INC	60	1
72372	BAUCKHAM, SPARKS THALL, SEEBER	144	1
72373	BEAVER RESEARCH COMPANY	103.2	1
72374	BEHRENS LIMITED	351.5	1
72375	BELL EQUIPMENT CO	184.96	1
72376	CHARTER COMMUNICATIONS HOLDING CO	845.72	4
72377	CLARK HILL, PLC	300	1
72378	CLARK TECHNICAL SERVICES, LLC	1,705.00	1
72379	Clear Heights Construction, LLC	40,204.45	1
72380	COBB COMMUNICATIONS INC	3,655.00	2
72381	CRONK SERVICES, LLC	342	2
72382	CRONK SERVICES, LLC	112	1
72383	CURCIO LAW FIRM PLC	2,263.80	1
72384	CYNTHIA ANN SUTHERLAND	385	1
72385	DANIELLE BIRD	229.51	1
72386	DELUXE ECHOSTAR LLC	159.8	1
72387	EJ USA,INC./EAST JORDAN IRON WORKS	840.26	1
72388	ENGELKING, KEN	35.02	1
72389	FAMILY FARM AND HOME	47.99	1
72390	FRONTIER COMMUNICATIONS OF MICHIGAN	776.52	2
72391	GHIST, TONYA	72.02	1
72392	GLOBAL ENVIRONMENTAL CONSULTING LLC	275	1
72393	GRAINGER	64.05	1
72394	GRAND RAPIDS POPCORN, LLC	443.75	1
72395	GRAUMAN III, DUANE	63.78	1
72396	HARN R/O SYSTEMS, INC.	7,956.63	2
72397	HOME DEPOT	104.71	1
72398	INDUSCO SUPPLY CO INC	247.33	3
72399	JAMES BYERLY	2,014.61	1
72400	JASON CARNS	75	1
72401	JAY GIBSON	300.8	1
72402	JEFFREY MORRIE	150	1
72403	JONES & HENRY ENGINEERS, LTD.	6,787.20	1
72404	KAECHELE PUBLICATIONS, INC	3,936.74	1
72405	KEN'S TIRE SERVICE, INC.	216	1
72406	KENNEDY INDUSTRIES, INC.	47,102.00	1
72407	KLOSTERMAN DISTRIBUTING	395.48	1
72408	LANCE R. LACY	231	1
72409	LEGG LUMBER - ALLEGAN	64.5	1
72410	MCEWEN LAW OFFICE, P.C.	1,975.20	1
72411	MCNALLY ELEVATOR COMPANY, INC.	138.75	1
72412	MICHIGAN RURAL WATER ASSOCIATION	810	1
72413	MOORE, BEN & VICKIE	437.42	1
72414	MOULENBELT, SHARON	10.12	1
72415	NORTHWEST KENT MECHANICAL CO	455	1
72416	NYE UNIFORM COMPANY	283.5	2
72417	OFFICE DEPOT, INC.	73.86	1

Check #	Vendor Name	Total Amount	# Invoices
72418	PENN VALLEY PUMP CO, INC	11,561.00	1
72419	PJ PRINTING LLC	1,043.31	3
72420	PJ PRINTING LLC	134.34	1
72421	PLUMBER'S PORTABLE TOILETS	110	1
72422	PROFESSIONAL CODE INSPECTONS OF MI	250	1
72423	PURITY CYLINDER GASES, INC.	309.68	1
72424	RATULOWSKI, MATTEW & TAMMIE HAUSE	22.51	1
72425	RIC AND STAN'S CARWASH	89.6	1
72426	ROY ELLIS	150	1
72427	SEEFELDT, MARIE	34.93	1
72428	SIGNART, INC	2,082.43	1
72429	SPEED WRENCH	4,815.57	2
72430	SPINS ON MUSIC LLC	300	1
72431	STATE INDUSTRIAL PRODUCTS CORP	691.83	1
72432	SUPERIOR CARTS	179	1
72433	THE FAIR PUBLISHING HOUSE, INC.	309.52	1
72434	VALLEY CITY LINEN	30.2	1
72435	WEST MICHIGAN AERIAL LLC	107.65	1
72436	WEST MICHIGAN BASEBALL FRANCHISING	451.44	1
72437	WEST MICHIGAN INTERNATIONAL	96.99	2
72438	WEST MICHIGAN UNIFORM	506.5	6
72439	WESTERN MICHIGAN FLEET PARTS,INC	135	1
72440	WEX BANK	2,966.30	1
72441	WHITE,JULIE	21.94	1
72442	WILLIAMS, BILLI	40.11	1
72443	WYOMING ASPHALT PAVING CO INC	2,105.07	3
72444	X-CEL CHEMICAL SPECIALTIES CO.	84	1
72445	YOUR FAMILY RESTAURANT	27.65	1
	Num of Checks: 84	$ 158,753.45	101

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
Doug Sweeris, Water Utilities Director
RE: Discussion to Hire Jones and Henry engineering firm to provide an odor study on the WRRF and the surrounding neighborhood
DATE: July 8, 2019

Summary

It is requested that City Council discuss whether an odor study at the Water Resource Recovery Facility is a step they would like to take as it relates to better understanding odor complaints.

As staff works to respond to complaints regarding the odor in the general neighborhood surrounding the Water Resource Recovery Facility, we reached out to a firm with experience in conducting odor studies. Jones and Henry, a West Michigan company has provided a quote to monitor odors at and around the WRRF facility to determine where specifically the odors are coming from, when they are at their worst, the impact the odors have on the surrounding community and provide recommendations on how best to handle the odors.

Jones and Henry have performed Odor Studies using the same devices proposed in the quote at the following sites:

2019 - Kalamazoo WRP - Industrial Line Odor Study. This study included quantitative and qualitative analysis of sulfide based odors as well as recommended mitigation measures.

2018 - Battle Creek, MI - Odor Studies Phase I and Phase II. Phase I included smoke testing in the collection system of the complaint area and a summary of findings, Phase II included a detailed quantitative and qualitative study of the WWTP including human surveys over a 4 month period.

No Date Given - Kalamazoo WRP - Odor Study in Support of Solids Handling Improvements. This study included quantitative sampling of sulfides related to sludge process and evaluation of a photo-ionzation odor control system. Work was in support of the sizing of equipment to be included in the solids handling project.

Recommendation

It is recommended that City Council discuss whether an odor study at the Water Resource Recovery Facility is a step they would like to take as it relates to better understanding odor complaints.

Attachment

Quote

Jones & Henry
ENGINEERS, LTD.

Fluid thinking®
4791 Campus Drive, Kalamazoo, MI 49008
Phone: 269.353.9650 JHeng.com

July 1, 2019

Douglas Sweeris - Utility Facilities Director
City of Allegan, Michigan
350 North Street
Allegan, MI 49010

Subject: City of Allegan
Proposal to provide Professional Engineering Services
WWTP Odor Study

Via: E-mail

Dear Mr. Sweeris:

Jones & Henry Engineers, Ltd. (J&H) is pleased to provide the City of Allegan (City) this proposal for Engineering Services related to the above referenced project. The City requested our services to study the potential causes, extent of issues, and potential remedy for ongoing resident odor complaints relating to the City's wastewater treatment plant (WWTP). Recently, our firm has provided similar studies for the Cities of Battle Creek and Kalamazoo.

Background

The City of Allegan WWTP receives wastewater from residents and industries within the service area. Additionally, the WWTP receives waste from septage haulers and industrial discharges from food production facilities.

The WWTP has dealt with odor problems which have impacted the residential areas bounding the site. In the past, the City has dealt with the problem by stopping operation of the blue sludge storage tank aerated mixing system and implementing a chemical oxidizer/cover scent system. These measures have helped lessen complaints but have not eliminated the problem.

Scope of Services

J&H will perform an evaluation/study of the odor problem and will provide proposed methods of treatment or elimination of the problem.

Odor Study

- J&H will deploy three (3), parts per million (ppm), hydrogen sulfide logging devices to produce a log of the concentration of hydrogen sulfide in process areas of the plant.
    - Loggers will be deployed at the headworks, digester, and blue storage tank
- J&H will deploy one (1), parts per billion (ppb), hydrogen sulfide logger to produce a log of concentrations in the atmosphere within the WWTP, and surrounding neighborhoods
- J&H will coordinate collection of three (3) process air samples for submission to St. Croix Sensory for qualitative odor analysis.

- J&H will review existing operational and sampling data to determine what, if any, changes could be implemented which would limit the impact of WWTP odors
- J&H will review weather data, as collected by the WWTP weather station, for trends relating to odor issues
- J&H will propose and provide a brief evaluation of three different odor control technologies/systems and their estimated implementation costs
- J&H will provide three (3) hard copies of the final study report

Additionally, if odor logger and sensory panel data is inconclusive, J&H will coordinate gas chromatography analysis of plant air sample(s) for an additional fee. (quote forthcoming, assumed to be less than $2,500.00)

The total cost to perform engineering services described above is a not to exceed fee of $20,000.00. These fees include reimbursable items (i.e. travel, printing costs, etc). Work will be billed on a time and material basis with outside consultant fees (St. Croix Sensory) being billed at their true cost +10%. 2019 Jones & Henry billing rates and quotation for sensory panel is attached for your review.

Work, including the deployment of logging equipment, can commence immediately upon authorization of this proposal. Assuming acceptance of this proposal on, or around, the week of July 8, 2019 would lead to a completion of data collection during the week of August 12, 2019 and submission of the draft study on, or around, September 17, 2019.

Engineering services will be performed by or under the direct supervision of a professional engineer. The standard of care for all professional engineering performed by Jones & Henry Engineers, Ltd. will be the care and skill ordinarily used by members of the profession practicing under similar circumstances at the same time and in the same locality. J&H makes no warranties, express or implied, in connection with the services described in our agreement.

Please feel free to contact us regarding any aspect of the project and/or our submittal. Thank you for your consideration and we look forward to working with the City of Allegan on this project. The City can authorize this proposal by countersigning below.

JONES & HENRY ENGINEERS, LTD.

Aaron J. Davenport, PE
Kalamazoo Office Director

_____
(Authorizing Signature and Date)

_____
(Title)

AJD/ajd
Attachments: 2019 Jones & Henry Billing Rates and Quote for St. Croix Sensory analysis

Typical Hourly fee, including overhead – 2019

Schedule of Charges

Classification	Hourly Rate
Principal	$150 - $185
Director / Senior Project Manager	$140 - $185
Project Manager	$125 - $160
Senior Engineer	$125 - $165
Project Engineer	$95 - $135
Engineer	$80 - $120
O&M Specialist	$120 - $130
Senior Construction Services Specialist	$90-$125
Construction Services Specialist	$70-$115
Information Systems Specialist	$80 - $140
Designer, Senior Technician	$85 - $100
Technician	$75 - $90
Project Assistant	$55 - $75
Administrative Assistant	$50 - $75

For expenses incurred in the work for travel, subsistence, subcontractors, toll telephone calls, fax, printing, copying, etc., the actual cost plus ten percent (10%) thereof.

Computer modeling and CAD charges are based on $10.00 per hour of use.

For services and supplies furnished by others at the expense of the Engineers beyond typical services, the actual cost plus thirty percent (30%) thereof.

The time and expense fees shall be payable monthly, each payment being equal to the amount earned during the preceding month.

Engineering services will be performed by or under the direct supervision of a professional engineer. The standard of care for all professional engineering performed by Jones & Henry Engineers, Ltd. will be the care and skill ordinarily used by members of the profession practicing under similar circumstances at the same time and in the same locality. Jones & Henry makes no warranties, express or implied, in connection with the services described in our agreement.

Quotation *by St. Croix Sensory, Inc.*

Company: **Jones & Henry Engineers**
Attn: **Alexis Kontorousis**
Address: **4791 Campus Drive**

City, State: **Kalamazoo, MI 48008**
Tel: **269-743-3701**
E-mail **akontorousis@jheng.com**

Quotation (RMA) No: **19182121**
Date Issued: **01-Jul-19**

Sampling Dates(s): TBD
Evaluation Dates(s): TBD

Service/Product Description	*Qty*	*Rate*	*Total*
Odorous Air Sample Evaluation of Detection & Recognition Thresholds following EN13725:2003 & ASTM E679-04, determined by 5 assessors on the AC'SCENT Olfactometer.	**3**	**$320.00**	**$960.00**
Odorous Air Sample Evaluation of Characterization. Includes histogram of odor descriptors, relative strength of characters and sensations, and Hedonic Tone.	**3**	**$55.00**	**$165.00**
Odorous Air Sample Evaluation of Intensity ASTM E544-99.	**3**	**$30.00**	**$90.00**
10-Litre, 2mil Tedlar Air Sampling Bag	**3**	**$25.00**	**$75.00**
Rental of Vac'Scent Air Sampling Chamber/week. Includes integral pump which runs on 4 D-size batteries & 10ft PTFE Tubing.	**1**	**$400.00**	**$400.00**
Estimated shipping of supplies and equipment from MN to MI via UPS Ground, air samples from MI to MN via UPS NDA and equipment from MI to MN via UPS Ground	**1**	**$333.62**	**$333.62**
7% Discount For Payment Made With Credit Card	**1**	**($85.05)**	**($85.05)**

$1,938.57

All prices in U.S. Dollars

Prepared by: Carrie Rickheim

Terms: Credit Card

Comments:

7% discount off laboratory evaluations if payment is made by credit card at time of order.

A service charge of 1.5% per month, 18% APR, will be added to balances over 60 days old. Please read the *Laboratory Services Terms & Conditions*.

Quote good for 60 days & Confidentia

St. Croix Sensory, Inc. 1150 Stillwater Blvd N. Stillwater, MN 55042 U.S.A. Tel:800-879-9231 Fax:651-439-1065
Email:stcroix@fivesenses.com Web:www.fivesenses.com

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Request to Close City Hall on Thursday July 25th and Friday July 26th to Coordinate the Move of City Hall from 112 Locust Street to 231 Trowbridge Street
DATE: July 8, 2019

Summary

It is requested that City Council close City Hall on Thursday July 25th and Friday July 26th to coordinate the move of City Hall from 112 Locust Street to 231 Trowbridge Street.

As the city wraps up the construction of its New City Hall at 231 Trowbridge we are now at the point where we need begin moving our operation from the current City Hall to the New City Hall. To streamline this process, we are requesting that City Council close down the current City Hall on Thursday July 25th and Friday July 26th.

On Thursday July 25th, staff will begin deconstructing their personal workspaces, including computers, files, personal items, etc. and being relocating their stuff to the New City Hall. On Friday July 26th City Staff will continue moving personal stuff as well as city files, records, printers, copiers, etc. from the old City Hall to the New City Hall.

We will then begin regular operations at the New City Hall on Monday, July 29, 2019.

Recommendation

It is recommended that City Council close City Hall on Thursday July 25th and Friday July 26th to coordinate the move of City Hall from 112 Locust Street to 231 Trowbridge Street.

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Request to Adopt Resolution 19.19 to Endorse the Lower Kalamazoo River Greenway Plan.
DATE: July 8, 2019

Summary

It is requested that City Council adopt Resolution 19.19 to Endorse the Lower Kalamazoo River Greenway Plan.

Throughout 2018 and part of 2019, the City of Allegan joined other communities, agencies and residents along the Kalamazoo River from Plainwell to Saugatuck to develop a plan that will allow communities to promote safe usage of the river as well as enhance connectivity along the river.

The Plan was funded by the Michigan Department of Environmental Quality and a Michigan Sea Grant and written by the ODC Network with assistance from GMB Architecture and Engineers and Bruns Leadership Consulting. An advisory committee of approximately 15 individuals provided constant feedback to the authors during the development of the plan as well as assisted in organizing and hosting the various community engagement meetings during the development of plan, including a community meeting in the basement of the Griswold Auditorium in Allegan Michigan on July 26, 2018.

It should be noted that over 300 stakeholders and participants offered input into the development of this plan.

Recommendation

It is recommended that City Council adopt Resolution 19.19 to Endorse the Lower Kalamazoo River Greenway Plan.

Attachment

Resolution 19.19
Lower Kalamazoo River Greenway Plan

LOWER KALAMAZOO RIVER GREENWAY PLAN

PREPARED FOR MICHIGAN DEQ
DECEMBER 2018

ADOPTED
JANUARY 2019

DEVELOPED BY

ODC NETWORK

DAVID NYITRAY, CHIEF OPERATING OFFICER

DAN CALLAM, GREENWAY MANAGER
TRACEY NALLY, DEVELOPMENT MANAGER

GMB ARCHITECTURE AND ENGINEERING

MATT HULL, LLA

NATE BOSCH, LLA

BRUNS LEADERSHIP CONSULTING

REBECCA BRUNS

ACKNOWLEDGMENTS

The Lower Kalamazoo River Greenway Master Plan has been generated with extensive planning, study and input. The ODC Network wishes to thank the hundreds of individuals, groups, and organizations for sharing their insight, vision and historical knowledge.

FUNDING SOURCES

Michigan Department of Environmental Quality
Michigan Sea Grant

The statements, findings, conclusions, and recommendations in this report are those of the authors and do not necessarily reflect the view of the funding entities.

REPORT CONTENTS

VI EXECUTIVE SUMMARY

1 INTRODUCTION
TO THE LOWER KALAMAZOO RIVER GREENWAY PLANNING REPORT

1 SETTING THE STAGE

2 WHAT IS A WATERSHED?

2 WHAT IS A GREENWAY?

4 FORMING CONNECTIONS
COOPERATION AND PARTNERSHIPS FOR THE SUCCESS OF THE LOWER KALAMAZOO RIVER GREENWAY

4 FINANCIAL SUPPORT OF PLANNING PROCESS

4 CORE PLANNING TEAM

4 ADVISORY GROUP

7 THE PLANNING PROCESS
PAST, PRESENT, AND FUTURE

7 INTRO TO THE PLANNING PROCESS

8 PLANNING IN ACTION

11 THE CONTEXT
UNDERSTANDING THE LOWER KALAMAZOO RIVER GREENWAY TODAY

11 COMMUNITY FABRIC

11 HISTORY

12 CONTEXT OF PLANNING EFFORT

12 EXTENT OF THE GREENWAY

14 GREENWAY POPULATION CENTERS

17 OVERVIEW OF LAND USE

17 NATURAL FEATURES

23 RECREATION AND PARK SPACE

26 MAJOR ENVIRONMENTAL CONCERNS

31 THE PLAN
SETTING THE VISION

31 OVERARCHING GOALS

32 TYPES OF PRACTICES AND IMPROVEMENTS

35 SEGMENT A: GUN RIVER, PLAINWELL, AND OTSEGO

39 SEGMENT B: OTSEGO TO CITY OF ALLEGAN

43 SEGMENT C & D: CITY OF ALLEGAN TO NEW RICHMOND

49 SEGMENT E: NEW RICHMOND TO LAKE MICHIGAN

53 SEGMENT F & G: RABBIT RIVER

59 FIRST STEPS
THE FUTURE OF THE KALAMAZOO RIVER GREENWAY

59 FIRST STEPS

60 ADDITIONAL RESOURCES
LEVERAGING COMPLETED STUDIES WITHIN THE LOWER KALAMAZOO RIVER GREENWAY

60 BIBLIOGRAPHY AND FURTHER READING

MAP CONTENTS

MAPS

3 STUDY AREA MAP

10 MAP OF FOCUS AREAS

13 GREENWAY MAP

14 POPULATION DENSITY MAP

15 DEVELOPED AREAS MAP

16 AGRICULTURAL LANDS MAP

18 FISHERIES MAP

19 LAND USE MAP

20 STATE FORESTRY/GAME LANDS MAP

21 ECOLOGICAL RARITY INDEX MAP

22 TOPOGRAPHIC RELIEF MAP

24 GREENWAY PARKS MAP

25 GREENWAY TRAILS MAP

28 BROWNFIELD SITES MAP

29 EPA CLEANUP MAP

30 LANDFILL SITES MAP

33 GREENWAY SEGMENTS MAP

36 SEGMENT A: OTSEGO/PLAINWELL/GUN RIVER PLAIN MAP

40 SEGMENT B: OTSEGO TO CITY OF ALLEGAN MAP

44 SEGMENT C: CITY OF ALLEGAN TO STATE GAME AREA MAP

46 SEGMENT D: STATE GAME AREA TO NEW RICHMOND MAP

50 SEGMENT E: NEW RICHMOND TO LAKE MICHIGAN MAP

54 SECTION F: LOWER RABBIT RIVER MAP

56 SECTION G: UPPER RABBIT RIVER MAP

EXECUTIVE SUMMARY

The ODC Network (ODC), a 501(c)3 nature-based education and conservation non-profit organization, was commissioned in January 2018 by the Michigan Department of Environmental Quality (MDEQ) to develop a master plan for a Lower Kalamazoo River Greenway in Allegan County (KRG). The purpose of this plan is to implement a greenway corridor along the Kalamazoo River in Allegan County addressing **environmental restoration, recreation, conservation, and education**.

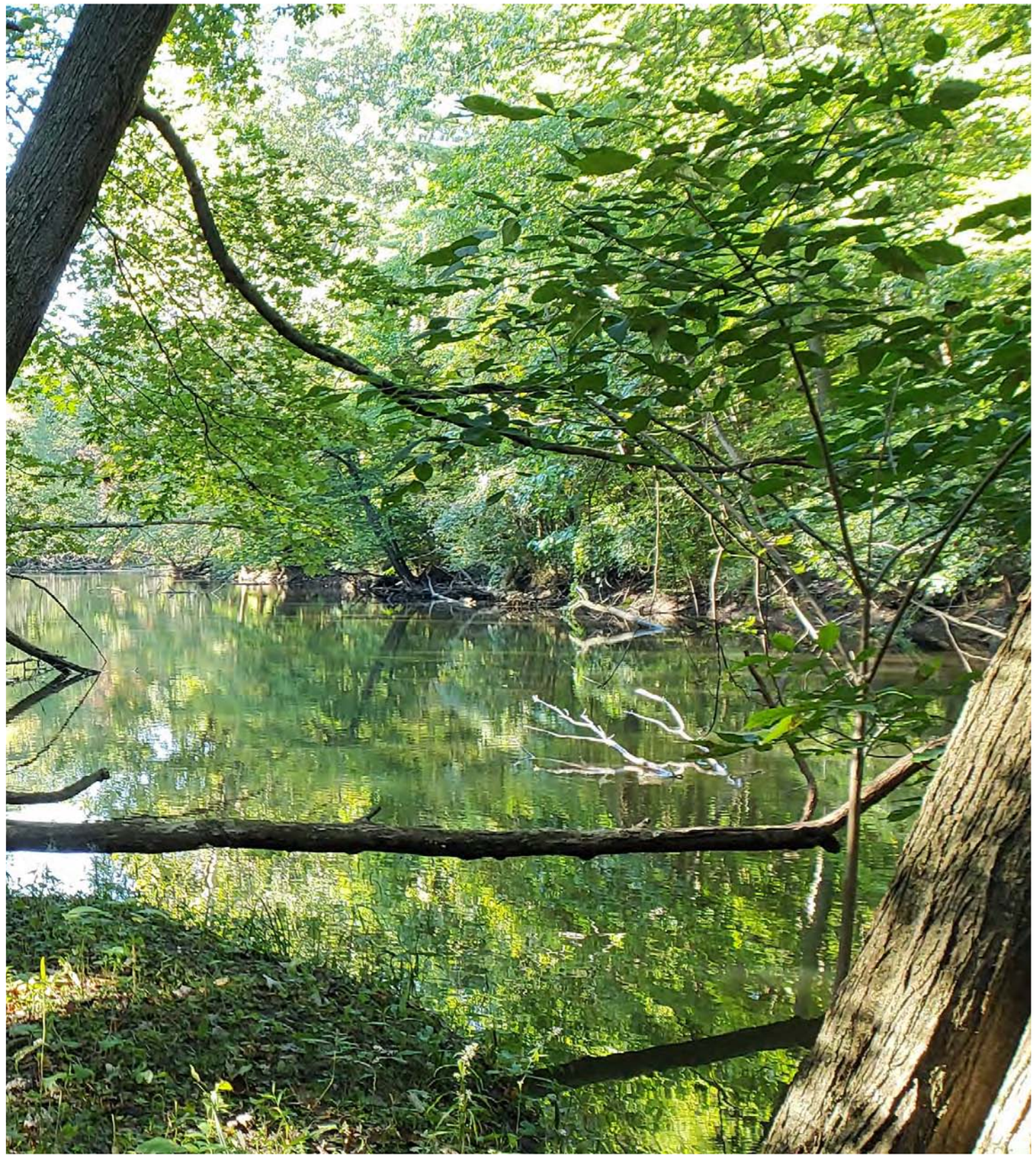
It was imperative to seek input from each community in order to develop an overarching plan for potential greenway projects connecting Allegan County communities. This took place with ODC staff conducting individual conversations and many group and public meetings. Representatives from units of government, conservation organizations, residents, plus county, state and federal agencies were sought for their knowledge and vision. After a year of community input and the review of existing reports, the ODC and their core team, consisting of GMB Architecture and Engineering and Bruns Leadership Consulting, developed this master plan.

The Kalamazoo River in Allegan County is part of a United States Environmental Protection Agency (EPA) Superfund designation for polychlorinated biphenyls (PCB) contamination, restricting use of the river and planning future activities in some situations. While the ongoing cleanup efforts will likely continue for years, the development of a Kalamazoo River Greenway will allow communities to:

- Promote safe usage of the river
- Enhance connectivity along the river

Additional issues facing the river corridor beyond the PCB levels include:

- Excess sedimentation
- High phosphorus levels
- Invasive species
- Land use impacts
- Lack of safe access points
- Need for economic development
- Negative reputation of the river



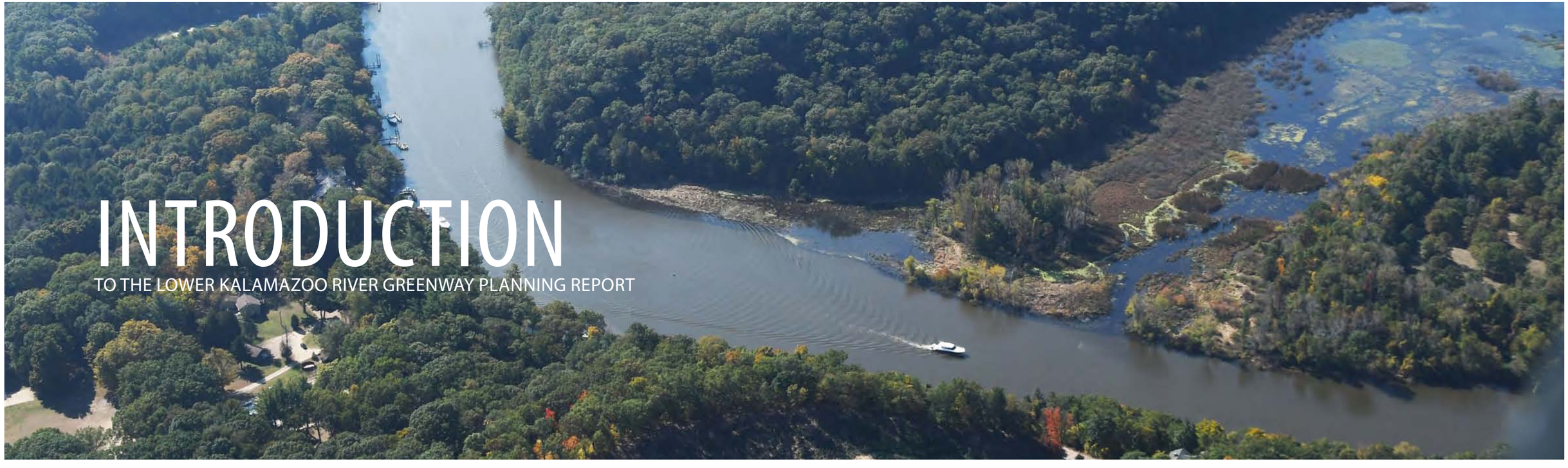
While there were numerous site-specific opportunities identified during the process, there were several broadly encompassing goals identified for the greenway. These included:

- Provide the means and opportunities to improve recreational assets and access along the river corridor
- Create opportunities for active and passive interpretation and education to inform visitors about safety, cultural history, natural history and recreation.
- Work on improving environmental quality along the rivers and their watersheds and address key ecological issues
- Implement best practices to reduce stormwater, sediment, and nutrient issues within the Kalamazoo Watershed
- Enhance regional economic development
- Protect and preserve existing areas of high quality habitat

To accomplish these goals, the following are examples of potential priority projects that could create the greatest positive impact:

- Select land acquisition
- Creating safe river access points
- Creating non-motorized pathways
- Improving river navigability
- Fixing severe sources of erosion
- Adding restrooms and other visitor amenities
- Protecting areas of high quality habitat
- Planning for long-term river restoration

This plan is to assist and guide each community to form a collaborative partnership to begin to plan and implement the KRG to address environmental restoration, recreation, conservation and education initiatives. This plan will also position units of government and organizations to be eligible and more competitive in seeking state and federal funding for their communities.



INTRODUCTION

TO THE LOWER KALAMAZOO RIVER GREENWAY PLANNING REPORT

SETTING THE STAGE

The ODC Network (ODC), a 501(c)3 nature-based education and conservation non-profit organization established in 2000, was commissioned in January 2018, by the Michigan Department of Environmental Quality (MDEQ), to develop a master plan for a Lower Kalamazoo River Greenway (KRG).

In conversations State Representative Mary Whiteford had with Allegan County residents, local elected officials and government agencies, it became apparent that a consensus was forming regarding an untapped asset, the Kalamazoo River. With encouraging studies, successful restoration, and future plans for the river by the EPA, communities have become interested in integrating nature and urban life and unifying regional efforts to establish one common greenway master plan.

A master plan would assure the waterway continues to improve to its original glory by providing:

- Recreation assets
- Opportunities for active and passive interpretation and education to inform visitors about safety, cultural history, natural history and recreation.
- Environmental quality and Address key ecological issues -- especially invasive species -- to ensure that areas of high quality habitat are maintained
- Implementation of best practices to reduce stormwater, sediment, and nutrient issues within the Kalamazoo Watershed.
- Economic development
- Preservation and protection of existing habitat

The proposed master plan includes community input from a wide cross section of individuals who discussed the Kalamazoo River's existing treasures and assets and ways the master plan could be a catalyst in the planning and development of potential opportunities with the stakeholder priorities in mind. This official plan will position governing bodies to secure funding from state and federal agencies as well as to receive buy-in from communities and philanthropic entities. These groups can support a greenway plan through: funding, zoning ordinances, policies and long-term maintenance on proposed projects.

Over many years, extensive research and discussions have taken place, throughout the county, related to the river's existing water quality, wildlife and habitat. It was vital that the ODC collect information as a cornerstone for the master plan. It was also necessary to build the trust of the community that this effort would be led by an experienced and qualified organization. The ODC has served since 2009 as a lead partner on a similar successful initiative the Macatawa River Greenway (MRG) that was initiated in 1996.

The MRG has preserved 19 miles along the Macatawa river corridor in Ottawa County, secured over $11 million dollars of public and private investment, protected 1387 acres, and made available to the public 20 miles of pedestrian trails. In addition, the ODC has been the lead agency in Project Clarity, an initiative in the Macatawa Watershed to reduce phosphorus and sediment in the river with more than a hundred on-the-ground projects resulting in a 45% reduction in phosphorus.

WHAT IS A WATERSHED?

A watershed is an area that drains to a single point. Often times, a watershed will be used to describe an area where water will flow to a body of water, be it a stream, lake, or even an ocean. A common analogy is a bathtub, where all the water inside of it eventually flows to the drain. Watersheds are generally far larger and more encompassing than greenways, which are narrower and more closely hug the river or stream it follows. While watersheds send water to rivers and lakes, they can also hold sources of pollution, which can include sediment, nutrients, sewage, and toxins.

WHAT IS A GREENWAY?

Greenways are corridors of protected green space managed for the benefit of conservation, economic vitality, and recreation. Greenways typically follow natural features like rivers linking people and habitat across a geographic region. In addition, greenways have been demonstrated to:

- Increase community support for addressing environmental restoration
- Promote recreation
- Encourage conservation
- Improve education on water quality and watersheds

The Kalamazoo River Greenway is focused around the green space along the Kalamazoo River corridor encompassed within Allegan County, which ranges from the width of the river to miles on either side. For the purposes of our planning, most of our efforts were focused within and near the hundred year floodplain (the areas along a river that have a 1% chance of flooding in a year), although in many instances the contributing watersheds will have to be taken into account as well.

Top Left: clean up effort along Kalamazoo River

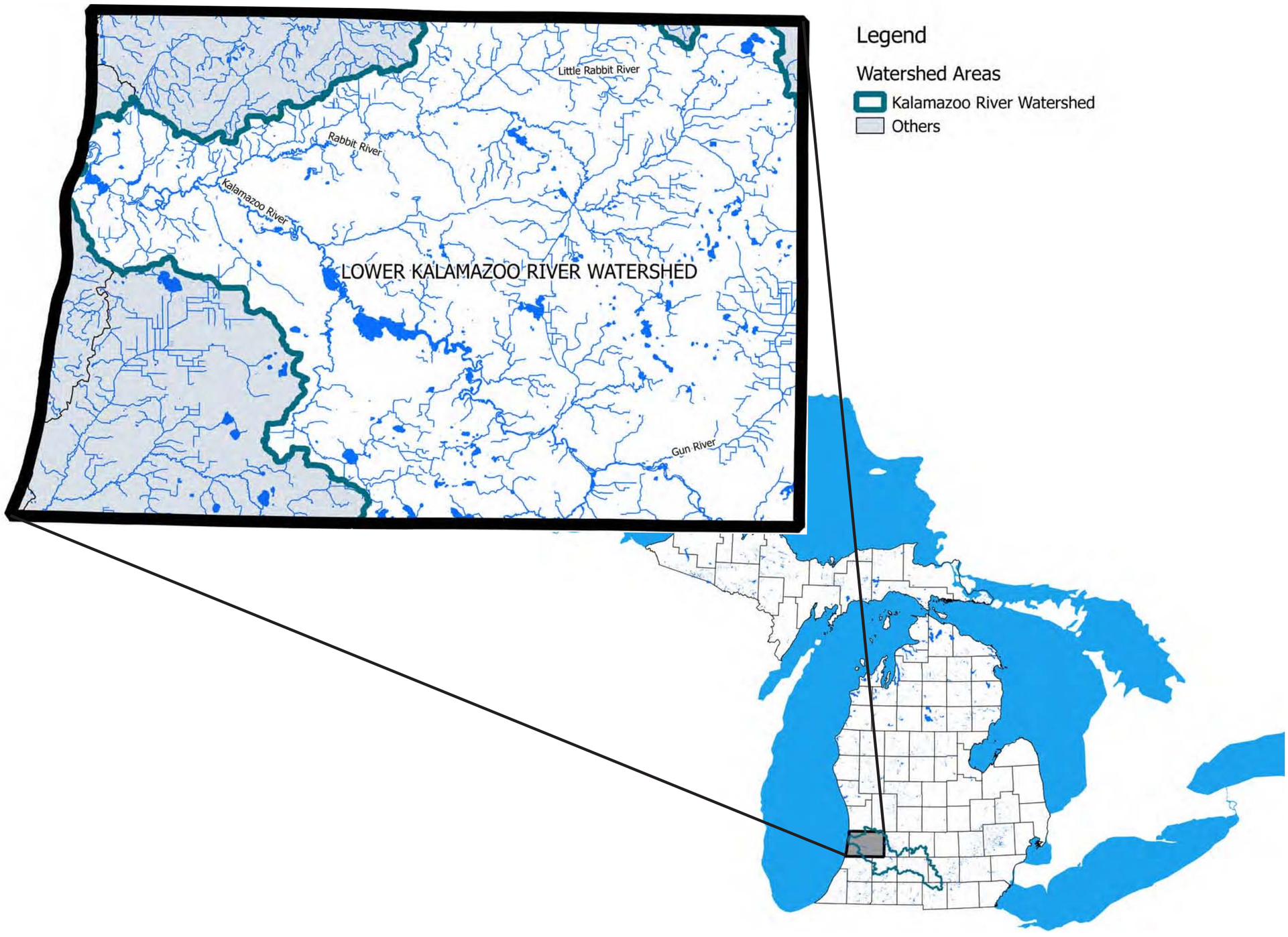
Top Right: kayak fishing on river

Bottom Left: rock bass in native habitat

Bottom Right: Macatawa River Greenway interpretive signage

STUDY AREA MAP

The Kalamazoo River Greenway corridor will focus on the areas along the Kalamazoo, Rabbit, and Gun Rivers in Allegan County, roughly between a quarter and half mile on either side of the channel, including lands with importance for conservation and/or recreation. The majority of Allegan County (just over 75%) drains into the Kalamazoo River, with smaller corners draining to the Macatawa to the northwest, Grand to the northeast, Black to the southwest, and directly into Lake Michigan to the west. Major tributaries that join the Kalamazoo in Allegan County include the Rabbit and Gun Rivers, with numerous smaller streams and drains. With its low gradient in the county, the river widens in several places to form lakes (Kalamazoo Lake in Saugatuck and the impounded Lake Allegan) and several large marshes, including Pottawatomi, Ottawa, and Swan Creek. Numerous other kettle lakes and ponds dot the watershed, including Miner, Dumont, and Monterey Lakes. Kalamazoo Lake also serves as a natural harbor along Lake Michigan -- the only one in Allegan County, with the nearest ports located in Holland to the north and South Haven to the south.



FORMING CONNECTIONS

COOPERATION AND PARTNERSHIPS FOR THE SUCCESS OF THE LOWER KALAMAZOO RIVER GREENWAY

"The Kalamazoo River is an integral component to the quality of life in the City of Saugatuck. Reducing the sediment that gets deposited into the Kalamazoo Harbor has been a primary concern of elected leaders and citizens for many years. A greenway master plan will be important to effectively address sediment issues and therefore is critical to the future success of the Saugatuck area.

Kirk Harrier, City Manager
City of Saugatuck

FINANCIAL SUPPORT OF PLANNING PROCESS

The Lower Kalamazoo River Greenway Master Plan was financially supported by the Michigan Department of Environmental Quality (MDEQ) Office of Administration with additional support from the Michigan Sea Grant. The statements, findings, conclusions, and recommendations in this report are those of the authors and do not necessarily reflect the view of the funding entities.

CORE PLANNING TEAM

The ODC partnered with GMB Architecture and Engineering and Bruns Leadership Consulting in facilitating the community meetings and providing design, content and maps for the master plan.

The ODC objectives were to serve as the lead for:

- **Community Partners:** identifying and coordinating key community partners who would support the development of and promote the implementation of the KRG Master Plan.
- **Data Collection:** aggregating current and past contaminated sediment and wildlife/habitat data and cataloging levels throughout the proposed greenway corridors. The analysis would lead to the recognition of contamination hotspots including brownfield sites, ecological areas of concern, erosion and sedimentation issues, and potential areas for contaminated sediments.
- **Community Engagement:** surveying residents and community stakeholders to determine community needs, wants, and opportunities connected with greenway development. In addition, to growing community buy-in from multiple sectors including but not limited to: businesses, pre-K12 and post secondary education, local governments, and community organizations.
- **Master Plan:** providing a priority list of projects that potentially will provide the greatest positive impact on the community.

ADVISORY GROUP

As an organization located in and serving Allegan County, the ODC initiated the greenway process with invitations to key county stakeholders to serve on an advisory group. To ensure success of future projects, it was imperative this group be engaged with the greenway project and use this knowledge, experience, and local connections to engage their communities in this process.

This group formed with the intent that they would collaborate with one another in the planning and development of future projects and provide the leadership to:

- Implement the necessary policies
- Find ways to fund the proposed projects and
- Encourage their residents to support the effort.

A strong section of individuals accepted our invitation and provided their input and guidance as part of the advisory group. The group represented federal (USDA) and state (DNR, DEQ) agencies, county commissioners, township supervisors, parks & recreation administration, conservation district and other

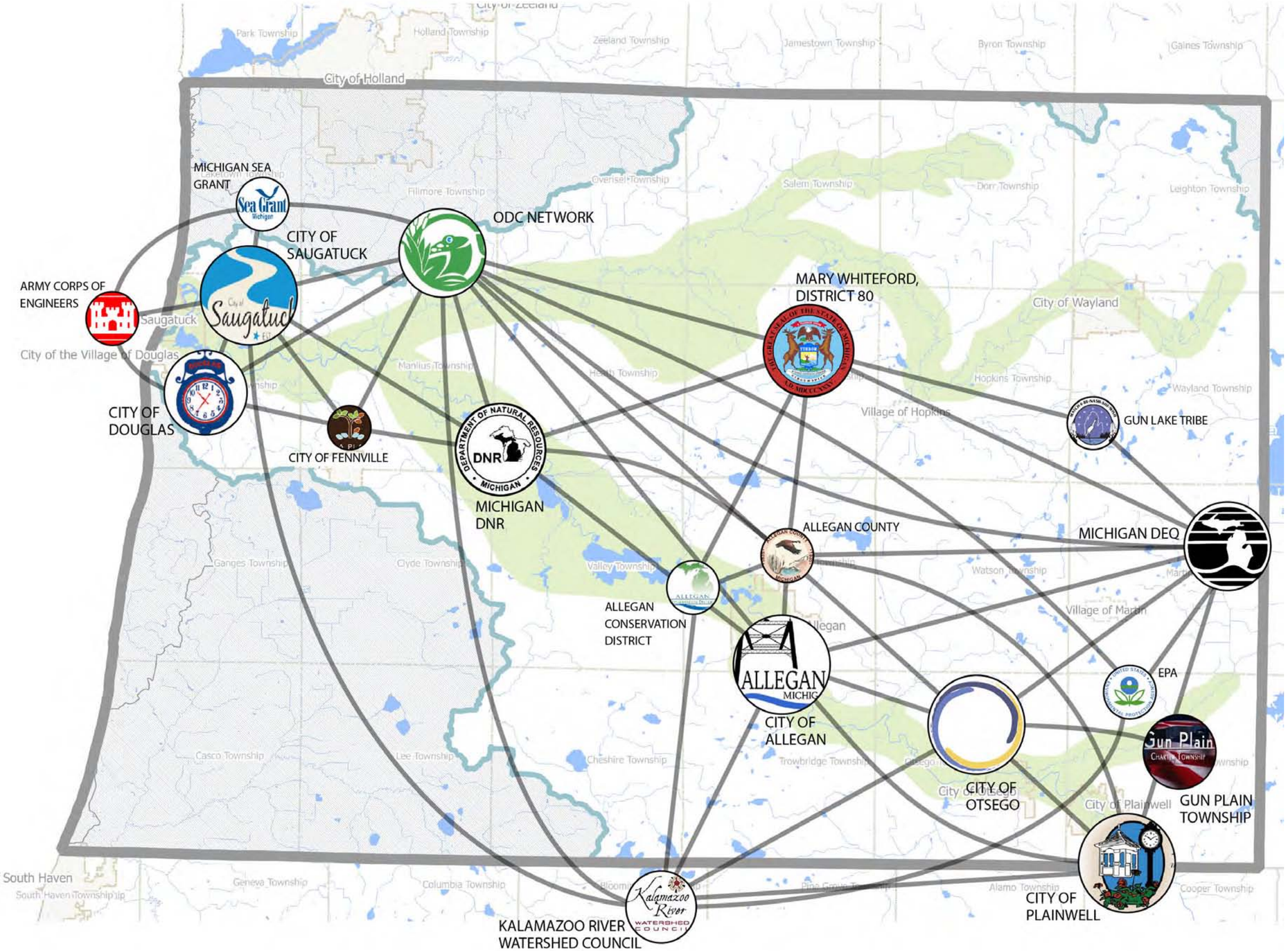
environmental groups, economic development supervisors, business owners, and a local Native American tribe.

The group met three times early in 2018 prior to seeking community input. They assisted in the determination of four focus areas where projects might be proposed and where each community input meeting would be held.

These advisors were instrumental in directing the ODC to existing river condition reports and assessments which positioned the ODC to become a future public repository. The group also recommended other key stakeholders to be interviewed by the ODC in order to obtain additional knowledge about the river so an even more informed recommendation could be made for the greenway master plan. These key stakeholders contributed insights on how a greenway would be instrumental for education, conservation, wildlife/habitat, economic development and safety while also sharing potential philanthropic support.

The group stayed informed of ODC's progress as to community stakeholder meetings and the collection of existing reports and assessments with an online shared document system that included meeting agendas, minutes, existing reports and assessments, contacts and marketing documents to be used in the advertisement of the four county community meetings. A lead administrator from each of the four focus areas assisted ODC in determining the best venue, time and way to advertise their respective community meeting.

The Advisory Group reconvened in November to review and provide final input of a draft of the KRG master plan.



THE PLANNING PROCESS

PAST, PRESENT, AND FUTURE

INTRO TO THE PLANNING PROCESS

At the beginning of 2018, the core team met and determined that the planning process should be a systems approach; interactive and collaborative by bringing together:

- Existing research regarding the condition and quality of the river
- Multiple city and township administrators to share and discuss future plans
- Incorporate these plans with community input

Making sure this was a collaborative effort was a top priority in order to have the final greenway master plan be mutually beneficial for all the communities within Allegan County.

TIMELINE

The core team first established a timeline to assign responsibilities and assure that the expected outcomes were met in a timely and efficient manner.

ADVISORY GROUP

The second step was to establish an advisory group. This group served as a significant resource to the core team. The group's views on current Kalamazoo River treasures; how they envisioned a greenway might benefit their community; and potential opportunities they saw in a county-wide greenway were captured and used as a model for the community meetings.

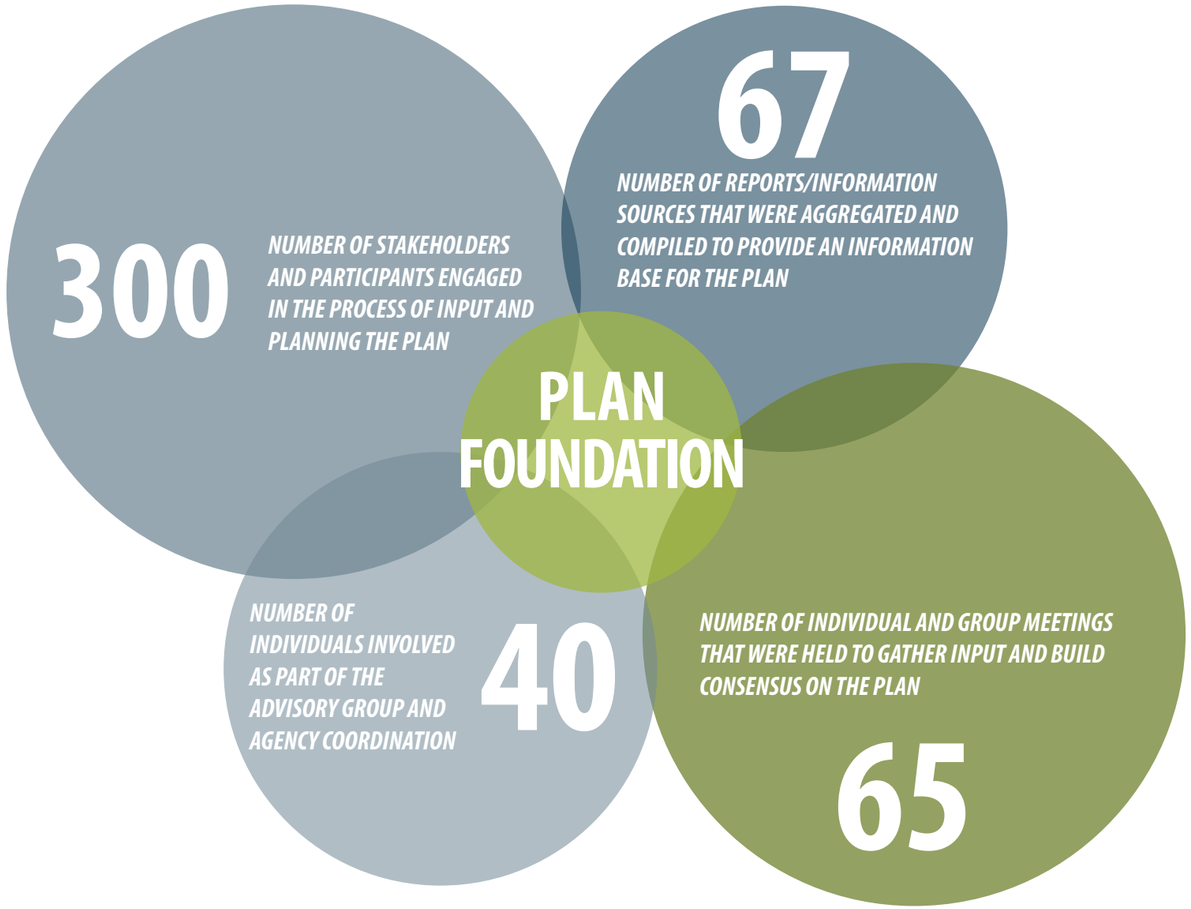
PUBLIC INPUT FOCUS AREAS

In collaboration, the core team and advisory group defined four focus areas within Allegan County where community input would be sought. Due to each of the areas' unique features and potential use of a greenway, having separate community meetings allowed for a more engaged and vibrant discussion. Four areas allowed a critical mass of citizens at each location to provide input about their community.

EXISTING PLANS

One of the goals for developing the master plan was to efficiently and effectively build upon current data and knowledge. There was some concern by the advisory group that the master plan process would duplicate documents that had already been developed by many of the communities. Many hours were spent by the ODC staff reviewing and summarizing these reports, dating back to the early 1990s, by government agencies, communities, groups, and individuals.

With the assistance of the advisory group, the ODC obtained 12 management/action, 4 remedial action, 8 assessments and 6 feasibility and analysis plans for the lower part of the Kalamazoo River. In addition, 21 government, regional and local organizational websites provided valuable information on wildlife, habitat and water quality of the river. For further context and details of these management plans refer to the appendices.



PLANNING IN ACTION

ADVISORY GROUP MEETINGS

An average of 15 advisory group members participated in the planning and process discussions. Interest and higher attendance grew throughout the year due to positive publicity and progress made by the core team.

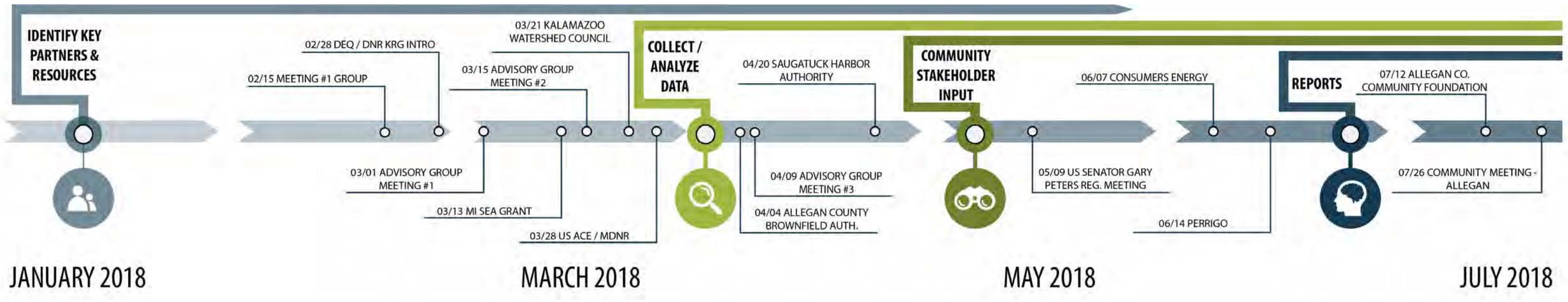
The Advisory group met four times in 2018: March 1, March 15, April 9 and November 15. In the first three meetings, the group determined:

- Project vision and goals
- Role of the advisory group
- Guiding principles and critical success factors
- Hopes and fears around the greenway
- Actions and community evaluation
- Potential stakeholders
- Community input focus areas
- Existing data collection repository process

In the final November meeting the group reviewed the draft and provided final input for the master plan.

PROPOSED PLAN

The Advisory group identified existing sites along the river corridor that could be immediately enhanced for public use as well as offered suggestions for new sites to consider for future planning. The advisory group had representatives from all sectors of land ownership and management which provided for a broad perspective.



PUBLIC ENGAGEMENT

After planning for the best method to survey the residents, four community meetings, one in each of the focus areas, took place in July and August of 2018. Five advisory group members (two from Saugatuck/ Douglas) hosted their respective meetings with the core team facilitating. The hour and a half meetings were held at publicly known facilities that would accommodate maximum attendance. This resulted in representation from residents, governing officials and business owners.

Focus Area	Date	Venue Location	Attendance
Central Allegan/ State Game	July 26, 2018	Allegan Griswold Auditorium	32
Otsego/ Plainwell/ Gun Plain Township	Aug 1, 2018	Gun Plain Charter Township Hall	32
Rabbit River	Aug 14, 2018	Salem Township Hall	10
Saugatuck/ Douglas/ Potawatomi Marsh	Aug 15, 2018	Saugatuck Brewing	68

Attendees were guided through a consistent format and invited to sit in small groups at tables that provided a map of their designated area, stacks of sticky notes and markers with an easel nearby. Everyone was asked to write individual responses on separate notes to the following questions which were then collected and placed onto their respective easel:

- What do you consider to be existing Kalamazoo River assets and treasures in your community?
- What opportunities or desires do you see for a Kalamazoo River Greenway?
- What are your top three priorities for a greenway in your area?

A scribe from each table took turns sharing their group's answers. To the surprise of many, including the core team, similar themes were appearing. These were noted by the facilitators placed on the graphic map.

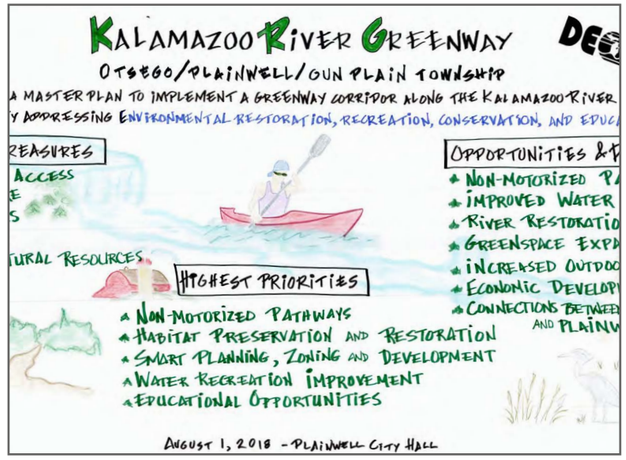
After discussions ended on the first two questions about treasures, assets, opportunities and desires, each group was invited to select from their individual responses their top three priorities for a greenway. These too were shared publicly and captured by the facilitators. All the flip chart sheets with the sticky notes and the graphic maps were retained by the core team and later summarized and used in the determination of recommended first steps in developing the greenway.

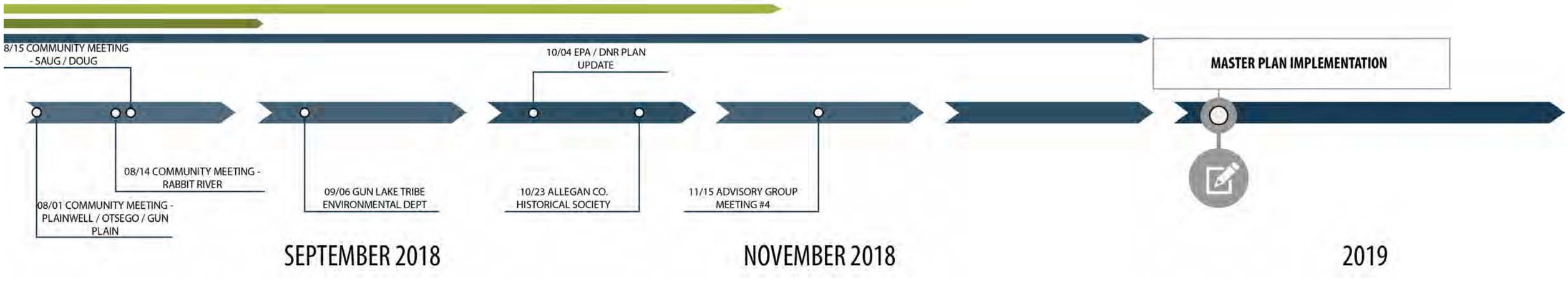
Top Left: Central Allegan Community Meeting

Top Right: Advisory Group Meeting

Bottom Left: Sticky Note Idea Generation at the Saugatuck / Douglas Community Meeting

Bottom Right: Sample of final community input board for Otsego/ Plainwell (see appendices for full boards from each meeting)



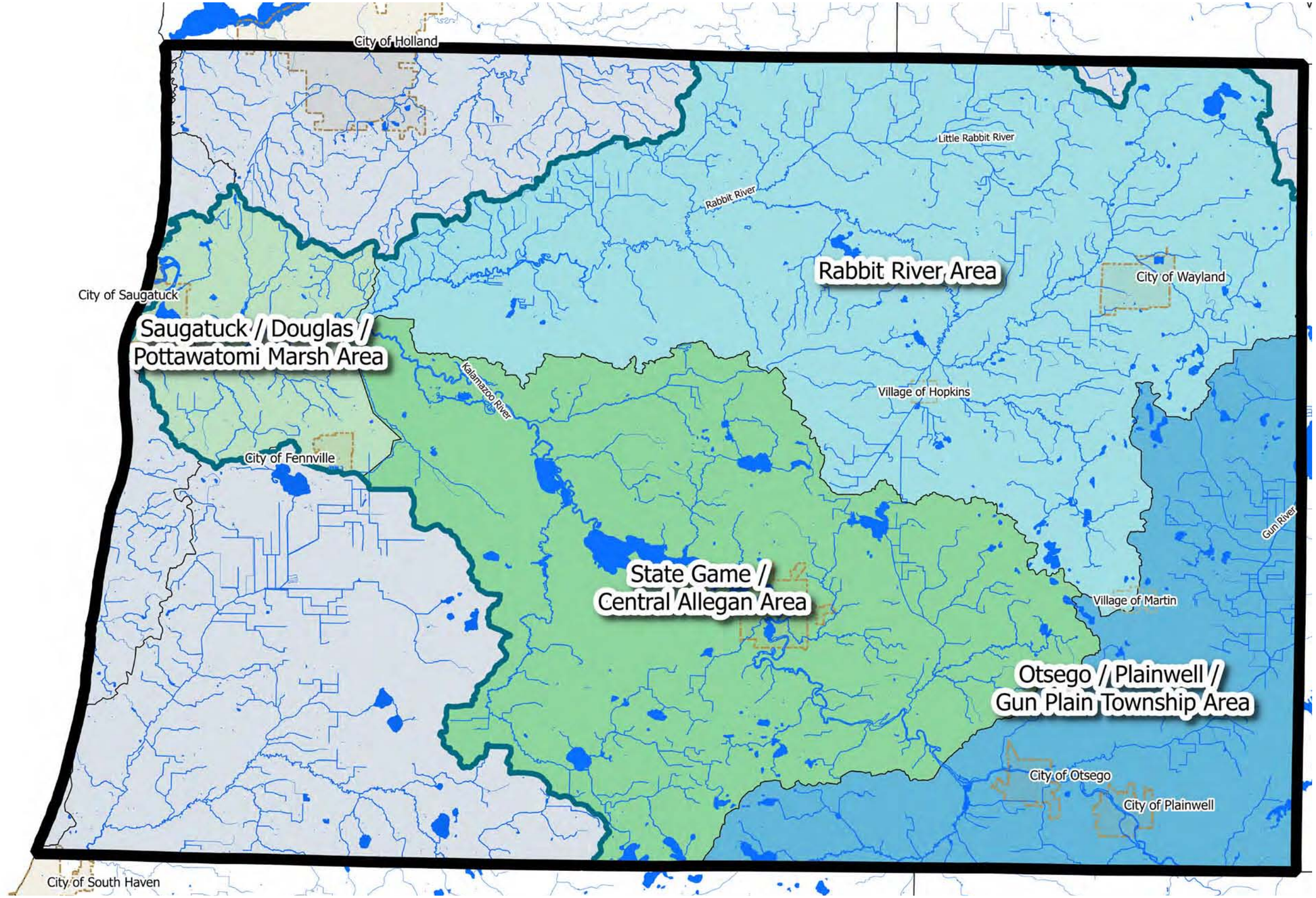


MAP OF FOCUS AREAS

The four focus areas were determined with the seven subwatershed districts, specific characteristics, demographics, challenges, and connectivity to the Kalamazoo River and its tributaries in mind. While the county has a number of clustered communities that have their own identities, for the purpose of planning and holding community input sessions, we divided the Kalamazoo Watershed in Allegan County into four areas. We encouraged community members and local officials to attend the meeting in their area, but several attended other sessions.

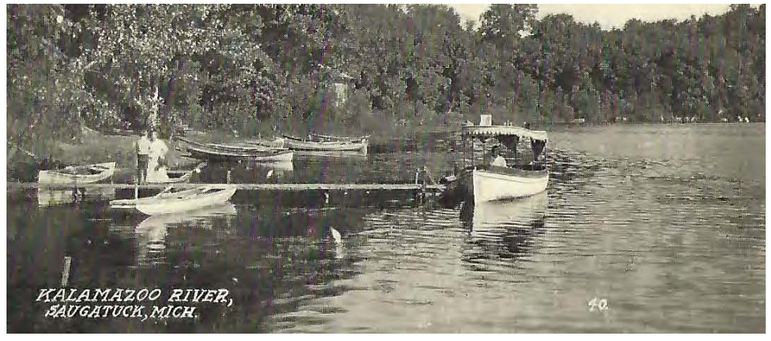
On the western end of the Kalamazoo River lies Saugatuck and Douglas. Both cities flourish due to tourism around their waterways. The sister cities of Otsego and Plainwell plus surrounding Gun Plain, Martin, and Otsego Townships focus of the river are more encompassed by their close proximity and economic development surrounding repurposing the river from industrial to public use.

The northern part of the county in the Rabbit River watershed is mainly agricultural, which would focus mostly on future restoration and conservation projects. With some similarities to the Rabbit River, the central Allegan/State Game area has miles of natural, undeveloped water frontage with the exception of the City of Allegan. The city's focus for a greenway is around their lake and interest to the improvement of its water quality.



THE CONTEXT

UNDERSTANDING THE LOWER KALAMAZOO RIVER GREENWAY TODAY



Top: Saugatuck Harbor during the early 20th century

Below: Kalamazoo River near Saugatuck during the early 20th Century

Historic images courtesy of the Allegan County Historical Society

COMMUNITY FABRIC

The context for the Kalamazoo River Greenway master plan is complex and nuanced, much like the diverse communities and landscapes within the watershed of the Kalamazoo River in Allegan County. This diversity may explain, in part, why until now there has been limited cohesive action taken across the whole of the county. At one corner of the county sit a pair of small cities with an industrious history of working along the river. At the other is a pair of resort communities nestled among the coastal dunes with a channel to Lake Michigan. In between are large tracts of preserved and protected forest and wetlands, productive farmland, and the county seat, sitting astride the river at the head of a large impounded lake. While each of these areas of the watershed have their own characteristics, demographics, and challenges, the connectivity of the Kalamazoo River and its tributaries bind them together into a whole.

HISTORY

History shows that the Kalamazoo River has played a significant role in the settlement of Allegan County. Settlers were attracted by the sources of water power and soon utilized the transportation value of the river with traders and lumbering pioneers moving their goods.

With the introduction of railroads, the river was no longer used for transportation but quickly enjoyed by residents and visitors as a recreational destination. Accounts from early residents tell of a river that was quiet and beautiful. Young couples could canoe for miles in solitude. The fishing was good, and anglers could often catch enough bass, salmon, or catfish for several meals.

After the Civil War and into the 20th century, various industries flourished which used the river for water intake and waste discharge. These industrial practices, residents using the river for disposal of sewage and trash, and changes in land use led to the degradation of the river from pre-settlement conditions. It was the result of industrial waste disposal that the entire Kalamazoo River below the City of Kalamazoo was designated as a Superfund site. In 1980, Congress established the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in response to growing concerns over the health and environmental risks posed by hazardous waste sites. CERCLA is informally called Superfund.

WHAT IS SUPERFUND?

Superfund was established in 1980 by an act of Congress, giving EPA the funds and authority to clean up polluted sites.

Goals of Superfund:

- Protect human health and the environment by cleaning up polluted sites
- Involve communities in the Superfund process
- Make responsible parties pay for work performed at Superfund sites.

According to the EPA, the Kalamazoo River was designated as an Area of Concern (AOC) under the 1987 Great Lakes Water Quality Agreement. The river was listed as an AOC due to historic releases of PCBs associated with de-inking operations at local paper mills. Because of this, the EPA has maintained certain priorities in the area including remediation of PCB-contaminated sediments in the river, control of nonpoint source pollution (particularly phosphorus) and habitat restoration. The communities represented in the Allegan County portion of this area, to which this greenway master plan is focused, have suffered negative health, financial, environmental, and recreational impacts.

While cleanup efforts are ongoing and likely will be for years to come, the effort of establishing a designated greenway will allow folks to further safely reconnect with nature and one another using the Kalamazoo River.

CONTEXT OF PLANNING EFFORT

A number of studies, plans, reports, and documents have been assembled over the decades, all focusing on different aspects of the county. Rather than attempt to replicate all of the work that has gone into this foundation of knowledge, we hope to leverage the strengths of these plans to help inform and coordinate future efforts. Recreation and waterfront master plans, watershed management plans, environmental testing reports, and others will all be important in informing future decisions. A complete bibliography of relevant materials is provided as an attachment at the end of this plan.

EXTENT OF THE GREENWAY

Defining a greenway itself can vary greatly based on communities. For some communities, a greenway may wind up being the width of a bike lane, while others are encompassing entire floodplains and river valleys. For the context of the KRG through Allegan County, there are several broader pieces of greenspace connected by narrower sections of river. In a few instances, the greenway proper may be no wider than a quarter mile, but it will expand to capture larger features such as Lake Allegan, the Allegan State Game Area, and the Pottawatomi Marsh. Areas for incorporation include areas with features of natural, cultural, or recreational importance that fit in with the broader greenway context. While many of the recreational, educational, and ecological goals of the greenway will be located within this narrow corridor, important aspects of management, including but not limited to pollutant sources, invasive species, adjacent pathways, and habitat corridors, are located in the greater watershed and surrounding landscape.

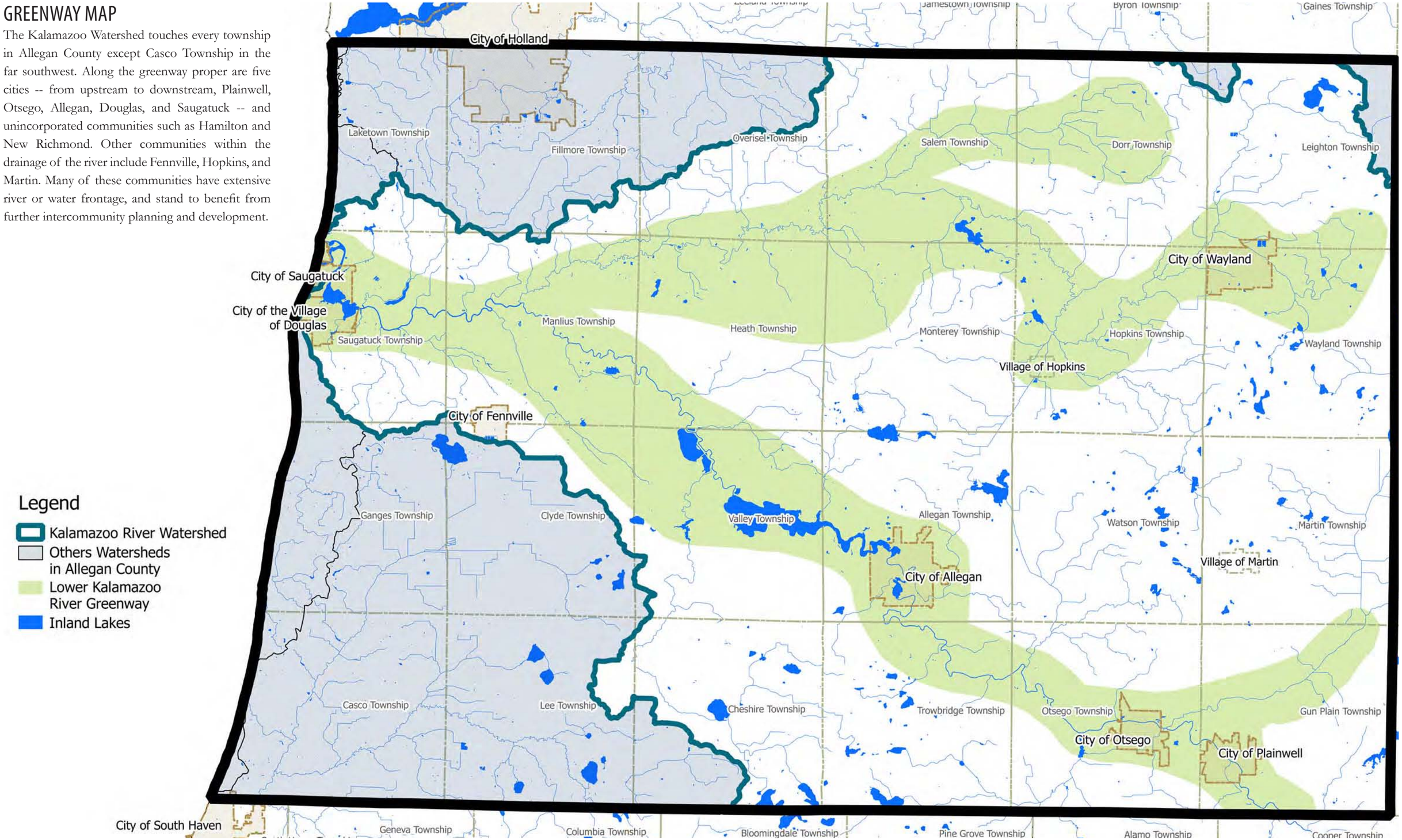
Upper Left: removing contaminated sediment near Otsego

Upper Right: stream restoration at Pine Creek impoundment

Lower Right: New Richmond Bridge

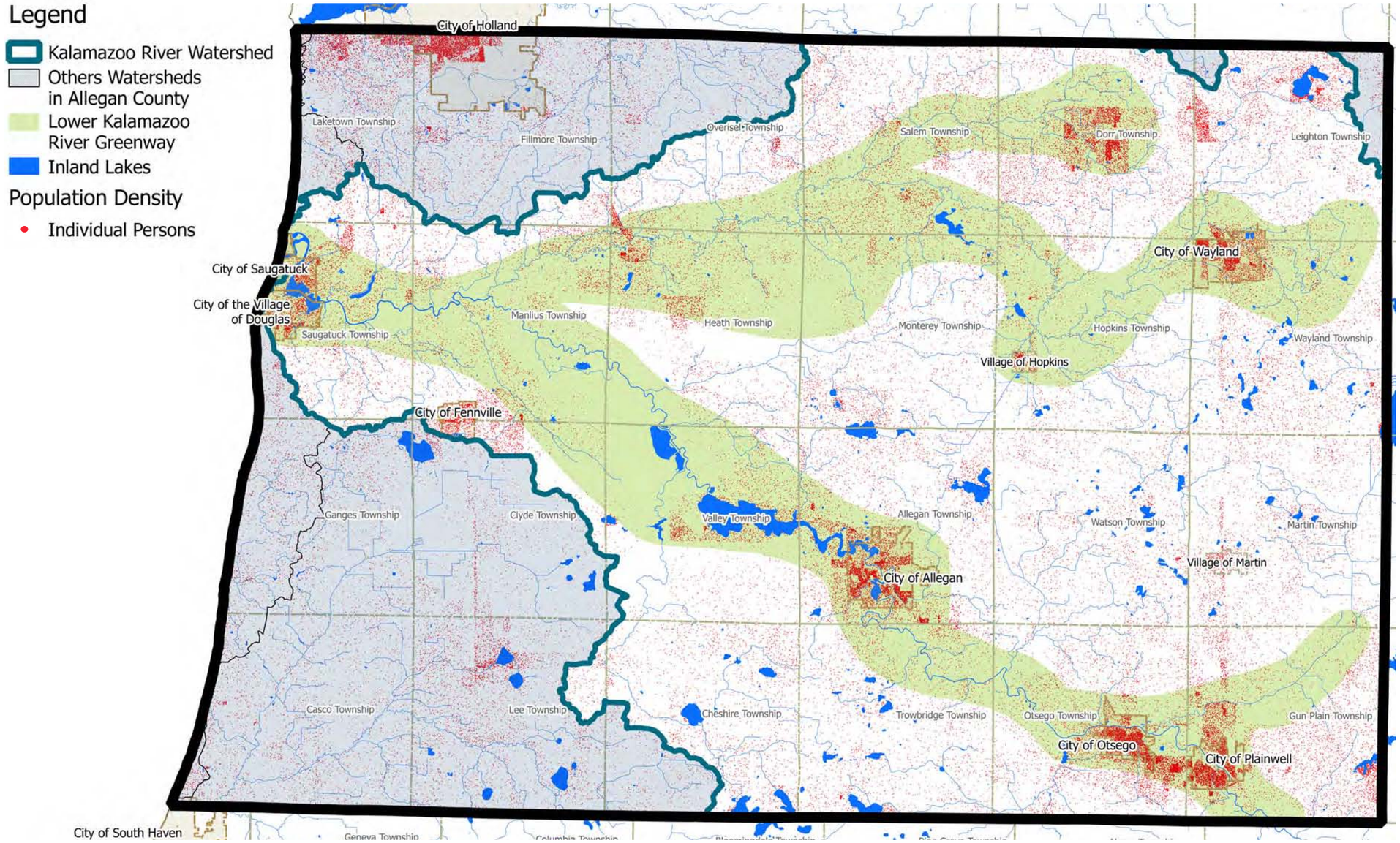
GREENWAY MAP

The Kalamazoo Watershed touches every township in Allegan County except Casco Township in the far southwest. Along the greenway proper are five cities -- from upstream to downstream, Plainwell, Otsego, Allegan, Douglas, and Saugatuck -- and unincorporated communities such as Hamilton and New Richmond. Other communities within the drainage of the river include Fennville, Hopkins, and Martin. Many of these communities have extensive river or water frontage, and stand to benefit from further intercommunity planning and development.



POPULATION DENSITY MAP

Compared to other West Michigan counties, the population of Allegan County is relatively low and spread out. With just under 120,000 residents, the total county population is not even half of neighboring Ottawa, Kent, and Kalamazoo counties. The most densely populated area in the county - the southern neighborhoods of Holland - are outside the project area. The Plainwell/Otsego area has a high concentration of people along the M-89 corridor south of the river, as does the city of Allegan. Saugatuck and Douglas have relatively low permanent populations, but the number of residents and visitors rise significantly during the summer tourism season. Throughout the rest of the county, the population is spread out in low numbers, including along the greenway corridor, largely consisting of single family homes and farms.



GREENWAY POPULATION CENTERS

Plainwell - the southeastern most city in Allegan County, with a population of around 3,800. US-131 is on its western border and M-89 splits the middle of town from east to west. The Kalamazoo River and its historic Mill Run bisect the city. Former paper mills still line the banks of the river and manufacturing continues to be a significant source of jobs. It is a bedroom community for the Grand Rapids and Kalamazoo metro areas.

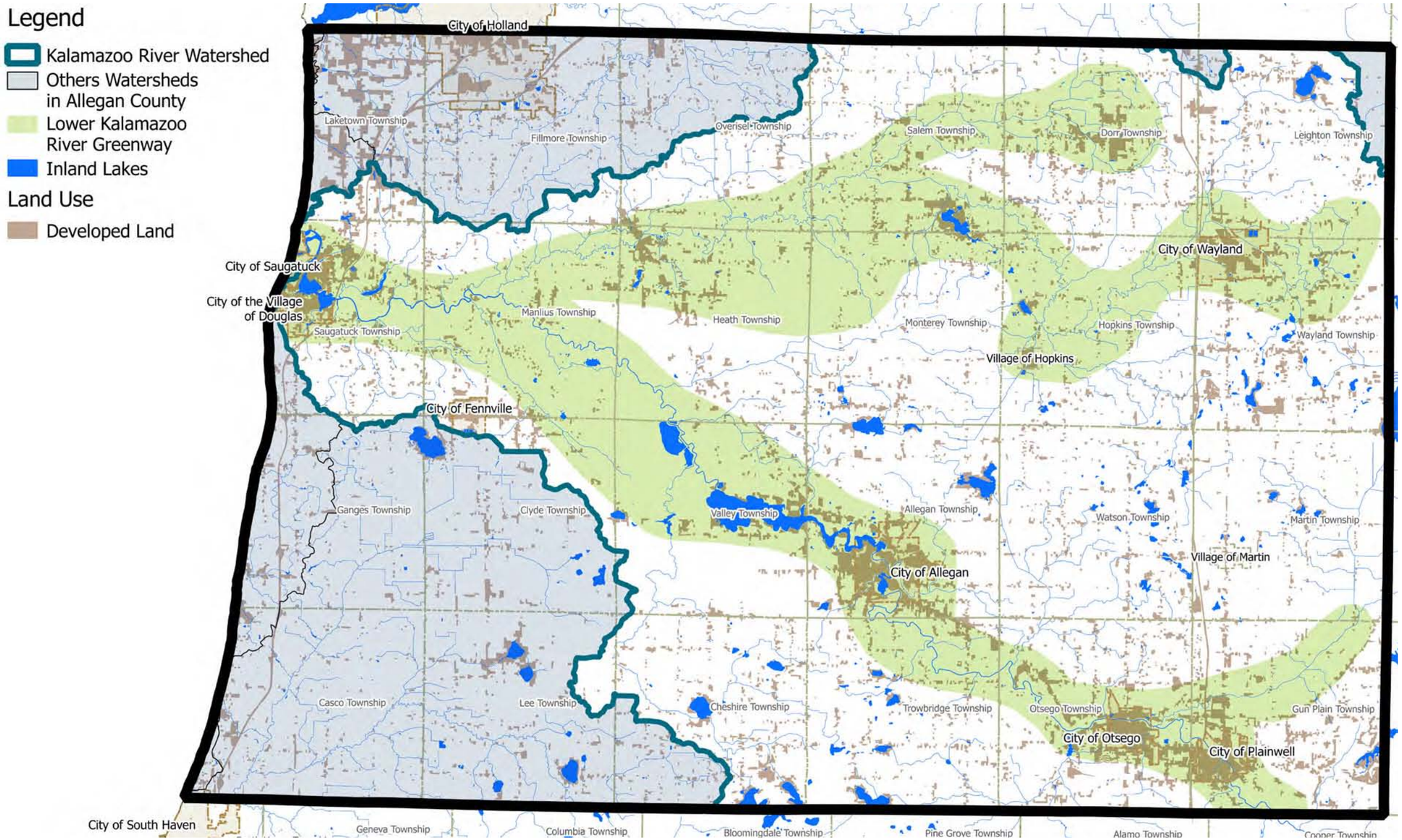
Otsego - located largely to the south of the Kalamazoo River, about four miles downstream from Plainwell. Also on M-89, but west of US-131, it also has a history of manufacturing along the river. Its population is roughly 4,000 people.

Allegan - located close to the geographic center of the county, the city of Allegan is the county seat. Its population is just under 5,000, with the largest employer being the pharmaceutical manufacturer, Perrigo. The Kalamazoo River runs through the middle of the town, with much of its downtown being a short distance from the water, which has been a focal point in recent years.

Fennville - a small city of around 1,400 residents located on M-89 between Clyde and Manlius Townships. While not located on the river proper, it is the closest city to the Allegan State Game Area, located at its western edge. It is known for nearby wineries and orchards, and with its position between Allegan and Douglas, presents as a day trip for many area visitors.

DEVELOPED AREAS MAP

Mirroring the population density of Allegan County in several ways, the developed areas along the Kalamazoo Greenway largely cluster around the small cities it passes through. Businesses, industry, and homes make up much of the developed land in the Plainwell, Otsego, and Allegan areas, with a great deal of it along the riverfront. Saugatuck and Douglas also have large areas of development, particularly homes and small businesses, which spread out into the surrounding township. Other areas of development follow major roadways through communities, such as along M-89 through Fennville and Allegan and M-40 through Hamilton. The largest tracts of undeveloped land prevail through the Allegan State Game Area, particularly in the areas around the Ottawa and Swan Creek Marshes.



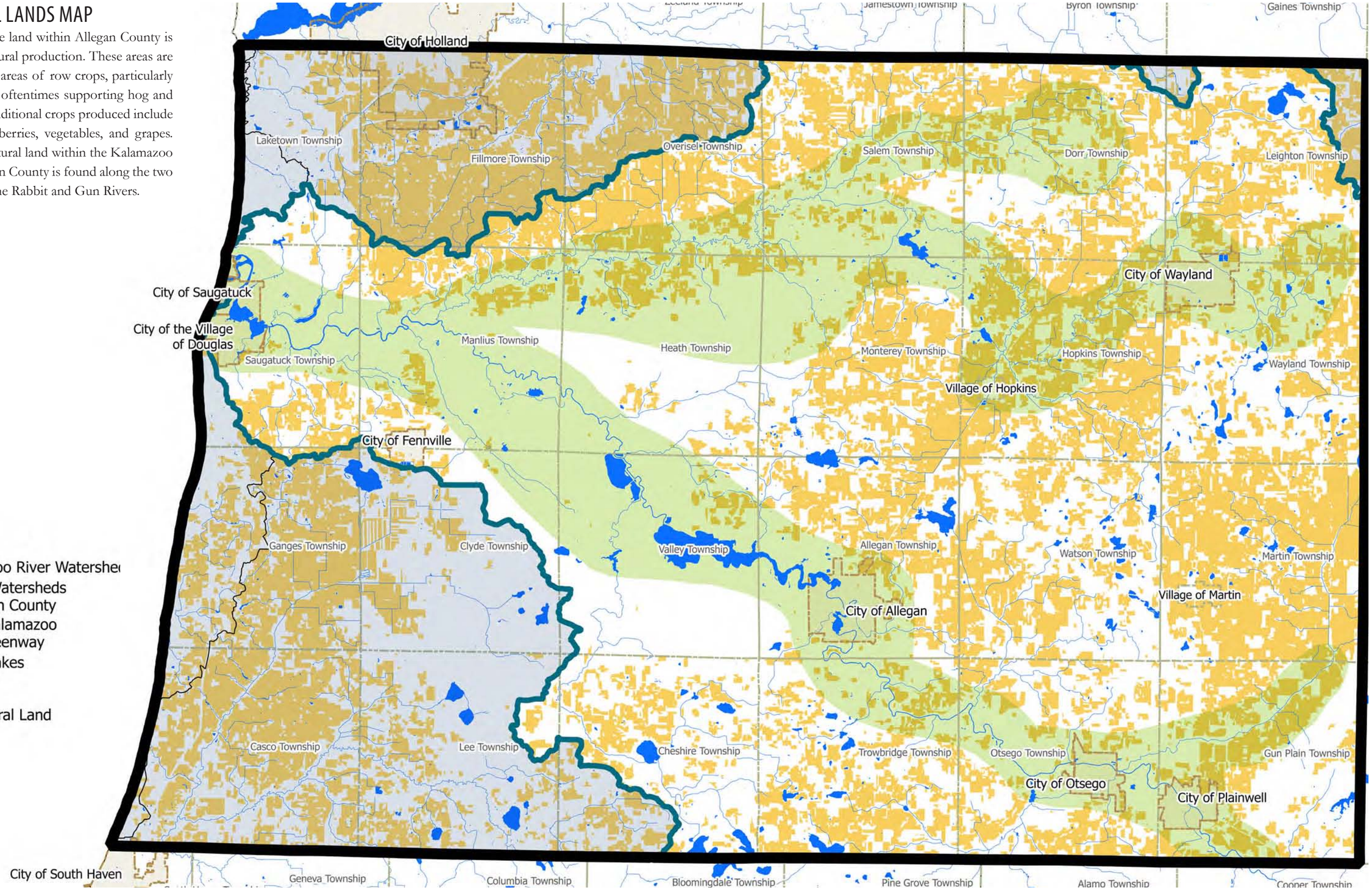
Hamilton - an unincorporated community in Heath Township along M-40, Hamilton is the largest community located on the lower Rabbit River. The railway trestle bridge and the dam protecting it historically connected via rail to Holland and now serves as a park for the community. Largely an agricultural community, the population is under 2,500 people.

Douglas - upstream and on the other side of Kalamazoo Lake from Saugatuck, Douglas became a city in the mid-2000's. Similar to Saugatuck, its permanent population of just over 1,000 grows significantly during summer tourism. Most manufacturing that once occurred has since left town, leaving tourism as the major economic driver.

Saugatuck - a city of just under 1,000 permanent residents, it is located closest to the mouth of the Kalamazoo River, and serves as a harbor for small vessels on Lake Michigan. Tourism is its largest industry, including charter fishing and other water-based recreation, with a significant increase in population during the summer months. It has several large parks and tracts of freshwater coastal dunes within and adjacent to its boundaries.

AGRICULTURAL LANDS MAP

Just over half of the land within Allegan County is currently in agricultural production. These areas are dominated by large areas of row crops, particularly corn and soybeans, oftentimes supporting hog and dairy operations. Additional crops produced include wheat, apples, blueberries, vegetables, and grapes. Most of the agricultural land within the Kalamazoo Watershed in Allegan County is found along the two largest tributaries, the Rabbit and Gun Rivers.



OVERVIEW OF LAND USE

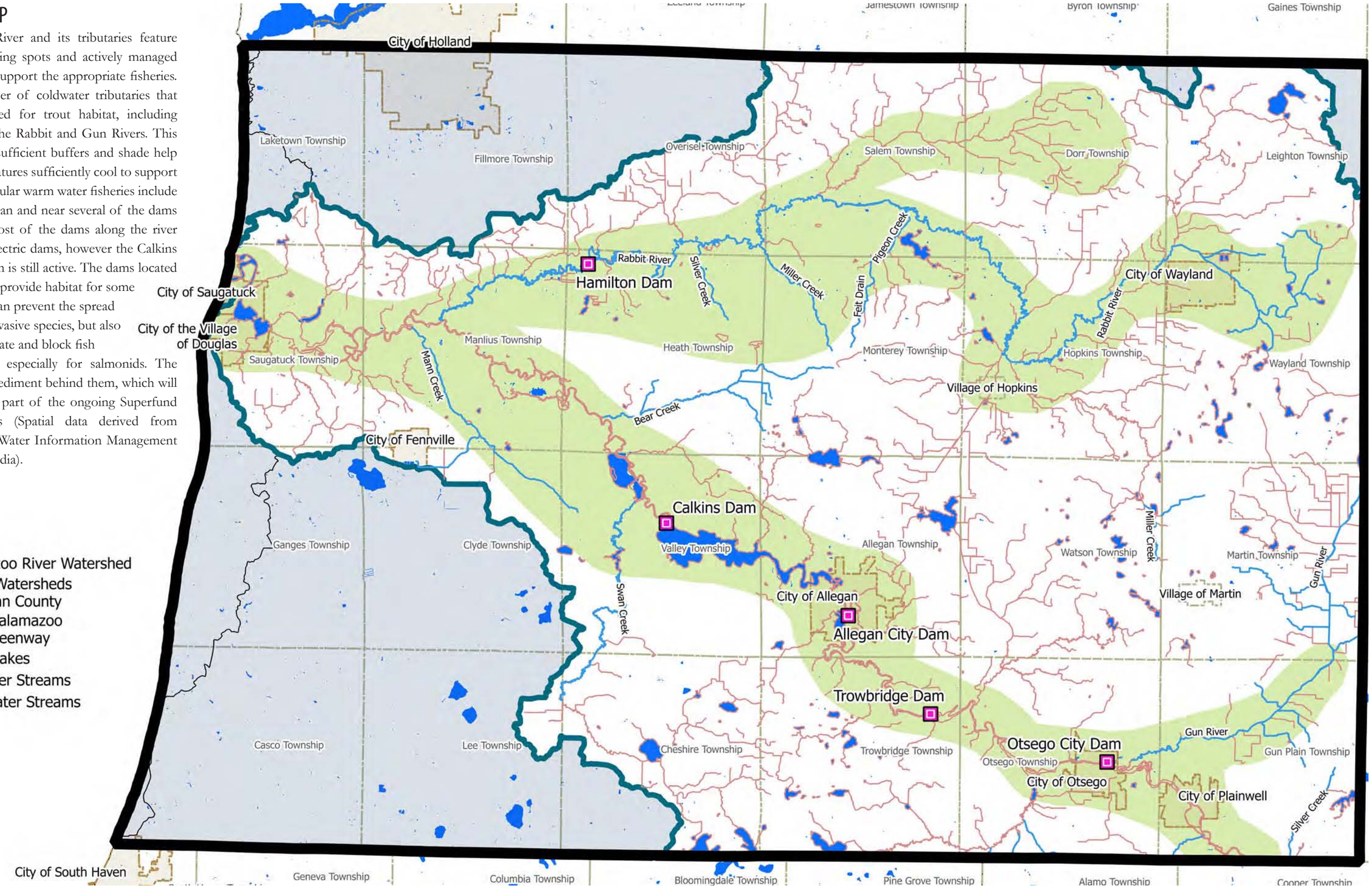
The land use throughout Allegan County is rather distinctive when compared with the rest of West Michigan. While it does have some small towns and areas of heavy agricultural use, the extensiveness of the state game area in the middle of the county gives much of the Kalamazoo River an untamed feeling not unlike areas farther up north. This is reflected in the relatively high levels of forested or undeveloped land (41.8%), compared with developed (6.3%) and agricultural (51.9%) (NOAA C-CAP 2010 dataset). Along the corridor of the Kalamazoo River in Allegan County, 29% of the core habitat is considered intact, higher than the adjoining Gun River (23%) and Rabbit River (10%), and far higher than more developed areas such as Grand Rapids (6%) and Holland (3%) (ESRI Living Atlas).

NATURAL FEATURES

The Kalamazoo is one of the largest rivers in Michigan, spanning and draining parts of eight counties, the last of which is Allegan. It is the seventh longest river located entirely within Michigan, draining just over 2,000 square miles with a median flow of 2,253 cubic feet per second at New Richmond (USGS). Like much of the river, the section that flows through Allegan County travels southeast to northwest, dropping roughly 140 feet from Plainwell to Saugatuck. Lake Allegan is the largest lake located on the river, created by a hydroelectric dam just downstream of the City of Allegan. Four other retired hydroelectric dams were located along the river, with one having been removed in 2018 and another scheduled for 2019. The river widens to form several marshes, including Swan Creek, Ottawa, and Pottawatomi, as well as Kalamazoo Lake, which separates Saugatuck and Douglas near its mouth. The Rabbit and Gun Rivers are the two largest tributaries to join the Kalamazoo in Allegan County. The Gun meets the Kalamazoo between Plainwell and Otsego, while the Rabbit joins just upstream of New Richmond. While there is some development on the river, primarily in and around the five cities, the river corridor remains fairly natural, especially in the large Allegan State Game Area between Douglas and Allegan. The river corridor below the Calkins Dam, as well as lower segments of Bear Creek, Sand Creek, Swan Creek, and the Rabbit River, have all been designated as natural rivers by the DNR.

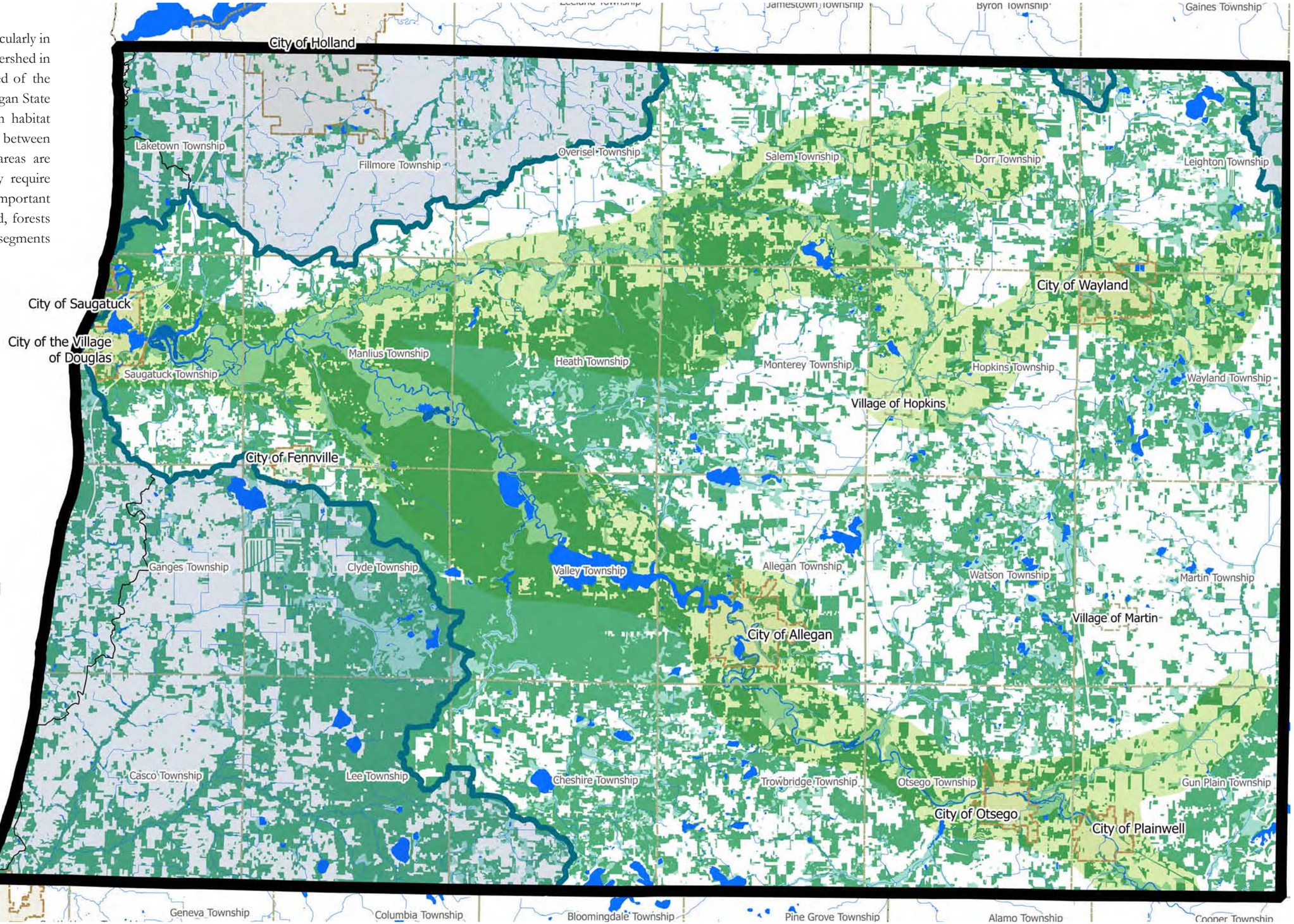
FISHERIES MAP

The Kalamazoo River and its tributaries feature many popular fishing spots and actively managed areas designed to support the appropriate fisheries. There are a number of coldwater tributaries that should be managed for trout habitat, including large sections of the Rabbit and Gun Rivers. This includes ensuring sufficient buffers and shade help keep water temperatures sufficiently cool to support these fisheries. Popular warm water fisheries include areas in Lake Allegan and near several of the dams along the river. Most of the dams along the river are retired hydroelectric dams, however the Calkins Dam below Allegan is still active. The dams located along the river can provide habitat for some types of fish and can prevent the spread of some aquatic invasive species, but also detrimentally separate and block fish passage upstream, especially for salmonids. The dams also collect sediment behind them, which will require cleanup as part of the ongoing Superfund restoration efforts (Spatial data derived from MIchigan Surface Water Information Management System and Wikipedia).



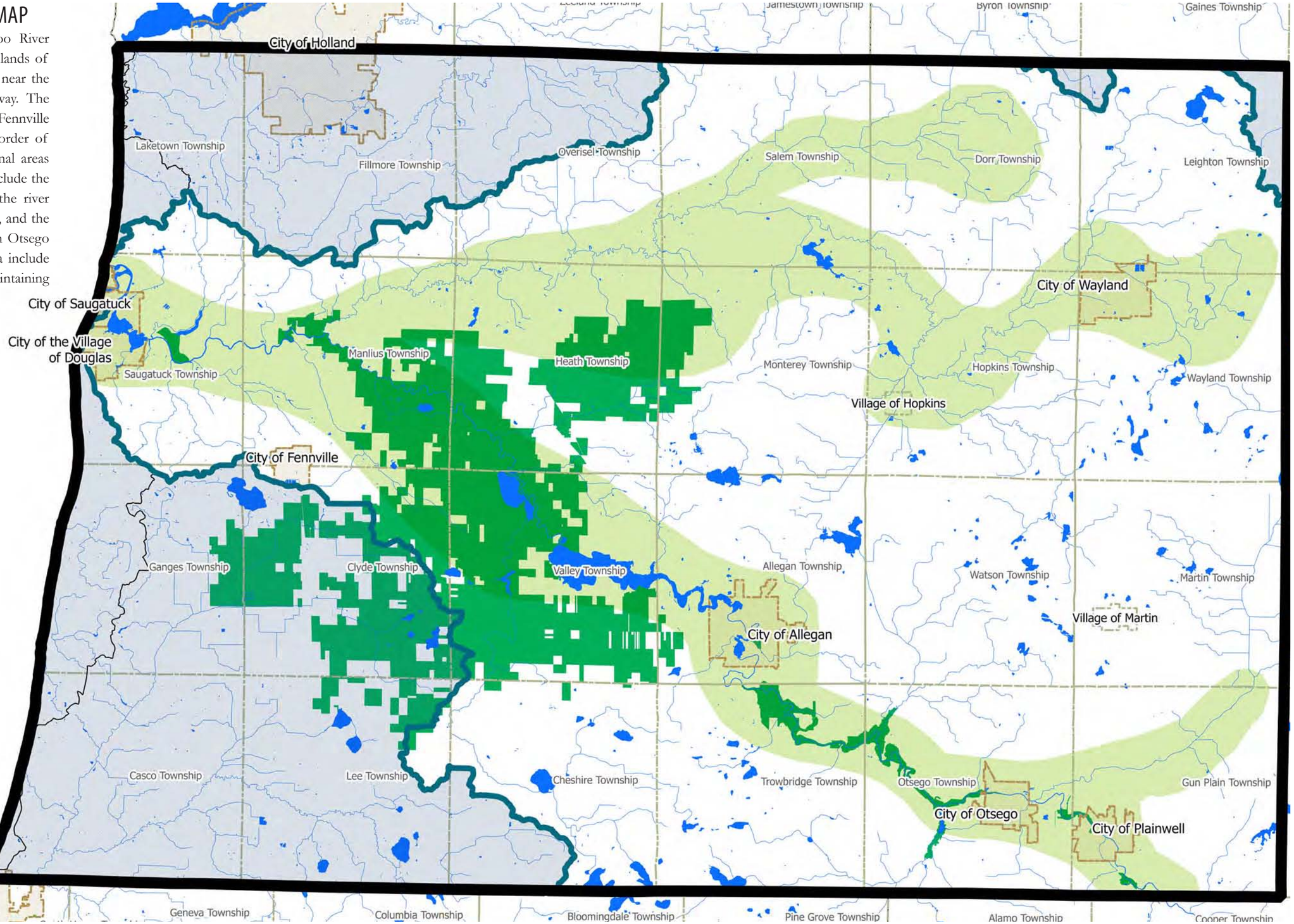
LAND USE MAP

Significant areas of open land remain, particularly in the western end of the the Kalamazoo Watershed in Allegan County. Much of this is comprised of the forest and wetlands that dominate the Allegan State Game Area. Large tracts of intact marsh habitat can be found along the greenway corridor between Douglas and Plainwell. Although these areas are impacted by contaminants and will likely require future remediation efforts, they represent important assets for the greenway. On higher ground, forests can be found in large, contiguous segments occasionally divided by roads.



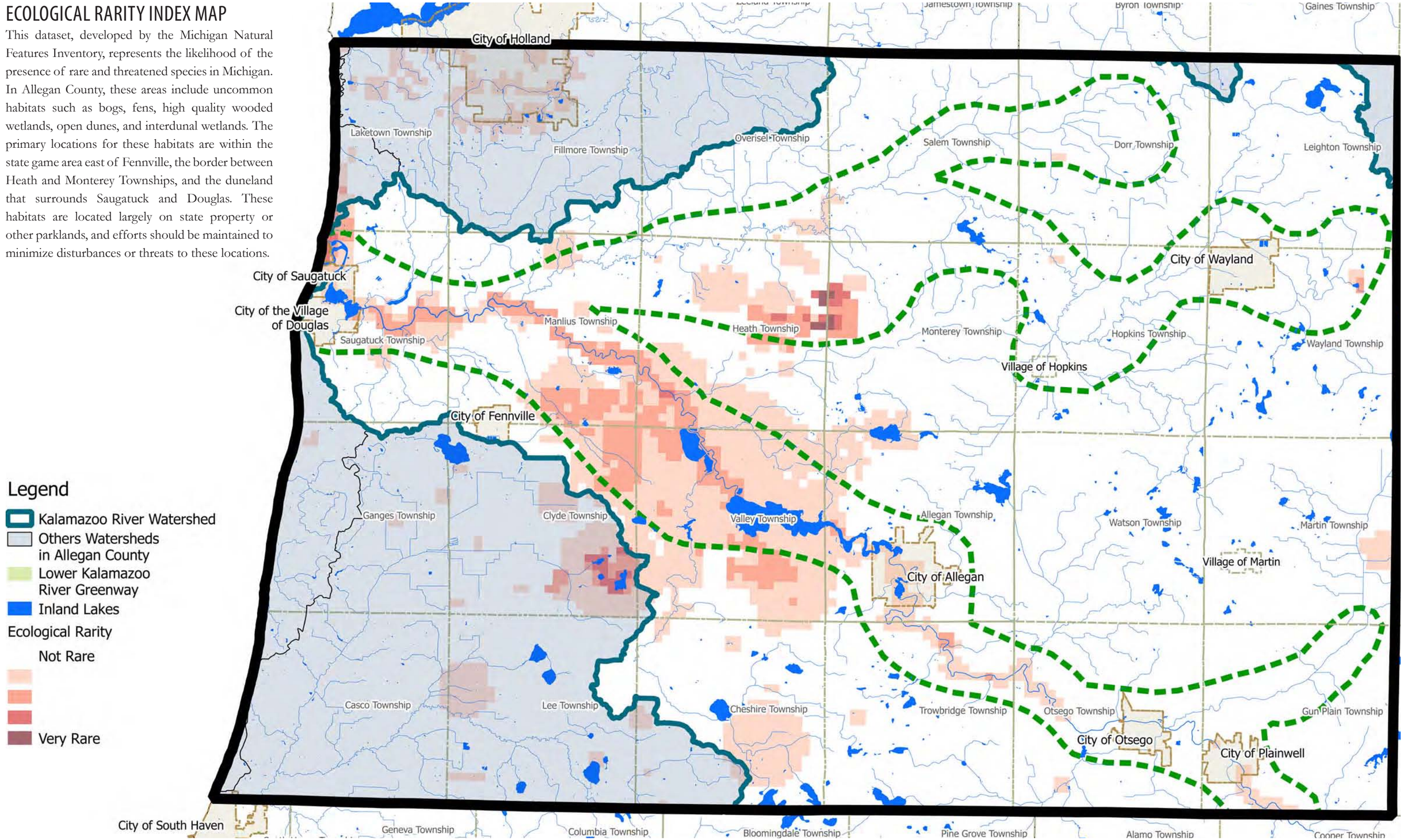
STATE FORESTRY/GAME LANDS MAP

While not entirely within the Kalamazoo River Watershed, the majority of the protected lands of the Allegan State Game Area are located near the middle of the Kalamazoo River Greenway. The two largest segments are found between Fennville and Allegan and in the area along the border of Heath and Monterey Townships. Additional areas managed as part of the state game area include the Webster Marsh in Saugatuck Township, the river bottomlands between Allegan and Otsego, and the wetlands and mid-channel islands between Otsego and Plainwell. Priorities for the game area include several areas managed for waterfowl, maintaining habitat quality, and providing recreational access to the river.



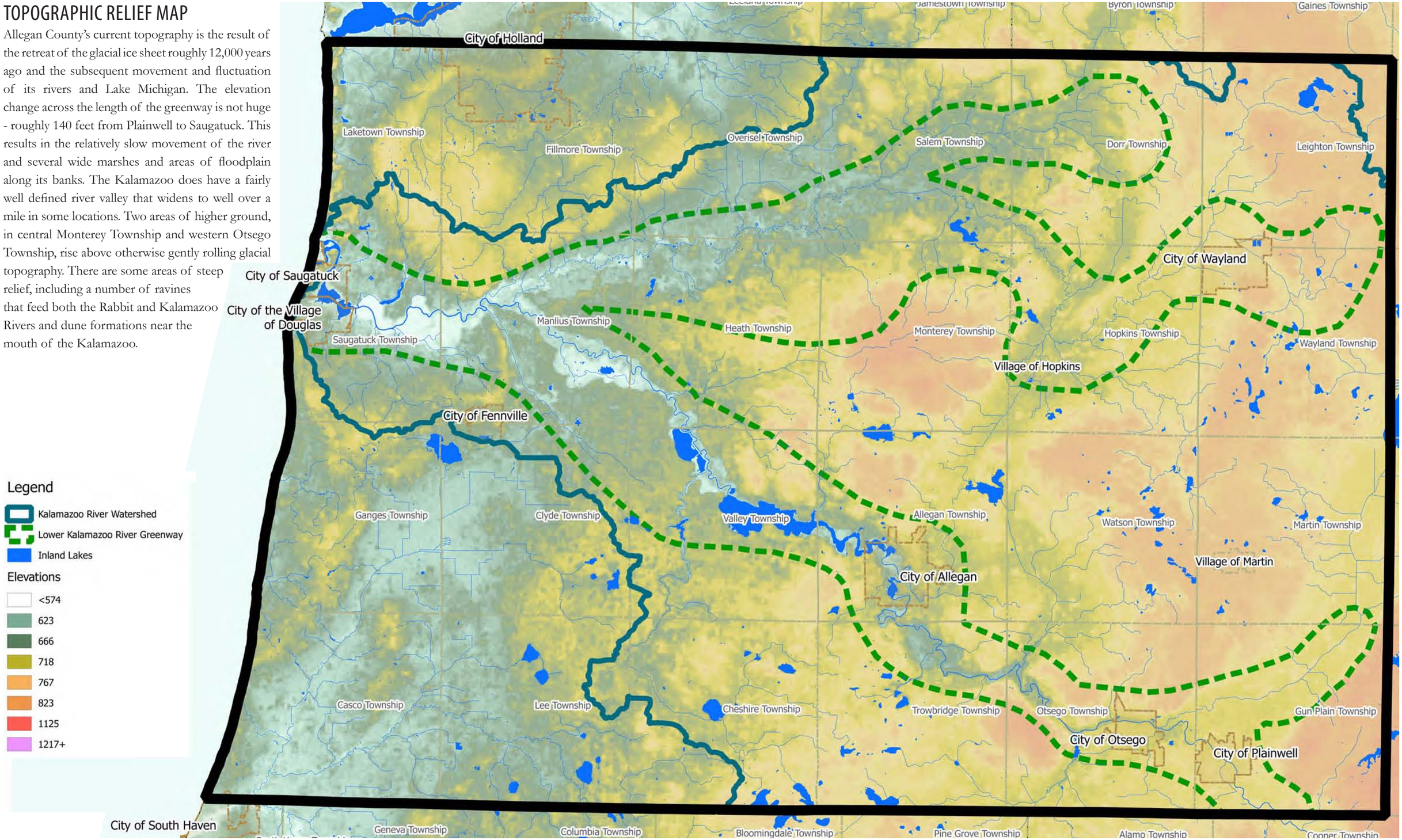
ECOLOGICAL RARITY INDEX MAP

This dataset, developed by the Michigan Natural Features Inventory, represents the likelihood of the presence of rare and threatened species in Michigan. In Allegan County, these areas include uncommon habitats such as bogs, fens, high quality wooded wetlands, open dunes, and interdunal wetlands. The primary locations for these habitats are within the state game area east of Fennville, the border between Heath and Monterey Townships, and the duneland that surrounds Saugatuck and Douglas. These habitats are located largely on state property or other parklands, and efforts should be maintained to minimize disturbances or threats to these locations.



TOPOGRAPHIC RELIEF MAP

Allegan County's current topography is the result of the retreat of the glacial ice sheet roughly 12,000 years ago and the subsequent movement and fluctuation of its rivers and Lake Michigan. The elevation change across the length of the greenway is not huge - roughly 140 feet from Plainwell to Saugatuck. This results in the relatively slow movement of the river and several wide marshes and areas of floodplain along its banks. The Kalamazoo does have a fairly well defined river valley that widens to well over a mile in some locations. Two areas of higher ground, in central Monterey Township and western Otsego Township, rise above otherwise gently rolling glacial topography. There are some areas of steep relief, including a number of ravines that feed both the Rabbit and Kalamazoo Rivers and dune formations near the mouth of the Kalamazoo.



RECREATION AND PARK SPACE

The quantity and quality of existing natural features in Allegan County provide the backdrop for many high quality recreational activities along the greenway. Hunting, fishing, motorized and non-motorized boating, hiking, and other pastimes are all significant parts of these communities, and they were repeatedly brought up during plan development. Efforts to help sustain those high quality habitats along the river will help to preserve and improve these locales and help ensure that the corridor remains higher quality than many neighboring watersheds. The wide tract of land managed by the DNR contains beautiful forest, river, and marshland, already primed for recreation, with private and publicly held land nearby with high value as well. Excellent waterfowl habitat can be found in several wide, marshy expanses of the river, attracting nesting and migrating birds. Fishing opportunities range from the large, deep waters of Lake Allegan to many favorite spots along the river. Sturgeon spawning habitat, salmon and steelhead running from Lake Michigan, and rare cold-water trout streams can also be found along the greenway.

There are already a number of parks and green spaces within the larger communities of Allegan County. Between the five cities and townships along the greenway, they have a total of 42 parks. However, only about half are along the river or within the greenway corridor, and most of these spaces are concentrated in the relatively confined spaces of city limits. There are a handful of parks managed by the county, and two state-operated recreation facilities in the Allegan State Game Area and Saugatuck Dunes State Park. As cited in the Allegan County Parks Plan, goals for the improvement of these communities include the increased development of trails and waterfront access, and concerns about lack of trails, safety, and funding.

Above: Allegan County Fairgrounds

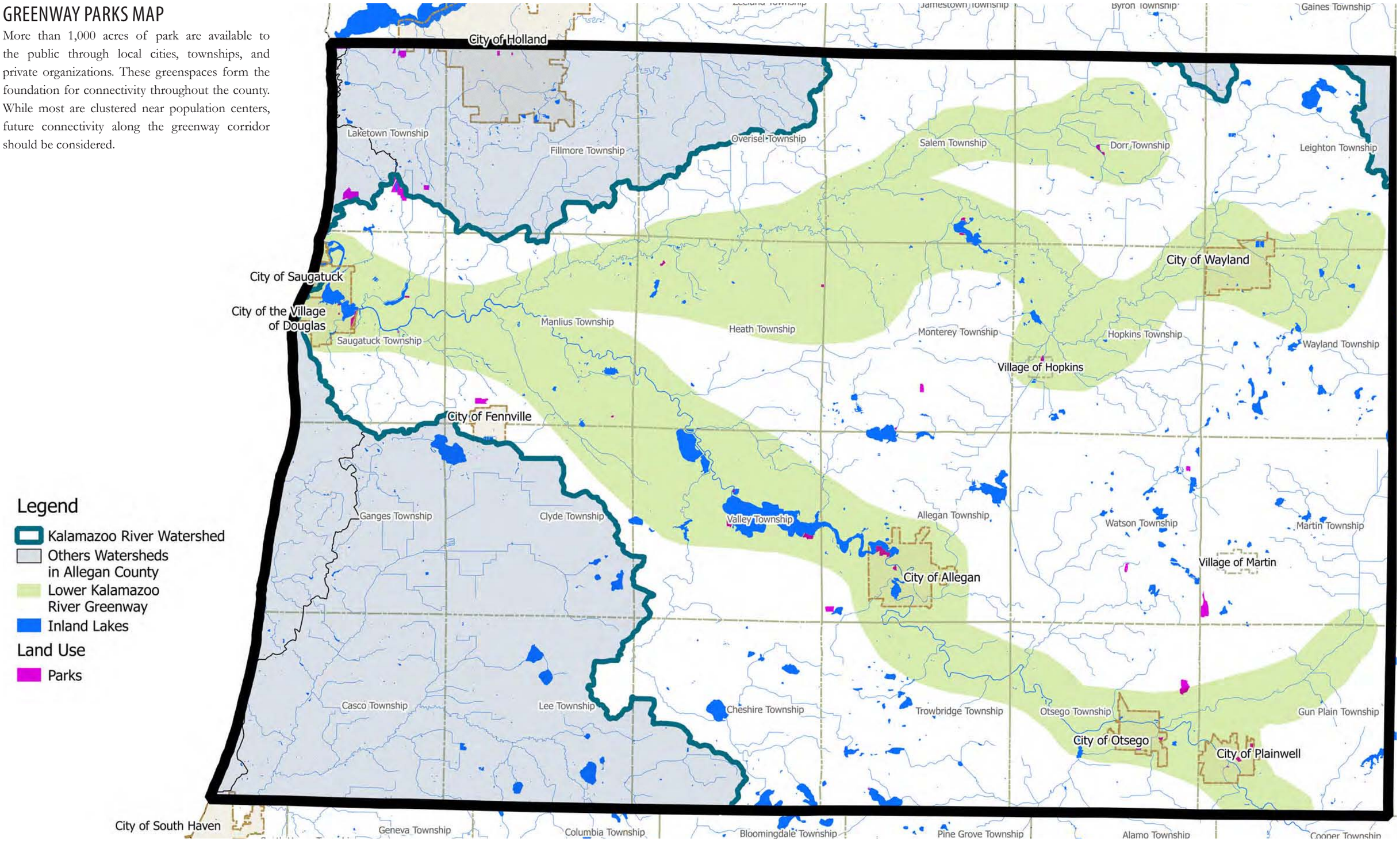
MUNICIPALITIES / TOWNSHIPS RECREATIONAL FACILITIES IN ALLEGAN COUNTY

(INFORMATION REFERENCED FROM ALLEGAN COUNTY'S RECREATION PLAN)

LOCATION	# OF PARKS	TOTAL ACRES	REC PLAN?	# OF STAFF	PLANS IN 5 YEARS?	TYPES OF IMPROVEMENTS PLANNED	RECREATION ISSUES
CITY OF ALLEGAN	8	78	YES	3.5	YES	RIVERFRONT RENOVATIONS / MT. BIKE TRAIL	TRAILS, BOAT ACCESS, IMPROVING EVENT SPACING / RECREATION ALONG RIVERFRONT
ALLEGAN TOWNSHIP	0	0	YES	0	YES	MNRTF GRANT FOR ACQUIS. & DEVEL. OF LAKE PROPERTY	LACK OF TRAILS
CASCO TOWNSHIP	1	20	YES	0	NO	NONE	FUNDING, MORE PARKING, EVENT CENTER
CHESHIRE TOWNSHIP	0	0	NO	NO RESP	NO RESP	NO RESP	NO RESP
DORR TOWNSHIP	3	20	IN PROG	NO RESP	NO RESP	NO RESP	NO RESP
CITY OF DOUGLAS	8	26	YES	NO RESP	NO RESP	NO RESP	NO RESP
CITY OF FENNVILLE	1	3	YES	0	NO	N/A	NO RESP
FILLMORE TOWNSHIP	1	20	YES	0	NO	N/A	LACK OF TRAILS, YOUTH & SENIOR REC
GANGES TOWNSHIP	1	<1	NO	0	YES	IMPROVE PARKING & WALKING ACCESS TO GLENN BEACH	PARKING, ACCESSIBLE PARKS, MORE ACCESS TO LAKE MICHIGAN
HEATH TOWNSHIP	2	15.5	YES	0	YES	IMPROVEMENTS TO SCHUTMAAT PARK	NO RESP
VILLAGE OF HOPKINS	2	4	NO	NO RESP	NO RESP	NO RESP	NO RESP
LAKETOWN TOWNSHIP	7	32.5	YES	0	YES	CONTINUE DEVEL. OF NEWEST PARK	TRAILS, YEAR ROUND REC, PROVIDING FOR ALL PHYSICAL ABILITY
LEE TOWNSHIP	0	0	NO	0	NO RESP	NO RESP	NO RESP
LEIGHTON TOWNSHIP	2	6	NO	0	NO	N/A	NO RESP
MANLIUS TOWNSHIP	0	0	NO	0	YES	DEVELOP REC PLAN	NO RESP
MARTIN TOWNSHIP	0	0	NO	NO RESP	NO RESP	NO RESP	NO RESP
MONTEREY TOWNSHIP	0	0	NO	NO RESP	NO RESP	NO RESP	NO RESP
CITY OF OTSEGO	3	98	YES	DPW STAFF	YES	UPGRADES TO MEMORIAL PARK	FUNDING
OTSEGO TOWNSHIP	0	0	NO	0	NO	N/A	NO RESP
OVERISEL TOWNSHIP	0	0	NO	NO RESP	NO RESP	NO RESP	NO RESP
CITY OF PLAINWELL	7	85	NO	DPW STAFF	YES	TRAIL EXTENSION	RIVER WALK EXTENSION, RIVER ACCESS, CONNECTING TO KVR TRAIL
SALEM TOWNSHIP	1	8	NO	0	YES	UPGRADES TO PARK	PARK AREA, SOFTBALL / BASEBALL
CITY OF SAUGATUCK	10	335.6	YES	20	YES	NEW PATH FROM PARK ST. TO OVAL BEACH	PEDESTRIAN SAFETY / CONNECTING TO OTHER BIKE TRAILS
SAUGATUCK TOWNSHIP	4	33	YES	0	YES	BLUE STAR TRAIL	CAPITAL REPLACEMENT, OPERATION FUNDING, VANDALISM / LITTERING
VALLEY TOWNSHIP	0	0	NO	0	NO	NO RESP	NO RESP
WATSON TOWNSHIP	0	0	NO	0	NO	N/A	NO FUNDING
CITY OF WAYLAND	5	32.5	YES	0	YES	ADD SPLASH PAD, ADD BARRIER FREE PLAYGROUND EQUIPMENT, INTER-URBAN TRAIL	FUNDING, AGING EQUIPMENT, ENCOURAGING USE
WAYLAND TOWNSHIP	0	0	NO	0	NO	NO	FUNDING

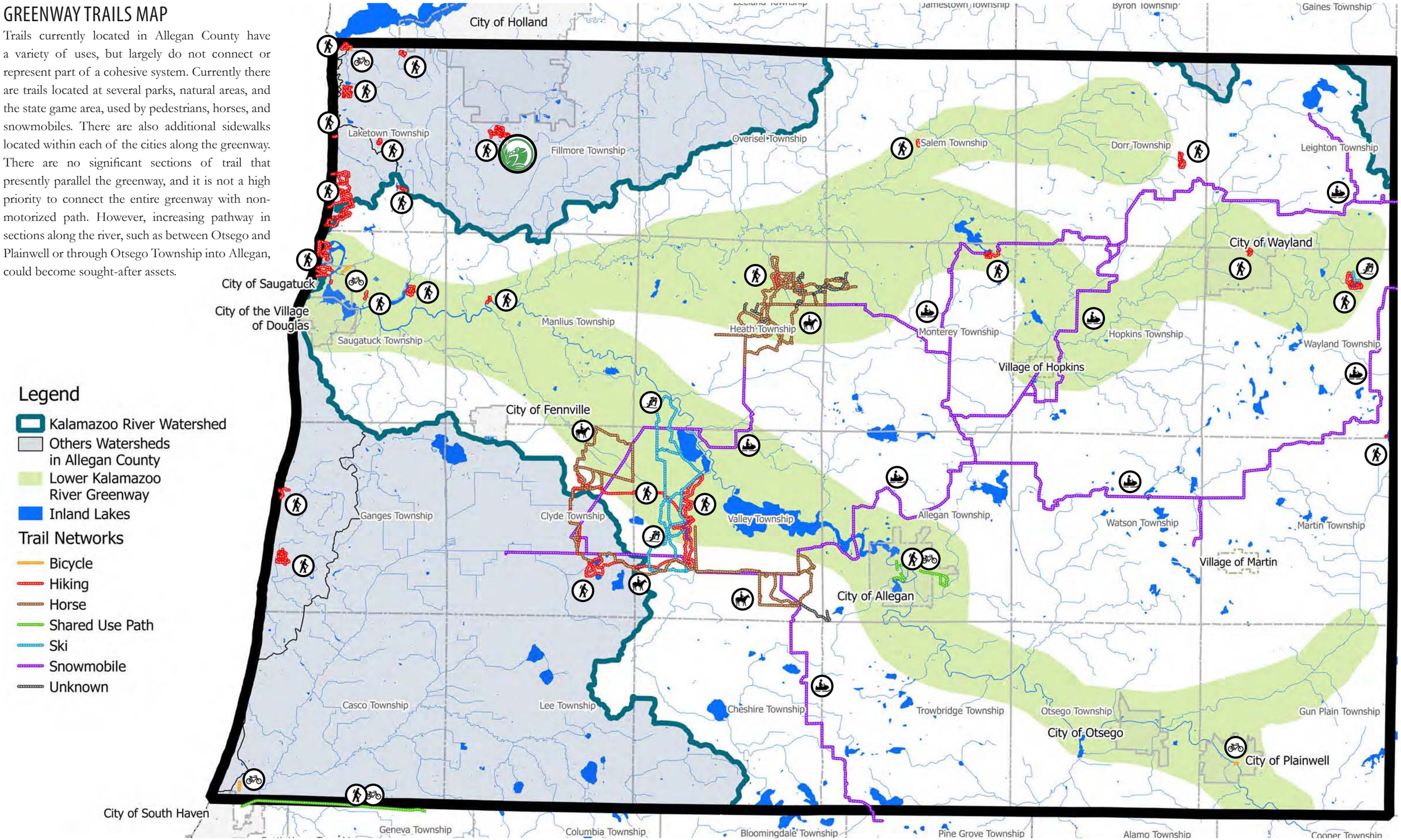
GREENWAY PARKS MAP

More than 1,000 acres of park are available to the public through local cities, townships, and private organizations. These greenspaces form the foundation for connectivity throughout the county. While most are clustered near population centers, future connectivity along the greenway corridor should be considered.



GREENWAY TRAILS MAP

Trails currently located in Allegan County have a variety of uses, but largely do not connect or represent part of a cohesive system. Currently there are trails located at several parks, natural areas, and the state game area, used by pedestrians, horses, and snowmobiles. There are also additional sidewalks located within each of the cities along the greenway. There are no significant sections of trail that presently parallel the greenway, and it is not a high priority to connect the entire greenway with non-motorized path. However, increasing pathway in sections along the river, such as between Otsego and Plainwell or through Otsego Township into Allegan, could become sought-after assets.



Left: Sediment filled water near the mouth of the Rabbit River

Right: Stream restoration near Otsego

MAJOR ENVIRONMENTAL CONCERNS

Industry has shaped the history of the Kalamazoo River significantly, and not always for the better. Many of the communities, including Allegan, Otsego, and Plainwell, grew up with the river at the back or the edge of town, often used as a means of getting rid of waste from paper recycling and production. The legacy of several of these businesses has been the contamination that has been left behind, affecting waterfront properties as well as the streams themselves. The sediment contains PCBs and other trace chemicals that are hazardous to human health. While the water itself is safe for activities such as paddling and sport fishing (fish should not be eaten), the contamination often gives the river a worse reputation than it deserves.

The designation of the entire Kalamazoo River in Allegan County as part of an EPA Superfund site due to contamination of river sediments is certainly an encumbrance when it comes to planning and developing areas along the river, and has to some degree handcuffed communities from implementing community development and recreation plans until restoration is completed. While these sites and contaminated sediment are being systematically addressed by the EPA and the responsible parties through the Superfund program, the contamination is a factor that will impact ongoing planning and activities for decades to come. These cleanups, however, also provide possible means for partnerships and coordinated efforts that can result in improved recreational access and opportunities.

In addition to the contamination of sediments located along the river corridor, Lake Allegan is currently under a TMDL (total maximum daily load) for the nutrient phosphorus by the MDEQ. Phosphorus, which in excess can lead to algae blooms and degraded habitat in water bodies, can be traced back to both point sources (water treatment plants, factories) and non-point sources (farm fields, stream banks). The goal is to have total phosphorus levels in Lake Allegan reach no higher than 60 parts per billion during summer months; during TMDL development, these numbers ranged from 69 to 127 ppb. [See TMDL agreement for further details]

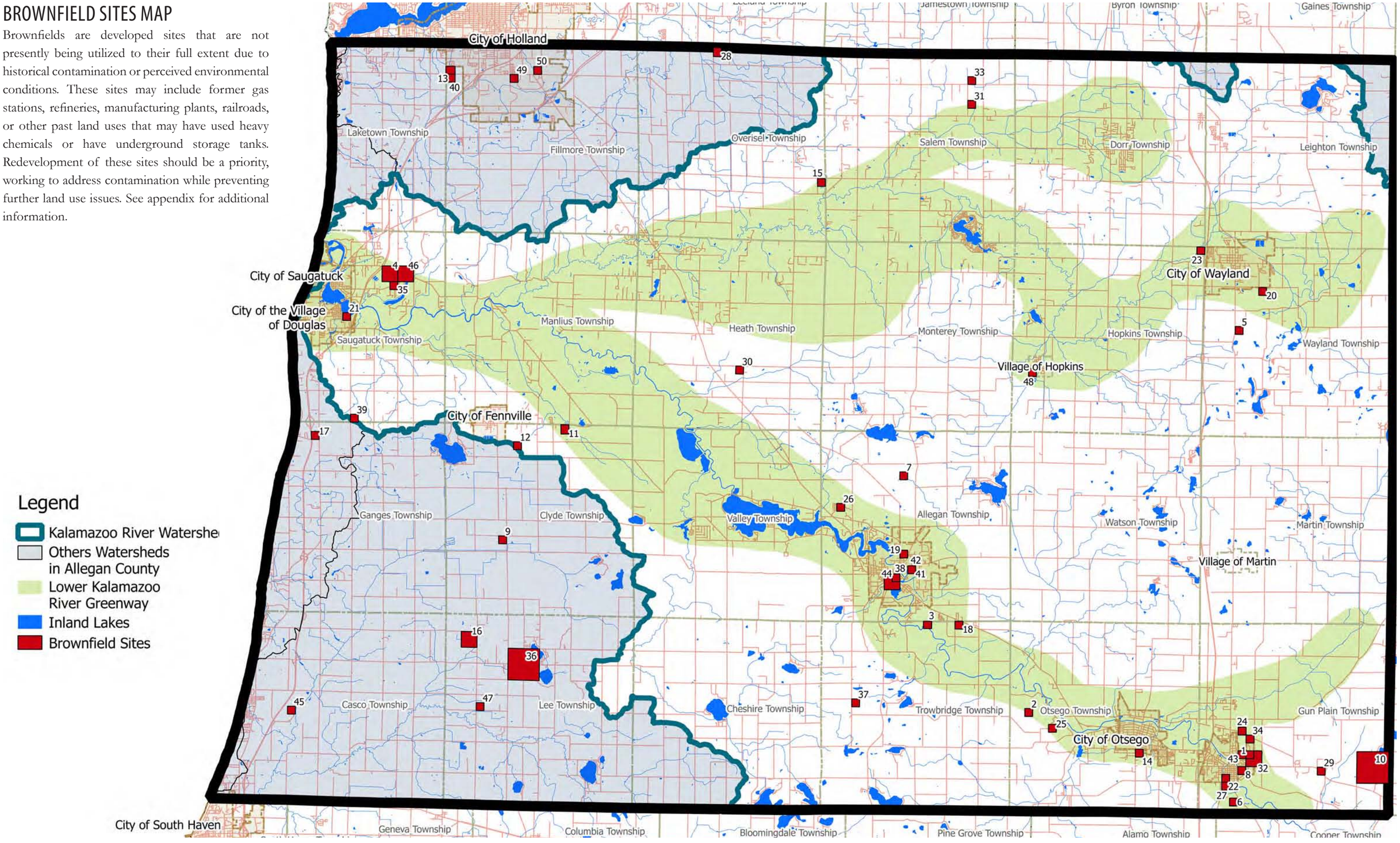
Regardless of the contamination issue, the excessive amount of sediment in the river remains an

impediment. Even though the dam that forms Lake Allegan acts as a sediment trap, holding back excess sediment and minimizing the phosphorus that continues past the dam, sources of sediment and phosphorus remain a concern for the conditions along the river corridor. Many of the cleanup efforts that remain on the Kalamazoo River are significantly impacted by the dams scattered between Plainwell and Allegan, which have years of silt buildup behind them. Sources of sediment from both the Rabbit and Kalamazoo River can impair downstream waters, and lead to sedimentation issues in Kalamazoo Lake and Harbor. Even though remediation will require either time or specific cleanup actions, sources of sediment and phosphorus throughout the watershed should be addressed to help minimize sedimentation.

Upper Left: Dam removal work conducted by the EPA near Otsego
Lower Left: Jewell Street waterfront, Otsego
Right: Kalamazoo River in Plainwell

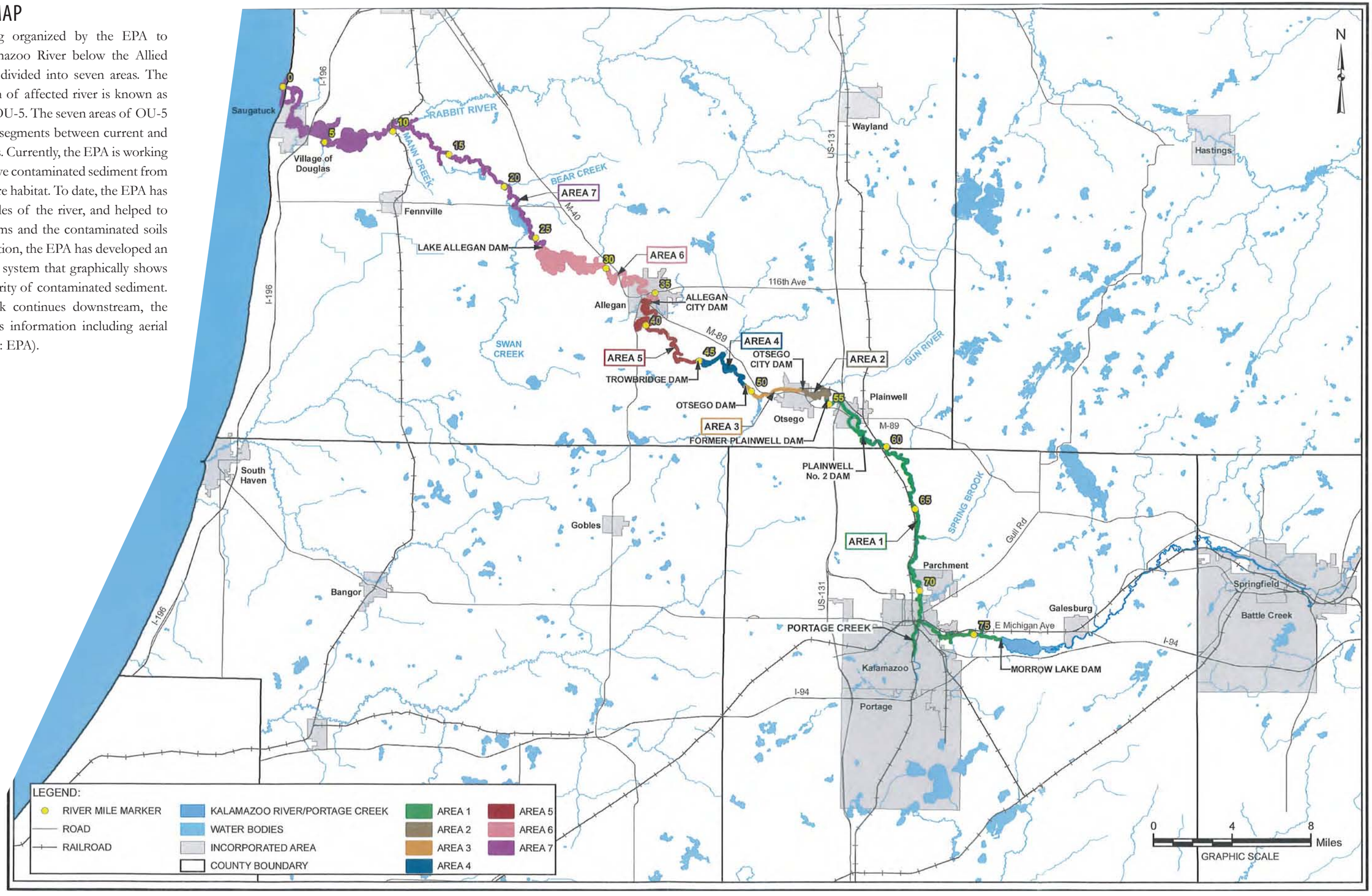
BROWNFIELD SITES MAP

Brownfields are developed sites that are not presently being utilized to their full extent due to historical contamination or perceived environmental conditions. These sites may include former gas stations, refineries, manufacturing plants, railroads, or other past land uses that may have used heavy chemicals or have underground storage tanks. Redevelopment of these sites should be a priority, working to address contamination while preventing further land use issues. See appendix for additional information.



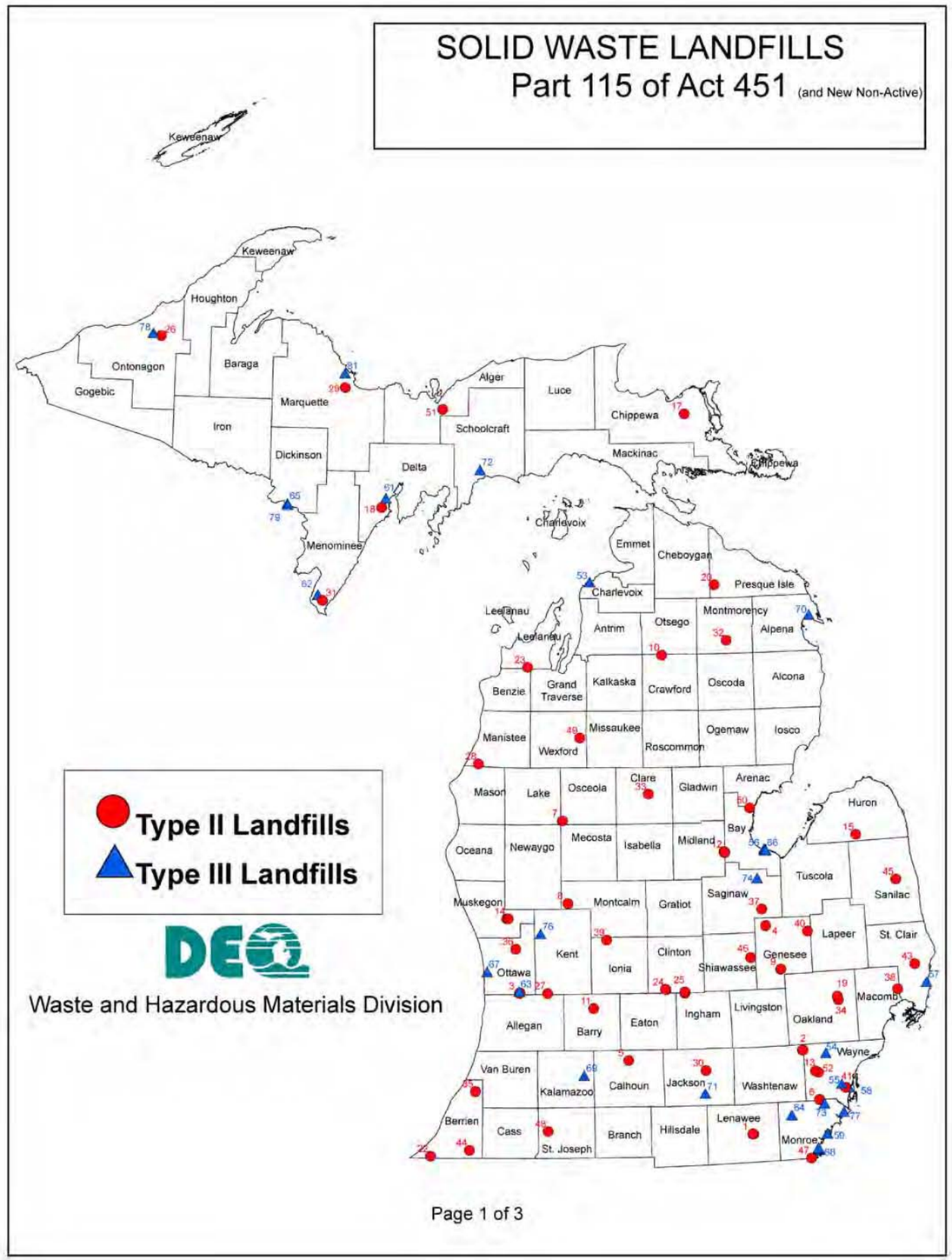
EPA CLEANUP MAP

Cleanup work being organized by the EPA to remediate the Kalamazoo River below the Allied Paper site has been divided into seven areas. The entire 80 mile stretch of affected river is known as Operable Unit 5, or OU-5. The seven areas of OU-5 are broken down by segments between current and former dam locations. Currently, the EPA is working downstream to remove contaminated sediment from the river and to restore habitat. To date, the EPA has cleaned up seven miles of the river, and helped to remove a pair of dams and the contaminated soils behind them. In addition, the EPA has developed an online map database system that graphically shows the location and severity of contaminated sediment. As remediation work continues downstream, the EPA will update this information including aerial photography (Source: EPA).



LANDFILL SITES MAP

Due to the contamination of Kalamazoo River sediment, any sediment dredged from the river will have to be stored in solid waste landfills that can accomodate them. Two regional locations have been designated to receive materials based on contamination level. For sediment up to 50ppm PCBs they can be brought to Ottawa County Farms Landfill in Coopersville, MI or Waste Management Inc' Autumn Hills Landfill in Zeeland, MI. While the option to build a storage facility for contaminated sediment in Saugatuck Harbor could be considered, the one-time cost of placing any dredged materials into a regional landfill may prove to be the most expedient option should a drop in lake levels in the short term necessitate dredging (Map source: Michigan DEQ).



THE PLAN

SETTING THE VISION

> *"The Greenway Master Plan will be the bedrock for local governments to use in getting grants to increase economic development, recreation, and conservation of the Kalamazoo River.*
>
> *Michael VanDenBerg, Supervisor*
> *Gun Plain Charter Township*

OVERARCHING GOALS

The Lower KRG plan is designed to layout a vision for the continued improvement of the river corridor for the benefit of the communities that lie along it. Through this plan, community members and visitors will have better ways of connecting with the riverfront and its communities.

To accomplish this, a broad, adaptive set of strategies have been laid out to provide strong but flexible guidelines to help project partners accomplish these goals:

- Provide the means and opportunities to improve recreational assets and access along the river corridor while protecting and preserving existing high quality resources
- Add opportunities for education – passive and active interpretation and use of different media to ensure the success of projects, safety of visitors, and to further share information of ecological, historical, and cultural significance
- Work on improving environmental quality along the rivers and their watersheds, with state and local partners, where feasible and appropriate, while coordinating with federal efforts
- Implement best practices to reduce stormwater, sediment, and nutrient issues within the Kalamazoo Watershed
- Implement projects with an eye toward economic development for the area while maintaining the character of the communities
- Protect and preserve existing areas of high quality habitat

Throughout our information gathering and public input process, concerns were raised about the environmental quality of the river. Most often, the ongoing Allied Paper Superfund Site cleanup and the associated cleanup efforts and their wide ranging impact on future river sites was repeatedly expressed. The cleanup, led by the EPA and responsible parties, will likely continue to take place over the coming decades. While there are other concerns that affect habitat and water quality that can be addressed -- including non-point sources of sediment and nutrients, altered hydrology, and invasive plant and animal species -- holistic restoration of the river corridor will be delayed until these cleanups are completed. In the meantime, addressing the other issues above through habitat management, green infrastructure, and education can improve both the greenway corridor and the reputation of the river, which in turn will increase its use, health and value.

Beyond site specific projects at individual sites, there are some broader efforts that can be made within regions across the greenway.

TYPES OF PRACTICES AND IMPROVEMENTS

This planning report identifies a variety of improvements and practices that are both specifically and generally applied throughout the greenway. The broad categories are listed here to provide a context and understanding of the possibilities of how they might be employed.

AGRICULTURAL BEST MANAGEMENT PRACTICES

On farmland within these areas, encourage the adoption of practices that will help to minimize the amount of sediment and nutrients reaching the streams while mimicking natural flow of water to that of pre-settlement conditions. These may include, but not be limited to, no-till and conservation tillage farming, cover crops, buffer strips, tile drain control structures, and two-stage channel construction.

GREEN STORMWATER INFRASTRUCTURE

Utilizing techniques to manage urban runoff from hard surfaces to infiltrate rainwater. This will especially help in the areas that are upstream of Lake Allegan to help address phosphorus levels. This can include things such as rain gardens, porous pavement, and stormwater detention areas.

INFORMATION AND EDUCATION (I&E) OPPORTUNITIES

These can be tailored based on a specific site, but the goal would be to increase appreciation and awareness for the river and stops along it. These can include interpretive signage, safety information, river monitoring and conditions, fishing guidelines, wayfinding maps, or educational programs. An increase in signage - informational, interpretive, and wayfinding - can provide visitors with a better experience. Signs can provide an increased sense of safety, guidelines for site use, better understanding of sites of ecological or cultural importance, and direct them to other nearby parks and greenspaces for further exploration. Unifying parks and communities through collaborative marketing efforts can also generate benefit all partners.

INVASIVE SPECIES MANAGEMENT

Important all along the corridor, monitoring for and rapid response to invasive species threats along the corridor will help to minimize efforts. A great deal of work has been done at numerous locations already, and the focus should be to identify new threats quickly and help to keep the areas of highest quality in such a condition. Species of concern already found along or near the greenway corridor include phragmites, narrow leaf cattail, purple loosestrife, and Japanese knotweed.

PRESERVE EXISTING HIGH QUALITY HABITAT

Chief among the priorities along the greenway corridor should be preserving the areas that are rare and hold high ecological value. This can include habitats such as interdunal wetlands, fens, and bogs, or larger tracts of marshes, forest, and dunes that are highly contiguous. This should include invasive species monitoring and carefully preventing overuse of these sites.

ACCESSIBLE LAUNCHES

While there are already a good number of access point along the river for both motorized boats and non-motorized vessels, additional sites and clarification of site use were repeated as wants during input sessions. This should include additional access sites at locations where there are large gaps between locations, better defining the type of vessel utilized for each location (fishing boat, outboard, kayak, canoe, etc), and incorporate handicap accessible launches at those locations that do not already have them.

NON-MOTORIZED PATH CONNECTIONS

While likely impractical to implement across the entire length of the greenway, adding trails and pathways in select locations can improve interconnectivity between communities and be an attraction for walkers, joggers, and cyclists who seek short to moderate length trips. These can connect to existing pathways and sidewalks, as well as other trail networks that pass through the greenway corridor, such as the Blue Star Trail and River to River Trail.

FACILITY IMPROVEMENTS

This a broad category that can include a number of additions to existing sites to make them more user friendly. This can include a number of improvements, including restroom facilities, parking, shelters and picnic areas, defined launches, maps, and signage.

CONTAMINATED SEDIMENT REMOVAL

Due to the PCB contamination of sediment within the Kalamazoo River channel, the river sediments will need to be cleaned up to safe levels. The EPA effort is systematic and ongoing, working from upstream areas to downstream areas. While this effort will not be directly managed as part of the KRG project, the restoration work that does take place will provide opportunities to create high quality habitat and have infrastructure in place to greatly improve recreational activities.

GREENWAY SEGMENTS MAP

These lettered segments represent portions of the Greenway that have similar natural, geographic or political features suited to implementation of the following plan.

A: GUN RIVER, PLAINWELL, AND OTSEGO

B: OTSEGO TO ALLEGAN CITY

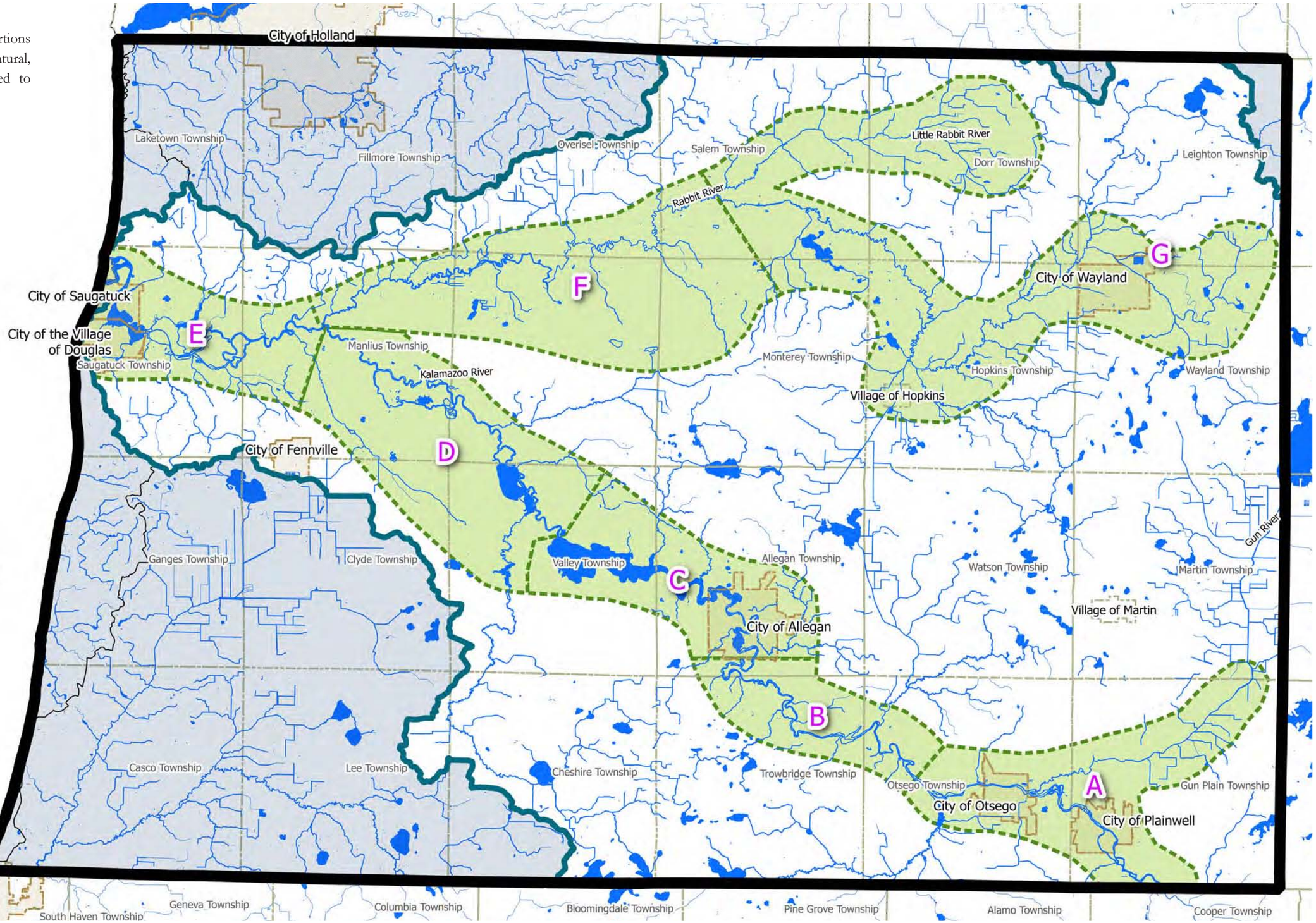
C: CITY OF ALLEGAN TO STATE GAME AREA

D: STATE GAME AREA TO NEW RICHMOND

E: NEW RICHMOND TO LAKE MICHIGAN

F: LOWER RABBIT RIVER

G: UPPER RABBIT RIVER



SEGMENT A: GUN RIVER, PLAINWELL, AND OTSEGO

Beginning in Plainwell and the surrounding Gun Plain Township, there are already several parks and greenspaces that take advantage of the waters that split the town. Between the main channel of the river on the east and Mill Run to the west, an emphasis has been placed by "The Island City" to improve access to the river and create bike lanes and pathways. Park spaces include Fannie Pell Park, Hicks Park, and Sherwood Park, with connecting bike lanes and the Riverwalk Trail providing destinations for residents. Surrounding Gun Plain Township has relatively limited pathways, and increasing the amount of both unimproved, natural trails and paved pathways was described as a desire by residents. Gun Plain's Park and Recreation Plan notes the desire for more waterfront access for fishing, park space, and walking access, which could be located along the Kalamazoo or Gun rivers. Otsego also has improved pathway along the river, notably between Jewell and Farmer Streets, but much of downtown is further off the river than Plainwell. Otsego's recent waterfront plan calls for additional infrastructure, including more parking, a farmer's market, pedestrian overlooks and bridges, and better boat access. Plainwell's location between Grand Rapids and Kalamazoo also represents a waypoint along a future "River to River Trail" between the two metropolitan areas.

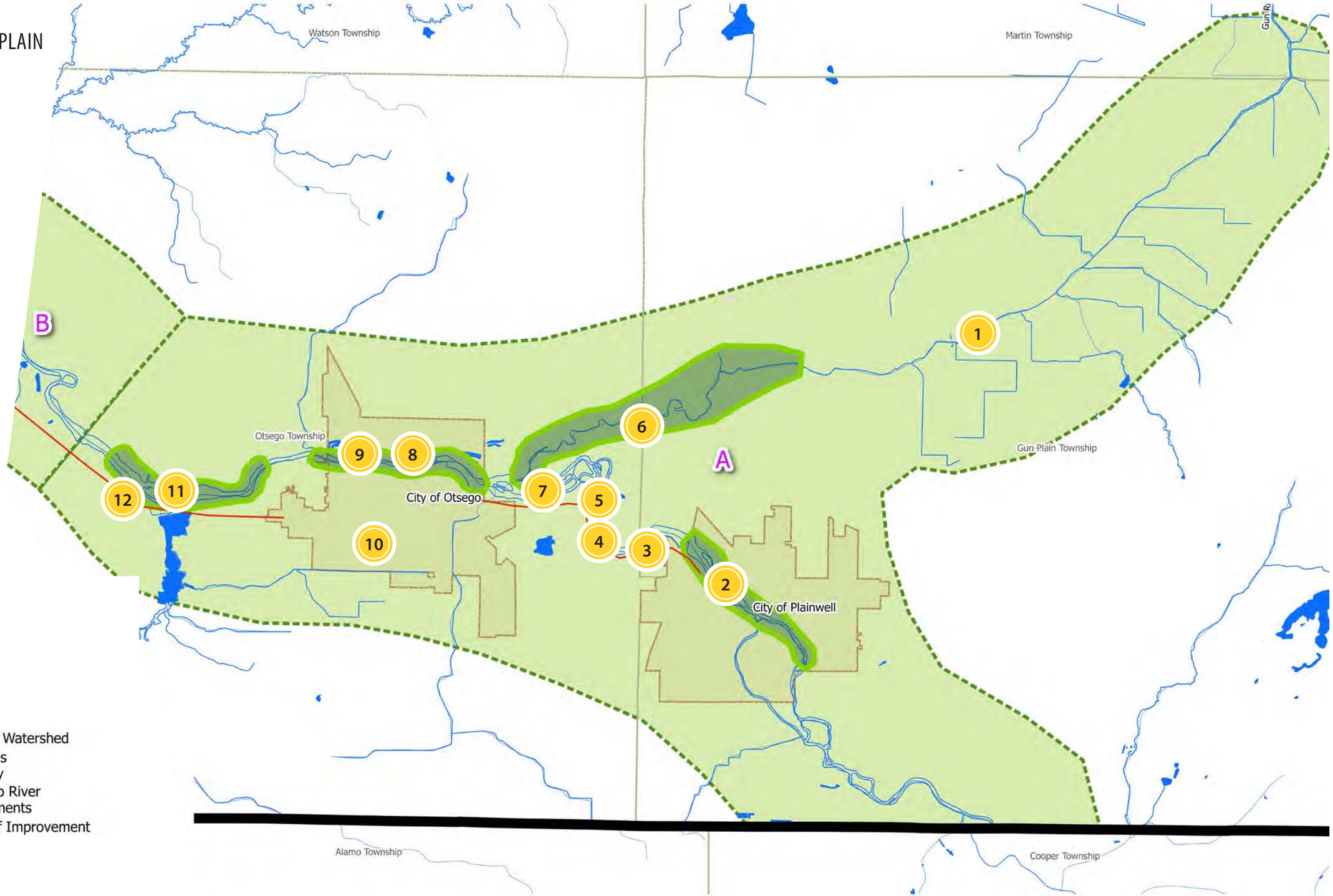
Connectivity issues remain in and between these three jurisdictions. US-131 runs between Plainwell and Otsego, with the busy M-89 corridor connecting the two. There is a large built up area on the west side of US-131 with a number of stores and restaurants that serve the two communities. Currently, there is a non-motorized pathway that crosses the US-131/M-89 interchange, however heavy traffic and numerous crossings and driveways pose safety questions. The river corridor, to the north of this business area, provides potential for non-motorized pathway and greenspace along its southern edge that could not only help to connect the communities of Otsego and Plainwell, but provide a destination for recreation that could be utilized by customers, employees, and drivers travelling the US-131 corridor. While an underpass under US-131 on the south bank of the river could be a future option for a wider, more scenic connection, utilizing the existing overpass along M-89 before finding a path to the river would be more immediate and cost effective.

Kayaking has become increasingly popular along this stretch of the river, with a launch in the middle of downtown Plainwell at Fannie Pell Park and river access also at Sherwood Park. A small parking area at the end of Jewell Street in Otsego presents a small pullout area and portage around the dam at the Otsego Paper site. However, an additional nearby access point would be desired in the Plainwell/Gun Plain/Otsego area. Facilities such as safe and accessible launch points, restrooms, and river information would greatly benefit this stretch of river. This would also make emergency river access easier for local first responders.

Numerous riverfront sites are presently locked into usage by current or former industries, including paper mills in Plainwell and Otsego. The large marshy area east of Otsego represents an important ecological asset. Due to contamination cleanup efforts, the area likely will not have a great deal of recreational value until well after these efforts are finished. However, ongoing management steps should be taken to ensure that the main river channel is open to paddlesports; education efforts are made to update visitors and residents on site history; and conditions for safety and habitat are managed to prevent these locations from simply becoming repositories for invasive species.

Below: Riverwalk Park, Plainwell

SEGMENT A: OTSEGO/ PLAINWELL/GUN RIVER PLAIN MAP



1 GUN RIVER WATERSHED

- Implement agricultural best management practices in Gun River watershed within Gun Plain Township

2 WATERFRONT REDEVELOPMENT DOWNTOWN PLAINWELL

- Continue redevelopment of waterfront property in Plainwell around former industrial sites
- Address appropriate and necessary cleanup of sites
- Incorporate waterfront into site redevelopment

3 US 131 UNDERPASS

- Determine feasibility and potential for non-motorized underpass under US-131
- Look at providing safer non-motorized route between Otsego, Plainwell, and adjoining townships

4 MARSH INVASIVE SPECIES

- Continue EPA cleanup efforts around former dam site near 12th Street
- Monitor and treat for non-native species in the area

5 PARK & ACCESS POINT

- Create small park and access point to river at north end of 12th Street
- Include possible kayak launch, wildlife viewing area, and interpretive signage
- Development should not impact previously completed restoration work by EPA

6 GUN RIVER CORRIDOR

- Protect existing green corridor along Gun River in Otsego and Gun Plain Townships
- Focus on area from 10th Street to river mouth
- Seek small waterfront park/access point in Gun Plain Township

7 CONNECTING PATHWAY

- Construct non-motorized pathway along river between Otsego and Plainwell
- Focus on areas on south side of river
- Look for feasible areas for safe route connecting to but behind development along M-89 corridor

8 JEWEL STREET ACCESSIBLE LAUNCH

- Install accessible launch along waterfront, likely at Jewell Street road end
- Ensure safe portage route around Otsego City dam

9 OTSEGO WATERFRONT

- Waterfront development and improvements per Otsego's waterfront master plan
- Improved trails, parking, and waterfront access
- Add wayfinding and interpretive signage along waterfront trail

10 GREEN STORMWATER INFRASTRUCTURE

- Encourage adoption of green stormwater ordinances
- Use green infrastructure where possible on development projects

11 PINE CREEK ACCESSIBLE LAUNCH

- Make Pine Creek impoundment area primary access point to this stretch of river
- Improve signage in area to direct boat traffic here, avoiding private property
- Coordinate with EPA cleanup activities for potential infrastructure improvements

12 CONTAMINATED SEDIMENT REMOVAL

- EPA continuing ongoing stream restoration work around former dam site
- Removing contaminated sediment and restoring stream banks

SEGMENT B: OTSEGO TO CITY OF ALLEGAN

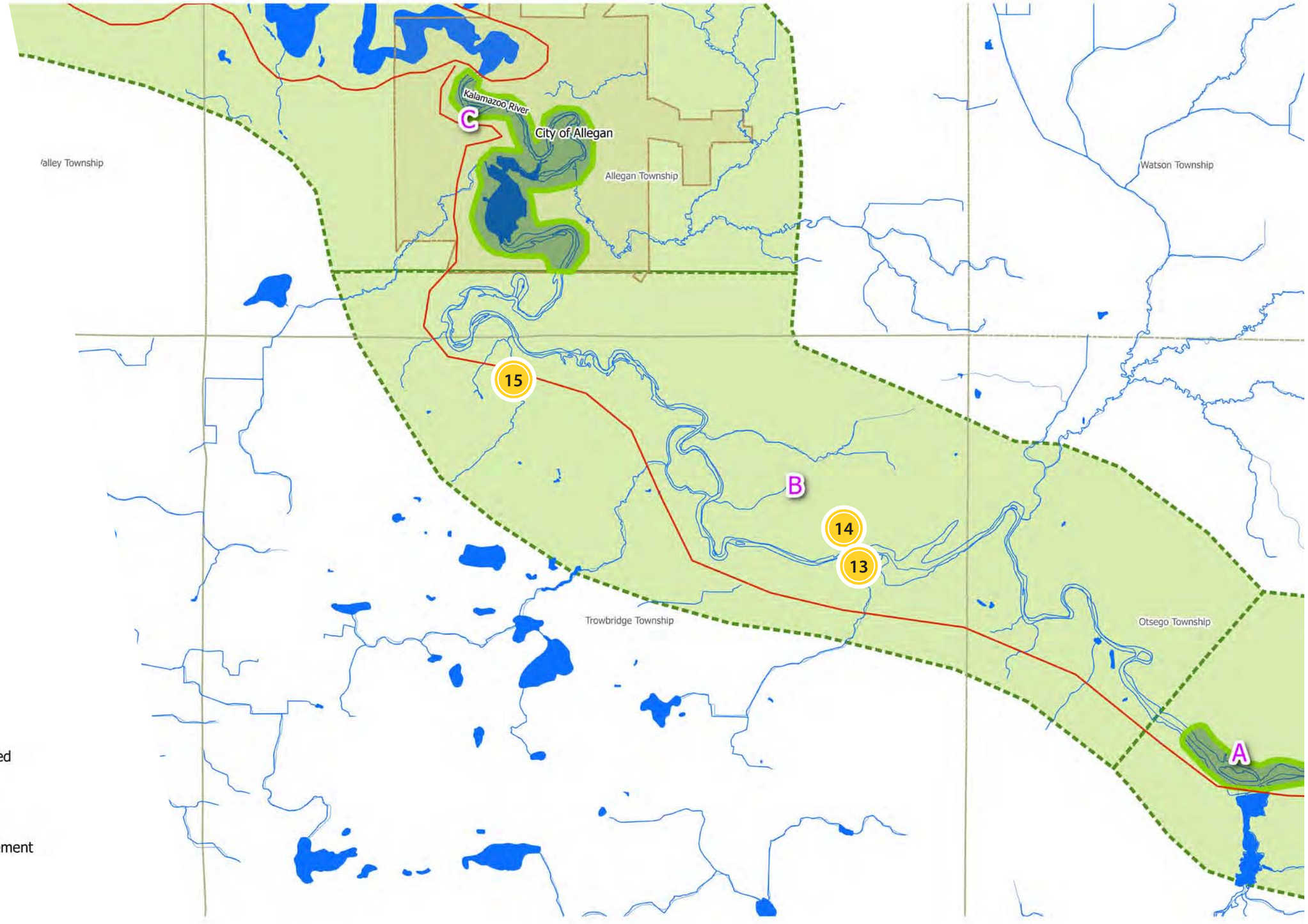
Downstream of Otsego are a number of small dams on an otherwise relatively undeveloped stretch of river. On the western outskirts of Otsego is the impounded mouth of Pine Creek, which is, for many, a significant access point to both the creek and the river. Recent work was conducted by the EPA in conjunction with the Department of Environmental Quality (DEQ) and Department of Natural Resources (DNR) to remove the Otsego (Township) dam that was located along River Road near the Bittersweet Ski area. Streambank restoration work was done on both sides of the river, and while more work is still needed, opportunities exist for improving an access point along this stretch of river. There are several road ends and pull-offs that see illegal river access, so a larger, more designated access would provide safety, education opportunities, and lessen impacts on other areas that are ecologically sensitive or on private property.

While there is an opportunity for expansion of pathway or greenspace along the south side of the river, neighbor and environmental impacts would need to be further assessed. However, this would provide a destination for residents of the west side of Otsego. It could also be the eastern entrance to an improved non-motorized pathway or bike lane on the south side of the river that could connect as far as the city of Allegan.

The planned removal of the Trowbridge Dam near 26th Street. This work will be extensive, and represents an opportunity to potentially expand and improve river access from 26th Street. Like the upstream former dam site in Otsego Township, further work will be needed to complete ecological restoration and remove contaminated sediment. Much of the the immediate river corridor in this area is already under control of the DNR, and will require some additional ecological restoration and control for invasive species. The crossing near 26th Street does represent a future access point following restoration activities.

Where the river wraps around much of the center of the city of Allegan there are multiple places for people to connect with the river. The city, which was built largely with the river at its back, has begun to embrace the waterfront as an asset. Extensive boardwalk and pathways connect Hanson and Mahan parks on the south side of downtown, with boardwalk connecting the two and a zip line spanning the river. Jaycee Park and the Trestle Trail over the river are on the north side of town. Identified as part of the Downtown Riverfront Development Project, further enhancements should be made to increase usage of the river, while ensuring safe usage around the Allegan City Dam and the Mill District. While there is a good deal of connection within the city, opportunities exist to connect to surrounding townships.

SEGMENT B: OTSEGO TO CITY OF ALLEGAN MAP



13 26TH STREET ACCESSIBLE LAUNCH

- Following removal of dam and related activities, improve access to river off 26th Street at current EPA staging area

14 TROWBRIDGE DAM REMOVAL

- Remove Trowbridge Dam near 26th Street bridge
- Restore surrounding stream

15 ALLEGAN TO OTSEGO CONNECTOR

- Explore potential for non-motorized pathway connecting Allegan and west side of Otsego

Image Credits

Lower Left: Trowbridge Dam Removal Project

Lower Right: https://belding.mi.us/belding_parks.php

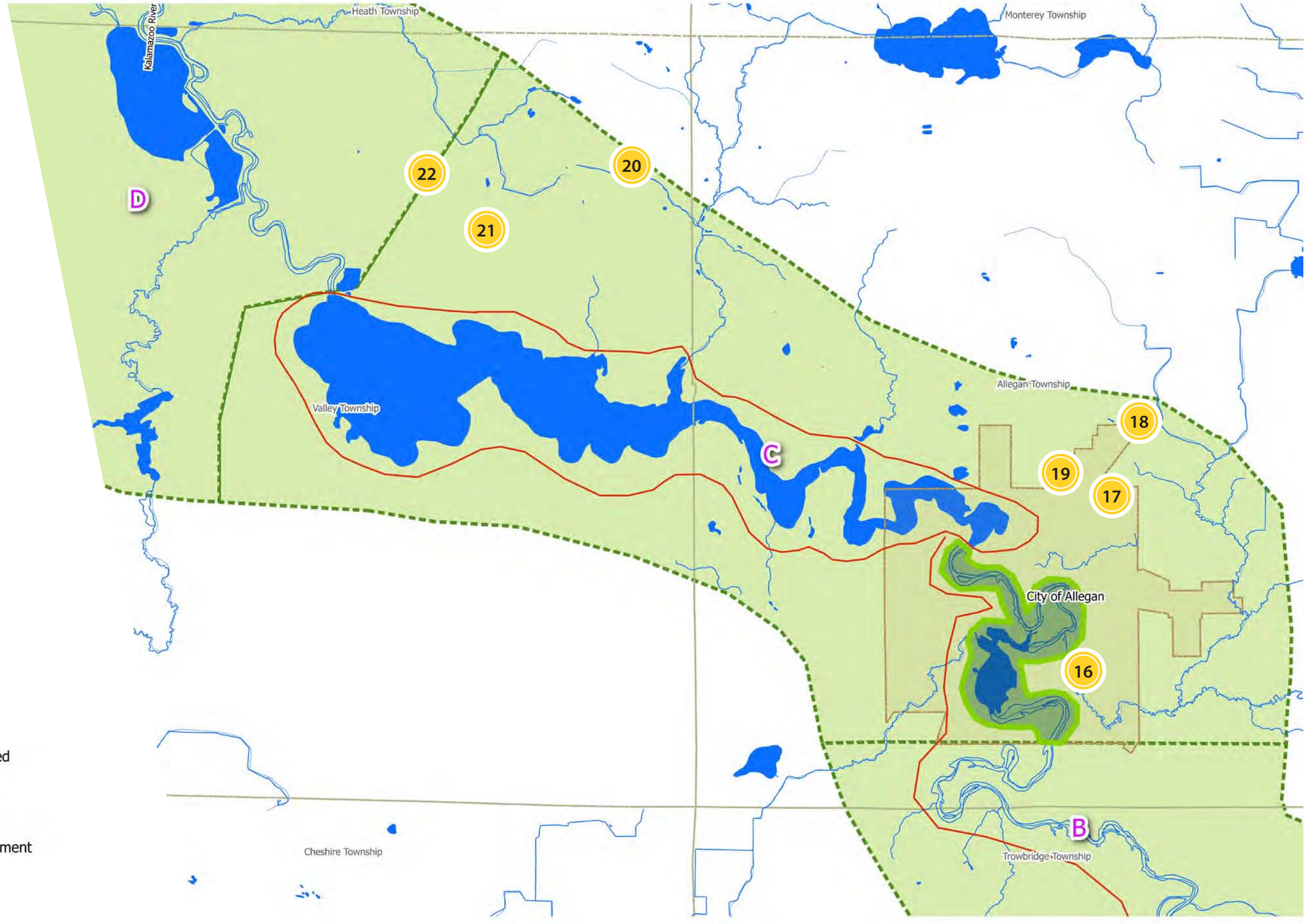
Above: Environmental Protection Agency

SEGMENT C & D: CITY OF ALLEGAN TO NEW RICHMOND

West of Allegan is the impounded Lake Allegan. This area begins where the urban area around Allegan meets the widening river near the north end of town and the county fairgrounds. Improving the river connection between the city and Lake Allegan can make both areas recreational gems for the area. Formed behind the dam at Calkins Bridge, the two square mile lake is surrounded by home sites, and is a popular fishery. The dam at the end is operated by Consumers Energy, and has nearby boat launches. Ensuring that the site is able to be used safely by both motorized and non-motorized boats, and that paddlers are able to safely portage around the dam, should be ongoing priorities. The size and length of the lake and proximity to Allegan make opportunities for a non-motorized pathway around the lake. Any such pathway should utilize existing right-of-ways and avoid private property. Ecologically, efforts should be continued to reduce levels of phosphorus in the lake and improve water quality. Ongoing efforts to address the phosphorus TMDL by reducing input levels from the surrounding watershed should be continued and supported.

The Allegan State Game Area comprises the majority of the river frontage and adjacent land between Calkins Dam and the confluence with the Rabbit River near New Richmond. This relatively untouched area represents the largest tract of cohesive habitat in the county, and as such should have minimal development. Designation as a wild river by the Michigan DNR should result in minimal development of the area, protecting in-stream and river valley habitat. While there should be little if any added points for public access to the river, there was mention of the desire for added facilities, signage, and restrooms at some of the connection points, such as the M-89 launch east of Fennville. The large marshes, Ottawa and Swan Creek, represent important wildlife habitat, and should be continued to be managed for invasive species.

SEGMENT C: CITY OF ALLEGAN TO STATE GAME AREA MAP



16 GREEN STORMWATER INFRASTRUCTURE

- Encourage adoption of green stormwater ordinances
- Use green infrastructure where possible on development projects

17 MILL DISTRICT IMPROVEMENTS

- Add additional wayfinding and interpretive signage around waterfront area
- Create natural areas in the Mill District
- Focus on cultural and natural history topics of note

18 RIVERFRONT INVESTMENT

- Encourage private developments that utilize the riverfront features

19 DOWNTOWN ACCESSIBLE LAUNCH

- Install an additional barrier-free kayak launches near downtown Allegan

20 LAKE ALLEGAN CORRIDOR

- Consider non-motorized pathway around Lake Allegan and Kalamazoo River
- Utilize existing right-of-ways adjacent to roadways
- Connect into City of Allegan
- Add observation points with interpretive signage along route

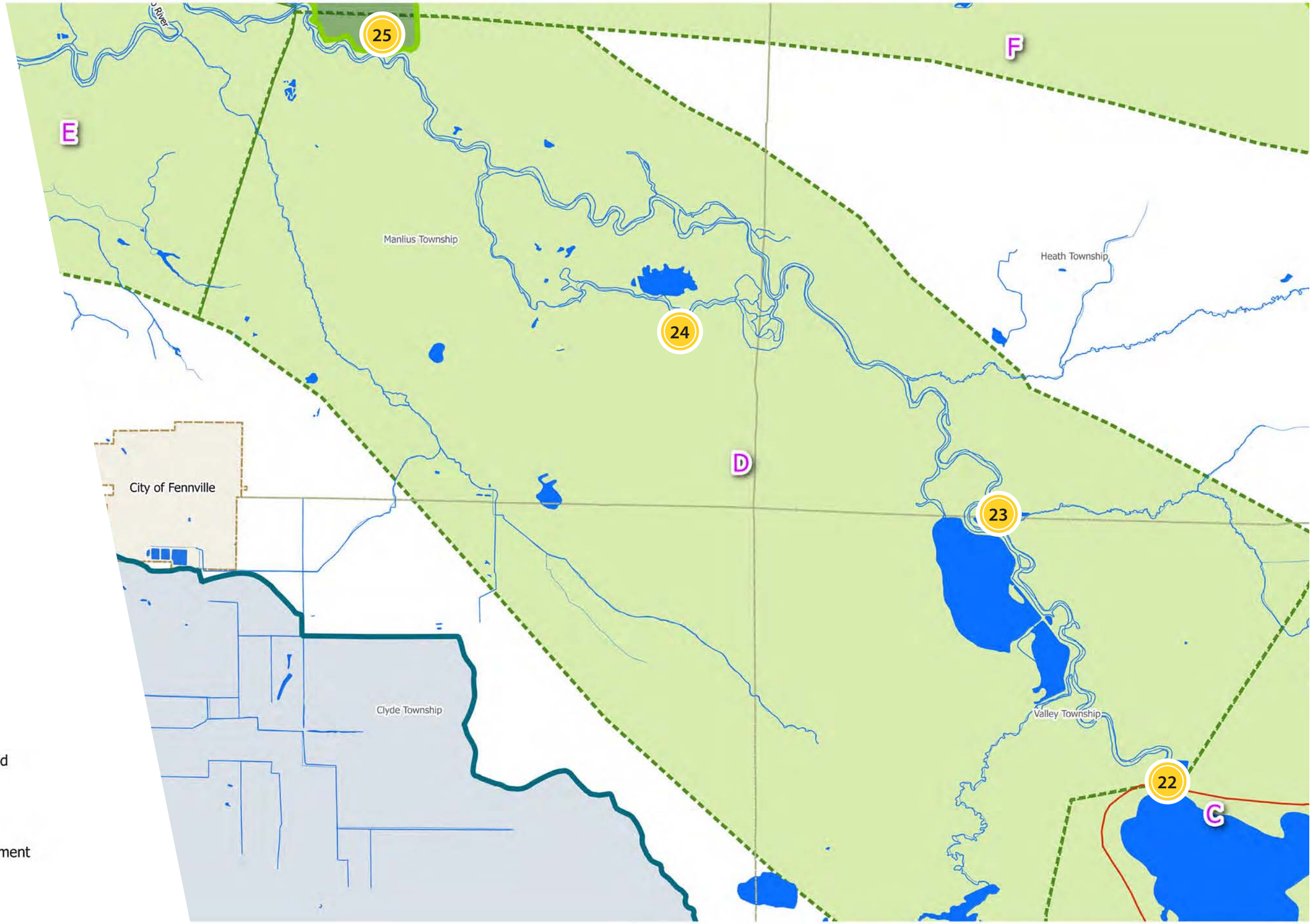
21 LAKE ALLEGAN HABITAT PRESERVATION

- Continue to address phosphorus TMDL on Lake Allegan
- Improve stormwater infrastructure in upstream areas
- Address agricultural non-point sources in upstream areas

22 FACILITY IMPROVEMENTS

- Ensure designated areas and rules defined for safe use by both motorized and non-motorized boat traffic
- Install interpretive and wayfinding signage at parking areas

SEGMENT D: STATE GAME AREA TO NEW RICHMOND MAP



22 CALKINS DAM IMPROVEMENTS

- Improve portage routes around the dam
- Ensure designated areas and rules defined for safe use by both motorized and non-motorized boat traffic
- Install interpretive and wayfinding signage at parking areas

23 M-89 LAUNCH IMPROVEMENTS

- Consider restroom and shelter additions at M-89 launch
- Install interpretive and wayfinding signage at parking area and waterfront

24 OTTAWA MARSH

- Identify and address invasive species in Ottawa Marsh as needed

25 RIVER ENHANCEMENT

- Protect outstanding non-state land at junction with Rabbit River
- Consider trails to river, emergency river access, restrooms, shelter

Image Credits

Lower Right: https://missionvalleynews.com/river-access-program-unveiled

Above Right: http://www.coloprecast.com/?page_id=203

SEGMENT E: NEW RICHMOND TO LAKE MICHIGAN

Below the junction with the Rabbit River tributary, the Kalamazoo River passes the New Richmond County Park, the first large park with river access below the largest tract of the State Game Area. The site of the annual release of sturgeon, by the Gun Lake Tribe, it represents important riverine habitat for this and many other species. Additional opportunities for information and interpretation should be maximized here at one of the busiest locations along the river. Downstream are two additional large marsh complexes, the Pottawatomi and Webster Marshes. The former is privately held and managed, while the latter is managed by the DNR. Both areas have already had significant management performed for invasive species, and these control efforts should be continued. Access to the Webster Marsh is typically made from the Hacklander boat launch or Schultz Park. This stretch of river also receives boat traffic that travels between Deep Harbor Marina and Saugatuck Harbor.

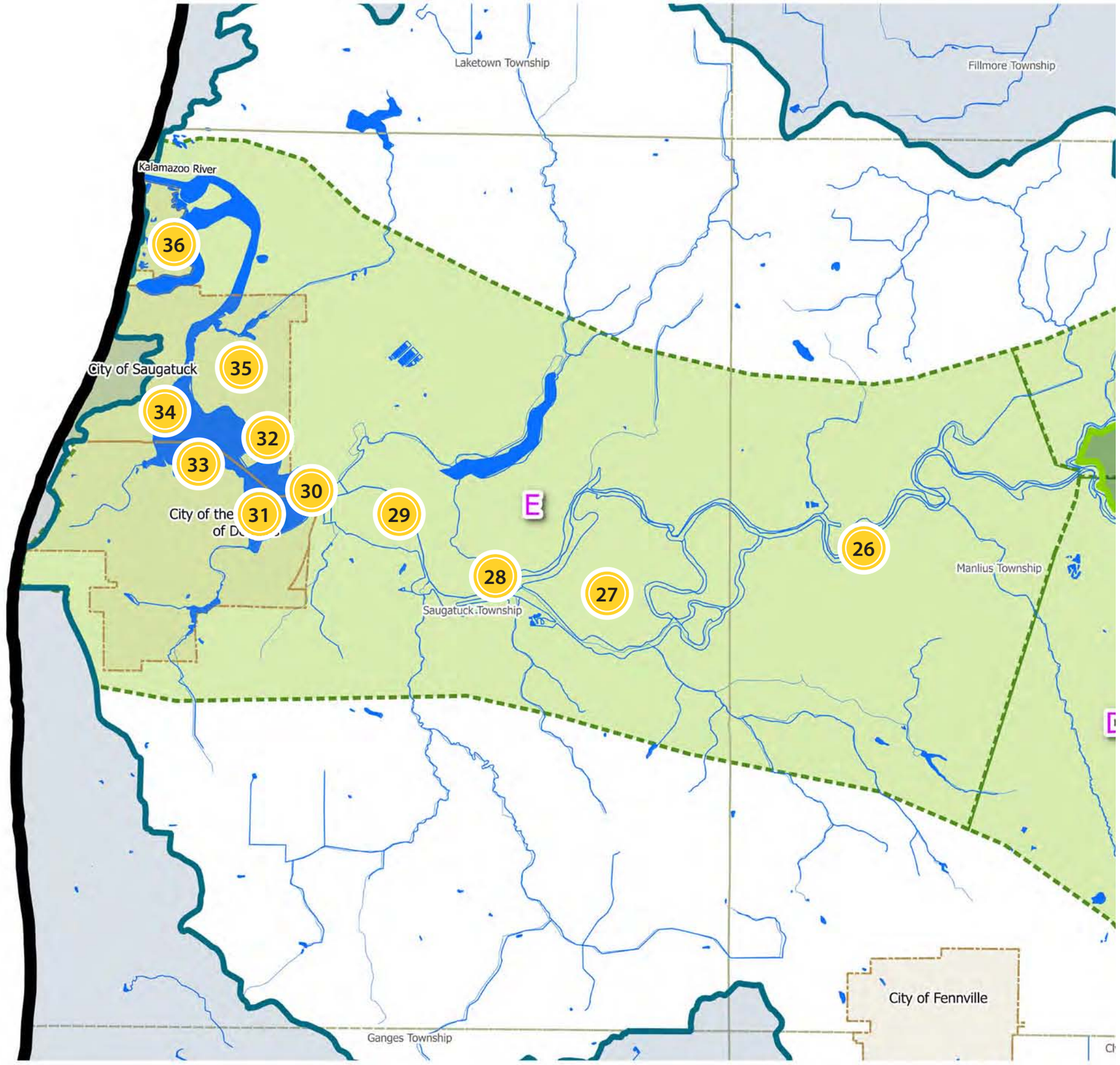
Saugatuck and Douglas, separated by the widening of the river into Kalamazoo Lake, is dotted with parks and access points all around Kalamazoo Lake. Wide streets and dedicated bike lanes and sidewalk, connecting to the vision for a broader Blue Star Bike Trail, enable riders to circle the harbor on land, while several road ends and parks provide water access. Better signage to direct and connect visitors between sites whether on the water or on land would be beneficial. While not as far along as several of the marshes, invasive species management has been underway in these communities, and continued efforts to keep phragmites, in particular, under control should continue.

Some of the highest quality habitat and rarest species can be found within a couple mile stretch of the mouth of the Kalamazoo River. There are several parks and preserves, including Saugatuck State Park, Tallmadge Woods, Patricia Birkholz Natural Area, and Saugatuck Harbor Natural Area, where visitors can experience these areas. Protecting and preserving these areas around Saugatuck should be one of the highest conservation priorities along the greenway. However, efforts to make sure that these areas are not overused or abused, should strike a balance between visitation and preservation. Future development on private property should be done in an environmentally friendly manner that is consistent with local zoning and the Tri-Community Master Plan.

In addition, success for future projects will depend greatly on the willingness of the local municipalities to collaborate. Throughout the public input process, it was very clear that residents desire open lines of communication between local government entities that other areas of the county benefit from. However, in many ways this area has both the high level of public interest and financial resources to be a key implementer of greenway projects in the future.

One particular issue that requires a collaborative approach is harbor management. While water levels in Lake Kalamazoo are high at the time of this plan's development, the viability of the harbor is dependent upon minimizing sediment transport from upstream. Area landfills should be able to accept any emergency dredgings that are made, however a more permanent means of funding these efforts, in conjunction with significant efforts to address upstream sources of sediment, should be pursued further.

SEGMENT E: NEW RICHMOND TO LAKE MICHIGAN MAP



Legend

Watershed Areas

- Kalamazoo River Watershed
- Other Watersheds in Allegan County
- Lower Kalamazoo River Greenway - Segments
- Proposed Area of Improvement

26 HACKLANDER SIGNAGE

- Install interpretive and wayfinding signage at Hacklander Boat Launch

28 NEW RICHMOND SIGNAGE

- Install additional interpretive and wayfinding signage at New Richmond Park

32 INTERCOMMUNITY PATHWAY

- Improve connections between Saugatuck, Douglas, and Saugatuck Township

34 ACCESSIBLE LAUNCH IN SAUGATUCK

- An accessible launch for access to downtown Saugatuck along area with breakwall

27 29 30 INVASIVE SPECIES MANAGEMENT

- Identify and address invasive species, especially phragmites, eurasian watermilfoil, purple loosestrife, and Japanese knotweed
- Continue efforts in Saugatuck Harbor, Wade's Bayou, Webster Marsh, Pottawatomi Marsh

31 HARBOR SETIMENT REMOVAL / MANAGEMENT

- Develop sustainable funding for harbor dredging when needed
- Work with upstream jurisdictions to reduce sediment inputs
- Dredging should result in safe harbor use and minimal habitat impact

33 DOUGLAS PUBLIC IMPROVEMENTS

- Public marina in Douglas for broader use of harbor and potential dredging funds

35 GREEN STORMWATER INFRASTRUCTURE

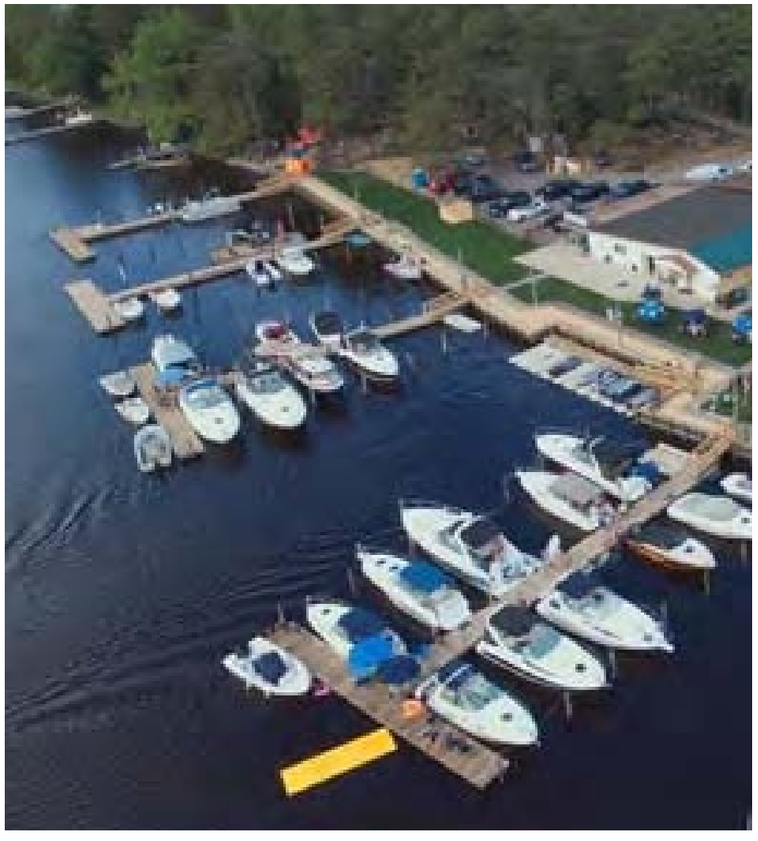
- Encourage adoption of green stormwater ordinances
- Use green infrastructure where possible on development projects

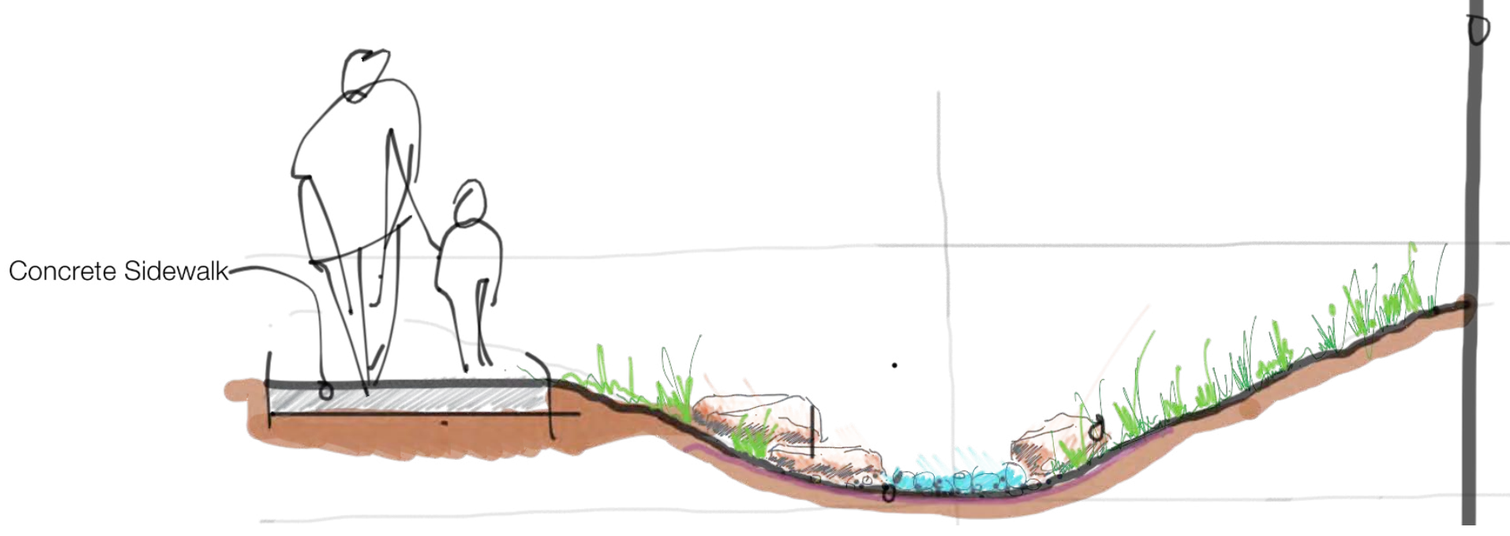
36 HABITAT PRESERVATION

- Protect dune habitats from invasive species
- Balance access to sensitive areas with need to protect them from overuse

Image Credit

Lower Left: http://sw-marina.com/wp/



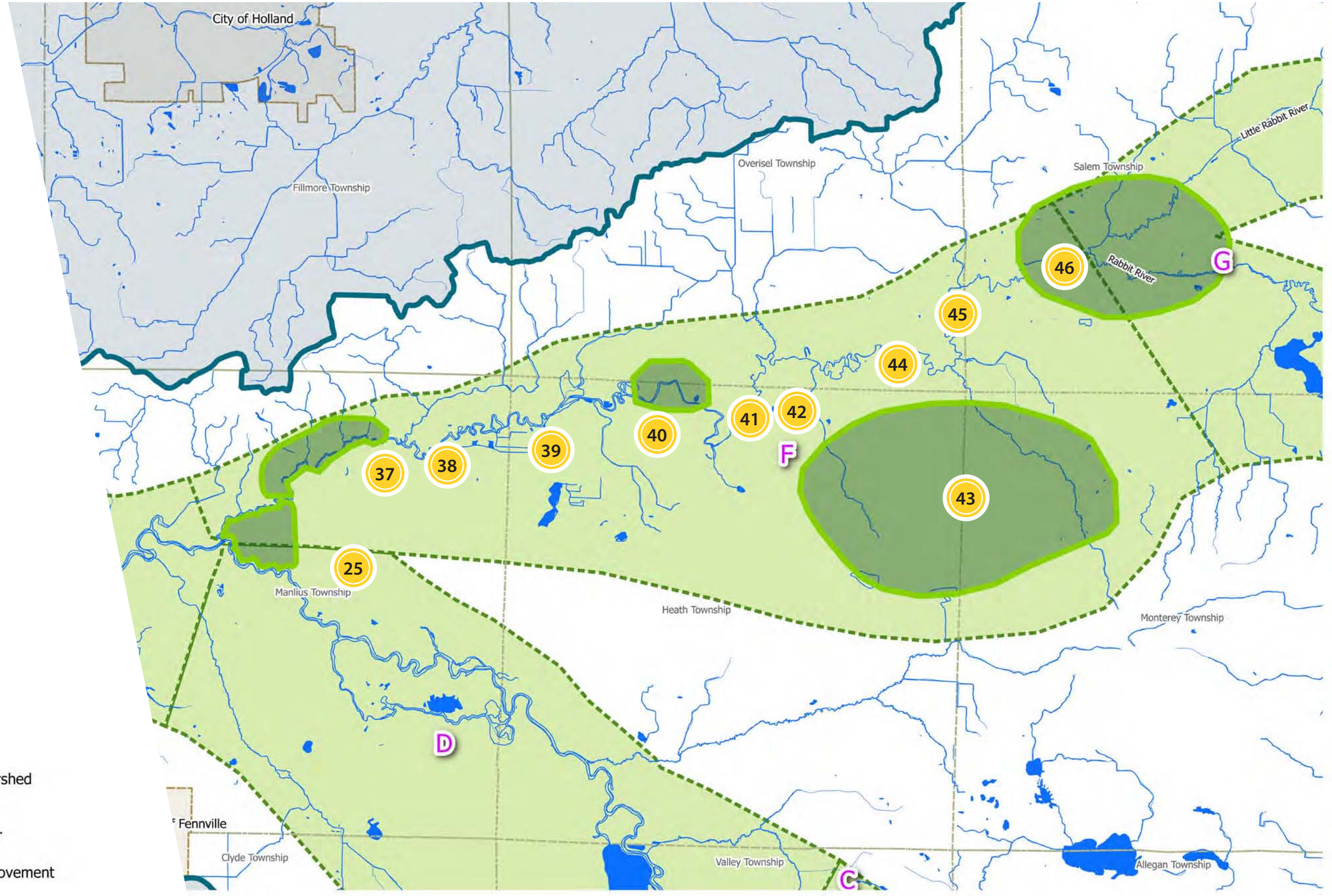


SEGMENT F & G: RABBIT RIVER

Not very far upstream of New Richmond is rather different topography and land use, with heavier agricultural areas closer to the narrower river valley. While the greenway corridor is relatively narrow in this area, it should not limit the focus or scope of work to that narrow area; rather, plans should be sure to encompass all impacting areas. There is concern about the amount of sediment reaching streams, and in several locations small drains and tributaries should be repaired and have hydrology issues addressed. In many locations, best management practices, such as wider vegetated buffers, are needed between streams and farmland. These not only help to filter sediment and nutrients, but can help shade and keep water temperatures cooler, providing better habitat.

One area that remains privately held is known as the Junction, a nearly 270 acre tract of land at the mouth of the Rabbit River. The acquisition and preservation of this tract would help provide an important and outstanding link of habitat along the river. Following the river upstream from the Junction is a favorite stretch of river for paddling and fishing. Additional greenspace and parkspace along this corridor should be sought. There is a desire for increased trails and greenspace for a variety of recreational activities throughout the Rabbit River corridor.

SECTION F: LOWER RABBIT RIVER MAP



25 LAND CONSERVATION

- Work with private landowners to conserve habitat near the confluence of the rivers
- Balance access to sensitive areas with need to protect them from overuse

37 EROSION REPAIR

- Address severe gully erosion along lower Rabbit River
- Address upstream hydrology with best management practices
- Stabilize where they meet the river

38 RECREATION IMPROVEMENTS

- Improve river corridor for fishing and paddling activities
- Consider implementation of woody debris management plan in river while protecting tree canopies
- Ensure sufficient habitat for cold water fishery (warm water in appropriate tributaries)
- Follow management and development guidelines laid forth in Natural Rivers Act of 1970

39 AGRICULTURE BEST MANAGEMENT PRACTICES

- Improve width and quality of stream buffer along river corridor and tributaries
- Implement practices that reduce sediment and nutrient loading within Rabbit River watershed

40 EDUCATION IMPROVEMENTS

- Add additional wayfinding and interpretive signage around Schumatt Park and trestle bridge area
- Focus on cultural and natural history topics of note
- Increase outdoor education at facilities like Rabbit River Preserve

41 HABITAT PRESERVATION

- Improve and protect important waterfront habitats
- Marshes, swamps, and floodplain forests such as those found at Rabbit River Preserve

42 TRESTLE BRIDGE

- Find suitable location upstream of trestle bridge for barrier-free kayak launch

43 HIGH QUALITY & RARE HABITAT PRESERVATION

- Protect areas of high quality habitat in Heath/Monterey Townships
- Fens, bogs, high quality forest
- Highest prevalence of rare or threatened species in the county
- Limit access to these sites and monitor for invasive species

44 EROSION REPAIR

- Address severe gully erosion along uppper Rabbit River
- Address upstream hydrology with best management practices
- Stabilize where they meet the river

45 COLD WATER FISHERIES

- Protect coldwater fisheries in tributaries to Rabbit River
- Protect buffers and minimize impacts from development

46 AGRICULTURE BEST MANAGEMENT PRACTICES

- Improve width and quality of stream buffer along river corridor and tributaries
- Implement practices that reduce sediment and nutrient loading within Rabbit River watershed

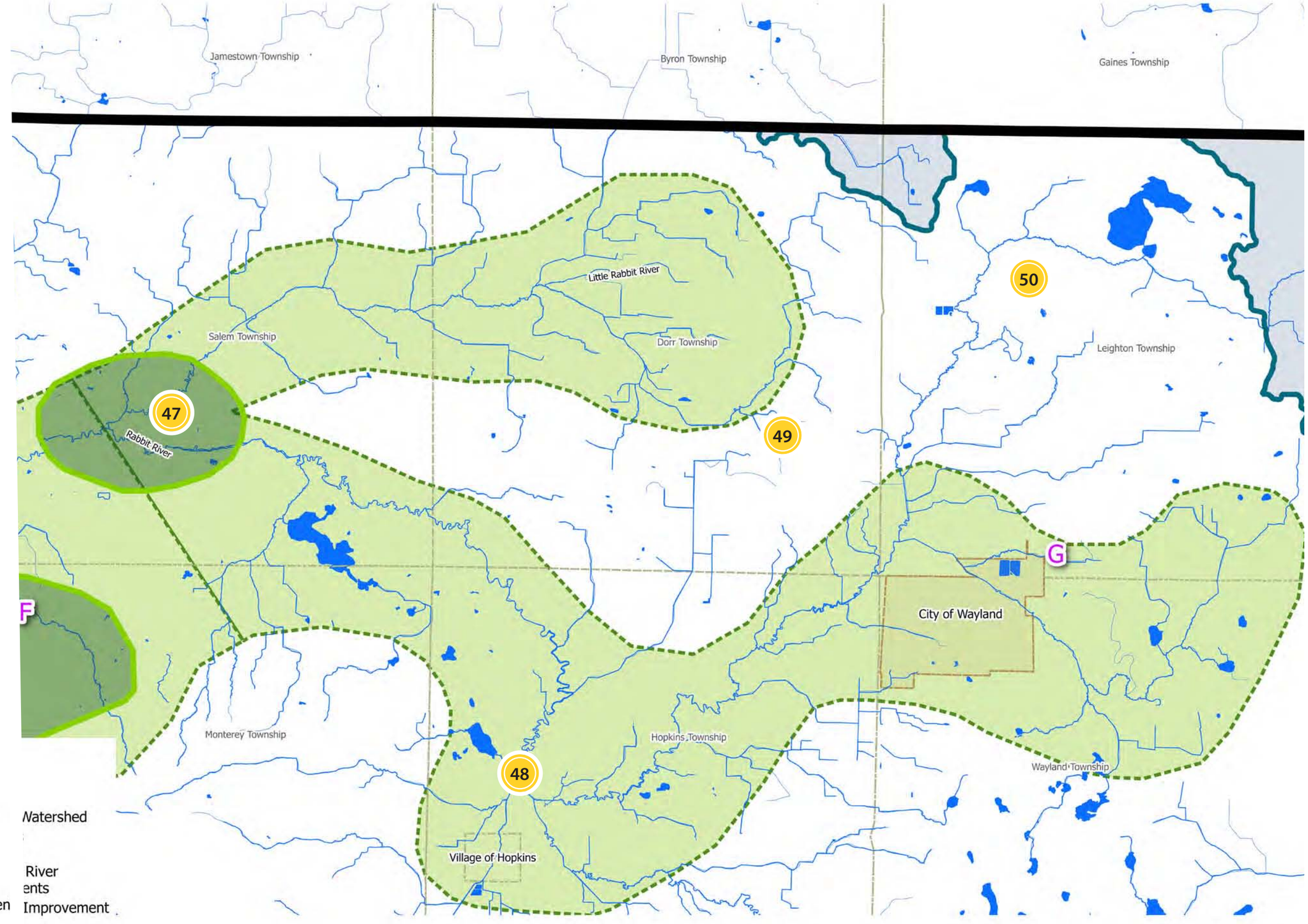
Image Credit

Left: http://visitwashougal.com/fishing/

Middle: https://www.wataugakayak.com/river-kayaking/

Right: http://www.watersheddata.com/erosion-popup.aspx?rwndrnd=0.9500259624328464

SECTION G: UPPER RABBIT RIVER MAP



47 PARK & WATER ACCESS

- Create park/water access to Rabbit River and/or Little Rabbit River in Salem Township

48 COLD WATER FISHERIES

- Protect coldwater fisheries in tributaries to Rabbit River
- Protect buffers and minimize impacts from development

49 AGRICULTURE BEST MANAGEMENT PRACTICES

- Encourage adaptation of BMPs, including cover crops, reduced tillage, and tile drain management.

50 AGRICULTURE BEST MANAGEMENT PRACTICES

- Improve width and quality of stream buffer along river corridor and tributaries
- Implement practices that reduce sediment and nutrient loading within Rabbit River watershed

Image Credit

Left: http://www.lax-a.net/es/escocia/dee/

Lower Right: https://www.researchgate.net/figure/Mowed-buffer-strip-separating-a-forest-from-agricultural-land-in-Italy_fig6_237421394

Upper Right: https://catawbalands.org/clc-reopens-spencer-mt-river-access-canoekayak-launch/

FIRST STEPS

THE FUTURE OF THE KALAMAZOO RIVER GREENWAY

FIRST STEPS

The implementation and success of this master plan will be both an evolving and an ongoing commitment by current and future partners. Therefore, the ODC recommends the following first steps.

- Present Lower Kalamazoo River Greenway Plan to units of government, organizations, and businesses
- Seek endorsements and obtain signed MOUs

After adoption of the plan, the implementation and coordination of future greenway efforts will be dependent on more detailed steps including:

- Establish a greenway network partnership team to oversee collaborative efforts and select an entity to coordinate this group.
- Begin integration of the master plan into local planning discussions
- Leverage public and private funding to maximize investment in greenway projects
- Conduct a periodic review of the plan to update priorities and account for completed work.

These efforts will ensure that the Lower Kalamazoo River in Allegan County will be restored and available to communities for recreation, education, and conservation, while providing a legacy for future generations.

For additional information please contact the ODC Network at odc@outdoordiscovery.org or by calling 616-393-9453.

ADDITIONAL RESOURCES

LEVERAGING COMPLETED STUDIES WITHIN THE LOWER KALAMAZOO RIVER GREENWAY

BIBLIOGRAPHY AND FURTHER READING

1. Alexander, Jackson, Kikuyama, Sasamoto, and Stevens, Kalamazoo River Watershed Land Conservation Plan. 2014. http://kalamazooriver.org/wp-content/uploads/2015/08/KRWLCP_Final.pdf

2. Allegan Conservation District, Gun River Watershed Management Plan. 2004. https://www.michigan.gov/documents/deq/ess-nps-wmp-gun-river_208913_7.pdf

3. Allegan Conservation District, "Rabbit River Watershed Pay-for-Performance Program." Program factsheet, 2017.

4. Allegan Conservation District, Upper Rabbit River Watershed Planning Project Watershed Management Plan. http://kalamazooriver.org/wp-content/uploads/2013/01/ess-nps-wmp-upper-rabbit_209163_7.pdf

5. Allegan County, 2015-2019 Recreation Plan. 2014. http://cms.allegancounty.org/sites/Office/Parks/ParksPages/2015-2019%20Recreation%20Plan.pdf

6. Allegan County, Brownfield Sites Map. 2006. http://www.allegancounty.org/docs/BRA/BRA20061114_map_Part201sites.pdf

7. Allegan County Drain Commission, Rabbit River Watershed Management Plan. July 2009. https://allegancd.org/wp-content/uploads/2012/12/Master-WMP_finalized82609_Part1.pdf

8. The Battle Creek River Watershed Management Plan. 2004. https://www.michigan.gov/documents/deq/ess-nps-wmp-battle-creek-river_208908_7.pdf

9. Calhoun Conservation District, Rice Creek Watershed Project. 2003. https://www.michigan.gov/documents/deq/ess-nps-wmp-rice-creek_208927_7.pdf

10. City of Otsego, "Community 5 Year Recreation Plan for The City of Otsego, Otsego Township and Otsego Public Schools." January 2010. https://www.cityofotsego.org/wp-content/uploads/2018/07/5yearplan.pdf

11. City of Plainwell, "City of Plainwell Community Recreation Plan 2016-2021." 2016. Prepared by Michigan Township Services. http://www.plainwell.org/getattachment/Services-Departments/Visiting-and-Recreation/Parks-and-Recreation/2016-2021-Rec-Plan.pdf.aspx?lang=en-US

12. City of Saugatuck, Harbor Management Plan. 2016. Prepared by Edgewater Resources, LLC. http://www.saugatuckcity.com/images/adobe-files/harbor/08-22-2016-saug-harbor-plan.pdf

13. City of Saugatuck, Saugatuck Township, and the City of the Village of Douglas. Tri-Community Master Plan. 2016. https://ci.douglas.mi.us/wp-content/uploads/2017/06/UpdatedTri-Comm-Master.pdf

14. City of the Village of Douglas, "Douglas Waterfront Public Marina Plan." 2015; updated 2017 (presentation). https://ci.douglas.mi.us/wp-content/uploads/2017/06/MarinaMarketPresentation.pdf

15. City of the Village of Douglas, Waterfront Master Plan. June 1, 2016. Prepared by Edgewater Resources, LLC. https://ci.douglas.mi.us/wp-content/uploads/2017/06/DouglasWaterfrontMasterPlan.pdf

16. Davis Creek Phosphorus Reduction Study. 2011. http://kalamazooriver.org/wp-content/uploads/2013/01/MASTER_Davis-Creek-Engineering-Report_2011_0916.pdf

17. Dexter, James L Jr., Pine Creek. 1991. Michigan Department of Natural Resources Status of the Fishery Resource Report 91-6.

18. Dexter, James L Jr., Silver Creek. 1993. Michigan Department of Natural Resources Status of the Fishery Resource Report 93-6. http://www.michigandnr.com/PUBLICATIONS/PDFS/ifr/ifrlibra/status/waterbody/93-3.htm

19. Dexter, James L Jr., Upper Rabbit River. 1991, updated 1996. Michigan Department of Natural Resources Status of the Fishery Resource Report 91-8. http://www.michigandnr.com/PUBLICATIONS/PDFS/ifr/ifrlibra/status/waterbody/96-4.htm

20. Diana, Matthew J, Silver Creek Survey Report. 2016. Michigan Department of Natural Resources.

21. Fishbeck, Thompson, Carr & Huber, "Hydrologic and Hydraulic Analysis of the Gun River Watershed." 2004. Prepared for Allegan Conservation District. https://www.michigan.gov/documents/deq/ess-nps-gunhh_201999_7.pdf

22. Forum of Greater Kalamazoo, Portage & Arcadia Creeks Watershed Management Plan. 2006. http://kalamazooriver.net/wp-content/uploads/2013/05/WMP.pdf

23. Four-Township Water Resource Council, Gull and Augusta Creeks Watershed Management Plan: the Four Township Watershed Area. Updated July 2017. https://kalamazooriver.org/wp-content/uploads/2018/02/FTWA_WMP_text_FINAL_8.7.17.pdf

24. Gun Plain Charter Township. Parks and Recreation Plan. July 2012. www.gunplain.org/images/pdfs/Park%20and%20Rec%20Plan%207-12-2012.pdf

25. Kalamazoo River Tourism, Recreation, and Environmental Planning Committee. "List of River Recommendations for Review" (undated).

26. Kalamazoo River Watershed Council, Kalamazoo River Watershed Management Plan. 2011. https://www.michigan.gov/documents/deq/wrd-nps-kalamazoo-wmp_387193_7.pdf

27. Kalamazoo River Watershed Council, The Kalamazoo River: Beauty and the Beast, Remedial and Preventive Action Plan for the Kalamazoo River Watershed Area of Concern. 2000. https://www.epa.gov/sites/production/files/2013-12/documents/2000_kalamazoo_river_rap.pdf

28. Michigan Department of Environmental Quality, "Biennial Remedial Action Plan update for the Kalamazoo River Area of Concern." 2007. https://www.michigan.gov/documents/dnre/dnre-water-ogl-aoc-KalRiver-RAP_337818_7.pdf

29. Michigan Department of Environmental Quality, "Stage 2 Remedial Action Plan Kalamazoo River Area of Concern." 2012. http://kalamazooriver.org/wp-content/uploads/2012/12/deq-ogl-aoc-KalamazooRiverStage2RAP_378185_7.pdf

30. Michigan Department of Environmental Quality, "Kalamazoo River/Lake Allegan Watershed Cooperative Agreement for the Reduction of Phosphorus Loading." October 1, 2016. https://www.michigan.gov/documents/deq/wrd-npdes-tmdl-agreement_616229_7.pdf

31. Michigan Department of Natural Resources, Michigan Statewide Comprehensive Outdoor Recreation Plan, 2018-2022. Prepared by Public Sector Consultants. https://www.michigan.gov/documents/dnr/SCORP2018-2022_Final2_609032_7.pdf

32. Michigan Sea Grant, Sustainable Small Harbors: Tools and Tactics Guidebook. 2017. http://www.miseagrant.umich.edu/smallharborsustainability/files/2016/05/17-502-Complete-Sustainable-Small-Harbors-Tools-and-Tactics-Guidebook-digital-050817.pdf

33. Otsego Downtown Development Authority, "Riverfront Redevelopment Land-Use Master Plan." 2018. Developed by C2 A&E.

34. Shuchman and Meadows, "Characterization of Kalamazoo Lake and Harbor Hydrology to Support Restoration Planning." September 2018, Michigan Technological University.

35. Smith, Kregg, Lake Sturgeon Rehabilitation in the Kalamazoo River. 2010, Michigan Department of Natural Resources, Fisheries Division. https://www.michigan.gov/documents/dnr/KzooRiverLkSturgeonRehabPlan_395540_7.pdf

36. Spoelstra, Jeffrey, "Kalamazoo River Area of Concern: Restoration Plan for the 'Loss of Fish and Wildlife Habitat' and 'Degradation of Fish and Wildlife Populations' Beneficial Use Impairments." Kalamazoo River Watershed Council, 2009. http://kalamazooriver.org/wp-content/uploads/2012/12/Final-Kzoo-Fish-Wildlife-BUI.pdf

37. United States Environmental Protection Agency, "Operable Unit 5 Area Map (draft)."

38. Wesley, J.K, Kalamazoo River Assessment. 2005, Michigan Department of Natural Resources. Fisheries Division Special Report 35. http://kalamazooriver.org/wp-content/uploads/2012/12/DNR-Fisheries-Division-Kalamazoo-River-Assessment-2005.pdf

39. Wesley, J.K., Mann Creek. 2001. Michigan Department of Natural Resources Status of the Fishery Resource Report 2001-3. http://www.michigandnr.com/PUBLICATIONS/PDFS/ifr/ifrlibra/status/waterbody/2001-3_Mann_Creek.pdf

WEB RESOURCES

Allegan Conservation District – Rabbit River Watershed Management Plan: https://alleganCD.org/programs/rabbit-river-watershed-project/rabbit-river-watershed-management-plan/

Army Corps of Engineers – Great Lakes and Ohio Division Environmental Operations: https://www.lrd.usace.army.mil/Missions/Civil-Works/Environmental/GreatLakes%20Programs/GreatlakesRemedialActionPlan/

EPA Allied Paper Superfund Site: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0502325

Gun Lake Tribe Environmental Department: https://gunlaketribe-nsn.gov/departments/administration/environmental/

Kalamazoo River Watershed Council: http://kalamazooriver.org/learn/plans/

Michigan Sea Grant – Sustainable Small Harbors: http://www.miseagrant.umich.edu/smallharborsustainability/

Michigan State University – River Wildlife Toxicology Study – 2002-03: http://www.riverwildlife.msu.edu/Pages_KRW/KRW_Overview.html

USGS – Kalamazoo River Gauge at New Richmond: https://waterdata.usgs.gov/usa/nwis/uv?04108660


Laketown Township
Fillmore Town
City of Saugatuck
City of the Village
of Douglas
Manlius Townsh
Saugatuck Township
City of Fennville
Ganges Township
Clyde Township

CITY OF ALLEGAN
ALLEGAN, MICHIGAN
RESOLUTION 19.19

A RESOLUTION TO ENDORSE THE LOWER KALAMAZOO RIVER GREENWAY PLAN

Council Member_____, offered the following resolution and moved for its adoption, seconded by Council Member_____:

WHEREAS, The Kalamazoo River traverses approximately four miles through the City of Allegan, a prominent and defining feature of the City; and

WHEREAS, At the request and with the assistance of State Representative Mary Whiteford, the ODC Network (ODC) began developing a plan for a greenway corridor in Allegan County along the Kalamazoo River in January of 2018; and

WHEREAS, The Greenway Plan was designed to bring together the diverse communities scattered along the Kalamazoo, Rabbit, and Gun Rivers to coordinate planning efforts and work together as a unified county on addressing ecological, educational, and developmental issues related to the river; and

WHEREAS, Through a planning process that involved over 300 people and dozens of meetings, the Greenway Plan was developed to identify types of projects along the river corridor; and

WHEREAS, The Greenway Plan reflects the feedback received during the planning process, yet remains adaptive and flexible enough to be updated or adapted based on future needs and accomplished projects; and

WHEREAS, The Greenway Plan addresses issues related to environmental restoration, recreation, conservation, and education which may include seeking collaboration and funding for projects such as improving river access, addressing pollutants, treating invasive species, creating pathways, creating improved educational opportunities, and preserving the highest quality habitats.

NOW THEREFORE, BE IT RESOLVED the City of Allegan City Council hereby endorses the Lower Kalamazoo River Greenway Plan to be used as an advisory document guiding public officials on a comprehensive approach to restoring the Kalamazoo River and its tributaries and help engage public involvement to determine financial feasibility (tax payer capacity) of any proposed projects.

DATED: July 8, 2019

YEAS:
NAYS:
ABSENT:
ABSTAIN:

RESOLUTION DECLARED:

_____
Rachel McKenzie, Mayor

CERTIFICATION

I, Danielle Bird, duly appointed City Clerk of the City of Allegan, do hereby certify that the above is a true and correct copy of a resolution adopted by the City Council of the City of Allegan, Michigan, on this 1st day of July, 2019.

_____
Danielle Bird, City Clerk

MEMORANDUM

TO: Allegan City Council
FROM: Joel Dye, City Manager
RE: Discussion on the next steps of the City Owned Dam and Power House along the Kalamazoo River.
DATE: July 8, 2019

Summary

It is requested that City Council discuss the next steps of the City Owned Dam and Power House along the Kalamazoo River.

At your June 28, 2019 City Council Meeting, you received a presentation from state and federal agencies regarding an Allegan Dam Feasibility and Conceptual Design Report. As part of the presentation, you were presented with three options on how the City could proceed with the City Owned Dam and Power House as it relates to the cleanup of the Kalamazoo River. These options included, repairing the dam and removing the power house, partial removal of the dam and removal of the power house or full removal of the dam and power house.

A conceptual budget was prepared for each of these options and city staff has uploaded these reports and their attachments to the city website for public consumption.

At that time it was mentioned that the City had about a year to make a decision. This is still true. It was also mentioned that the state has additional money to assist with community outreach if the city chooses to proceed with the full dam removal. This additional money equates to approximately $29,000.

If City Council is leaning to approving a full dam removal, then a decision to use this additional money to assist in the community outreach will need to be made in the near future. It should be noted that since the June 28, 2019 presentation we have not received any negative feedback on the plans presented as it relates to the full dam removal, we have only received positive feedback.

Recommendation

It is recommended that City Council discuss the next steps of the City Owned Dam and Power House along the Kalamazoo River.

Attachment
Public Outreach Proposal
Allegan City Dam Report

Dam Removal Conceptual Drawings

AECOM
10850 Traverse Highway
Traverse City, MI 49684

231-932-7592 tel
231-932-7595 fax

May 22, 2019

Mr. Mark Mills
Michigan DNR
4590 118th Avenue
Allegan, MI 49010

Subject: Allegan City Dams – Community Outreach Phase

Dear Mr. Mills:

As requested, we are providing the following change order for moving forward the Allegan City Dam removal project. This phase of the project will consist of two (2) tasks:

1) Presenting the selected alternative - full dam removal - to the City and stakeholders.
2) Providing support for a public outreach effort.

Throughout this process, preliminary engineering and landscape architecture design will continue. This activity will provide refinements to the plans that incorporate additional information as it becomes available (such as storm sewer outfall locations, existing sheet pile wall designs and public and stakeholder feedback on plans and renderings).

Plans, Renderings and Presentation Materials:

During this phase of the project, there is generally less emphasis on progressing engineering analysis and design. However, based on continued receipt of data, and incorporation of public input, revisions are often needed in plans, renderings and presentation materials. Included within this scope is general analysis time, revisions to plans, updates to the two bird's eye renderings, development of an on-the-ground rendering, and development of up to three (3) materials pallet boards. We have also found it helpful to develop project narrative and Frequently Asked Question handouts to help facilitate discussions with project stakeholders and the general public. Our team will coordinate these efforts with local partners to produce these documents.

Our estimate for this task is $29,000.

Communications:

AECOM will be communicating directly with MDNR and the City of Allegan staff. To facilitate this outreach phase, AECOM anticipates attending up to six (6) meetings as outlined below.

Initial City Commission presentation: June 17, 2019 (included in previous scope)
Public Outreach Planning Meeting: Date and location TBD

Project Stakeholder Meeting (Trails, fishing, and other organized stakeholder groups): Date and location TBD
Public Outreach Meeting: Date and location TBD
Public Spaces Commission Meeting: Date and location TBD
Planning Commission Meeting: Date and location TBD
City Commission update: Date and location TBD

While the dates and locations have not been determined at this time, it is our assumption that the location will be in the City of Allegan and all meetings will occur before September 2019.

Additionally, AECOM will have regular internal meetings to coordinate work being completed and regular communication with MDNR staff.

Our estimate for participating in the above meetings is $12,000. We anticipate this work will be completed by August 30, 2019.

Total fee for this phase of the project is estimated at $41,000.00.

We look forward to continuing to serve you on this exciting project. If you have any questions, or require any additional information regarding this proposal, please feel free to contact us at (231) 922-4301.

Sincerely yours,

Troy Naperala, PE
Michigan Water Business Line Leader
troy.naperala@aecom.com

Dan DeVaun, PE
Michigan Water Resources Leader
dan.devaun@aecom.com

AECOM Imagine it. Delivered.

Allegan Dam Feasibility and Conceptual Design Report

May 22, 2019

Quality information

Prepared by	Checked by	Verified by	Approved by

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for: Michigan Department of Natural Resources

Prepared by:

AECOM
10850 Traverse Highway
Traverse City, MI 49684
aecom.com

Table of Contents

1. Introduction and Purpose 6
2. Site Assessment and Data Analysis 7
3. Project Goals and Constraints 9
3.1 Mitigate Safety Concerns at the Dams 9
3.2 Improve Fish Passage and Habitat Quality 9
3.3 Improve Recreational Opportunities 10
3.4 Manage Contaminated Sediments and Waste 10
4. Alternatives 11
4.1 Complete Dam Removal 11
4.1.1 Hydrologic and Hydraulic Analyses 11
4.1.2 Geomorphic Assessment 11
4.1.3 Fish Passage and Habitat Assessment 15
4.1.4 Sediment Assessment 16
4.1.5 Goals Assessment 18
4.2 Partial Dam Removal 18
4.2.1 Hydrologic and Hydraulic Analyses 19
4.2.2 Geomorphic Assessment 20
4.2.3 Fish Passage and Habitat Assessment 21
4.2.4 Sediment Assessment 21
4.2.5 Goals Assessment 21
4.3 Dam Rehabilitation or Modification 22
4.3.1 Recommended Repairs/Modifications 23
4.3.2 Hydrologic and Hydraulic Analyses 24
4.3.3 Geomorphic Assessment 24
4.3.4 Fish Passage and Habitat Analysis 24
4.3.5 Sediment Assessment 25
4.3.6 Goals Assessment 25
5. Cost Estimates 25
6. Goals Matrix 26
7. References 28
Appendix A 29
Conceptual Graphics of Alternatives .....
Appendix B .....
Conceptual Cost Estimates .....

Figures

Figure 1. Location of Allegan City Dam. 7
Figure 2. Diagram of Main Spillway Components 8
Figure 3. Historic 1873 map of Allegan City and Kalamazoo River. 12
Figure 4. Bathymetry (U.S. ft) of project area. Provided by MDEQ, 2011. 13
Figure 5. Site Overview for Dam Removal Alternative. 14
Figure 6. Estimated Sediment Thickness within Allegan City Dam impoundment (Wood, 2018). 17
Figure 7. PCB Concentrations at Sediment Sampling Points in the Project Area. 17
Figure 8. Site Overview for Partial Dam Removal Alternative. 19
Figure 9. Conceptual depiction of full-width rock ramp for fish passage 20
Figure 10. Site Overview for Dam Repair/Maintenance Alternative. 23

Tables

Table 1. Regional Reference Curve Values for Channel Geometry. 15
Table 2. Experimental Swimming Speeds for Fish Species. 16
Table 3. Conceptual Cost Estimates. 26
Table 4. Matrix of Project Goals and Alternatives 27

1. Introduction and Purpose

This report is intended to consider the feasibility of conceptual design alternatives for addressing fish passage, safety, and maintenance, concerns at the City of Allegan Dam on the Kalamazoo River in Allegan County, Michigan (Figure 1). This study will also investigate opportunities for improving public interaction with the river.

The goals of the dam removal/modification project as determined by Michigan Department of Natural Resources (MDNR) and city staff are to:

- Mitigate safety concerns associated with the deteriorating powerhouse and necessary dam repairs,
- Improve the riverine ecosystem including fish passage and habitat quality,
- Improve recreational opportunities, and
- Manage contaminated sediments and waste within the project site.

The City of Allegan Dam site is part of a USEPA Superfund site for PCB contamination. The Allied Paper Inc./Portage Creek/Kalamazoo River Superfund site includes PCB-contaminated soil and sediment in landfills, paper mill properties, approximately 80 miles of the Kalamazoo River, adjacent riverbanks and contiguous floodplains, and portions of Portage Creek. Allegan Dam is part of the site's operable unit (OU) 5, which includes the bed and floodplain sediment of Portage Creek and Kalamazoo River, and part of subunit Area 5, which includes the Kalamazoo River bed and floodplain from Trowbridge Dam to Allegan City Dam.

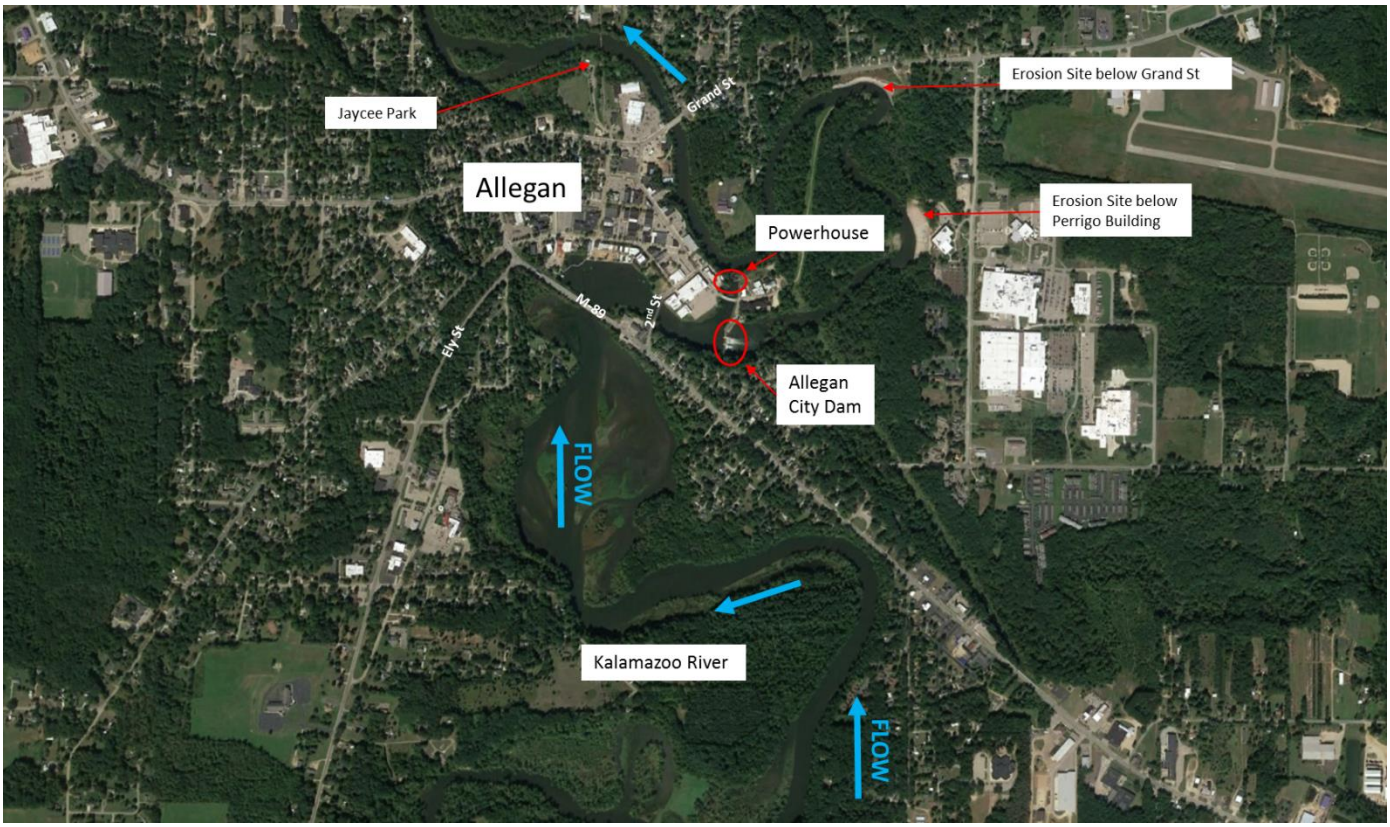


Figure 1. Location of Allegan City Dam.

2. Site Assessment and Data Analysis

The Allegan City Dam NID# MI00489, has a structural height of 14 ft and hydraulic height of 9 ft, a listed storage of 1,100 acre-feet, and is classified as a high hazard dam (USACE, 2019). MDEGLE defines a high hazard dam as - “A dam whose failure may cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads. Dams constructed in existing or proposed residential, commercial or industrial areas will be classified as high hazard dams, unless the applicant presents clear and convincing evidence to the contrary.” The dam operates along the mainstem of the Kalamazoo River near downtown City of Allegan and maintains a 135 acre impoundment along downtown Allegan. The dam originally maintained water levels for the adjacent millrace and powerhouse. The millrace extends approximately 500 ft north of the principal spillway to the powerhouse structure, before dropping (~10 ft) back to the river below the oxbow. The powerhouse consists of two sections, the older western section, and newer eastern section, which still contains a turbine and generating equipment. According to maps provided by the City of Allegan, no utility or pipelines pass through the impoundment at, or upstream of the principal spillway.

The dam consists of a 100 ft long right earthen embankment, a 200 ft wide principal spillway section, and a 575 ft long left earthen embankment. The earthen embankments have crest widths of approximately 33 ft. The principal spillway consists of four separate spillway sections: a 51.5-ft wide south stoplog section (spillway bay #1), a 52-ft wide north stoplog section (spillway bay #2), and two 24-ft wide radial gates (spillway bays #3 and #4). The four spillway bays are separated by concrete piers and needle sections (See Figure 2). The dam maintains a head of approximately 9 ft, with 3 ft of freeboard under normal operating conditions (MDEQ 2017).

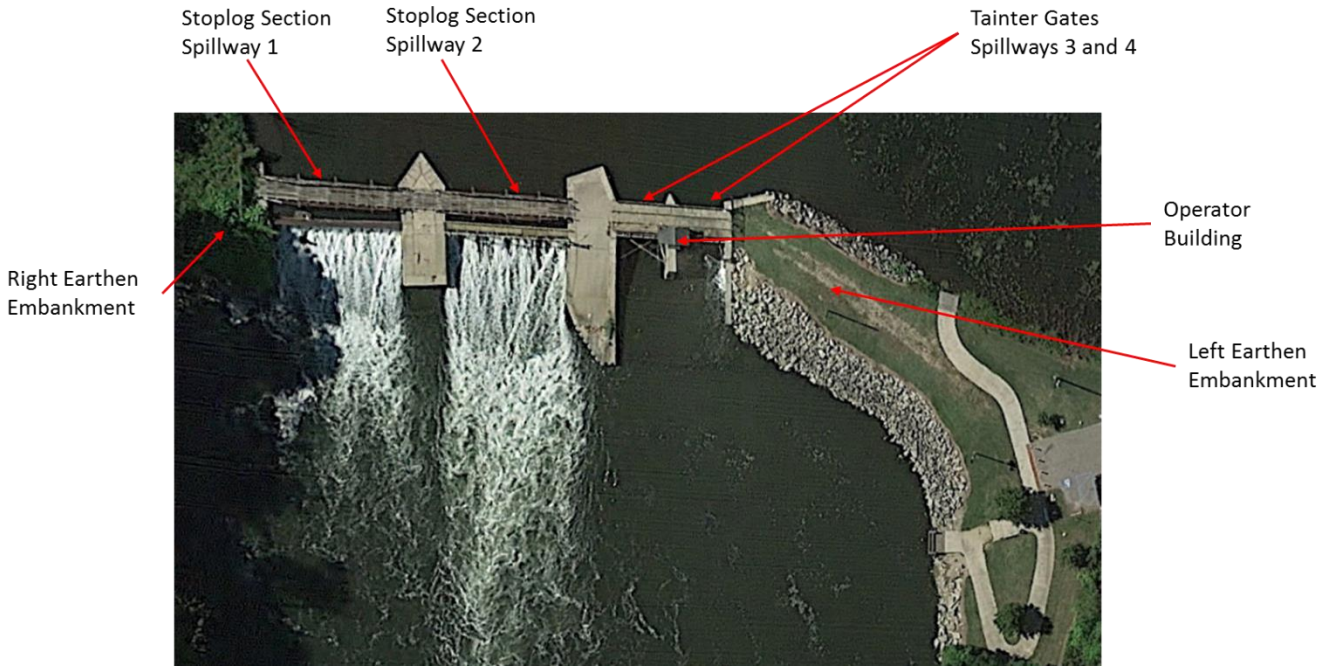


Figure 2. Diagram of Main Spillway Components

As early as 1835 a dam and sawmill may have existed at or near the current site. The current dam, originally named the Imperial Carving Dam, was constructed in 1900 for hydromechanical power (MDEQ 2017). The radial gates were installed in the principal spillway structure around 1910. The dam was used to run machinery for furniture manufacturing. In 1920 the dam was converted to use for hydroelectric power generation, the eastern section of the powerhouse was likely constructed around this time. After electrical generation ended in 1997 the City of Allegan purchased the dam to maintain the downtown waterfront area upstream of the dam. Deteriorating conditions and safety concerns led the City to carry out repairs and upgrades to the dam in 2000 and 2003 (MDEQ 2017). MDNR Fisheries Division recommended removal at this time, however, the City preferred to maintain the impoundment and waterfront in their current condition.

Since that time the powerhouse on the millrace has experienced advanced deterioration and has been condemned. Currently water in the headrace is prevented from flowing into the lower downstream river by walls and gates at the powerhouse. Due to this retention of water at a higher elevation than the downstream river, an inspection report from Lawson-Fisher Associates dated June 2017 noted that any failure at the powerhouse could be sudden and severe (LFA, 2017). However, the concrete bulkhead that was constructed upstream of the intake of the western powerhouse is newer and the intake of the eastern powerhouse is in better overall condition. Both MDEQ and LFA concluded that sudden failure is unlikely in the immediate future (LFA, 2017 and MDEQ, 2017). However, the powerhouse will need to be repaired, replaced, or removed.

The MDEQ 2017 Dam Safety Inspection Report notes that the principal spillway will overtop at the design flow (200-yr flood discharge of 14,000 cfs). At this flow impoundment levels would rise to an elevation of 631.2 ft and overtop portions of the earthen embankment, with maximum overtopping velocity estimated to be 7.3 fps, with a 2.3 ft head differential. Under these conditions the riprap erosion protection on the downstream side of the embankment would be expected to be sufficient such that the embankment would see only minimal damage. As such the dam is considered to safely convey the design flood. The FEMA Flood Insurance Study for this area lists the 100-yr flood water surface elevation at 633.0 ft (FEMA, 1989). The FEAM study used NGVD29 as a datum and the MDEQ report is assumed to reference NAVD88. Converting the datum puts the FEMA 100-yr flood water surface elevation at 632.55 ft. The discrepancy between the FEMA and MDEQ results should be explored during future phases of the project if a non-removal alternative is select to ensure the safety of people and property.

3. Project Goals and Constraints

3.1 Mitigate Safety Concerns at the Dams

As noted above, the Allegan City Dam consists of the main channel concrete dam, the millrace, and two powerhouse sections blocking flow from the millrace to the main channel. The older of the two powerhouse sections has not been operational for some time, and the newer (east) powerhouse section ceased operations in 1997. Significant deterioration to the powerhouse since that time has resulted in the powerhouse being condemned. Also of concern is the deteriorating catwalk over one of the spillways of the mainstem dam. The catwalk is unsafe for use and currently prevents access to the south embankment for maintenance activities. Any alternatives will need to address removal or rehabilitation of the powerhouse structures as well as removal or modification of the mainstem dam.

Any failure of either the powerhouse or principal spillway dam could result not only in damages downstream due to flooding and erosive forces, but also the potential downstream transport of contaminated sediments from within the impoundment.

Other safety concerns include the flooding potential of the low-lying mill district area and Perrigo Plant 1 facility at Water Street and State Street, which lie within the current FEMA delineated 100-yr floodplain, and have experienced repeated inundation events. Information from the city public works director indicated that one of the main operational goals of the dam is to maintain impoundment levels low enough to prevent flooding of these areas.

3.2 Improve Fish Passage and Habitat Quality

The current dam acts as a barrier to aquatic organism passage. Downstream of the dam only one other dam (below Lake Allegan) remains a barrier between Allegan and Lake Michigan. Upstream of Allegan City Dam, a number of dam removals from Trowbridge to Otsego aim to open up over 40 miles of river and stream habitat. All alternatives should take into account the provision of some form of fish passage to allow populations below the dam to reconnect with populations and newly opened habitat upstream of the dam. Providing fish passage would also improve fishing opportunities both upstream and downstream of the dam. The Kalamazoo River Assessment (Wesley 2005), found that “Passing Great Lakes fishes above Lake Allegan into the upper portions of the Kalamazoo River has the potential to re-establish spawning runs of native (lake sturgeon, walleye, whitefish, and suckers) and naturalized (Chinook salmon, coho salmon, steelhead, and brown trout) fishes, and restore self-sustaining fish populations in the river and Lake Michigan. Substantial fishery, recreational, and economic benefits could result from these spawning runs.”

Fish species in the Kalamazoo River which should be considered in fish passage alternatives include: salmonids, sturgeon, smallmouth bass, walleye, and spotted gar. Another important fish species to consider is logperch. This small fish acts as a host for endangered native mussels. Logperch carry the immature mussels up and down the river, transporting them to new habitat and connecting different genetic populations. Habitat fragmentation has been a major cause of decline for native mussels, and designing fish passage that would accommodate logperch and reconnect populations and establish new communities in recently restored habitat is a priority.

Habitat and water quality degradation have occurred due to excessive nutrient issues, unwanted algae growth, low dissolved oxygen, contaminated sediments, and the transition from running water to still-water habitat. The MDNR Kalamazoo River Assessment notes that “this segment of river has excellent gradient that could provide fish habitat in the form of pools and riffles,” and “it should be a high priority to maintain and promote more natural riparian areas in the Kalamazoo River system” (Wesley, 2005). However, the Kalamazoo River currently has fish consumption advisories between the city of Kalamazoo and Lake Allegan for no consumption due to PCB contamination.

3.3 Improve Recreational Opportunities

The Kalamazoo River Water Trail extends from Albion to Lake Michigan. Current portage conditions around Allegan City Dam are considered somewhat dangerous and infrastructure for portaging and recreation are limited upstream and downstream of the dam. Removal of the dam or partial removal with provision of kayak/canoe passage over a fish passage feature would enhance recreational accessibility and opportunities, while increasing boater safety.

Removing the dam or providing fish passage would improve recreational fishing opportunities. The Kalamazoo River Assessment also notes that in this segment “a much better fishery would be expected if the dams were removed and water quality improved,” also noting -“For example, the fish community of the Kalamazoo River between the City of Kalamazoo and Plainwell is diverse and dominated by smallmouth bass and was once over populated with carp. This transition occurred naturally after water quality improvements were made.” (Wesley, 2005)

The removal of upstream dams and removal/management of contaminated sediments in their former impoundments has opened up greater opportunity for paddling and recreation and restored upstream connectivity. Potential area plans also include a desire to consider land trails to connect communities along the river. A goal of both the MDNR and City is to increase boating access, both motorized and non-motorized access. The current portage site around the dam is the next likely opportunity for trailered boat access downstream of Trowbridge dam.

Within the city, one of the goals of the master plan has been to improve and expand recreational opportunities, waterfront access, and non-motorized trails. The alternatives below provide varying amounts of park space and differing opportunities for access and recreation.

3.4 Manage Contaminated Sediments and Waste

As noted above, the Kalamazoo River from Trowbridge Dam to Allegan City Dam makes up Area 5 of the EPA Superfund site for the Kalamazoo River/Portage Creek. Allegan City Dam has trapped contaminated sediments upstream in the impoundment and limits their downstream migration. Any removal of the dam/drawdown of the impoundment would create conditions that could lead to mobilization of contaminated sediment, or exposure of contaminated sediment on reclaimed public lands that could be exposed to public use. Even if the dam were to remain in place, some management of contaminated sediment is expected as part of the Superfund site. Ultimately the EPA-led Superfund program will drive the plans for remediation. However, all dam removal/repair alternatives need to consider the consequences for remediation, removal and disposal, or capping of contaminated sediments within the project area, and must be coordinated with EPA and EGLE. For example, several dam removals upstream have been completed in conjunction with sediment removal.

It is crucial for the City’s decision about dam removal or repair to be made prior to the completion of Superfund remediation plans, in order to coordinate remediation. If the decision is made to keep the dam in place, or to partially remove it, the City would be responsible for maintaining and replacing the dam indefinitely, as it acts as a containment structure preventing downstream movement of contaminated sediments. If the decision is made to alter the impoundment for recreational use (i.e. dredging) or redevelopment (i.e. addition of green space), or to remove the dam in the future, the City would then be responsible for properly remediating contamination associated with those activities. If the decision to remove the dam is made prior to Superfund remediation plans, the intended use of the areas will drive the remediation project extents. In other words, remediation of the restored channel, floodplain, park space, and exposed impoundment soils would become a consideration/inclusion in the Superfund clean-up project, rather than being the responsibility of the City.

4. Alternatives

This conceptual analysis will consider three alternatives – complete dam removal, partial dam removal, and dam rehabilitation/modification. All three alternatives will incorporate measures for isolation or removal of contaminated sediments.

4.1 Complete Dam Removal

The complete dam removal alternative would include removing the entirety of the dam and restoring the river to its pre-dam condition, as closely as is practicable. Under this scenario the powerhouse upper structures would be demolished, but the foundations would be kept and the lower areas filled. Additionally, we would propose construction of a stable earthen slope on the downstream side of the powerhouse to provide a natural aesthetic. The millrace would likewise be filled and used for open space or other uses depending on ownership. This scenario would include the removal and replacement of the Mill District Road bridge with on-grade roadway. Additional park space, landscaping, and a trail or overlook at the former powerhouse site could be incorporated.

The benefits include natural aquatic habitat; fish passage; no dam related operation and maintenance costs; a natural free flowing river; reclaimed bottom lands and floodplains; and abundant recreational opportunities associated with a natural river. The costs include loss of the impoundment/smaller river width; contaminated sediment disposal/exposure; and potential impacts to bridge crossings and other infrastructure. This option would have the greatest aesthetic change from the current conditions.

4.1.1 Hydrologic and Hydraulic Analyses

The Allegan City Dam is operated as a run-of-the-river dam and is not operated to provide flood storage/downstream flood mitigation. This means that inflow equals outflow on a near instantaneous basis, and that downstream flows are not decreased by the dam. Information from the city dam operator indicated that the dam is operated at maximum capacity during storm events to prevent flooding in the area immediately upstream of the dam. A 2001 spillway capacity assessment performed by Lawson-Fisher Associates (LFA 2001) found that the dam has the capacity to pass the 200-yr (14,000 cfs) event, though it would overtop portions of the right embankment. The 200-yr headwater elevation reached 631.2 ft in the spillway capacity model, a rise of 4.5 ft above the normal headwater elevation. Given the impoundment size of 135 acres, this would provide storage of approximately 0.2% of the 200-yr storm event inflow volume, indicating that the dam does not provide any significant flood attenuation. The dam has the spillway capacity (13,550 cfs without overtopping) to pass events smaller than the 200-yr event (100-yr event is 12,000 cfs) without overtopping, and is operated to pass flood flows while preventing upstream flooding.

Assuming no flood attenuation, we can also assume that downstream flood flows and water surface elevations would not change significantly with removal of the dam. Upstream of the dam, flows would remain the same, but water levels could drop as much as 8-9 ft (the normal level of head maintained by the dam) under bankfull conditions. There would also be a significant drop in upstream flood elevations post dam-removal, which would be expected to alleviate some of the flood issues along the low-lying historic district and Perrigo Plant 1 facility. Given the drop in water surface elevation and re-contouring of the channel bottom/impoundment depth, water would no longer flow through the millrace.

4.1.2 Geomorphic Assessment

Upstream of the M-89 bridge the channel likely historically had a braided pattern. The 1837 historic map shows islands and several “bayous” through this area (Figure 3). More current bathymetry (Figure 4) shows the presence of several channels through the impoundment. Final bathymetry would be dependent upon contaminated sediment management and removal as well as more detailed bathymetric and hydraulic analyses. Under all channel restoration scenarios, however, a significant area of new bottomlands would be exposed for recreation, wildlife habitat, or other opportunities. Land ownership

issues would need to be considered here as well as contaminated sediment exposure. The current alternative shows a single channel through the upper impoundment, minimizing the area of flow through contaminated sediments and volume of sediment removal.

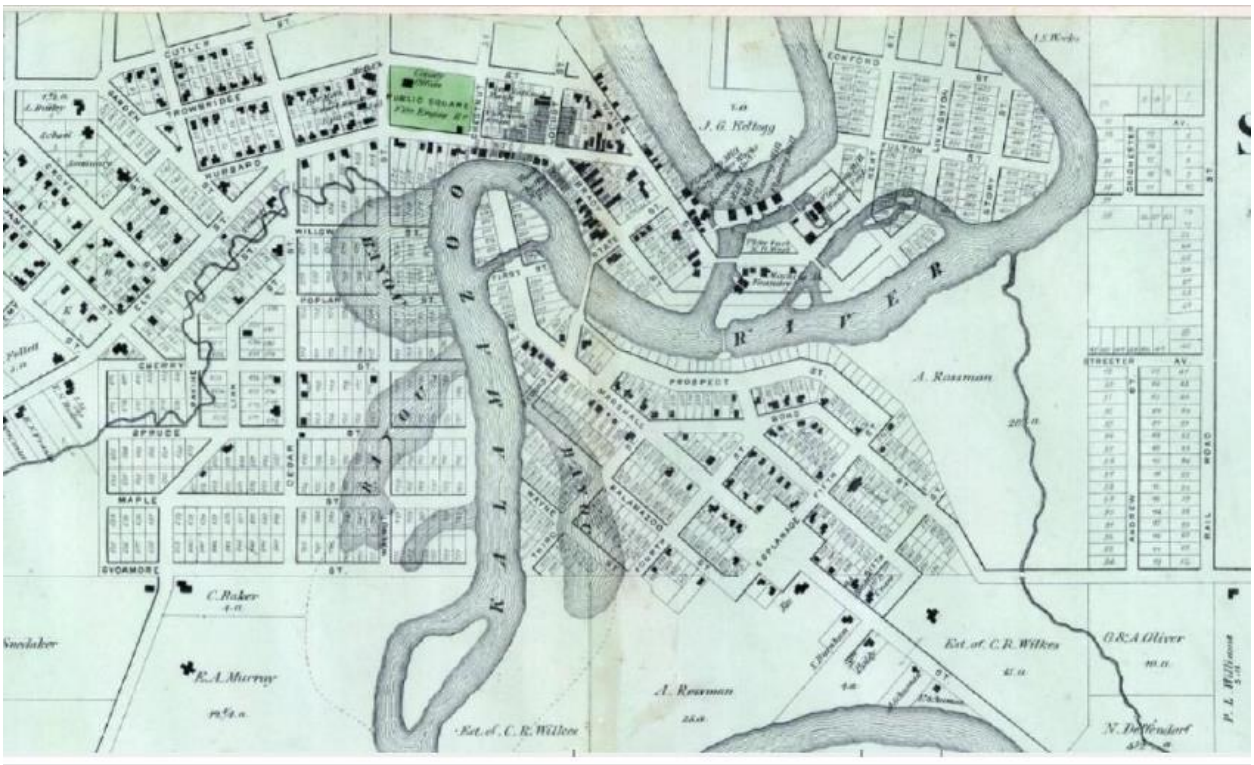


Figure 3. Historic 1873 map of Allegan City and Kalamazoo River.

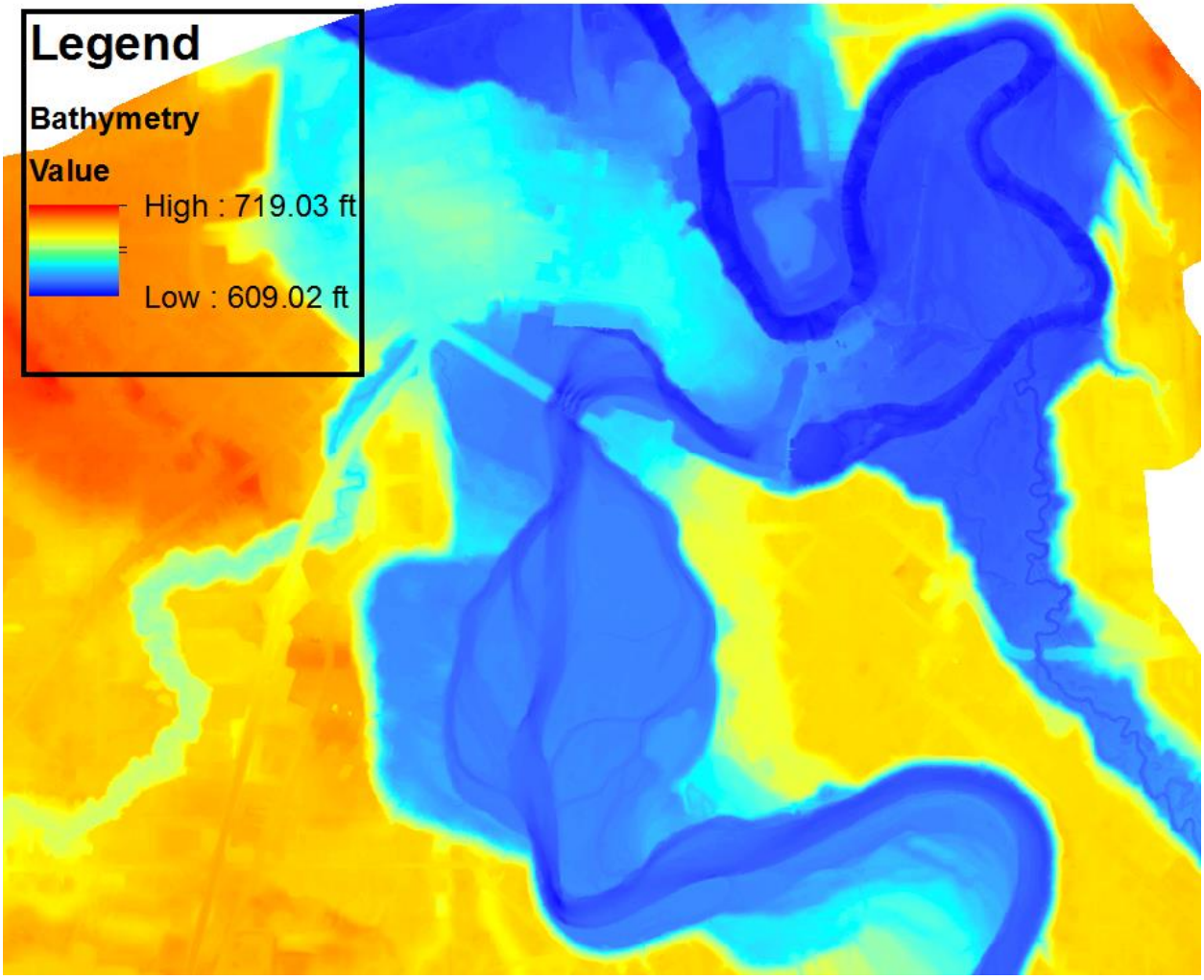


Figure 4. Bathymetry (U.S. ft) of project area. Provided by MDEQ, 2011.

The existing wetland/backwater area just upstream (south-side) of the M-89 bridge would experience a lowering of the water table and water surface elevation. However, this area appears to be fed by a separate tributary/stream source and would remain a wetland area adjacent to the channel, though its wetland type would likely change. The wetland/backwater area just downstream (north side) of the M-89 bridge, adjacent to the west end of the boardwalk and Hanson Park, does not appear to have a separate water source and would be unlikely to remain as a wetland. This area could be converted to parkland between the boardwalk and restored channel, as an extension of Hanson Park. The floating dock and canoe/kayak access at this location would need to be moved. Refer to Figure 5 and below. A full conceptual rendering is located in Appendix A.

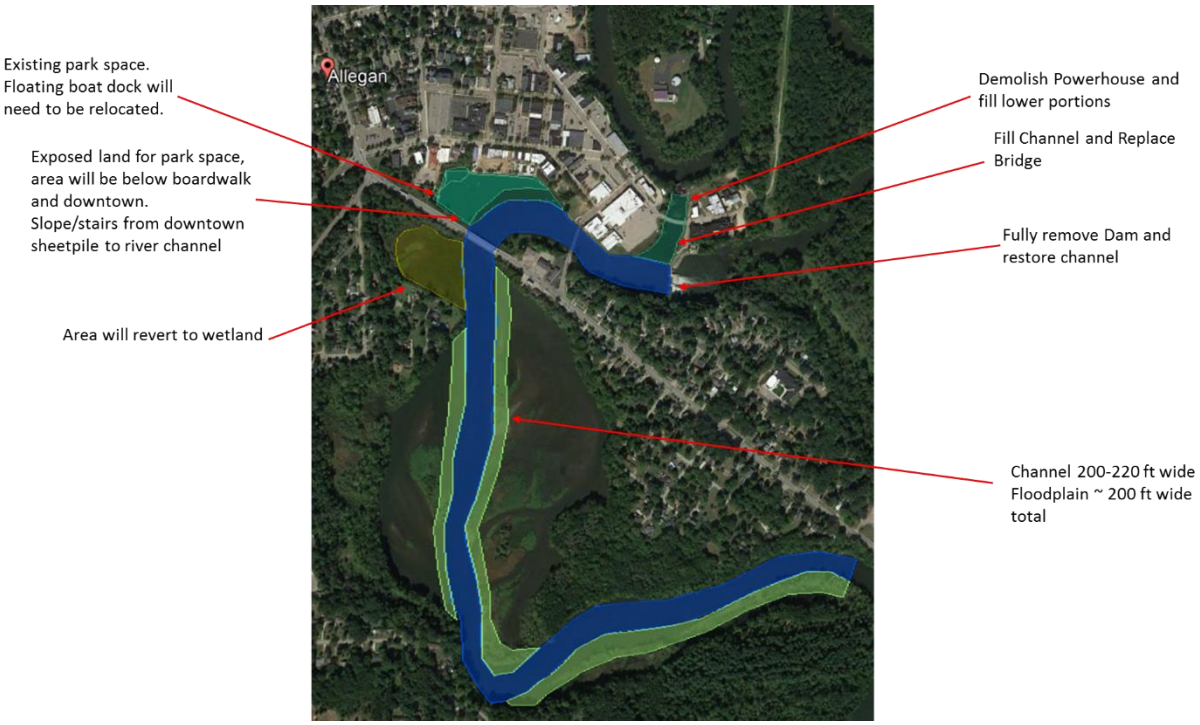


Figure 5. Site Overview for Dam Removal Alternative.

Downstream of the M-89 bridge the channel could be allowed to reestablish itself in the existing preferential flow path along the south bank (Figure 4). This configuration allows for park space along the downtown boardwalk, sloping down to the restored channel, with fill used to stabilize the sheetpile walls along this section. Structural analysis of the sheetpiling would be needed for this alternative. The floodplain and recreational space along the north bank would extend roughly to the Mahan Park area, just upstream of the Second Street bridge. Below Second Street the channel is somewhat constrained and would retain its general path through to the main spillway site, with the exception of no longer connecting to the millrace. Downstream of the dam site, channel geometry would not be expected to change significantly as downstream flows/ water surface elevations would remain largely unchanged. The removal of the dam would allow the natural movement of sediment downstream, which would have the potential to help to alleviate downstream erosion concerns. For instance, the downstream bends below Perrigo headquarters and adjacent to Grand St have seen significant expenditures to mitigate bank erosion, and erosion at these locations may be reduced by the new movement of sediment from upstream. This would depend on the sediment transport processes through the reach, and would require a detailed sediment transport/load analysis to determine downstream effects. The impacts of the selected alternative on downstream bank erosion should be considered during the design phase.

USGS and MDEQ have developed reference curves to predict what channel geometry would be expected for a river based on its region and drainage area. Table 1 shows reference curve data for the drainage area based on reference curve equations from USGS and MDEQ for Southeast Michigan, a local power curve for the Kalamazoo River provided by MDEQ, and the local power curve supplemented with AECOM data gathered for the Trowbridge, and Otsego dam removals. The table shows a range of predicted conditions for channel geometry. The USGS curve seems most consistent with downstream geometry, and is what we have based our estimates on for the conceptual design. Based on regional reference curve data for this area the restored channel would be expected to have a width of approximately 200-220 ft and a depth of approximately 4.5 ft under bankfull conditions (~4400 cfs). A floodplain of one bankfull width is included in all areas where practicable. The full channel and floodplain width would be 400-440 ft. Through the downtown riverfront area channel width could be as wide as 280 ft, with limited space for floodplain in some areas. This geometry would vary throughout the project area based on topography, sediments, gradient, and bedform (riffle, run, pool etc). This channel geometry corresponds well with the channel geometry existing upstream and downstream of the impoundment.

Table 1. Regional Reference Curve Values for Channel Geometry.

Allegan City Dam (Drainage Area = 1554 mi^2)				
Bankfull Characteristic	USGS Report (2009)	MDEQ Local Curve (Present)	Local Power Function	Local Power Function w/ AECOM Data
Width (ft)	208	350	325	243
Depth (ft)	4.87	3.27	3.08	4.26
Area (ft^2)	1007	1060	997	1038
width / depth	43	107	106	57

Proposed channel restoration would incorporate a natural channel design approach, targeting regional reference curve and reference reach geometry. The channel bed would target the pre-dam alluvium as a baseline, to the extent practicable. This would provide a natural channel substrate, uncover pre-dam habitat, remove contaminated sediments, increase channel stability, and mitigate the potential for head-cutting. Once contaminated sediment removal plans are in place, a channel profile and plan can be designed to promote a state of dynamic-equilibrium based on current bed material supply and hydrology.

4.1.3 Fish Passage and Habitat Assessment

Under a full dam removal scenario, the channel profile would be recreated to connect the channel bed upstream of the dam/impoundment with the channel bed downstream of the impoundment; with slope and bedforms similar to those expected under natural, free flowing conditions. Water quality would improve with increased velocity and dissolved oxygen, reduced sedimentation, reduced nutrient levels and a reduction in eutrophication. Habitat would increase for native running-water fishes, with reduced fine sediments, increased bed gradient and increased bedform diversity. Woody debris and riffle/pool patterns would also be restored in the relic channel and could be enhanced with engineered structures for increased habitat value. Removal of contaminated sediment would contribute to improved fish health and recreational opportunities. Improved fish passage would also serve to restore connectivity to native mussel populations and other aquatic species. In addition, mussel beds in the impoundment which have been buried in sediment would be uncovered and returned to running-water habitat. The Kalamazoo River has known occurrences of state threatened and endangered mussels, and the project area would have the potential for propagation and stocking efforts in the future.

Removal of the dam would provide fish passage into the upper reaches of the Kalamazoo River and the newly reconnected reaches from upstream dam removals. As noted, if Allegan City Dam were removed, only one dam would remain between Allegan and Lake Michigan. Providing fish passage or dam removal at Allegan City dam could provide additional influence for adding fish passage at Calkins Dam, which would mean passage would be provided all the way to Lake Michigan. A full dam removal would provide the greatest fish and aquatic species passage opportunity for the widest range of species, and the greatest increase in running-water habitat. Removal of the dam would open up approximately nine river miles upstream to Trowbridge Dam (which is under plans for removal). Coarse estimates of channel velocities show a range of velocities along the length of the channel, as well as across channel cross-sections throughout the project area. Velocities range from 0.25 ft/s to 4.56 ft/s under bankfull flow

conditions. Higher velocities correspond to the narrower/more channelized sections of the river. High velocities can be mitigated by providing boulders, woody debris, and bedforms to create velocity gradients and low velocity areas that allow fish with lesser swimming abilities to pass under a variety of flow conditions. See Table 2 for experimental swimming speeds of a variety of fish species. More detailed hydraulic analysis would be need to be completed once an alternative is selected.

Table 2. Experimental Swimming Speeds for Fish Species.

Scientific Name	Common Name	Swim Category	Min Swim Speed	Max Swim Speed	Swim Speed	Speed Units
Esox lucius	Northern pike	Prolonged	0.62	1.56	Calculated	ft/s
Micropterus dolomieui	Smallmouth bass	Prolonged	1.64	3.87	Calculated	ft/s
Micropterus salmoides	Largemouth bass	Prolonged	NR	NR	1.31	ft/s
Oncorhynchus mykiss	Rainbow trout	Prolonged	1.55	2.73	2.18	ft/s
Oncorhynchus mykiss	Steelhead	Prolonged	2.73	3.21	2.99	ft/s
Oncorhynchus tshawytscha	Chinook salmon	Prolonged	4.10	6.43	5.08	ft/s
Salmo trutta	Brown trout	Prolonged	NR	NR	3.02	ft/s
Sander vitreus	Walleye	Prolonged	0.98	2.20	1.59	ft/s
Target for Logperch and small fish		Prolonged			1.00	ft/s
Oncorhynchus mykiss	Steelhead	Burst	14.01	26.97	20.34	ft/s
Sander vitreus	Walleye	Burst	5.25	8.53	Calculated	ft/s
Oncorhynchus tshawytscha	Chinook salmon	Burst	10.99	22.00	14.00	ft/s
Target for Logperch and small fish					3.00	ft/s

* data from table provided by Matt Diana, MDNR Fisheries

4.1.4 Sediment Assessment

Full dam removal would involve a significant amount of earthwork and sediment management/disposal. More stringent management/containment measures may be required in those areas where sediments would be exposed to potential contact with the public, such as in newly established recreation areas. However, future liability and exposure risk would both be reduced under this alternative. The full dam removal would result in transitioning the "sediment" to "soils" by drawing down the water level and uncovering it. The soils would then be remediated to the appropriate regulatory level, which will result in protecting the aquatic environment, the most likely exposure pathway to humans. Contaminated sediment remediation would be guided, and carried out by EGLE, EPA Superfund planning. The cost of sediment remediation would fall to Superfund, rather than the City.

The 135-acre impoundment has soft sediment deposits varying in thickness from less than one foot to more than 13 feet, according to Superfund sampling and analysis carried out by Wood Environment and Infrastructure Solutions, Inc in April and October 2017. Figure 6 shows sediment sampling points and estimated thickness within the impoundment. Figure 7 shows areas of higher PCB concentrations within the project area. Investigation of sediment quality, depth and contamination levels is ongoing through Superfund. Remedial action levels vary by area and use criteria. The depth of contamination also influences remedial actions. As alternatives are discussed and further developed, more detailed estimates of sediment remediation volumes can be determined.

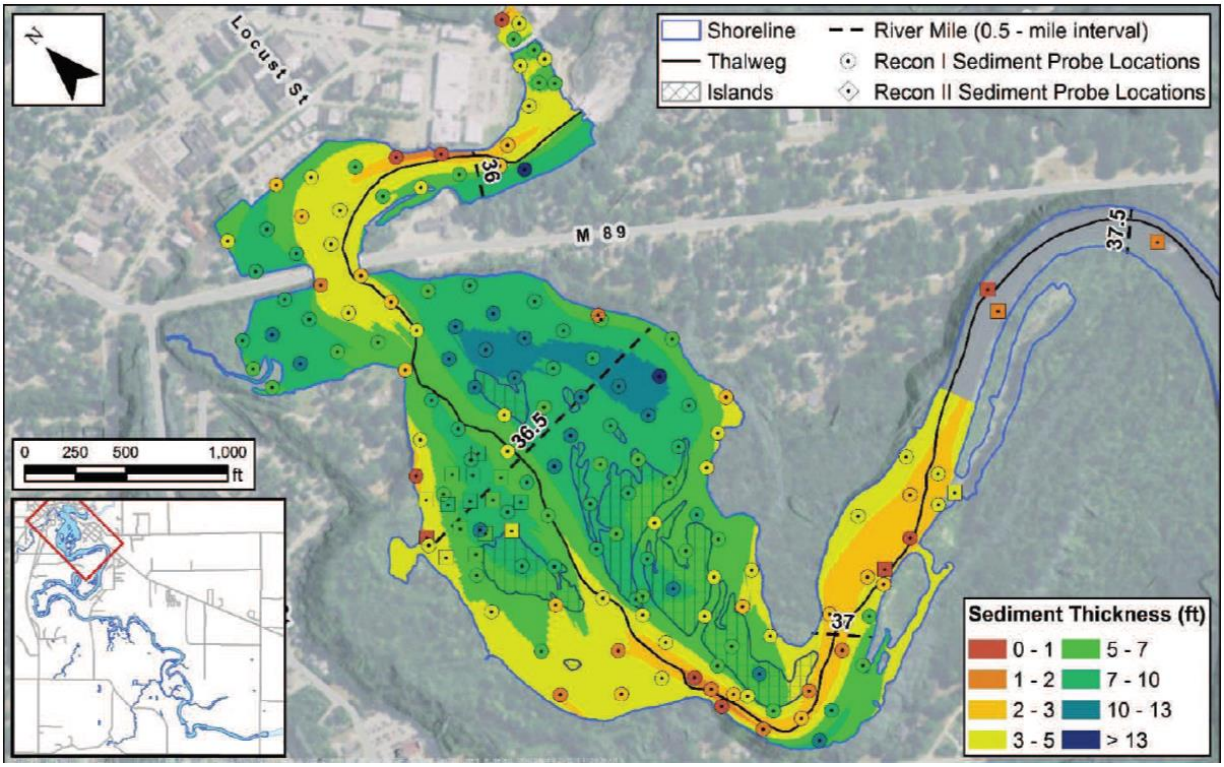


Figure 6. Estimated Sediment Thickness within Allegan City Dam impoundment (Wood, 2018).

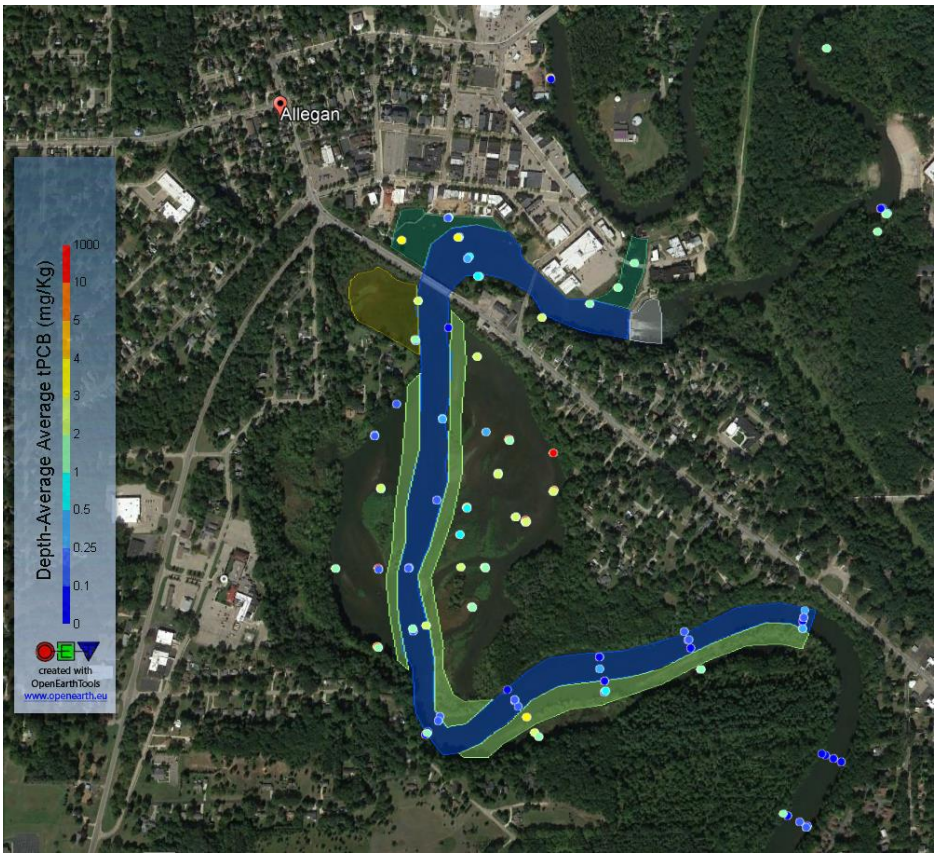


Figure 7. PCB Concentrations at Sediment Sampling Points in the Project Area.

Sediment management volumes would vary depending on channel restoration alternatives. Currently, a single thread, main channel with a floodplain totaling one bankfull channel width is considered. This would require an estimated 300,000 cubic yards of sediment removal/dredging for the channel and floodplain.

4.1.5 Goals Assessment

Dam removal and drawdown of the impoundment could provide for additional park space and non-motorized trails along the river. Such trails could provide connectivity to communities upstream, such as Plainwell, or to other recreational areas nearby. These options would be in line with city and county goals for recreation and development. Increased open space along the downtown area and restored channel could enhance downtown outdoor opportunities and ambience, and be in line with the City's historic and outdoor/nature oriented character. Removal of the dam would also increase boater safety, access, and paddling opportunities which are currently hindered by the presence of the dam and difficult portage. Large areas of reclaimed lands in the upper impoundment would provide the greatest increase in space for recreation and habitat of all the alternatives. Refer to Figure 5 and the full dam removal graphic in Appendix A.

Dam removal would provide the highest level of fish and aquatic organism passage, re-creating conditions naturally found elsewhere along the river and removing all barriers to migration in the project area. Under these conditions, most native and desirable introduced species would be able to pass upstream and downstream. This removal of barriers and restoration of running-water conditions, bedform diversity, and habitat would provide the greatest enhancement to fishery and aquatic organism populations and health. This, in turn, would provide the greatest increase to fisheries recreation and related economic returns. Under dam removal scenarios, the greatest volume of contaminated sediment would be removed or excluded from the channel, further enhancing aquatic ecosystem health.

Full dam removal would involve the greatest amount of earthwork and sediment management/disposal. As such it would have the highest total cost associated with these restoration activities. However, sediment management costs would be borne by the Superfund project. Ongoing exposure and future liability concerns for the City from contaminated sediments would be minimized under this alternative, and at the cost of Superfund/EGLE rather than the City.

The condemned powerhouse and associated risk of failure/liability would be resolved, and dam maintenance and repair costs would be eliminated in the future. Upstream flooding would be mitigated. However, dam removal also represents the greatest change in aesthetics to the downtown area. Detailed hydraulic and scour analyses of the M-89 bridge would be required as well as scour protection measures such as riprap. The 2nd Street bridge is a clear span bridge, with abutments outside of the current channel, but within the floodplain. Investigation of the foundation and more detailed hydraulic and scour analyses would also need to be done to ensure no detrimental effects to the 2nd Street bridge supports. The Mill District Road bridge would be replaced and the millrace filled. This alternative represents both great opportunities and great challenges for significantly reimagining the downtown riverfront area.

The full dam removal alternative would have the greatest availability of grant funding. It would also have the greatest support from MDNR and hence the greatest likelihood to see funding assistance from MDNR. As noted, EPA/Superfund/PRP's would be responsible for sediment remediation planning and costs. The cost of the powerhouse and millrace fill, and the removal of the main spillway dam would be costs to the city, and any grant funding obtained. The overall cost directly to the City could potentially be lowest under this alternative. The long-term maintenance costs to the city would be minimized or eliminated for this alternative.

4.2 Partial Dam Removal

The partial dam removal alternative would reduce the height of the dam, remove above-water appurtenances, and create an area of rapids that would be navigable by small crafts under a range of flow conditions, and accommodate volitional passage of desirable aquatic species. This option would

allow for some of the sediments to stay in place and keep the river wider and deeper, with a lower gradient, than under the complete dam removal alternative.

The possibility was also considered for creating a whitewater feature through the former powerhouse and millrace. While the general channel size and vertical drop might be sufficient for the provision of such a feature, issues concerning fish passage and splitting the river's flow make this option infeasible. During summer months, when such a feature would be used, summer flows are frequently too low to provide flow through both channels, or flow that would be sufficient for a whitewater feature. The high velocities coming from a whitewater millrace would also attract fish to an impassable feature. As such, the partial dam removal alternative would include the demolition and filling of the former powerhouse, as in the full removal alternative, with filling of the millrace and replacement of the Mill District Road bridge. The filling of this area will provide increased protection from flood flows which could cut through the millrace and create a potential breach. A potential alternative, instead of filling the millrace, could be to create a wetland complex within the millrace, or maintain it as a slackwater area/pond, and keep the bridge in place. This alternative would require additional geotechnical and hydraulic analysis to ensure the integrity of the filled powerhouse foundation. Additional park space, landscaping, and a trail or overlook at the former powerhouse site could be incorporated.

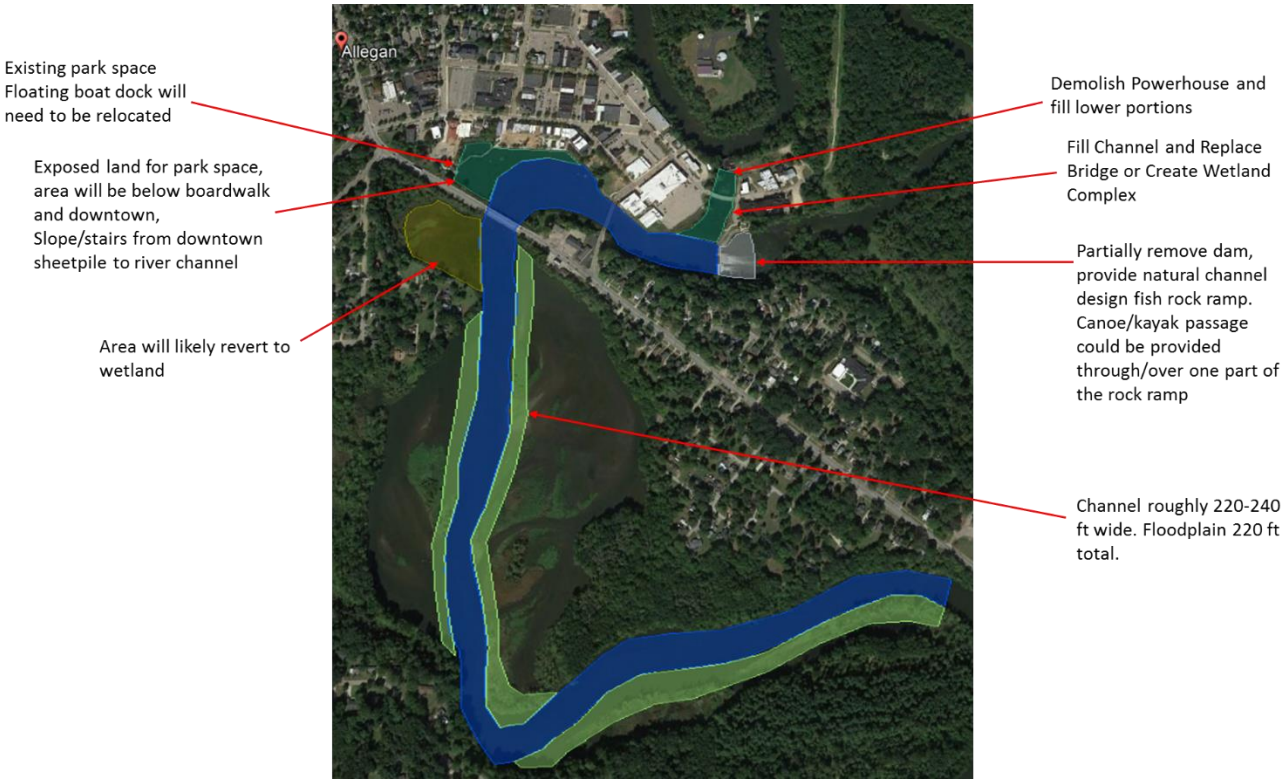


Figure 8. Site Overview for Partial Dam Removal Alternative.

4.2.1 Hydrologic and Hydraulic Analyses

Removal of the above-surface portions of the dam, down to the concrete sill at approximate elevation 620 ft, would drop the water level in the impoundment by 4-5 ft. This drop could be greater given sediment dredging/channel reconfiguration efforts that would deepen the channel.

As with the full dam removal scenario there would also be a significant, though lesser, reduction in upstream flood elevations, which would be expected to alleviate some of the flood issues along the low-lying historic district and Perrigo Plant 1 facility. Given the drop in water surface elevation and re-contouring of the channel bottom/impoundment depth, water would no longer flow through the millrace, unless it were also recontoured/dredged to a lower elevation and maintained as a slackwater area. The

water would be high enough under this scenario to design and maintain the millrace as a wetland complex, if desired.

In order to provide fish passage, a rock ramp feature would be incorporated downstream of the dam sill (Figure 9), stepping down the channel at a 3% or shallower gradient, extending roughly 200 ft downstream to tie-in to the existing streambed. There is some additional space to extend the rock ramp if a shallower gradient were desired, but there are downstream limits from channel bends and islands.

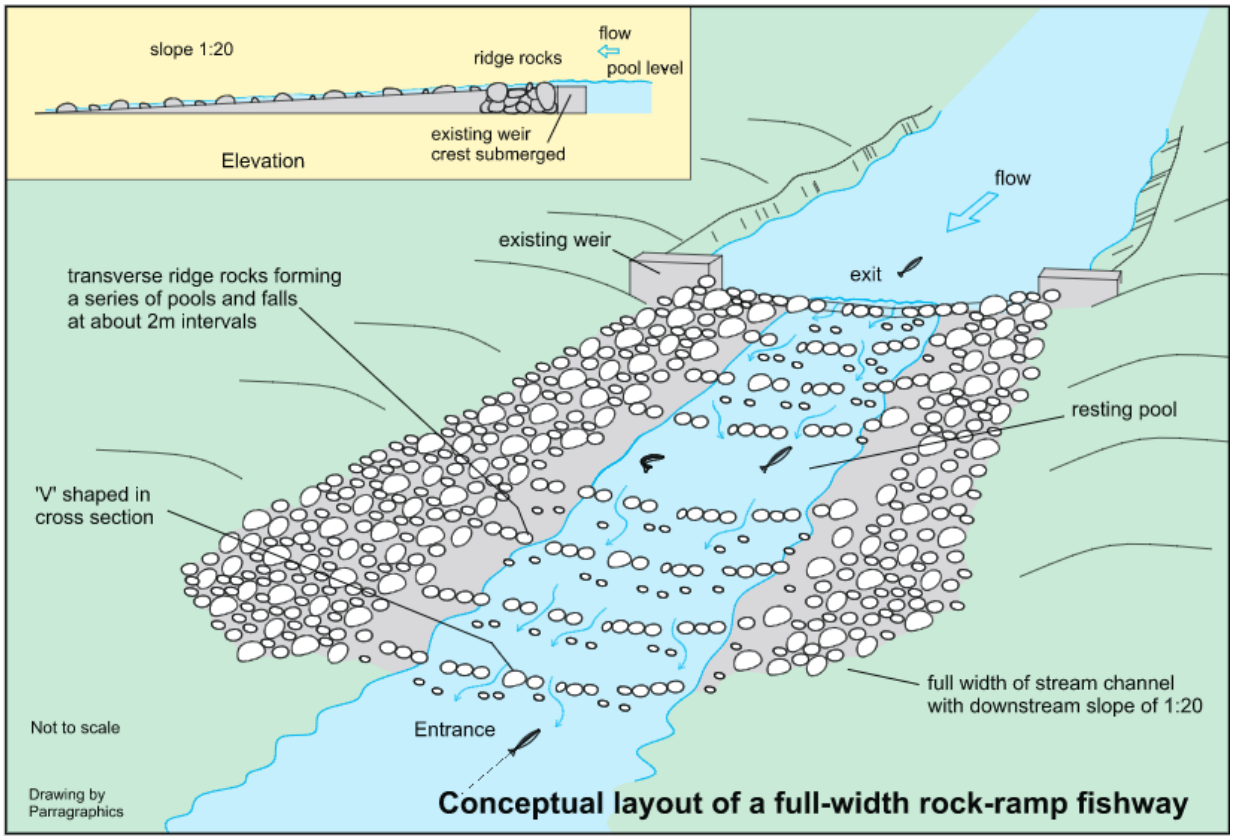


Figure 9. Conceptual depiction of full-width rock ramp for fish passage (Thorncraft and Harris, 2000).

4.2.2 Geomorphic Assessment

Channel/impoundment changes for the partial dam removal would be similar to those for full dam removal. However, the width of the channel through the downtown area of the impoundment would be wider, ~375 ft rather than ~280 ft. The newly exposed park space adjacent to Hanson Park would be smaller. The main channel and floodplain through the upper impoundment would also be wider, 240-280 ft channel width, and deeper, with ~240-260 ft total floodplain width.

A considerable, though lesser, area (approximately 15 fewer acres) in the upper impoundment would be exposed and available for habitat, recreational, or other use. The existing wetland/backwater area just upstream of the north side of the M-89 bridge would remain a wetland area, as in the full dam removal scenario. This configuration would also allow for park space along the downtown boardwalk, sloping down to the restored channel, with fill used to stabilize the sheetpile walls along this section. Structural analysis of the sheetpiling would be needed for this alternative. Below Second Street the channel is somewhat constrained and would retain its general path through to the main spillway site, with the exception of no longer connecting to the millrace. Downstream of the dam site, channel geometry would not be expected to change significantly as downstream flows/ water surface elevations would remain largely unchanged.

As with the full dam removal the proposed channel restoration would incorporate a natural channel design approach. Bedform diversity and woody debris would be incorporated for habitat purposes and bed stability. Some excavation of the channel bed would be needed, but due to the higher elevation at the dam and the shallower gradient, the channel would not reach down to pre-dam alluvium. Once contaminated sediment removal plans are in place, we can then design a channel profile and plan to be in a state of quasi-equilibrium based on current bed material supply and hydrology.

4.2.3 Fish Passage and Habitat Assessment

Habitat changes would be similar to those with the full dam removal alternative. Considerable running-water habitat would be created in the upper impoundment, and opportunities would exist to incorporate natural channel treatments along some portions of the banks in the downtown impoundment area. Fish passage would be provided via a full-channel width rock ramp. By mimicking natural channel design and using boulders to create resting pools and velocity gradients, many targeted species should be able to achieve passage over the remaining dam. How effective a fish passage is depends on the design, flows, site conditions, and species involved. Effectiveness and passage in any given year also depends on flow and site conditions aligning with spawning run times and preferences. More detailed analysis and coordination with the MDNR would be required for this alternative.

Coarse estimates of channel velocities show a range of velocities along the length of the channel, as well as across channel cross-sections throughout the project area. Velocities range from 0.25 ft/s to 3.44 ft/s under bankfull flow conditions. Higher velocities correspond to the narrower/more channelized sections of the river. Over the rock ramp velocities range from 1.0 ft/s – 3.0 ft/s. High velocities can be mitigated by providing boulders, woody debris, and bedforms to create velocity gradients and low velocity areas.

4.2.4 Sediment Assessment

As with full dam removal a significant amount of earthwork and sediment management/disposal would be involved in this alternative. More stringent management/containment measures may be required in those areas where sediments would be exposed to potential contact with the public, such as in newly established recreation areas. However, future liability and exposure risk to the city would both be reduced under this alternative, although not as much as under full removal. Contaminated sediment remediation would be guided by EGLE, EPA Superfund planning

Once remediation plans are made and carried out by EGLE/EPA Superfind, the City would then inherit the remaining sediment condition. If the decision is made to keep a partial dam in place, the City would be responsible for maintaining and replacing that structure indefinitely, as it acts as a containment structure preventing downstream movement of contaminated sediments, or be responsible for remediating the remaining contamination in the future. In addition, the dam would continue to accumulate some sediments behind it, causing the impoundment to become shallower and weedier over time. If the decision is made to alter the impoundment for recreational use (i.e. dredging) or redevelopment (i.e. addition of green space), or to remove the dam in the future, the City would then be responsible for properly remediating contamination associated with those activities.

Considering a single thread main channel and floodplain equivalent to one bankfull width, sediment removal for the channel and floodplain would be approximately 161,000 cubic yards for this alternative.

4.2.5 Goals Assessment

By partially removing the dam, a higher water surface elevation and larger impoundment can be maintained in the downtown waterfront area than with a full dam removal. At the same time, new recreational, trail, and habitat areas can be incorporated along the millrace, Hanson Park and riverfront area, and the upper impoundment. The 2nd Street bridge is a clear span bridge, with abutments outside of the current channel, but within the floodplain. Investigation of the foundation and more detailed hydraulic and scour analyses would also need to be done to ensure no detrimental effects to the 2nd Street bridge supports.

Some shift from slack-water to running-water habitat would be expected in the project area, with accompanying boost in habitat value for running-water game-fish and other aquatic/riverine species. Fish passage would be provided by a full-channel width, natural-type rock ramp, however, fish passage would be less efficient than with a full dam removal – which would be more likely to allow passage for all native species. Boater accessibility and safety through the rock ramp would need to be addressed, however, boater access would be improved by providing passage through the rock ramp, over the dam. As such, partial dam removal would have a middle range value for fish passage and fishery recreation/economic enhancement. A smaller area of land would be exposed for trails, habitat, and recreation than with a full removal. Running-water habitat would also be less. The remaining dam sill would contain/accumulate some amount of sediment and the channel/impoundment would likely become shallower and slower over time.

Safety concerns would be addressed by filling-in and demolishing the powerhouse and removing the above-surface portions of the main spillway, making catwalk replacement and gate maintenance unnecessary. Dam operation/maintenance costs would be reduced or eliminated, though some maintenance and debris removal of the remaining dam sill and rock ramp would be required. The City would need to maintain and possibly replace the remaining dam in time, as it acts as a contaminated sediment containment structure. The millrace could be filled and used for park space, or potentially converted to a wetland complex.

Considerable earthwork and sediment removal/management would be required. The channel and floodplain dimensions would be wider. Sediment would not be removed down to pre-dam alluvium, and a greater extent of slope and channel stability measures would be needed. Water quality would be expected to improve, along with aquatic ecosystem health with the removal of contaminated sediments from the restored channel and floodplain. However, contaminant removal and ecosystem improvement would be less than under a full dam removal. As with the full dam removal, considerable aesthetic changes would occur in the downtown area and upper impoundment.

4.3 Dam Rehabilitation or Modification

The dam rehabilitation or modification alternative would keep the dam in place and modify the existing structure to reduce maintenance costs and reduce risk of failure (See Figure 10). There would be no changes to the river level or physical configuration and the river would look the same from the renovated river front area. Contaminated sediments would be capped or otherwise managed in accordance with Superfund remediation plans. Fish passage would be provided via a fish ladder on the northern bank.

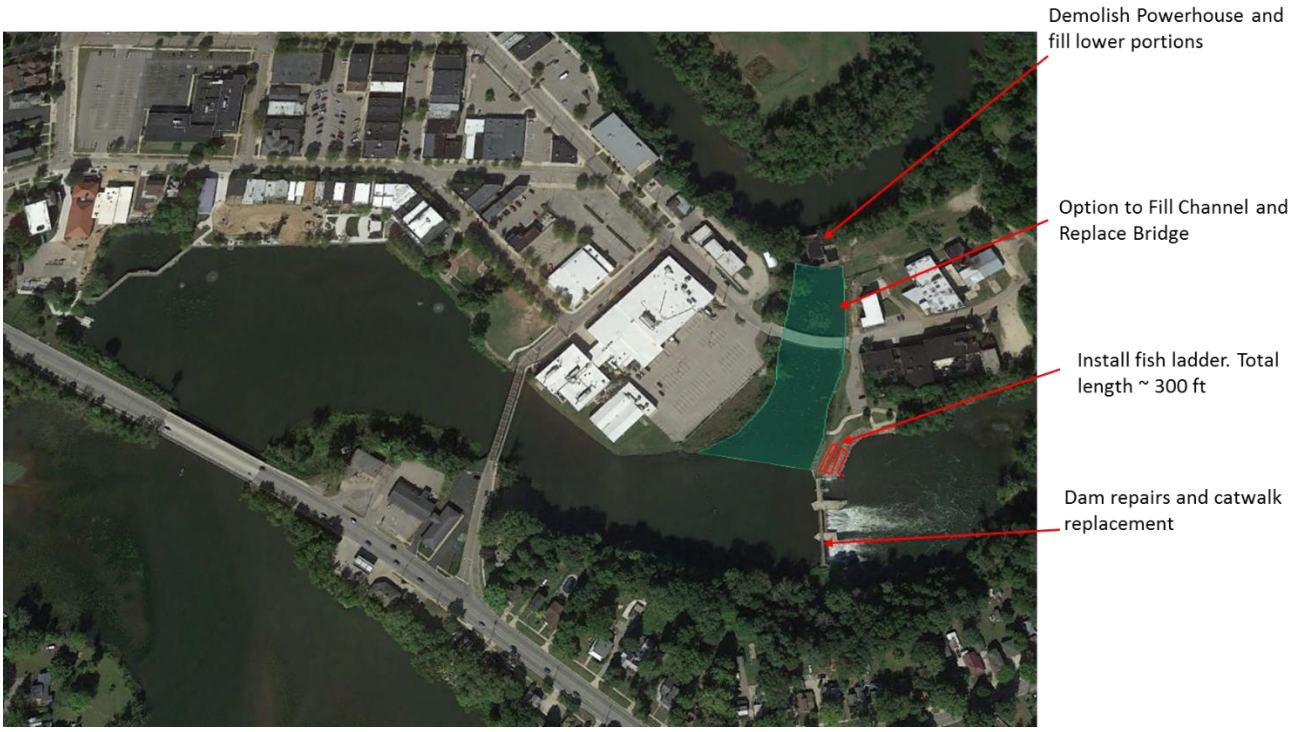


Figure 10. Site Overview for Dam Repair/Maintenance Alternative.

4.3.1 Recommended Repairs/Modifications

The Michigan Department of Environmental Quality (MDEQ), Water Resources Division, Hydrologic Studies and Dam Safety Unit, released a Dam Safety Inspection Report for the Allegan City Dam on December 10, 2017 (MDEQ, 2017). The report summarizes the results of an inspection performed on September 19, 2017.

The report recommends repair or replacement of the existing catwalk which spans across Spillway Bay #1 and Spillway Bay #2. Currently, this catwalk is considered unsafe and access is prevented.

A report by Lawson-Fisher Associates (LFA), dated June 30, 2017, makes the same recommendation (LFA, 2017). In addition, LFA noted minor repairs to concrete abutments are required, and a steel guardrail should be installed on the stop log access catwalk which spans across Spillway #2.

A set of plans developed by LFA, dated July, 2001, shows proposed improvements to Spillway #1 and Spillway #2. These improvements allow for the installation and removal of stop gates at the two spillways. The improvements were completed for Spillway #2 (the aforementioned stop log access catwalk was part of these improvements), but not for Spillway #1.

Instead of replacing the existing catwalk across the two spillways, AECOM recommends implementing the improvements designed by LFA at Spillway #1, with the exception of providing a guardrail on both sides of the catwalk, instead of one as shown on the LFA plans. We further recommend a second guardrail be installed on the stop log access catwalk which spans across Spillway #2. Adding a catwalk across Spillway #1 will allow for the removal of the existing catwalk which is currently inaccessible. We do not recommend replacing this catwalk. Another advantage to installing a catwalk across Spillway #1 in accordance with the LFA plans is that it will allow for the installation and removal of stop gates at that spillway.

We estimate the cost of constructing these improvements will be approximately $50,000. This cost does not include the cost for constructing additional stop gates, nor does it include any engineering fees which may be required.

The 2017 dam inspection report also notes the need to repair, replace, or remove the abandoned powerhouse. A February 3, 2016 Powerhouse Removal Study performed by LFA provided several removal options and cost estimates. Similar to AECOM's recommendation, one option in the report was to keep the existing foundations of both powerhouse sections, remove the upper structure, and fill the entire lower area with cement-based material (LFA, 2016). We concur that this option would be the most cost-effective way to address the safety concerns at the powerhouse and to provide a long-term solution to preventing failure/release of impounded water and sediment through the millrace. Additionally, we would propose construction of a stable earthen slope on the downstream side of the powerhouse to provide a natural aesthetic. Filling the remainder of the millrace and replacing the bridge with on-grade roadway also reduces the risk of a cut-off channel forming through the millrace at high flows. A cut-off channel would breach into the downstream river and potentially release contaminated sediment, while flooding the adjacent low-lying areas of the mill district.

Another alternative could include removing all of the components of the powerhouse and substructure and replacing it with an earthen dam. This would be significantly more expensive and poses significant constructability issues with managing surface and ground water. If this option were pursued, additional geotechnical investigation would be required to determine need for foundation improvements and seepage mitigation. While cost-effectiveness is a concern, other goals and values such as recreational, aesthetic, and ecological concerns could also be incorporated into other alternatives for stabilization and restoration of this area, such as trails, landscaping, and/or an overlook above the river.

4.3.2 Hydrologic and Hydraulic Analyses

No significant changes would be made to the structure or height of the dam. No changes in hydraulics would be expected with the dam repair/maintenance alternative. Water surface elevations throughout the impoundment and downtown area would remain the same, as would downstream flows and tailwater elevations. A portion of the flow would be diverted through the fish passage. Upstream flooding issues would be expected to remain the same.

4.3.3 Geomorphic Assessment

No significant changes to geomorphology would be incorporated in this alternative. The appearance and water levels through the downtown area and upper impoundments would remain as existing. Filling in the powerhouse would provide a permanent barrier to flow through the millrace.

4.3.4 Fish Passage and Habitat Analysis

With the dam remaining in place, provisions would need to be made for fish passage around the dam. A rock ramp up to one of the bays of the dam was considered. However, space is limited below the dam by channel bathymetry, sinuousity, and the presence of downstream islands. In addition, the dam embankment already overtops at the 200-yr design flow, while operating at maximum capacity. Passage would need to be provided without reducing spillway capacity. A fish-ladder on the northern embankment is proposed to allow provisional fish passage around the dam.

Fish ladders in Michigan are observed to pass many species including: coho salmon, chinook salmon, steelhead, suckers, brook trout, brown trout, channel catfish, smallmouth bass, carp, and walleye. Fish with lesser swimming/jumping capabilities such as sturgeon and logperch would be unlikely to pass through the fish ladder. How effective a fish passage is depends on the design, flows, site conditions, and species involved. More detailed analysis and coordination with the MDNR would be required for this alternative.

With the dam and impoundment in place, habitat would remain unchanged as slack-water habitat. While connectivity to restored upper reaches would be provided, habitat value within the project area would not be enhanced, and the impoundment would have limited value for running-water game fish.

4.3.5 Sediment Assessment

No immediate dredging/ channel modification or restoration work would be included for the dam repair/maintenance option. Long-term sediment management would be required, as at all dams, which retain sediment. Contaminated sediment remediation would be guided by EGLE, EPA Superfund planning. Sediment in the impoundment will likely be considered to be capped if it is buried under clean sediment, so very little of the impoundment may be remediated. In addition, the dam would continue to accumulate sediments behind it, causing the impoundment to become shallower and weedier over time. The City would be responsible for maintaining and replacing the dam indefinitely, as it acts as a containment structure preventing downstream movement of contaminated sediments. If the decision is made to alter the impoundment for recreational use (i.e. dredging) or redevelopment (i.e. addition of green space), or to remove the dam in the future, the City would then be responsible for properly remediating contamination associated with those activities.

4.3.6 Goals Assessment

The dam repair/maintenance option would address the safety concerns at the dam by filling the abandoned powerhouse lower portions and removing the upper portions, and addressing the decaying catwalk and limited access to the right embankment. Upstream flood levels would not be mitigated.

A fish ladder/weir on the left embankment would provide passage to some, though not all, species of fish between Lake Allegan and the restored reaches above Allegan where three dams have recently been removed. If fish passage were provided at Calkins Dam, then provisional connectivity would be restored all the way to Lake Michigan. Since the impoundment would remain unchanged, and no channel/running-water habitat would be restored in the project area, this alternative would provide the smallest benefit to fish populations and habitat, and associated economic and recreational opportunities. The fish ladder could act as a local point of interest during spawning runs, however, it's location on the left bank may further inconvenience portaging for boaters.

This alternative would not enhance boater accessibility or passage around/over the dam. No additional park/recreational areas or trails would be created.

No immediate sediment removal/management would be required, this alternative would have the lowest sediment management cost. Sediment management and remediation would be determined by EPA Superfund, state, and city coordination.

Ongoing maintenance costs and liability concerns with the main spillway of the dam and impounded sediments would remain.

5. Cost Estimates

Conceptual cost estimates were developed for each of the three alternatives based on the available data and proposed channel and floodplain geometry. These early estimates have an expected accuracy range of -30% to +50%. This level of contingency is common at this conceptual evaluation stage. These conceptual costs include estimates for permitting, design engineering, and construction management and oversight. However, these costs are only estimated as a percent of the total construction cost.

The operation and maintenance costs over a 100 year life cycle were also estimated for each alternative. These are provided in the table both in total dollars and converted to net present value for comparison (with 3% interest rate). The dam maintenance and partial dam removal alternatives include the cost of complete replacement of the dam, or remaining dam structure, in the estimates. Often complete

replacement is not necessary, but rather ongoing maintenance and periodic rehabilitation of portions of the structure or appurtenances. However, as the dam would act as a contaminated sediment containment structure indefinitely, complete replacement costs were included as a conservative estimate of what could be needed in the long-term. Table 3 below summarizes the conceptual cost estimates for each alternative discussed in the report above.

Cost estimates are also shown with the sediment management cost removed, as this cost would mainly or entirely fall to Superfund/EGLE and not to the City. Operation and maintenance costs and net present value calculations do not include sediment management, these represent costs expected to fall to the City. Potential grant funding is not taken into account in these estimates.

Detailed conceptual cost estimates are provided in Appendix B. Renderings of conceptual design alternatives, along with detailed cost estimates for park space improvements can be found in Appendix A.

Table 3. Conceptual Cost Estimates.

Estimated Construction Cost	Dam Repair	Partial Removal	Full Removal
Spillway Modifications	$ 1,035,372.35		
Powerhouse Demolition and Head Race Fill	$ 1,028,397.41	$ 1,028,397.41	$ 1,028,397.41
Partial Dam Removal		$ 3,069,852.22	
Full Dam Removal			$ 1,506,103.56
Channel Restoration		$ 3,436,304.40	$ 3,048,090.00
Sediment Management		$ 10,222,000.00	$ 19,107,000.00
Contingencies	$ 1,238,261.85	$ 11,272,412.42	$ 14,813,754.58
Estimated Park Development Cost	$ 256,920.00	$ 1,030,800.00	$ 2,512,200.00
Total Cost with Contingencies	**$ 3,713,103.61**	**$ 30,059,766.45**	**$ 43,522,865.54**
Total Cost without Sediment Mgmt Cost	**$ 3,713,103.61**	**$ 13,704,566.45**	**$ 12,951,665.54**
Total O&M Cost Over 100-yrs	$ 28,925,991.64	$ 5,463,516.37	$ 315,187.50
Net Present Value O&M Cost (100-yr)	$ 6,906,534.31	$ 1,407,235.42	$ 288,693.29
Net Present Value Construction and O&M	**$ 10,310,328.08**	**$ 14,671,652.30**	**$ 12,854,717.31**

	Dam Repair would not be supported by MDNR and associated grants	Partial Removal would not be supported by MDNR and associated grants	Full Removal Costs will be eligible for grant funding from MDNR and other state and federal grant programs, lowering the actual cost to the City
Estimated Cost to the City	**Dam Repair**	**Partial Removal**	**Full Removal**
Spillway Modifications	$ 1,035,372.35		
Powerhouse Demolition and Head Race Fill	$ 1,028,397.41	$ 1,028,397.41	$ 1,028,397.41
Partial Dam Removal		$ 3,069,852.22	
Full Dam Removal			$ 1,506,103.56
Estimated Park Development Cost	$ 256,920.00	$ 1,030,800.00	$ 2,512,200.00
Contingencies, Permitting, Engineering, Admin	$ 1,392,413.85	$ 3,077,429.78	$ 3,028,020.58
Total Cost with Contingencies	**$ 3,713,103.61**	**$ 8,206,479.41**	**$ 8,074,721.54**
Total O&M Cost Over 100-yrs	**$ 28,925,991.64**	**$ 5,463,516.37**	**$ 315,187.50**
Total Construction and O&M Cost over 100-yrs	**$ 32,639,095.25**	**$ 13,669,995.78**	**$ 8,389,909.04**

6. Goals Matrix

A brief summary of the project goals/concerns and how they are met for each of the three alternatives is presented in

Table 4 below. Categories are color-coded as follows: red: no change or negative impact; yellow: some improvement; green: most improvement.

Table 4. Matrix of Project Goals and Alternatives

	Dam Repair and Maintenance	Partial Dam Removal	Full Dam Removal
Dam Safety	Safety addressed, but long-term risks remain	Long-term risk significantly reduced, but sediment containment and dam risks remain	Dam removed, no long term maintenance or liability
Flood Management	Flood issues upstream and erosion issue downstream remain unchanged	Flood levels upstream are lowered	Flood levels upstream are lowered, sediment transport can occur downstream to alleviate some erosion
Maintenance Cost	Dam costs remain, additional cost to implement fish ladder	Some work to maintain rock ramp, boat passage,	No dam or fish passage maintenance costs
Improved Recreation Opportunities	Least change to current condition	Increased boat passage , habitat, open space	Largest increase in boater access, habitat, and open space
Improved Fish Passage	Fish ladder provides passage to some fish	Rock ramp provides passage to numerous fish species	Restored channel approaches natural conditions, provides best conditions for passage for greatest number of species
Improved Fish Habitat	No change from current condition	Some increase in running-water habitat	Significant increase in running-water habitat
Contaminated Sediment Mgmt	Sediment likely to be capped in place, lesser amount removed, becomes responsibility of the City	Medium amount of sediment to manage/dispose of, however, it is removed from project site/ecosystem	Largest amount of sediment to manage/dispose of, however, it is removed from project site/ecosystem
Construction Cost Estimate	$3,302,031.61	$28,410,486.45	$39,503,345.54
Construction Cost without Sediment Remediation Cost	$3,302,031.61	$12,055,286.45	$8,932,145.54
Long Term Operation and Maintance Cost Estimates	$3,492,441.51	$748,633.51	$288,693.29
Potential Funding	MDNR/EGLE/NRD will not assist with cost of repairs/maintenance for existing structure. Fish ladder assistance from MDNR is also uncertain. Sediment capping/remediation would be carried out by EGLE/EPA.	May be able to find grants to support some portions of the partial removal, such as the rock ramp for fish passage. Sediment remediation would be carried out by EGLE/EPA.	Full removal will have the most opportunity for obtaining grants. MDNR would likely assist with full removal and restoration of fish passage and habitat. Sediment remediation would be carried out by EGLE/EPA. The City would potentially bear the lowest cost responsibility under this
Permitting	This alternative would involve addressing known concerns with the dam and powerhouse and continuing to operate/inspect the existing spillway.	The rock ramp would be a new structure and therefore would likely have the greatest permitting effort/challenges.	Considerable permitting effort would be required for erosion control, structure removal, flow management, and changes to the channel. However, the state stakeholder departments would have the greatest support for the dam removal alternative.
Ecological Benefit	No ecological benefit seen from this alternative beyond Superfund basic remediation/capping of sediments.	Some ecological benefit from increased running-water habitat, increased fish passage, sediment capping and soil remediation, which would benefit ecosystem health.	Greatest ecological benefit. Natural flow and sediment transport. Return to pre-dam condition as well as practicable, passage for most native fish and other aquatic organisms, return to running-water habitat throughout project area, potential for restored native mussel habitat, greatest sediment removal and soil remediation, greatest benefit to ecosystem health from contaminant remediation/removal.

7. References

FEMA. 2018. Superfund Site: Allied Paper, Inc/Portage Creek/Kalamazoo River, Kalamazoo, MI. Available online at http://www.epa.gov/superfund/allied-paper-kalamazoo

FEMA, 1989. Flood Insurance Study – City of Allegan, Michigan, Allegan County. Community No. 260003. Federal Emergency Management Agency. May 4, 1989.

LFA, 2017. Existing Powerhouse and Catwalk Inspection. Lawson-Fisher Associates P.C. Project File No. 201735.00. June 30, 217.

LFA, 2016. Powerhouse Removal Study. Lawson-Fisher Associates P.C. Project File No. 201583.00. February 3, 2016.

MDEQ, 2017. DAM SAFETY INSPECTION REPORT ALLEGAN CITY DAM – DAM ID NO. 489 KALAMAZOO RIVER, ALLEGAN COUNTY SE ¼ SECTION 28, T2N, R13W. Hydrologic Studies and Dam Safety Unit Water Resources Division. December 10, 2017.

Rachol, C.M., Fitzpatrick, F.A., and Rossi, T., 2005, Historical and simulated changes in channel characteristics of the Kalamazoo River, Plainwell to Otsego, Michigan: U.S. Geological Survey Scientific Investigations Report 2005-5044, 62 p. Available online at https://pubs.usgs.gov/sir/2005/5044/pdf/SIR2005-5044.pdf

Thorncraft, G. and Harris, J.H. 2000. Fish Passage and Fishways in New South Wales—A Status Report. Cooperative Research Centre for Freshwater Ecology Canberra, Australia.

USACE, 2019. National Inventory of Dams database. United States Army Corps. Available online at https://nid-test.sec.usace.army.mil. Accessed 2/8/2019

Wesley, J.K. 2005. Kalamazoo River assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report 35, Ann Arbor.

Appendix A

Conceptual Graphics of Alternatives

Wetlands & Potential Stormwater Storage

Hillside Step Down

Hillside Water Feature

Key Overlooks

Kayak Rail Portage

Relocated Kayak Launch

Boat Launch

- Park Land
- Wetlands
- Trees & Vegetation
- Riparian Vegetation
- Pedestrian Bridges
- Boardwalks
- Overlooks
- Trails
- Existing Walks
- River

Wetlands, Trails, & Boardwalks

Pedestrian Bridge Trail Loop Connection

Fish Habitat / Wetland Fringe

Main Overlook

Bench Swings

ALLEGAN CITY DAM - FULL REMOVAL

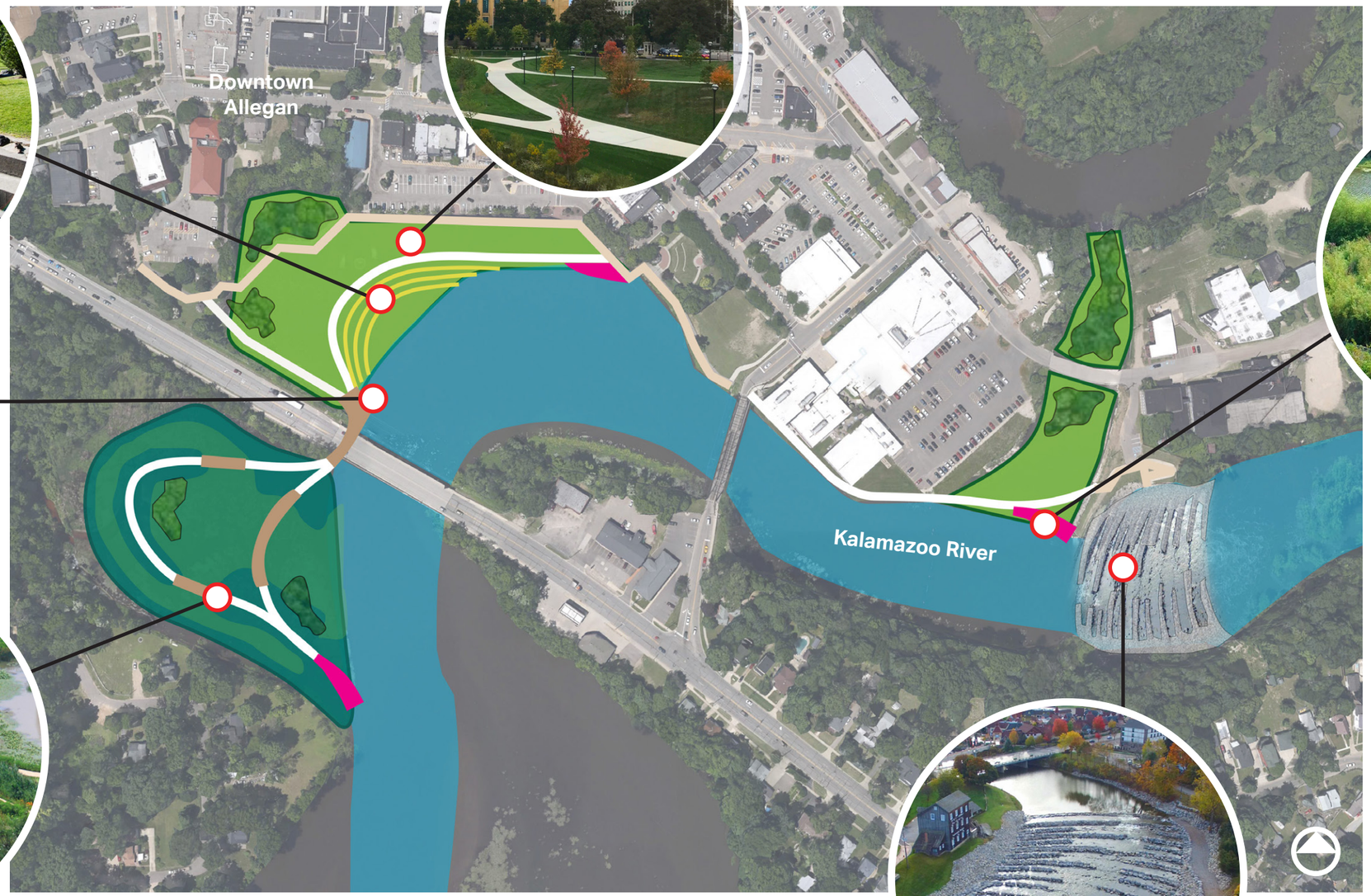
MAY 8, 2019

AECOM

Trails & Lawn Along River

Step Down to River Edge /
Water Feature Potential

Relocated Kayak Launch



Key Overlooks

Wetlands, Trails, &
Boardwalks

Full Width Rock
Ramp Fishway

- Park Land
- Wetlands
- Trees & Vegetation
- Boardwalks
- Overlooks
- Trails
- Existing Walks
- River

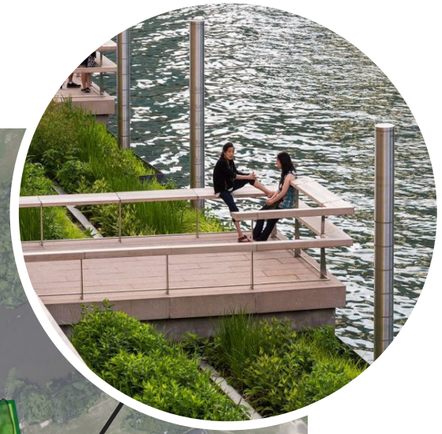
ALLEGAN CITY DAM - PARTIAL REMOVAL

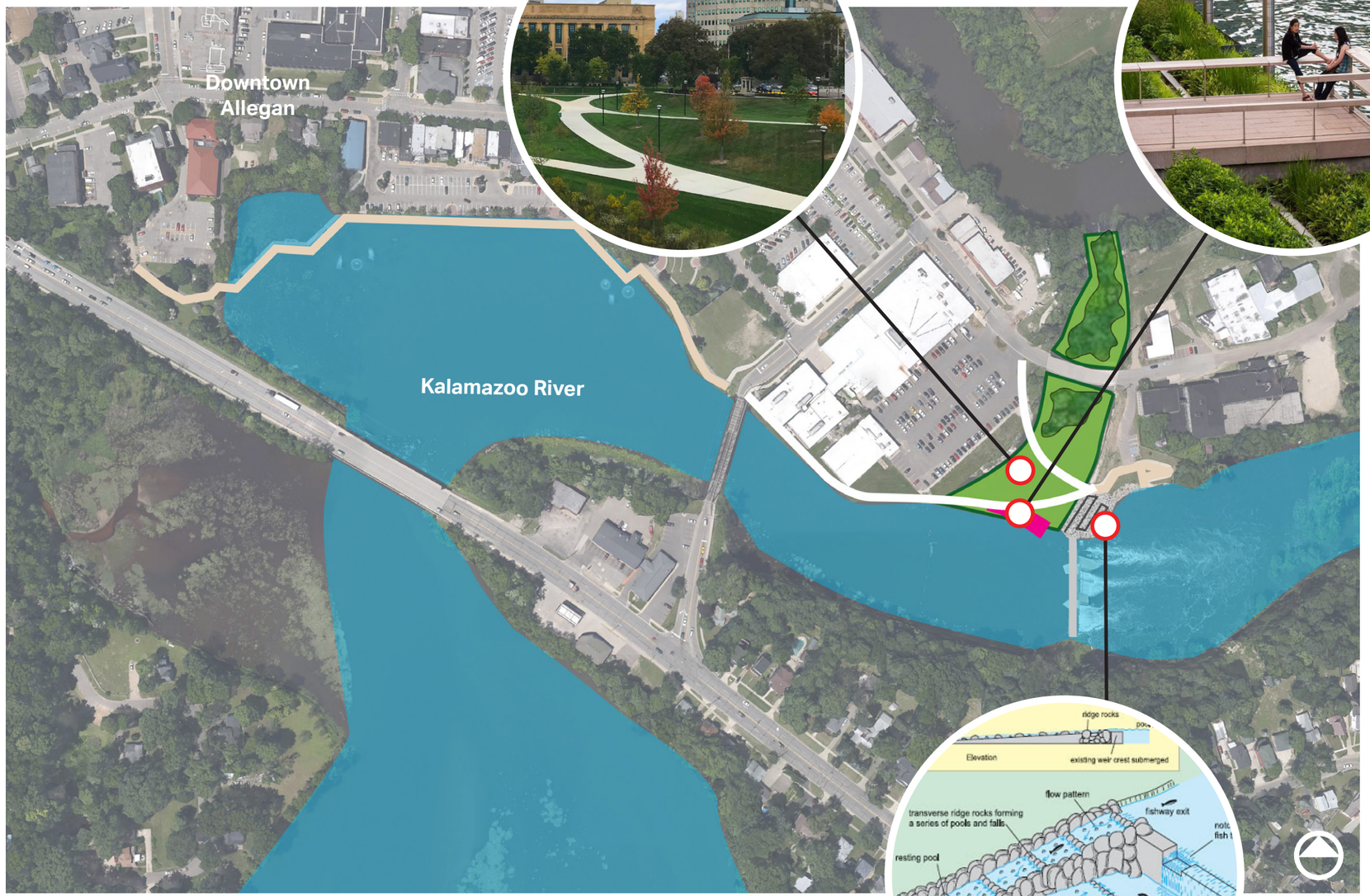
MAY 8, 2019

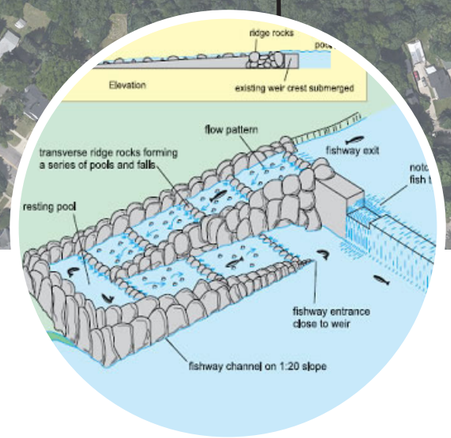
AECOM

Trails & Lawn Areas

Overlook







Fish Ladder

- Park Land
- Trees & Vegetation
- Overlooks
- Trails
- Existing Walks
- River

Appendix B

Conceptual Cost Estimates

Alternative: Full Dam Removal

Allegan City Dam Full Removal	Units	Unit Price	Quantity	Subtotal
Site Services	Lump Sum	$150,000.00	1	$ 150,000.00
Mobilization/Demobilization	Lump Sum	$400,000.00	1	$ 400,000.00
Traffic Control	Lump Sum	$15,000.00	1	$ 15,000.00
Clear Site Vegetation	Acre	$4,000.00	1	$ 4,000.00
Erosion and Pollution Control	Acre	$15,000.00	1	$ 15,000.00
Temporary Access Road	Lump Sum	$60,000.00	1	$ 60,000.00
Vibration Monitoring	Lump Sum	$10,000.00	1	$ 10,000.00
Flow Diversion/Mgmt	Lump Sum	$100,000.00	1	$ 100,000.00
Steel Sheet Piling	Square Foot	$20.00	2550	$ 51,000.00
North Embankment Concrete Wall Removal	CYD	$100.00	167	$ 16,666.67
South Embankment Concrete Wall Removal	CYD	$100.00	119	$ 11,851.85
Transportation and Disposal of Concrete Debris	TN	$15.00	7903	$ 118,548.00
Spillway Pier 1	CYD	$100.00	733	$ 73,333.33
Spillway Pier 2	CYD	$100.00	1304	$ 130,370.37
Spillway Pier 3	CYD	$100.00	122	$ 12,222.22
Dam Sill	CYD	$100.00	1111	$ 111,111.11
RipRap Armoring - North Side	CYD	$100.00	433	$ 43,333.33
RipRap Armoring - South Side	CYD	$100.00	217	$ 21,666.67
Operator Building Removal	LSUM	$25,000.00	1	$ 25,000.00
Catwalk Removal	LSUM	$25,000.00	1	$ 25,000.00
Gate Removal	LSUM	$75,000.00	1	$ 75,000.00
StopLog Removal	LSUM	$25,000.00	1	$ 25,000.00
Concrete Apron Removal	SYD	$30.00	400	$ 12,000.00
Estimated Construction Cost				$ 1,506,103.56

Demolition and Fill of Powerhouse Structures	Units	Unit Price	Quantity	Subtotal
Traffic Control	Lump Sum	$5,000.00	1	$ 5,000.00
Clear Site Vegetation	Acre	$4,000.00	0.5	$ 2,000.00
Erosion and Pollution Control	Lump Sum	$20,000.00	1	$ 20,000.00
Vibration Monitoring	Lump Sum	$10,000.00	1	$ 10,000.00
As-Built Topographic Survey	Lump Sum	$3,500.00	1	$ 3,500.00
Restoration of Original Site Conditions	Lump Sum	$10,000.00	1	$ 10,000.00
Project Close Out	Lump Sum	$10,000.00	1	$ 10,000.00
Hazardous Materials Abatement	Lump Sum	$100,000.00	1	$ 100,000.00
Concrete Fill	CYD	$300.00	347	$ 104,000.00
Flowable Fill	CYD	$161.00	423	$ 68,037.41
Sheet Piling	SFT	$20.00	1288	$ 25,760.00
Pumping Out Powerhouse	Lump Sum	$10,000.00	1	$ 10,000.00
Removal of Abandoned Bridge	SYD	$60.00	200	$ 12,000.00
Demolition of Upper Structures	SFT	$30.00	3500	$ 105,000.00
Removal of Trash Rack	Lump Sum	$2,000.00	1	$ 2,000.00
Bridge Demolition	SFT	$33.00	4800	$ 158,400.00
Fill Mill Race	CYD	$12.00	22600	$ 271,200.00

Topsoil	Acre	$8,000.00	1.85	$ 14,800.00
Seeding	Acre	$6,000.00	1.85	$ 11,100.00
Replace Road	MILE	$2,000,000.00	0.04	$ 80,000.00
Concrete Removal	SYD	$30.00	20	$ 600.00
Miscellaneous Debris Removal	CYD	$25.00	200	$ 5,000.00
Estimated Construction Cost				$ 1,028,397.41

Kalamzoo River Channel Restoration	Units	Unit Price	Quantity	Subtotal
Sediment Management				$19,107,000
Site Mobilization	Lump Sum	$100,000.00	2	$200,000
Water Treatment Costs	per 1,000 gal	$25.00	14,200	$355,000
Capital cost for Treatment	Lump Sum	$1,000,000.00	1	$1,000,000
Annual Operating Costs	per year	$200,000.00	2	$400,000
Flood Plain Sediment Removal	CYD	$6.00	50,000	$300,000
Channel Sediment Removal and Dewatering	CYD wet	$35.00	350,000	$12,250,000
Disposal <50 ppm from channel and floodplain (dry)	CYD dry	$40.00	80,000	$3,200,000
Disposal of Non-Contaminated Materlas (dry)	CYD dry	$6.00	200,000	$1,200,000
Haul Roads	ft	$10.00	14,000	$140,000
River Crossings	each	$3,000.00	4	$12,000
Erosion Control/Sediment Traps	Lump Sum	$50,000.00	1	$50,000
Channel and Bank Stabilization				$1,523,090
Engineered Riffle	SYD	$85.00	5,200	$442,000
Scour Protection	SYD	$85.00	4,634	$393,890
Rootwad/Tree in Low Bank	LF	$300.00	1,500	$450,000
Rock Bank Protection	LF	$100.00	1,200	$120,000
Brush Mattress	LF	$9.00	800	$7,200
Soil Wrap	LF	$50.00	2,200	$110,000
Planting, Stabilization and Erosion Control				$1,525,000
Emergent Seed Mix	Acre	$7,000.00	65	$455,000
Wooded Seed Mix and Tree Plantings	Acre	$7,000.00	30	$210,000
Erosion Blanket and Live Staking	Acre	$6,000.00	20	$120,000
Live Staking	Acre	$5,000.00	4	$20,000
Topsoil	Acre	$8,000.00	90	$720,000
Estimated Construction Cost				$22,155,090
Estimated Park Development Cost				$ 2,512,200.00

Full Dam Removal Cost				$ 27,201,790.96
Contingency Cost (40%)				$ 10,880,716.39
Engineering and Permitting (10%)				$ 2,720,179.10
Construction Admin/RPR (10%)				$ 2,720,179.10
Estimated Total Project Cost				$ 43,522,865.54

Alternative: Partial Dam Removal

Allegan City Dam Partial Removal	Units	Unit Price	Quantity	Subtotal
Site Services	Lump Sum	$150,000.00	1	$ 150,000.00
Mobilization/Demobilization	Lump Sum	$400,000.00	1	$ 400,000.00
Traffic Control	Lump Sum	$15,000.00	1	$ 15,000.00
Clear Site Vegetation	Acre	$4,000.00	1	$ 4,000.00
Erosion and Pollution Control	Acre	$15,000.00	1	$ 15,000.00
Temporary Access Road	Lump Sum	$60,000.00	1	$ 60,000.00
Vibration Monitoring	Lump Sum	$10,000.00	1	$ 10,000.00
Flow Diversion/Mgmt	Lump Sum	$100,000.00	1	$ 100,000.00
Steel Sheet Piling	Square Foot	$20.00	2550	$ 51,000.00
North Embankment Concrete Wall Removal	CYD	$100.00	83	$ 8,333.33
South Embankment Concrete Wall Removal	CYD	$100.00	59	$ 5,925.93
Transportation and Disposal of Concrete Debris	TN	$15.00	2442	$ 36,630.00
Spillway Pier 1	CYD	$100.00	367	$ 36,666.67
Spillway Pier 2	CYD	$100.00	652	$ 65,185.19
Spillway Pier 3	CYD	$100.00	61	$ 6,111.11
Operator Building Removal	LSUM	$25,000.00	1	$ 25,000.00
Catwalk Removal	LSUM	$25,000.00	1	$ 25,000.00
Gate Removal	LSUM	$75,000.00	1	$ 75,000.00
StopLog Removal	LSUM	$25,000.00	1	$ 25,000.00
Rock Ramp			1	$ 1,956,000.00
Weir Boulders	EA	1200	$ 300.00	$ 360,000.00
Additional Rock/Channel Fill Materials	CYD	5200	$ 300.00	$ 1,560,000.00
In Channel Placement (Operator and Excavator)	DAY	12	$3,000.00	$ 36,000.00
Estimated Construction Cost				$ 3,069,852.22

Demolition and Fill of Powerhouse Structures	Units	Unit Price	Quantity	Subtotal
Traffic Control	Lump Sum	$5,000.00	1	$ 5,000.00
Clear Site Vegetation	Acre	$4,000.00	0.5	$ 2,000.00
Erosion and Pollution Control	Lump Sum	$20,000.00	1	$ 20,000.00
Vibration Monitoring	Lump Sum	$10,000.00	1	$ 10,000.00
As-Built Topographic Survey	Lump Sum	$3,500.00	1	$ 3,500.00
Restoration of Original Site Conditions	Lump Sum	$10,000.00	1	$ 10,000.00
Project Close Out	Lump Sum	$10,000.00	1	$ 10,000.00
Hazardous Materials Abatement	Lump Sum	$100,000.00	1	$ 100,000.00
Concrete Fill	CYD	$300.00	347	$ 104,000.00
Flowable Fill	CYD	$161.00	423	$ 68,037.41
Sheet Piling	SFT	$20.00	1288	$ 25,760.00
Pumping Out Powerhouse	Lump Sum	$10,000.00	1	$ 10,000.00
Removal of Abandoned Bridge	SYD	$60.00	200	$ 12,000.00
Demolition of Upper Structures	SFT	$30.00	3500	$ 105,000.00
Removal of Trash Rack	Lump Sum	$2,000.00	1	$ 2,000.00
Bridge Demolition	SFT	$33.00	4800	$ 158,400.00
Fill Mill Race	CYD	$12.00	22600	$ 271,200.00
Topsoil	Acre	$8,000.00	1.85	$ 14,800.00
Seeding	Acre	$6,000.00	1.85	$ 11,100.00

Replace Road	MILE	$2,000,000.00	0.04	$ 80,000.00
Concrete Removal	SYD	$30.00	20	$ 600.00
Miscellaneous Debris Removal	CYD	$25.00	200	$ 5,000.00
Estimated Construction Cost				$ 1,028,397.41

Kalamzoo River Channel Restoration	Units	Unit Price	Quantity	Subtotal
Sediment Management				$10,222,000
Site Mobilization	Lump Sum	$100,000	2	$200,000
Water Treatment Costs	per 1,000 gal	$25	7,000	$175,000
Capital cost for Treatment	Lump Sum	$1,000,000	1	$1,000,000
Annual Operating Costs	per year	$200,000	2	$400,000
Flood Plain Sediment Removal	CYD	$6	25,000	$150,000
Channel Sediment Removal and Dewatering	CYD wet	$35	170,000	$5,950,000
Disposal <50 ppm from channel and floodplain (dry)	CYD dry	$40	39,000	$1,560,000
Disposal of Non-Contaminated Materlas (dry)	CYD dry	$6	97,500	$585,000
Haul Roads	ft	$10	14,000	$140,000
River Crossings	each	$3,000	4	$12,000
Erosion Control/Sediment Traps	Lump Sum	$ 50,000.00	1	$50,000
Channel and Bank Stabilization				$2,338,304
Engineered Riffle	SYD	$85	8,000	$680,000
Scour Protection	SYD	$85	4,634	$393,890
Rootwad/Tree in Low Bank	LF	$300	3,000	$900,000
Rock Bank Protection	LF	$100	2,000	$200,000
Brush Mattress	LF	$9	1,602	$14,414
Soil Wrap	LF	$50	3,000	$150,000
Planting, Stabilization and Erosion Control				$1,098,000
Emergent Seed Mix	Acre	$7,000	45	$315,000
Wooded Seed Mix and Tree Plantings	Acre	$7,000	25	$175,000
Erosion Blanket and Live Staking	Acre	$6,000	18	$108,000
Live Staking	Acre	$5,000	4	$20,000
Topsoil	Acre	$8,000	60	$480,000
Estimated Construction Cost				$13,658,304

Estimated Park Development Cost				$ 1,030,800.00

Estimated Construction Cost				$ 18,787,354.03
Contingency Cost (40%)				$ 7,514,941.61
Engineering and Permitting (10%)				$ 1,878,735.40
Construction Admin/RPR (10%)				$ 1,878,735.40
Estimated Total Project Cost				$ 30,059,766.45

Alternative: Maintain Dam

Demolition and Fill of Powerhouse Structures	Units	Unit Price	Quantity	Subtotal
Traffic Control	Lump Sum	$5,000.00	1	$ 5,000.00
Clear Site Vegetation	Acre	$4,000.00	0.5	$ 2,000.00
Erosion and Pollution Control	Lump Sum	$20,000.00	1	$ 20,000.00
Vibration Monitoring	Lump Sum	$10,000.00	1	$ 10,000.00
As-Built Topographic Survey	Lump Sum	$3,500.00	1	$ 3,500.00
Restoration of Original Site Conditions	Lump Sum	$10,000.00	1	$ 10,000.00
Project Close Out	Lump Sum	$10,000.00	1	$ 10,000.00
Hazardous Materials Abatement	Lump Sum	$100,000.00	1	$ 100,000.00
Concrete Fill	CYD	$300.00	347	$ 104,000.00
Flowable Fill	CYD	$161.00	423	$ 68,037.41
Sheet Piling	SFT	$20.00	1288	$ 25,760.00
Pumping Out Powerhouse	Lump Sum	$10,000.00	1	$ 10,000.00
Removal of Abandoned Bridge	SYD	$60.00	200	$ 12,000.00
Demolition of Upper Structures	SFT	$30.00	3500	$ 105,000.00
Removal of Trash Rack	Lump Sum	$2,000.00	1	$ 2,000.00
Bridge Demolition	SFT	$33.00	4800	$ 158,400.00
Fill Mill Race	CYD	$12.00	22600	$ 271,200.00
Topsoil	Acre	$8,000.00	1.85	$ 14,800.00
Seeding	Acre	$6,000.00	1.85	$ 11,100.00
Replace Road	MILE	$2,000,000.00	0.04	$ 80,000.00
Concrete Removal	SYD	$30.00	20	$ 600.00
Miscellaneous Debris Removal	CYD	$25.00	200	$ 5,000.00
Estimated Construction Cost				$ 1,028,397.41

Main Spillway Modifications and Fish Passage	Units	Unit Price	Quantity	Subtotal
Site Services	Lump Sum	$150,000.00	1	$ 150,000.00
Mobilization/Demobilization	Lump Sum	$50,000.00	1	$ 50,000.00
Concrete Cylinders	EA	$166.00	3	$ 498.00
Weld Inspector	DAY	$580.00	1	$ 580.00
Job Trailer	MO	$873.00	1	$ 873.00
Crane Crew	DAY	$1,475.00	1	$ 1,475.00
Concrete Patching	SF	$43.00	2	$ 86.00
Remove Steel Trusses at Walkways	EA	$125.00	4	$ 500.00
Field Welding	LF	$11.75	83	$ 975.25
L 2 X 2 X 1/4	LF	$28.00	106	$ 2,968.00
L 3 X 3 X 3/8	LF	$46.00	41	$ 1,886.00
C6 X 8.2	LF	$48.50	53	$ 2,570.50
3/8" Plate	SF	$22.00	14	$ 308.00
S6X12.5 Vertical Extensions	LF	$35.50	119	$ 4,224.50
S8 X 18.4 Trolley Rail	LF	$45.00	53	$ 2,385.00
Steel Guardrails	LF	$65.40	159	$ 10,398.60
2" FRP Grating	SF	$35.50	159	$ 5,644.50
Fishladder	VF	$80,000.00	10	$ 800,000.00
Estimated Construction Cost				$ 1,035,372.35

Estimated Park Development Cost				$ 256,920.00

Estimated Construction Cost				$ 2,320,689.76
Contingency Cost (40%)				$ 928,275.90
Engineering and Permitting (10%)				$ 232,068.98
Construction Admin/RPR (10%)				$ 232,068.98
Estimated Total Project Cost				$ 3,713,103.61

					Date	16-May-19
Conceptual Cost of Construction						
PROJECT: Allegan Dam Full Removal						
Park Development						
		Allegan, Michigan				
		ESTIMATOR		TE		
Construction Costs						
	QUANTITY		LABOR & MATERIAL			
	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL		TOTAL COST
Mobilization, 5% Const Cost	1	LS	$100,000	100,000		$100,000
Construction Sign	2	LS	$1,000	2,000		$2,000
Erosion and Sediment Control	1	LS	$15,000	15,000		$15,000
Excavation/Grading	11000	CY	$25	275,000		$275,000
Stepped Edge Stone Blocks	120	EA	$1,200	144,000		$144,000
Relocated Kayak Launch	1	LS	$5,000	5,000		$5,000
Fountain Relocation	3	EA	$5,000	15,000		$15,000
Conc Walks	2400	SY	$25	60,000		$60,000
Boardwalk Overlook	600	LF	$800	480,000		$480,000
Ped Bridge	300	LF	$1,200	360,000		$360,000
Spriral Ramp to 2nd St Bridge	1	LS	$400,000	400,000		$400,000
Topsoil Import	1200	CY	$25	30,000		$30,000
Seeding and Mulching	30000	SY	$3	90,000		$90,000
Trees, 2" cal.	90	EA	$600	54,000		$54,000
Ornamental Trees	35	EA	$400	14,000		$14,000
Perennials	600	EA	$45	27,000		$27,000
Aqutic Plantings	300	EA	$75	22,500		$22,500
Subtotal						**$2,093,500**
Contingency, 20%						**$418,700**
Construction TOTAL						**$2,512,200**

					Date	16-May-19
Conceptual Cost of Construction						
PROJECT: Allegan Dam Partial Removal						
Park Development						
		Allegan, Michigan				
		ESTIMATOR		TE		
Construction Costs						
	QUANTITY		LABOR & MATERIAL			
	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL		TOTAL COST
Mobilization, 5% Const Cost	1	LS	$100,000	100,000		$100,000
Construction Sign	2	LS	$1,000	2,000		$2,000
Erosion and Sediment Control	1	LS	$15,000	15,000		$15,000
Excavation/Grading	7000	CY	$25	175,000		$175,000
Stepped Edge Stone Blocks	120	EA	$1,200	144,000		$144,000
Relocated Kayak Launch	1	LS	$5,000	5,000		$5,000
Fountain Relocation	3	EA	$5,000	15,000		$15,000
Conc Walks	1720	SY	$25	43,000		$43,000
Boardwalk Overlook	200	LF	$800	160,000		$160,000
Topsoil Import	1200	CY	$25	30,000		$30,000
Seeding and Mulching	30000	SY	$3	90,000		$90,000
Trees, 2" cal.	65	EA	$600	39,000		$39,000
Ornamental Trees	35	EA	$400	14,000		$14,000
Perennials	600	EA	$45	27,000		$27,000
Subtotal						**$859,000**
Contingency, 20%						**$171,800**
Construction TOTAL						**$1,030,800**

					Date	16-May-19
Conceptual Cost of Construction						
PROJECT: Allegan Dam Repair						
Park Development						
		Detroit, Michigan				
		ESTIMATOR		TE		
Construction Costs						
	QUANTITY		LABOR & MATERIAL			
	NO. UNITS	UNIT MEAS.	PER UNIT	TOTAL		TOTAL COST
Mobilization, 5% Const Cost	1	LS	$15,000	15,000		$15,000
Construction Sign	2	LS	$1,000	2,000		$2,000
Traffic Control, 5% Const Cost	1	LS	$15,000	15,000		$15,000
Demo, Misc	300	CY	$50	15,000		$15,000
Excavation,	1000	CY	$25	25,000		$25,000
Bioretention Soil	250	CY	$75	18,750		$18,750
Bioretention Rock	250	CY	$75	18,750		$18,750
Curb Inlet	3	EA	$2,000	6,000		$6,000
Runnel/trench Drain	3	EA	$4,000	12,000		$12,000
Headwalls	3	EA	$2,000	6,000		$6,000
Conc Walks	200	SY	$25	5,000		$5,000
Topsoil Import	900	CY	$25	22,500		$22,500
Turfgrass establishment	6000	SY	$3	18,000		$18,000
Trees, 2" cal.	24	EA	$600	14,400		$14,400
Ornamental Trees	8	EA	$400	3,200		$3,200
Perennials	300	EA	$45	13,500		$13,500
Interpretive Signs	2	EA	$2,000	4,000		$4,000
Subtotal						**$214,100**
Contingency, 20%						**$42,820**
Construction TOTAL						**$256,920**

Net Present Value Life Cycle Cost Estimates

	Alternatives		
Year	Dam Repair	Partial Removal	Full Removal
0	$ 3,713,103.61	$ 13,704,566.45	$ 12,951,665.54
1	$31,387.50	$62,662.50	$63,037.50
2	$31,387.50	$62,662.50	$63,037.50
3	$31,387.50	$62,662.50	$63,037.50
4	$30,000.00	$3,000.00	$63,037.50
5	$60,000.00	$7,800.00	$63,037.50
6	$30,000.00	$3,000.00	$0.00
7	$30,000.00	$3,000.00	$0.00
8	$30,000.00	$3,000.00	$0.00
9	$30,000.00	$3,000.00	$0.00
10	$60,000.00	$7,800.00	$0.00
11	$30,000.00	$3,000.00	$0.00
12	$30,000.00	$3,000.00	$0.00
13	$30,000.00	$3,000.00	$0.00
14	$30,000.00	$3,000.00	$0.00
15	$60,000.00	$7,800.00	$0.00
16	$30,000.00	$3,000.00	$0.00
17	$30,000.00	$3,000.00	$0.00
18	$30,000.00	$3,000.00	$0.00
19	$30,000.00	$3,000.00	$0.00
20	$60,000.00	$7,800.00	$0.00
21	$30,000.00	$3,000.00	$0.00
22	$30,000.00	$3,000.00	$0.00
23	$30,000.00	$3,000.00	$0.00
24	$30,000.00	$3,000.00	$0.00
25	$60,000.00	$7,800.00	$0.00
26	$30,000.00	$3,000.00	$0.00
27	$30,000.00	$3,000.00	$0.00
28	$30,000.00	$3,000.00	$0.00
29	$30,000.00	$3,000.00	$0.00
30	$60,000.00	$7,800.00	$0.00
31	$30,000.00	$3,000.00	$0.00
32	$30,000.00	$3,000.00	$0.00
33	$30,000.00	$3,000.00	$0.00
34	$30,000.00	$3,000.00	$0.00
35	$60,000.00	$7,800.00	$0.00
36	$30,000.00	$3,000.00	$0.00
37	$30,000.00	$3,000.00	$0.00
38	$30,000.00	$3,000.00	$0.00
39	$30,000.00	$3,000.00	$0.00
40	$60,000.00	$7,800.00	$0.00
41	$30,000.00	$3,000.00	$0.00
42	$30,000.00	$3,000.00	$0.00
43	$30,000.00	$3,000.00	$0.00
44	$30,000.00	$3,000.00	$0.00
45	$60,000.00	$7,800.00	$0.00
46	$30,000.00	$3,000.00	$0.00
47	$30,000.00	$3,000.00	$0.00
48	$30,000.00	$3,000.00	$0.00
49	$30,000.00	$3,000.00	$0.00
50	$25,381,829	$4,896,328.87	$0.00
51	$30,000.00	$3,000.00	$0.00

	Alternatives		
Year	Dam Repair	Partial Removal	Full Removal
52	$30,000.00	$3,000.00	$0.00
53	$30,000.00	$3,000.00	$0.00
54	$30,000.00	$3,000.00	$0.00
55	$60,000.00	$7,800.00	$0.00
56	$30,000.00	$3,000.00	$0.00
57	$30,000.00	$3,000.00	$0.00
58	$30,000.00	$3,000.00	$0.00
59	$30,000.00	$3,000.00	$0.00
60	$60,000.00	$7,800.00	$0.00
61	$30,000.00	$3,000.00	$0.00
62	$30,000.00	$3,000.00	$0.00
63	$30,000.00	$3,000.00	$0.00
64	$30,000.00	$3,000.00	$0.00
65	$60,000.00	$7,800.00	$0.00
66	$30,000.00	$3,000.00	$0.00
67	$30,000.00	$3,000.00	$0.00
68	$30,000.00	$3,000.00	$0.00
69	$30,000.00	$3,000.00	$0.00
70	$60,000.00	$7,800.00	$0.00
71	$30,000.00	$3,000.00	$0.00
72	$30,000.00	$3,000.00	$0.00
73	$30,000.00	$3,000.00	$0.00
74	$30,000.00	$3,000.00	$0.00
75	$60,000.00	$7,800.00	$0.00
76	$30,000.00	$3,000.00	$0.00
77	$30,000.00	$3,000.00	$0.00
78	$30,000.00	$3,000.00	$0.00
79	$30,000.00	$3,000.00	$0.00
80	$60,000.00	$7,800.00	$0.00
81	$30,000.00	$3,000.00	$0.00
82	$30,000.00	$3,000.00	$0.00
83	$30,000.00	$3,000.00	$0.00
84	$30,000.00	$3,000.00	$0.00
85	$60,000.00	$7,800.00	$0.00
86	$30,000.00	$3,000.00	$0.00
87	$30,000.00	$3,000.00	$0.00
88	$30,000.00	$3,000.00	$0.00
89	$30,000.00	$3,000.00	$0.00
90	$60,000.00	$7,800.00	$0.00
91	$30,000.00	$3,000.00	$0.00
92	$30,000.00	$3,000.00	$0.00
93	$30,000.00	$3,000.00	$0.00
94	$30,000.00	$3,000.00	$0.00
95	$60,000.00	$7,800.00	$0.00
96	$30,000.00	$3,000.00	$0.00
97	$30,000.00	$3,000.00	$0.00
98	$30,000.00	$3,000.00	$0.00
99	$30,000.00	$3,000.00	$0.00
100	$60,000.00	$7,800.00	$0.00
NPV Maintenance only	$6,906,534.31	$1,407,235.42	$288,693.29
NPV Life-Cycle Total	$10,310,328.08	$14,671,652.30	$12,854,717.31

Total Cost Over 100 years	$28,925,991.64	$5,463,516.37	$315,187.50

5.13.2019

Inputs:

Lifecycle Cost Item	Unit Price	Unit	Maintain Dam	Partial Removal	Full Removal
Invasive Species Control	$ 750.00	$/acre	$1,387.50	$59,662.50	$63,037.50
Rock Ramp Debris Cleaning	$ 500.00	LSUM	$0.00	$500.00	$0.00
Rock Ramp Boulder Mgmt	$ 2,500.00	LSUM	$0.00	$2,500.00	$0.00
Dam Operation and Maintenance	$ 5,000.00	LSUM	$5,000.00	$0.00	$0.00
Dam and Fishladder Inspection and Repairs, Every 5 years	$ 30,000.00	LSUM	$30,000.00	$4,800.00	$0.00
Dam Replacement		LSUM	$25,381,829.14	$4,896,328.87	$0.00
Fish Ladder Operation and Maintenance	$ 25,000.00	LSUM	$25,000.00	$0.00	$0.00
Total cost every 5 years -			$186,937.50	$318,112.50	$315,187.50
Total cost every 5 years without Invasive Species Control			$180,000.00	$19,800.00	$0.00

ALLEGAN CITY DAM - Existing Conditions Looking Upstream

JUNE 5, 2019

AECOM

ALLEGAN CITY DAM - Full Dam Removal Looking Upstream

JUNE 5, 2019

AECOM

ALLEGAN CITY DAM - Existing Conditions View of Downtown Waterfront

JUNE 5, 2019

AECOM

ALLEGAN CITY DAM - Full Dam Removal View of Downtown Waterfront

JUNE 5, 2019

AECOM