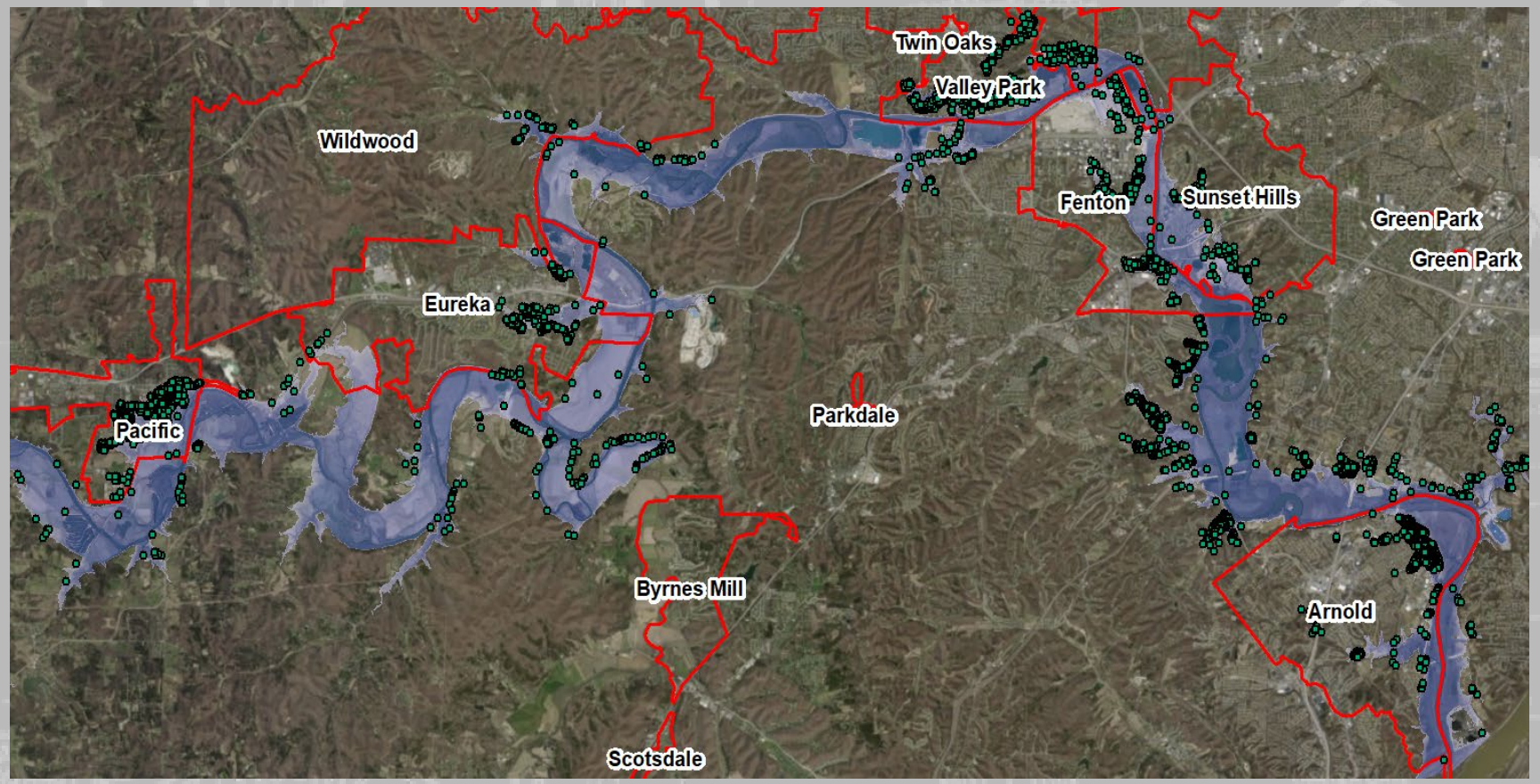
LOWER MERAMEC MULTI-JURISDICTIONAL FLOODPLAIN MANAGEMENT PLAN (FMP) DRAFT FINDINGS

U.S. Army Corps of Engineers
St. Louis District

Meeting Dates:
January 27, 2020 - Eureka
January 29, 2020 – Sunset Hills
February 12, 2020 - Arnold



U.S.ARMY

US Army Corps of Engineers®

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AGENDA

1. Meramec Basin History
2. Introduction of partners
3. Background and coordination of Floodplain Management Plan
4. Report contents
5. Summary of Findings
6. Highlights of significant measures to reduce flood risk
7. Action Plan
8. Potential Funding Sources
9. Next Steps
10. The Nature Conservancy Floodplain Prioritization Tool
11. Q&A
12. End of formal meeting / opportunity to meet with partners

PREVIOUS MERAMEC BASIN STUDIES

Meramec Basin Plan (1964)

- Authorized reservoirs in the Meramec River Basin
- Significant public opposition during referendum
- De-authorized by Congress in 1990

Lower Meramec Flood Damage Reduction Study (1987)

- Specifically prohibited reservoir alternative
- Considered array of structural alternatives throughout the Basin
- Resulted in Valley Park Levee construction

PARTNERS

U.S. ARMY

United States Environmental Protection Agency

East-West Gateway Council of Governments

City of Union, State of Missouri

Fenton City of Parks Missouri

FEMA

Jefferson County Missouri 1818

Eureka Proud Past

City of Arnold Missouri

USGS science for a changing world

Missouri Department of Natural Resources

Franklin County Missouri Commission

City of Valley Park

City of Sunset Hills

Missouri Dept of Public Safety Emergency Management

Saint Louis County

The Nature Conservancy nature.org

Wildwood

FLOODPLAIN MANAGEMENT PLANNING

Follows a 10-step planning process:

Step 1. Organize
Step 2. Involve the public
Step 3. Coordinate
Step 4. Assess the hazard
Step 5. Assess the problem
Step 6. Set goals
Step 7. Review possible activities
Step 8. Draft an action plan
Step 9. Adopt the plan
Step 10. Implement, evaluate, revise.

Steps included in FMP Schedule

Step performed by communities

PARTNER & PUBLIC COORDINATION

Partner

- Planning Committee, Advisory Group, NGO's, Legislative/Congressional Staff
- 5 In-person scheduled Partner Meetings
- 5 Partner Update Webinars

Public

- 3 Public Workshops (Arnold, Pacific, Sunset Hills) to Gather Information
- Public comment period
- USACE National Nonstructural Committee Assessment of 17 structures in the Lower Meramec Basin
- 3 Public Meeting to Share Findings

REPORT CONTENTS

Executive Summary
List of Figures
List of Tables
List of Appendices
1. Introduction
2. Floodplain Management Plan Development
3. Future Conditions
4. Floodplain Hazard Assessment
5. Consequences Assessment
6. Goals and Objectives
7. Strategies and Tools
8. Action Plan
9. References

Appendix A – Public Involvement Results
Appendix B – Floodplain Ordinances for Communities*
Appendix C – FMP Participation Resolutions
Appendix D – USACE National Nonstructural Committee Assessment
Appendix E – USACE Analysis of National Nonstructural Committee Assessment
Appendix F – Healthy Watershed Funding Options
Appendix G – Flood Insurance Rates Maps
Appendix H – Model FEMA CRS Checklist

* Appendix B only has 3 communities' ordinances (Arnold, Eureka, St. Louis County)

FEMA FLOODPLAIN MAPS (FIRMS)

FEMA conducted a Flood Insurance Study for Jefferson County June, 2019

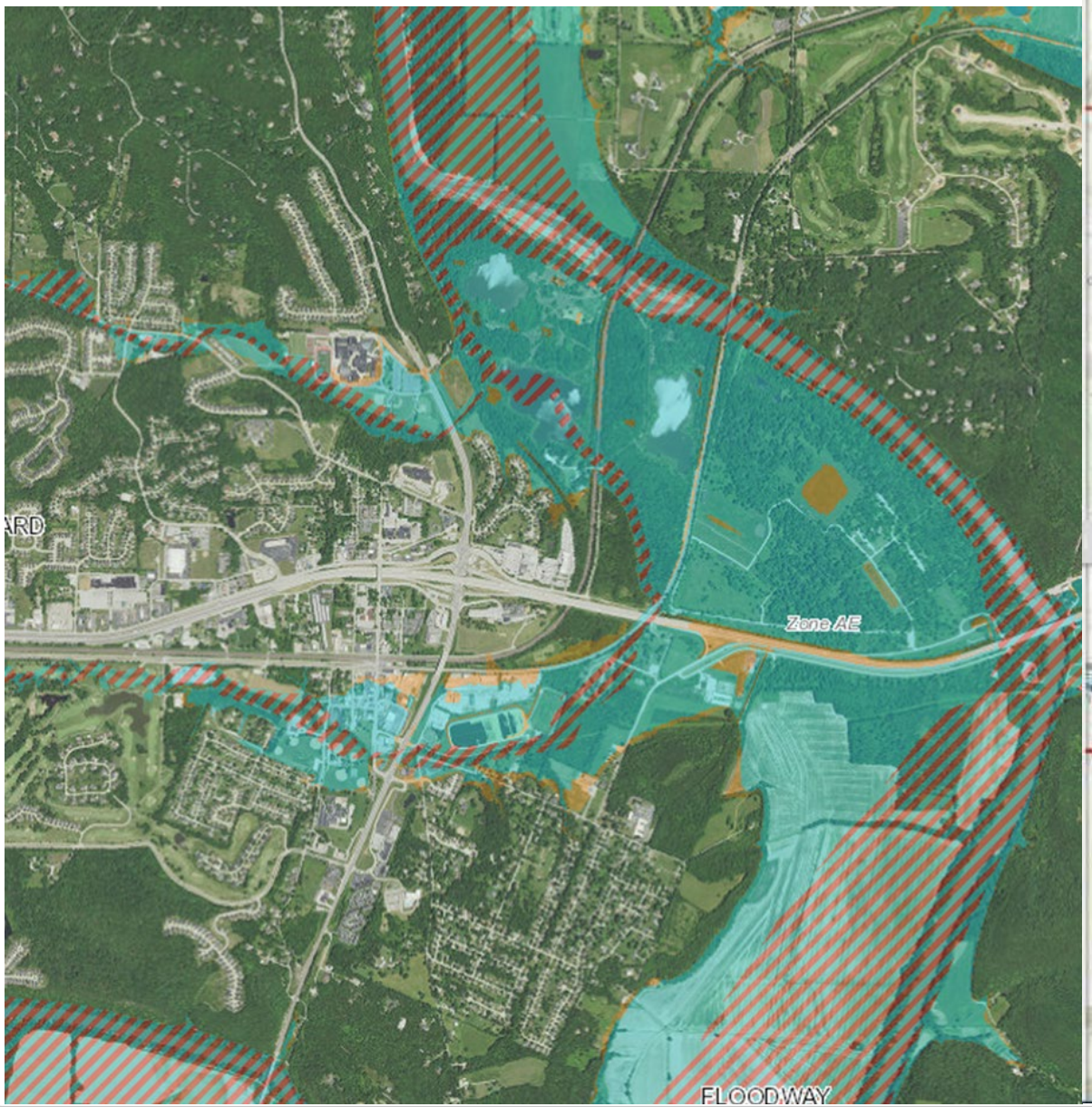
Revisions are anticipated for:
-St. Louis County in 2021
-Franklin County in 2021-2022

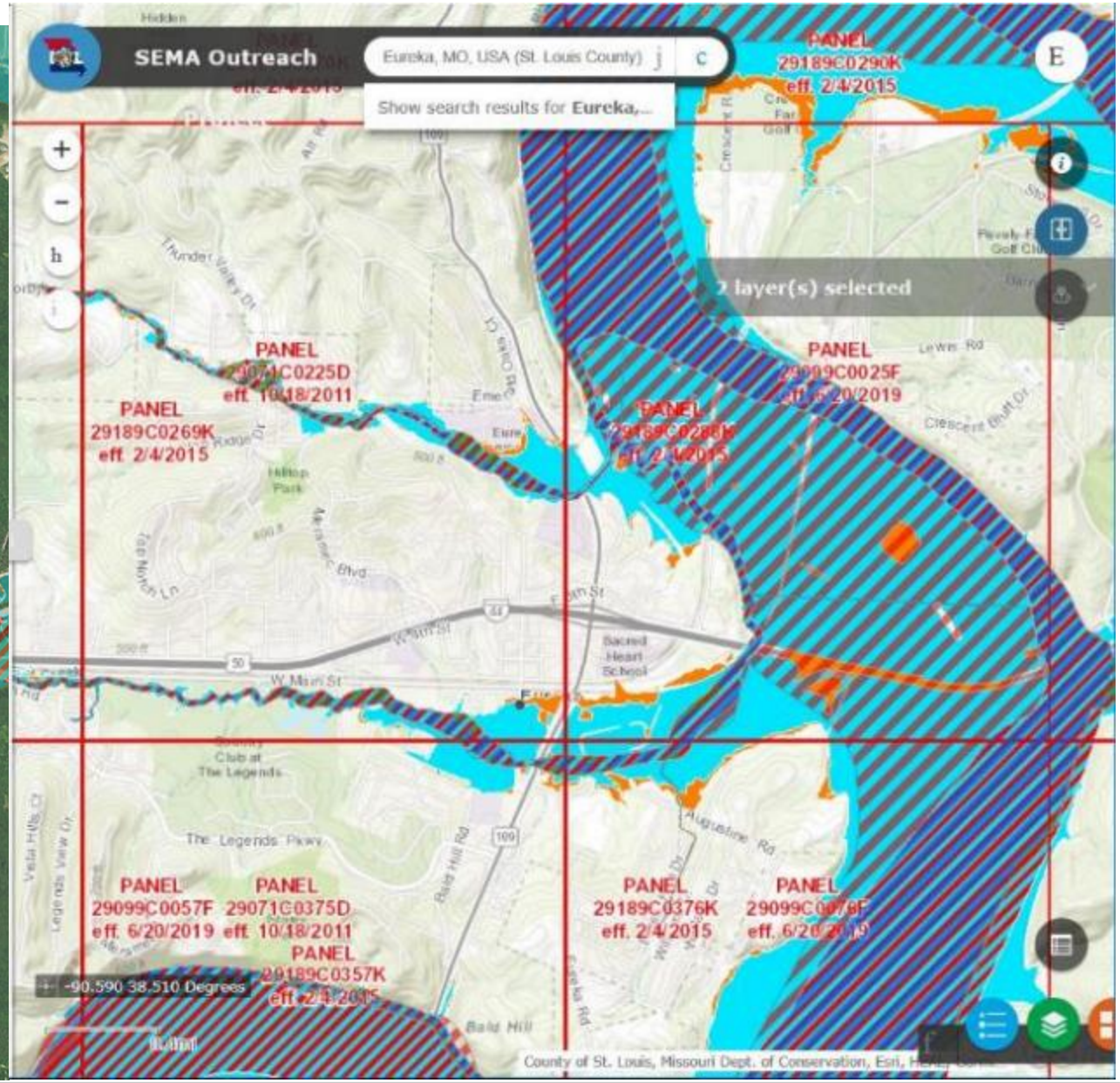
The data acquired from the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) informed this Floodplain Management Plan (FMP).

FIRMs can be found on SEMA's website.

County	Initial Countywide Effective Date	Revised Countywide Effective Date(s)	Anticipated Countywide Updates
Franklin	October 18, 2011		2021-2022
Jefferson	April 5, 2006	June, 2019	
St. Louis	August 2, 1995	August 23, 2000 February 4, 2015	2021

Example: Effective vs. Preliminary FIRMs





LIST OF POTENTIAL TOOLS

TOOLS	EVALUATION	
Land Use Policies and Regulations	EFFECTIVE	RECOMMENDED
Public Alert Flood Warning System	EFFECTIVE	RECOMMENDED
Warning Dissemination, Multi-Media	EFFECTIVE	RECOMMENDED
Flood Emergency Preparedness Plans (or EAPs)	EFFECTIVE	RECOMMENDED
Development Policies - Moratorium	EFFECTIVE	NOT RECOMMENDED
Structure Elevations	EFFECTIVE	RECOMMENDED
Buyouts (Structure and Land Acquisition)	EFFECTIVE	RECOMMENDED
Flood proofing (Wet & Dry)	EFFECTIVE	RECOMMENDED
Community Education and Advocacy	EFFECTIVE	RECOMMENDED
Temporary Flood Risk Adaptive Measures	EFFECTIVE	RECOMMENDED
Information and Education	EFFECTIVE	RECOMMENDED
Flood Insurance	EFFECTIVE	RECOMMENDED
Community Rating System (CRS)	EFFECTIVE	RECOMMENDED
Local Drainage and Utility Protection	EFFECTIVE	FURTHER EVALUATION NEEDED
Tax Adjustments	EFFECTIVE	FURTHER EVALUATION NEEDED
Post-Flood Recovery Processes	EFFECTIVE	RECOMMENDED
Wetlands, Stream, and Riparian Protection and Restoration	EFFECTIVE	RECOMMENDED
Enhancement of Recreation and Education Opportunities	EFFECTIVE	RECOMMENDED
Detention/Retention Basins	EFFECTIVE	FURTHER EVALUATION NEEDED
Levees and Floodwalls	EFFECTIVE	FURTHER EVALUATION NEEDED

LIST OF MEASURES WE CONSIDERED

Physical Nonstructural Measures	Nonphysical Nonstructural Measures
Elevation	Flood Warning Systems
Relocation	Flood Insurance
Buyout/Acquisition	Floodplain Mapping (FIRM)
Dry Floodproofing	Flood Emergency Preparedness Plans
Wet Floodproofing	Land Use Regulations
	Evacuation Plans (EAPs)
	Risk Communication

CONSEQUENCES / STATISTICS

- The 1-percent AEP flood event recommendations identify the cost and approach to mitigating all 942 structures that are expected to be damaged during such a potential flood event.

- Of the structures located within the 1% floodplain in the Lower Meramec Basin,
  - 162 (17%) are recommended to be elevated,
  - 122 (13%) are recommended to be acquired,
  - 357 (38%) are recommended to be flood proofed,
  - 254 (27%) are recommended to be relocated, and
  - 47 (5%) had inundation below the first floor, and therefore only required either a sewer check valve or relocation of utilities.

COMMUNITY RATING SYSTEM (CRS)

EFFECTIVE RECOMMENDED

- The CRS is a national program through FEMA and the National Flood Insurance Program (NFIP) that evaluates a community's floodplain management efforts;
- Can result in National Flood Insurance premium reductions;
- FEMA is currently reviewing the draft Floodplain Management Plan and will assign preliminary CRS points

FEMA Fact Sheet

Federal Insurance and Mitigation Administration

Community Rating System

June 2017

The National Flood Insurance Program (NFIP) Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum NFIP standards. Any community in full compliance with the minimum NFIP floodplain management requirements may apply to join the CRS.

1,444 Communities Participate in the CRS

Nearly 3.6 million policyholders in 1,444 communities participate in the CRS by implementing local mitigation, floodplain management, and outreach activities that exceed the minimum NFIP requirements.

Under the CRS, flood insurance premium rates are discounted to reward community actions that meet the three goals of the CRS, which are: (1) reduce flood damage to insurable property; (2) strengthen and support the insurance aspects of the NFIP; and (3) encourage a comprehensive approach to floodplain management.

Although CRS communities represent only 5 percent of the over 22,000 communities participating in the NFIP, more than 69 percent of all flood insurance policies are written in CRS communities.

CRS Classes

The CRS uses a Class rating system that is similar to fire insurance rating to determine flood insurance premium reductions for residents. CRS Classes* are rated from 9 to 1. Today, most communities enter the program at a CRS Class 9 or Class 8 rating, which entitles residents in Special Flood Hazard Areas (SFHAs) to a 5 percent discount on their flood insurance premiums for a Class 9 or a 10 percent discount for Class 8. As a community engages in additional mitigation activities, its residents become eligible for increased NFIP policy premium discounts. Each CRS Class improvement produces a 5 percent greater discount on flood insurance premiums for properties in the SFHA.

** CRS Class changes occur on May 1 and October 1 of each year. The data contained in this fact sheet were current through May 2017.*

"FEMA's mission is to support our citizens and first responders to en improve our capability to prepare for, protect against, respond to,

Federal Insurance and Mitigation Administration

Community Rating System

CRS Credit

A community accrues points to improve its CRS Class rating and receive increasingly higher discounts. Points are awarded for engaging in any of 19 creditable activities, organized under four categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Warning and response.

Formulas and adjustment factors are used to calculate credit points for each activity.

The communities listed below are among those that have qualified for the greatest premium discounts:

Class 1: Roseville, California

Class 2: Sacramento County, California
Fort Collins, Colorado
Tulsa, Oklahoma
King County, Washington
Pierce County, Washington
Thurston County, Washington

Class 3: Louisville–Jefferson County, Kentucky
Ocala, Florida

Class 4: Charlotte, North Carolina
Palm Coast, Florida
Charleston County, South Carolina
Maricopa County, Arizona

Benefits of the CRS

Lower cost flood insurance rates are only one of the rewards a community receives from participating in the CRS. Other benefits include:

- Citizens and property owners in CRS communities have increased opportunities to learn about risk, evaluate their individual vulnerabilities, and take action to protect themselves, as well as their homes and businesses.
- CRS floodplain management activities provide enhanced public safety, reduced damage to property and public infrastructure, and avoidance of economic disruption and loss.
- Communities can evaluate the effectiveness of their flood programs against a nationally recognized benchmark.
- Technical assistance in designing and implementing some activities is available to community officials at no charge.
- CRS communities have incentives to maintain and improve their flood programs over time.

How to Apply

To apply for CRS participation, a community must initially inform the Federal Emergency Management Agency (FEMA) Regional Office of its interest in applying to the CRS and will eventually submit a CRS application, along with documentation that shows it is implementing the activities for which credit is requested. The application is submitted to the Insurance Services Office, Inc. (ISO)/CRS Specialist. ISO works on behalf of FEMA and insurance companies to review CRS applications, verify communities' credit points, and perform program improvement tasks.

A community's activities and performance are reviewed during a verification visit. FEMA establishes the credit to be granted and notifies the community, the State, insurance companies, and other appropriate parties.

Each year, the community must verify that it is continuing to perform the activities that are being credited by the CRS by submitting an annual recertification. In addition, a community can continue to improve its Class rating by undertaking new mitigation and floodplain management activities that earn even more points.

CRS Training

CRS Specialists are available to assist community officials in applying to the program and in designing, implementing, and documenting the activities that earn even greater premium discounts. A week-long CRS course for local officials is offered free at FEMA's Emergency Management Institute (EMI) on the National Emergency Training Center campus in Emmitsburg, Maryland, and can be field deployed in interested states. A series of webinars is offered throughout the year.

For More Information

A list of resources is available at the CRS website: www.fema.gov/national-flood-insurance-program-community-rating-system. For more information about the CRS or to obtain the CRS application, contact the Insurance Services Office by phone at (317) 848-2898 or by e-mail at nfipcrs@iso.com.

"FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

LAND USE POLICIES AND REGULATIONS

EFFECTIVE **RECOMMENDED**

Potential Land Use Policies and Regulations

- Building restrictions in the floodplain
- Bringing in fill
- Freeboard requirements (Number of Feet Above Base Flood Elevation)

Jefferson County

- Floodplain ordinance adopted in March 2006 and recently revised on **June 20, 2019**.
- Regulation aimed at restricting new development in the floodplain
- Includes requirements for building in Special Flood Hazard Areas (SFHA)
- Includes requirement that residential and non-residential construction in SFHA shall be elevated to **BFE +3 ft.**
- **Model ordinances available through SEMA**

ORDINANCE TABLE

Community Name	Free board (Feet)	Repetitive Loss Definition	Non Conforming Use	Mandatory Disclosure	Critical Development Protection	Additional Floodway Requirement	Hazardous Materials	Cumulative Substantial Damage/ Improvement	Setbacks Stream Buffer	Enforcement (min 100.00)
Eureka	1	X	X							500
Pacific	2	X	X			X		X		100
Union	2									1000
Valley Park	1	X	X							500
Sunset Hills	1	X	X							500
Arnold	3	X	X							500
Franklin Co.	2	X	X		X		X	X	X	100
St. Louis Co.	1	X		X					X	
Jefferson Co.	3		X		X	X	X			1000
Wildwood	2	X	X				X			
Fenton	2	X	X		X		X			500

COMMUNITY EDUCATION AND ADVOCACY

EFFECTIVE RECOMMENDED

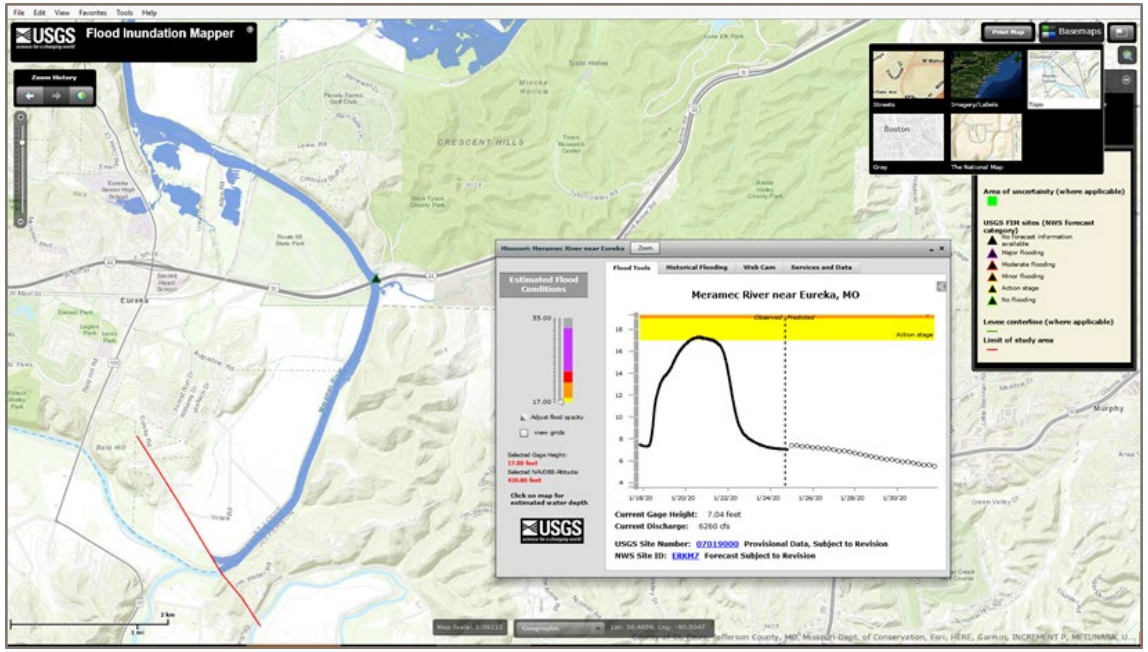
- Communication between a unit of government and its constituents, at any and all levels, creates trust and a sense of shared responsibility for the citizens
- There must be a balance between community activism and governance
- It is **recommended** for the cities and counties in the Lower Meramec Basin to form an official committee or group that has representatives from the city government, private citizens, and any other county or municipal representatives deemed beneficial to the committee.
- The mission of this committee will be to openly communicate the risk of living in or near a floodplain and to host public meetings, both formal and informal, to help citizen and business owners prepare for and respond to all types of natural disasters (including flooding).

PUBLIC ALERT AND WARNING SYSTEM

EFFECTIVE RECOMMENDED

- Many communities participate in and promote the CodeRED Alert system.
- Recommended to install flood warning lights near intersections and roads that are flood prone.
- Recommended to continue using Meramec River gages as well as National Weather Service predictions to help plan for potential evacuations and emergency situations.
- USGS Flood Inundation Mapper

https://wimcloud.usgs.gov/apps/FIM/FloodInundationMapper.html

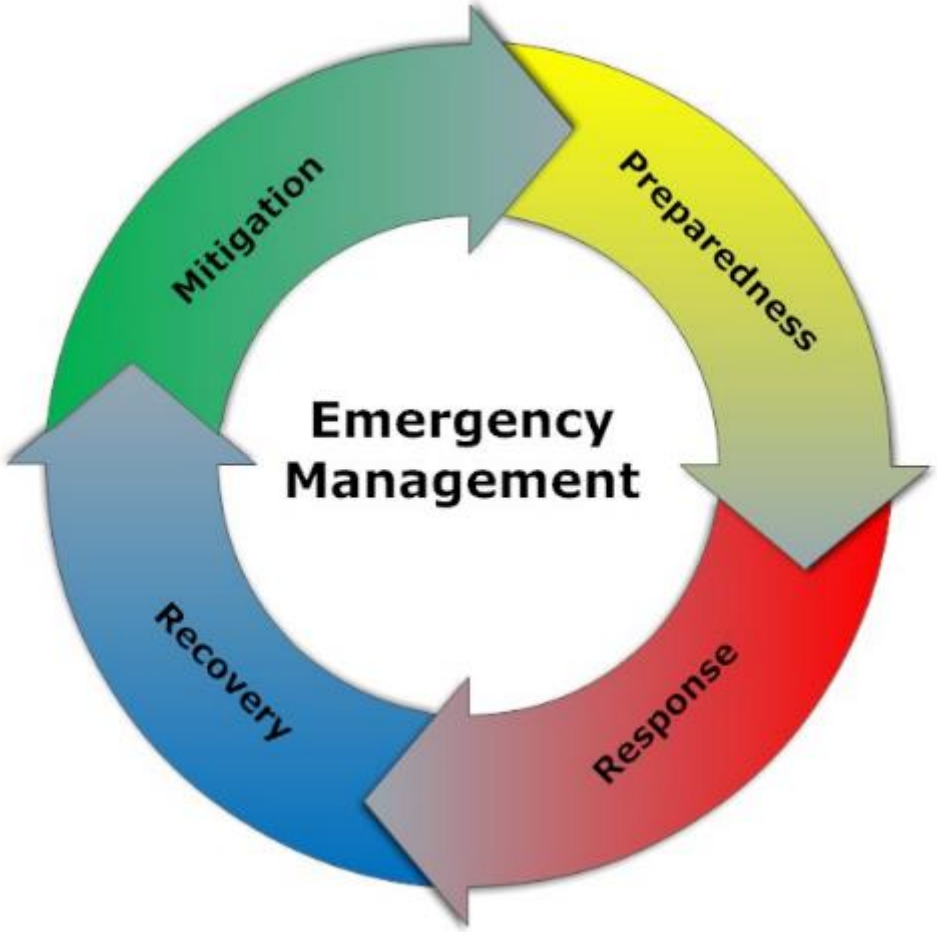


EMERGENCY ACTION PLAN

EFFECTIVE **RECOMMENDED**

Inter-related to the flood warning system is an emergency preparedness plan for flooding. Generally speaking, emergency preparedness plans include several topics related to identifying the risk:

- Emergency operation plans based on indicators or stages of the magnitude of the risk;
- Emergency communication plans;
- Emergency evacuation plans;
- After action plans.



DEVELOPMENT POLICIES - MORATORIUM

EFFECTIVE **NOT RECOMMENDED**

- A moratorium on development in the floodplain would prohibit any building in the floodplain by law until a specified time when solutions could be created to reduce the flooding impacts from the Meramec River.
- In researching the moratorium, it was determined that such a measure would only impact a very small number of vacant properties in the Lower Meramec communities and might be considered a “taking” if implemented. These factors do not lend to this tool being considered moving forward.

44 CFR 60.3(d)(3): *In the regulatory floodway, communities must prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge. (FEMA Regulation)*

TEMPORARY FLOOD RISK MEASURES

EFFECTIVE **RECOMMENDED**

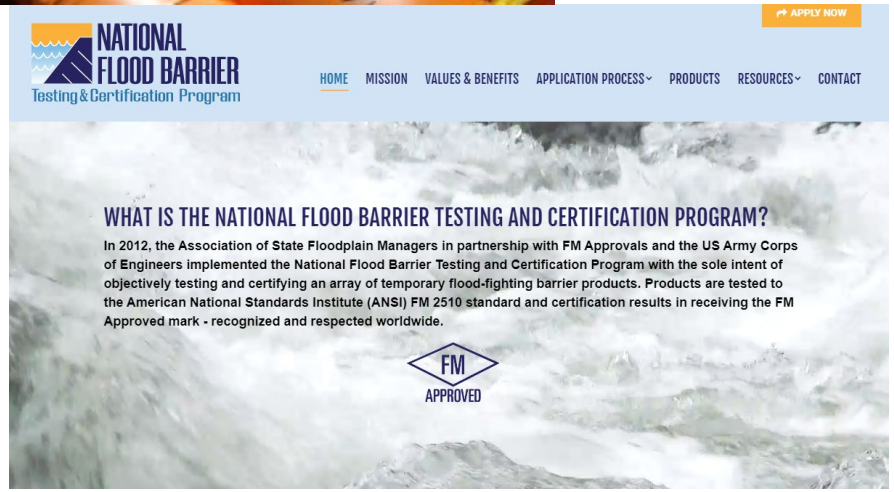
Common temporary measures:

1) polyethylene sheeting attached or hung onto the structure exterior in combination with door and window closures;

2) clear liquid sealant applied to the structure exterior in combination with caulking of large cracks in the exterior and placement of door and window closures;

3) sandbag berms located around all or a portion of the structure;

4) any of the barriers certified through the National Flood Barrier Testing and Certification Program
   https://nationalfloodbarrier.org/



FLOOD RISK ADAPTIVE MEASURES

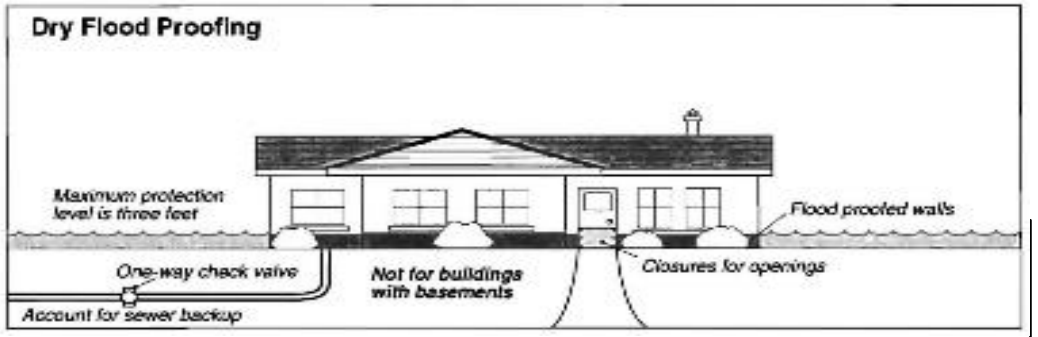
EFFECTIVE **RECOMMENDED**

USACE National Non-Structural Committee results documented in Appendix D

- Elevation
- Wet floodproofing →
- Dry floodproofing
- Sewer check valves
- Relocate utilities

Appendix E

- Further environmental and economic analysis determined the final recommendations
- Full structure list with recommendations



Structure Photographs

Front

Rear

Structure Characteristics

Characteristic	Description
Occupancy -…	Residential (Single Family Dwelling).
Configuration -	One and one half story with crawlspace, rear addition(s), gable roof.
Construction -	Masonry (stone) foundation. Wood frame with siding.
Condition - …	Very good.
Other -……	Addition – One story, wood frame (rail car), siding, gable roof.

Structure and Flood Elevations

FF	LAG	CS	BFE	Δ BFE-FF	Δ BFE-LAG	Δ BFE-CS
501.1 ft	499.7 ft	*499.7 ft	506.5 ft	5.4 ft	6.8 ft	6.8 ft

ABBREVIATIONS:
FF – First Floor Elevation
B – Basement Floor Elevation
BFE – Base Flood Elevation
LAG – Low Adjacent Grade Elevation
CS – Crawl Space Ground Elevation
Δ – Delta (Elevation Difference)
* - Estimated

Site Visit Observations & Flood Risk

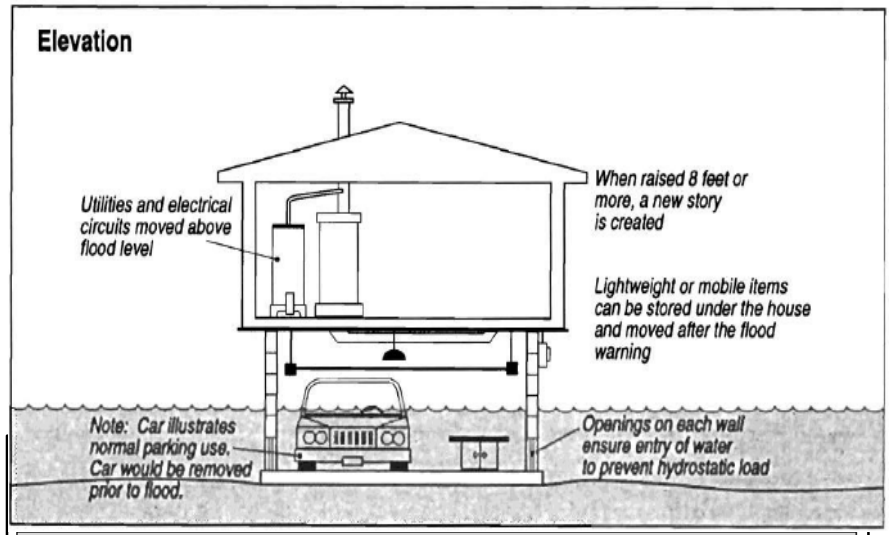
General: The structure was viewed/observed from the exterior and interior. The structure was occupied and in very good condition. The property owner was present during the site visit.

STRUCTURE ELEVATIONS

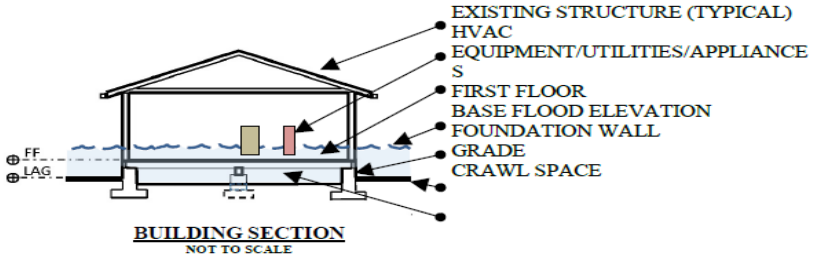
EFFECTIVE RECOMMENDED

- Elevating structures involves raising the structure in place to reduce frequency and/or depth of flooding during high-water events.

- Elevation can be completed on fill, foundation walls, piers, piles, posts or columns. Selection of proper elevation method depends on flood characteristics such as flood depth or velocity and condition of the structure and site.



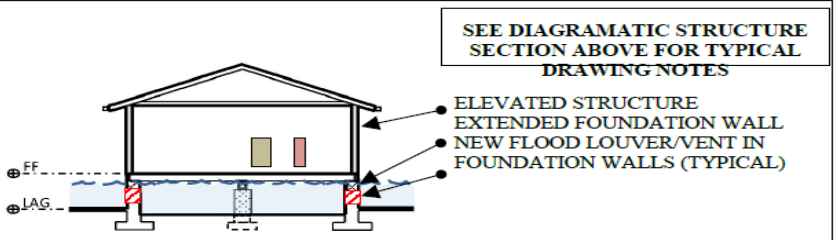
Diagrammatic Structure Section (Existing)



Recommendation

1. Relocate/elevate building utilities/systems/storage to upper level above BFE.
2. Fill crawl space to grade level (if necessary).
3. Elevate structure on new foundation.
4. Wet flood proof crawl space.

Diagrammatic Structure Section (Recommendation)



ACQUISITION (STRUCTURE AND LAND BUYOUT)

EFFECTIVE RECOMMENDED

The rationale for acquisition was based on identification of acquisition as the least cost mitigation approach, except when:

- Total cost is within 25% of other nonstructural measures

It was assumed that since acquisition completely removes the flood hazard into perpetuity, that the property owner and city would elect to pay marginally more to acquire the structure rather than select a mitigation measure that does not fully remove the risk of damage.

WETLAND RESTORATION, OPEN SPACE, & RECREATION

EFFECTIVE

Reducing flood risk through open space preservation and habitat restoration is a large scale proposition based on watershed size, topography and rainfall intensity.

In general, an effectively applied tool requires:

1. identification or mapping of available open space,
2. prioritization of parcels,
3. acquisition of property or educate/inform landowners about available incentivized conservation programs and
4. restoration of habitat types that attenuate or reduce the floodwater velocities.

RECOMMENDED

- City & County parks and recreation systems include park sites, including general parkland, sports fields and courts, picnic facilities, natural resource areas and related support facilities.
- Open space along a stream provides for an area that is free and clear of man-made structures to allow stormwater runoff and flood waters to flow unobstructed, as nature intended.

ACTION PLAN

Lower Meramec Multi-Jurisdictional Floodplain Management Plan Action Plan:

1) Adopt the Lower Meramec Multi-Jurisdictional FMP
2) Implement Nonstructural Recommendations in Appendix E **
3) Develop/Update a Comprehensive Public Outreach Plan
4) Develop/Update a Flood Emergency Preparedness Plan (and Evacuation Plan)
5) Adopt/Update Higher Regulatory Floodplain Management Standards
6) Maintain and Expand the Existing Flood Warning Systems
7) Join the CRS

**See Table outside with Maps/Property List Tables

APPENDIX F: POTENTIAL FUNDING SOURCES

Grants

- FEMA
- HUD
- EPA
- USFWS
- State (DNR, DOC, DOT)
- Mo NRCS
- Mo Conservation Heritage Foundation
- National Fish and Wildlife Foundation
- Other NGO's

Loans

- MoDNR
- EPA
- USDA
- HUD

Capital Improvement Plans

Bonds

- General Obligation, Revenue, Green

Taxes

- Sales Tax
- Watershed Improvement District
- Community Improvement District
- Neighborhood Improvement District
- TIF District
- Soil and Water Conservation Sub-district

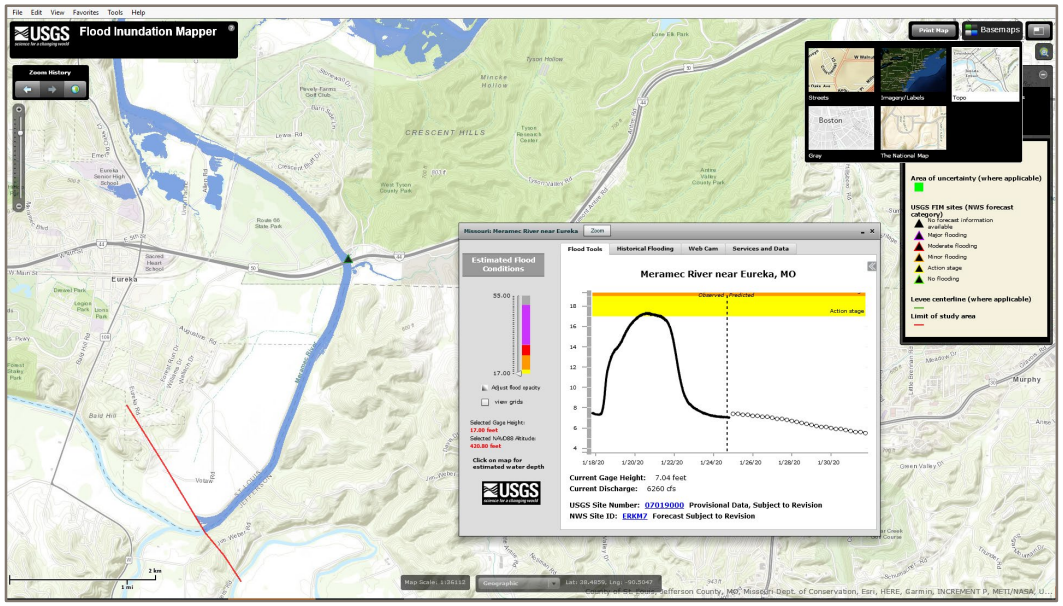
Fees

- Stormwater Fees
- Development Impact Fee
- Fee In-Lieu of Stormwater Management Practices
- On-Bill Donations

Incentive Programs

- Environmental Incentives or Pay-for-Performance
- Stormwater Credits

ONGOING INITIATIVES



- USACE CAP Eureka 205 - ongoing
- USACE CAP Projects in Pacific and Arnold
  - have been requested to USACE HQ
- FEMA – Updating FIRMS
- USGS/USACE – Flood inundation mapping study

  https://wimcloud.usgs.gov/apps/FIM/FloodInundationMapper.html
- TNC's Floodplain Prioritization Tool using Lower Meramec as pilot project

NEXT STEPS

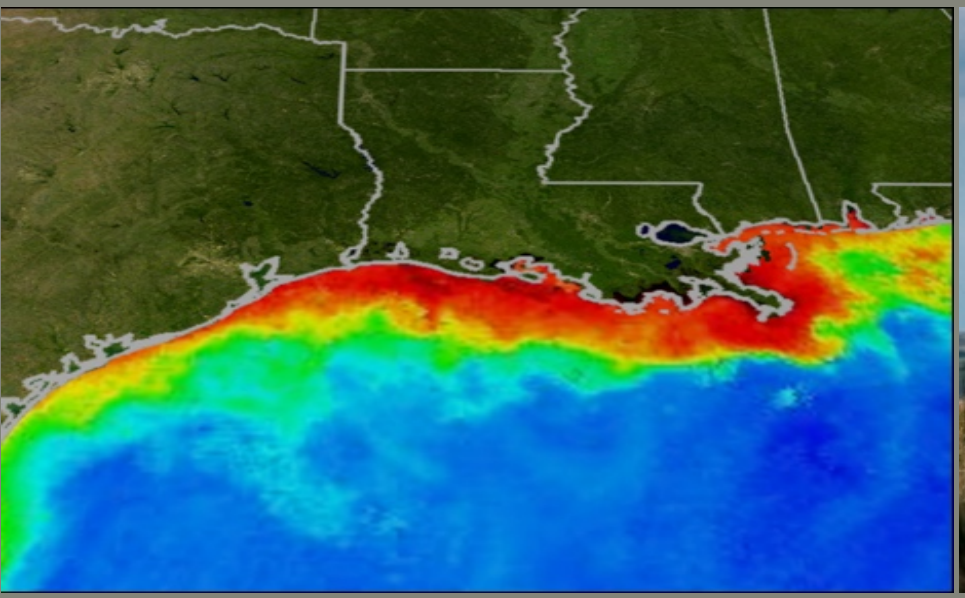
Tentative Timeline:

- February, 2020 – FEMA Preliminary CRS Review Complete (estimated)
- March, 2020 – Final FMP Transmitted to Partners

City and County governments may then formally adopt the final FMP.
It is also recommended that the FMP is reviewed and updated regularly.

Lower Meramec Floodplain Prioritization Tool

Multiple Benefits of Floodplains



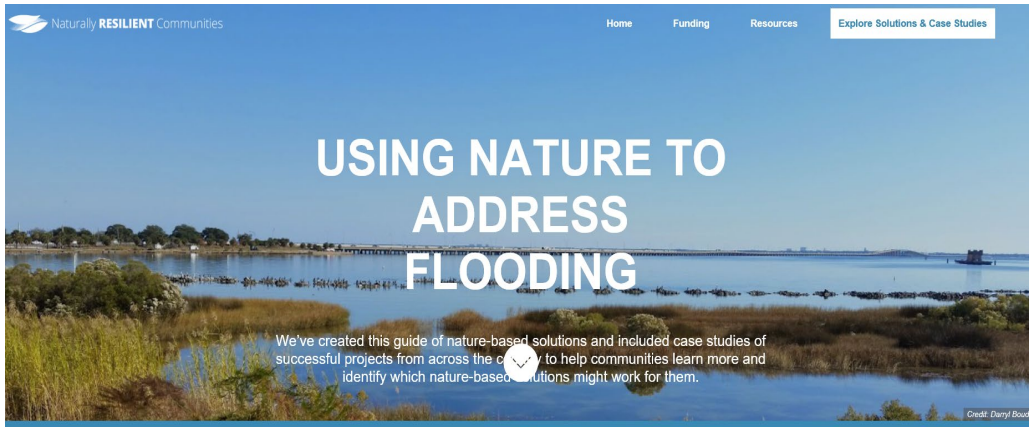
The **Lower Meramec Floodplain Prioritization Tool** allows the user to identify opportunities for floodplain conservation and restoration. The tool is designed to help decision-makers optimize their investments and minimize the impacts of development.

Link to the FP Tool: https://maps.freshwaternetwork.org/meramec-floodplain/

Note: *The Tool is not compatible with Internet Explorer*

Nature-based Solutions

- Buyouts in floodplains
- Restoring floodplains & wetlands
- Open space conservation
- Protecting & restoring habitat along rivers
- Flood-friendly culverts
- Green Stormwater Infrastructure



Naturally Resilient Communities Website:

NRCSOLUTIONS.ORG/

The Nature Conservancy

Freshwater Network – Lower Meramec Floodplain Tool

Identify Floodplain Units

Select Flood Frequency

1-in-5-year | **1-in-100-year** | 1-in-500-year

View Floodplains By Watershed

HUC-12 | **Catchment**

Select Management Action

Protection | Restoration

Filter Floodplain Units

Available Floodplain Area

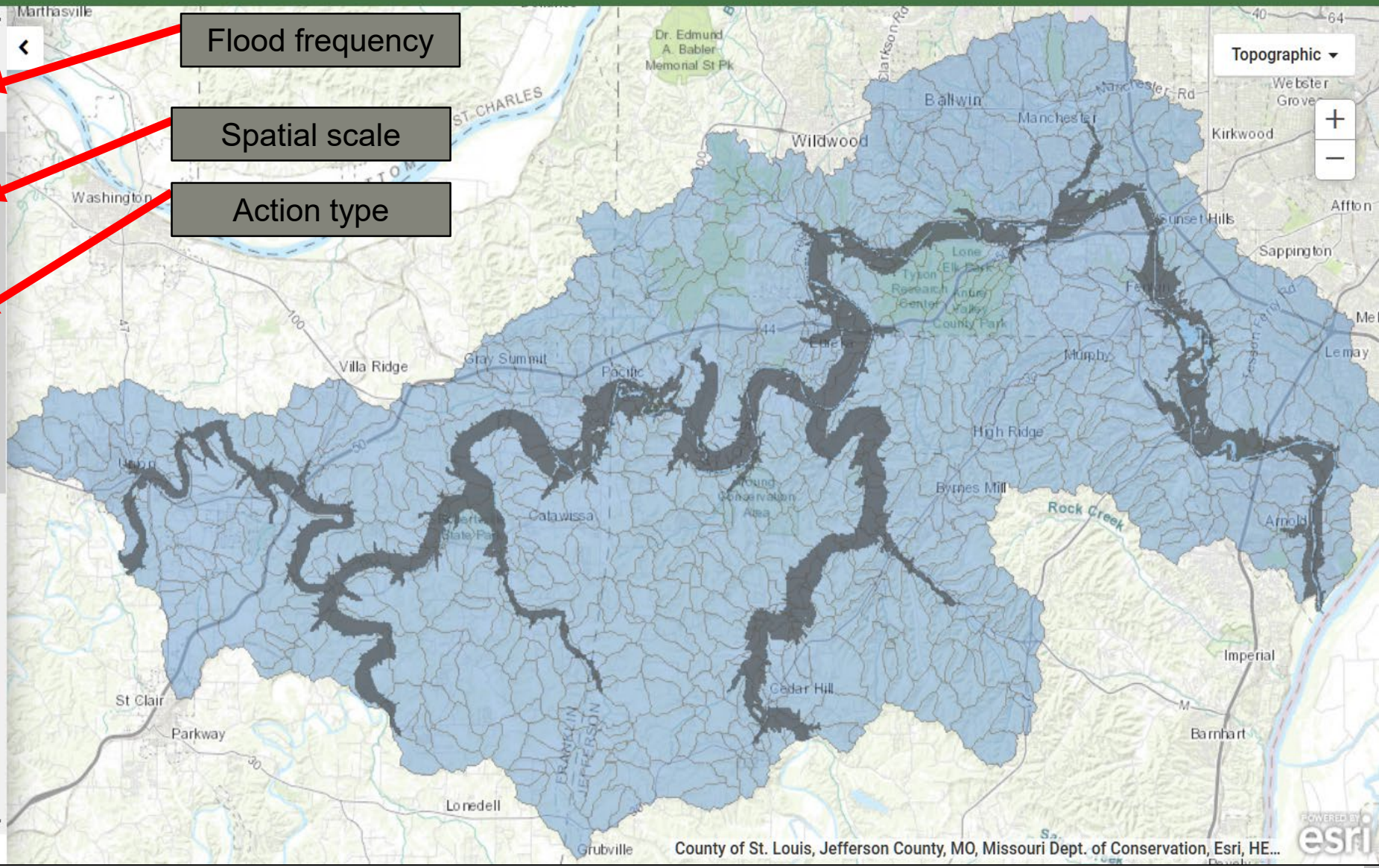
Available floodplain area for given flood frequency and management action — 0 to 400 acres

Water Quality

Total nitrogen (SWAT model) — 0 to 100

Total phosphorus (SWAT model) — 0 to 100

Sediment (SWAT model) — 0 to 100



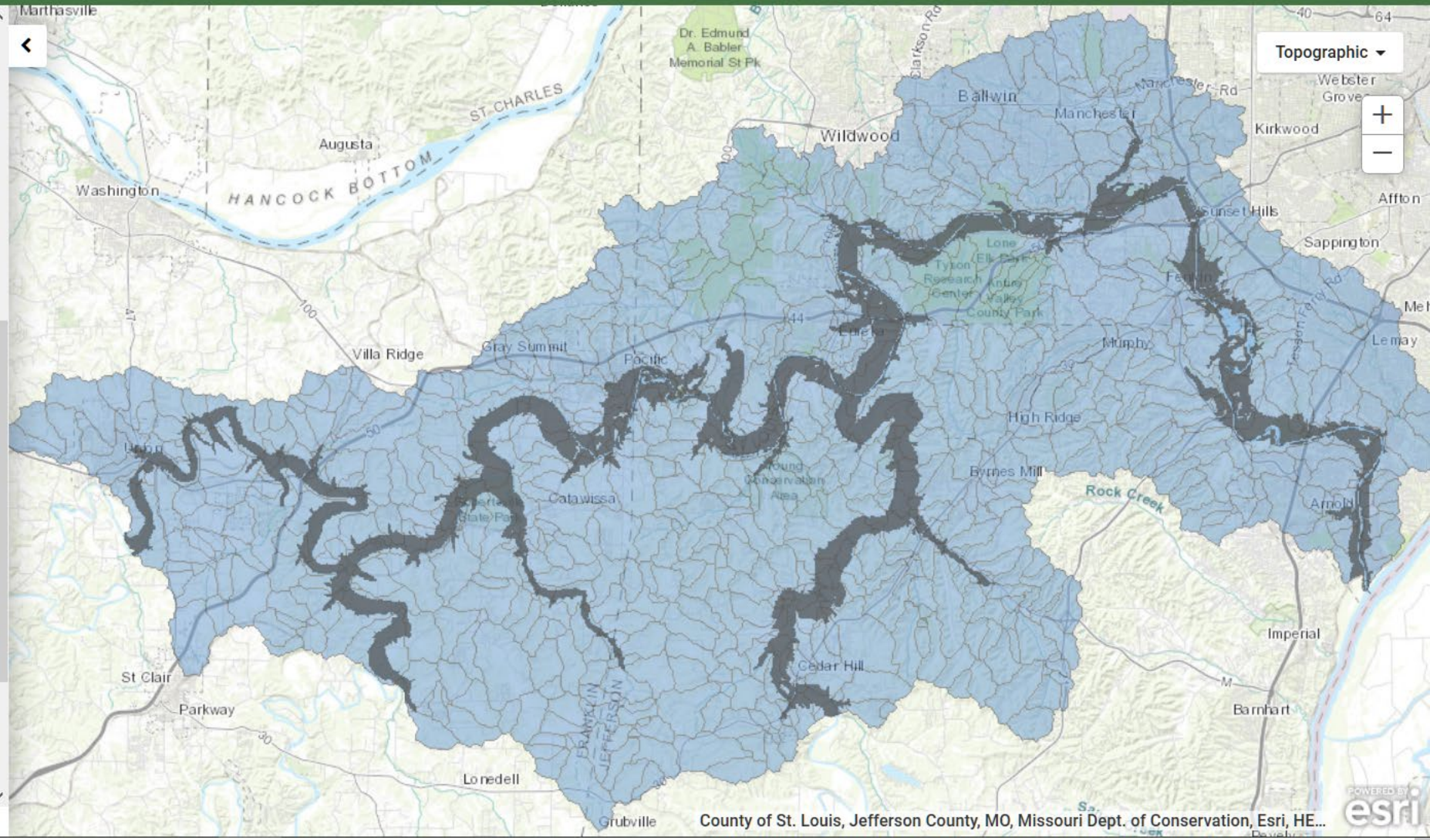
The Nature Conservancy

Environmental, Economic and Social Data

Freshwater Network – Lower Meramec Floodplain Tool

Filter Floodplain Units

- Available Floodplain Area
- Water Quality
  - Total nitrogen (SWAT model) — 0 to 100
  - Total phosphorus (SWAT model) — 0 to 100
  - Sediment (SWAT model) — 0 to 100
  - Accumulated sediment (SWAT model) — 0 to 100
  - Nutrient loading to Gulf of Mexico (SPARROW model) — 0 to 100
- Land Conversion
- Connectivity
- Priority Conservation Area/Natural Areas
- Habitat
- Population Exposure
- Flood Damages
- Social Vulnerability



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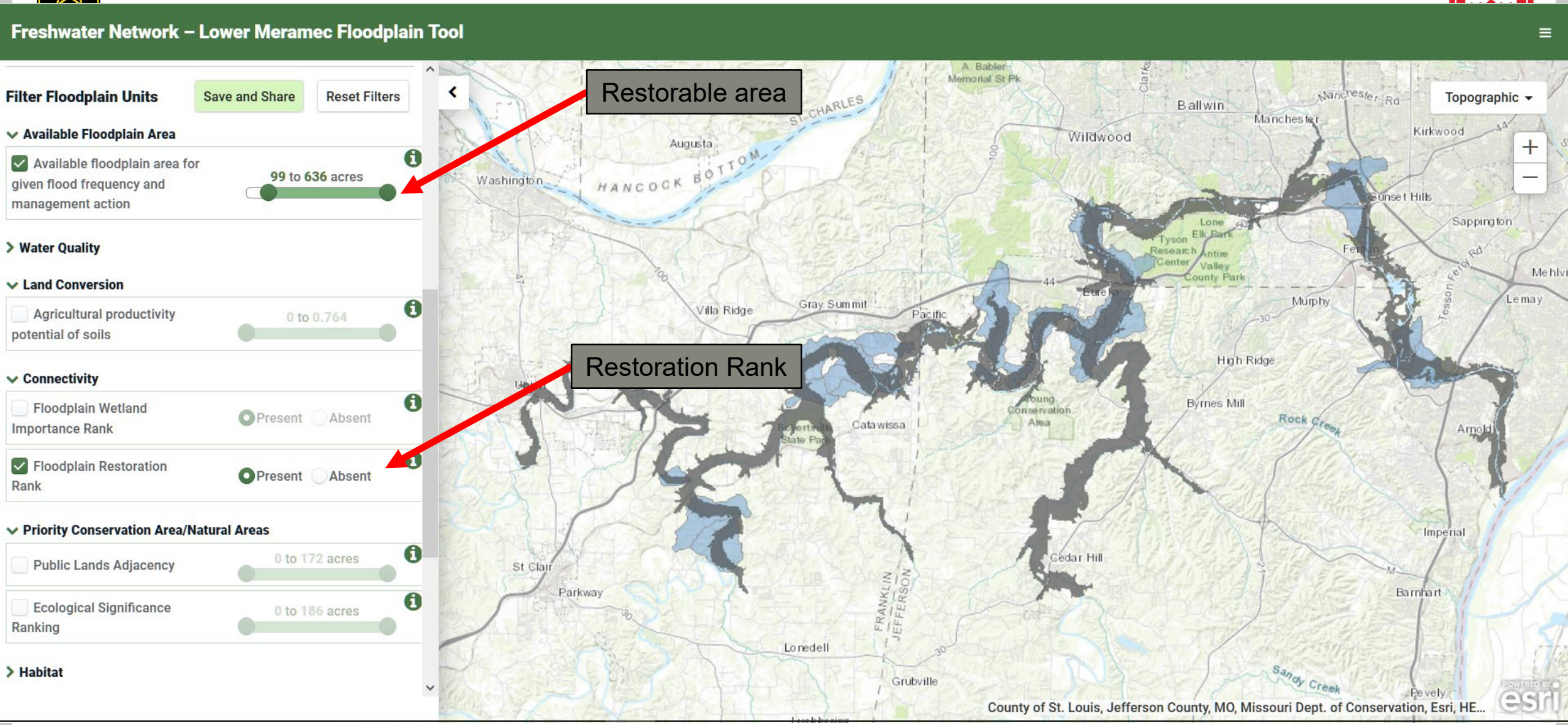
Prioritization Example



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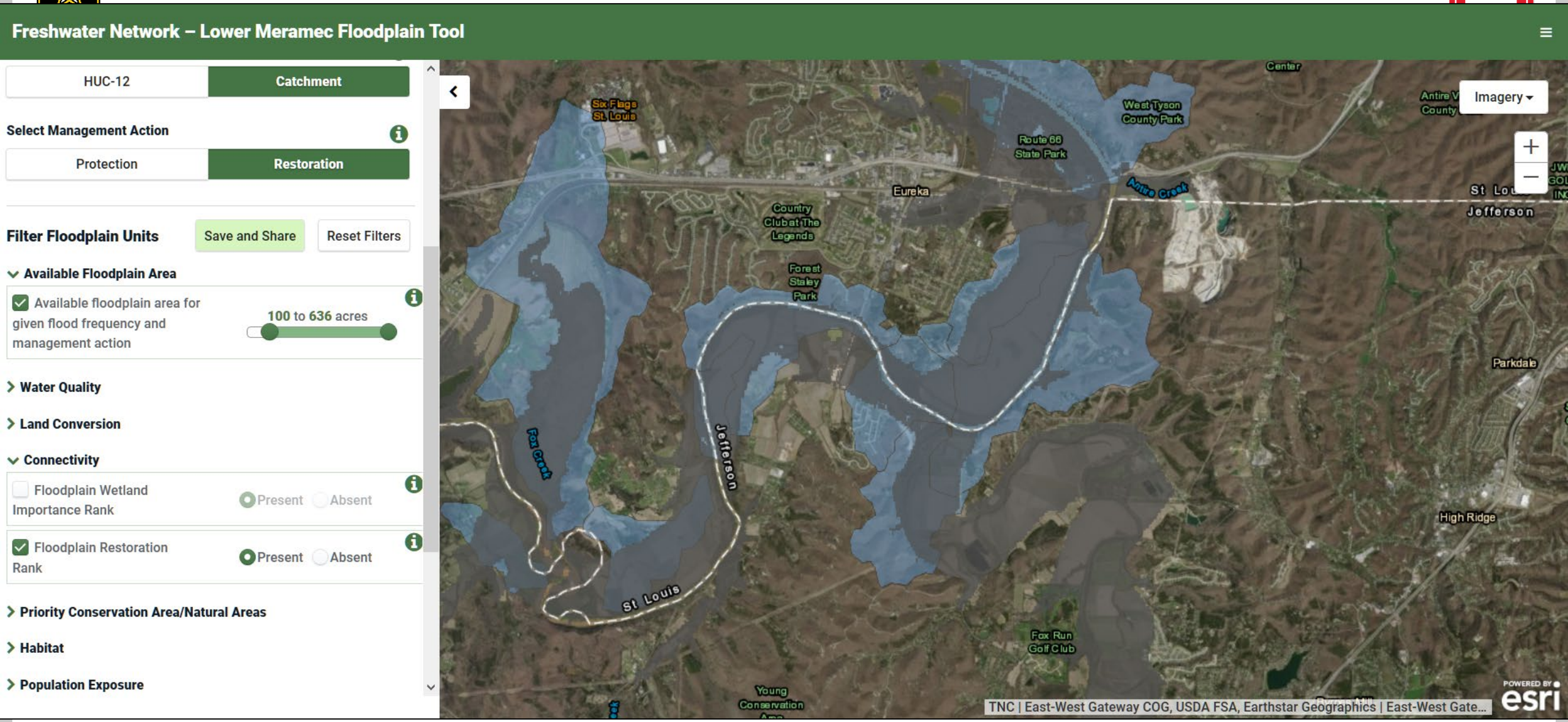
Topographic or Imagery



Floodplain Management Plan Environmental Hub Analysis

Freshwater Network – Lower Meramec Floodplain Tool

Filter Floodplain Units

Available Floodplain Area

Available floodplain area for given flood frequency and management action — 0 to 400 acres

Water Quality

Connectivity

Floodplain Wetland Importance Rank — Present / Absent

Priority Conservation Area/Natural Areas

Habitat

Population Exposure

Flood Damages

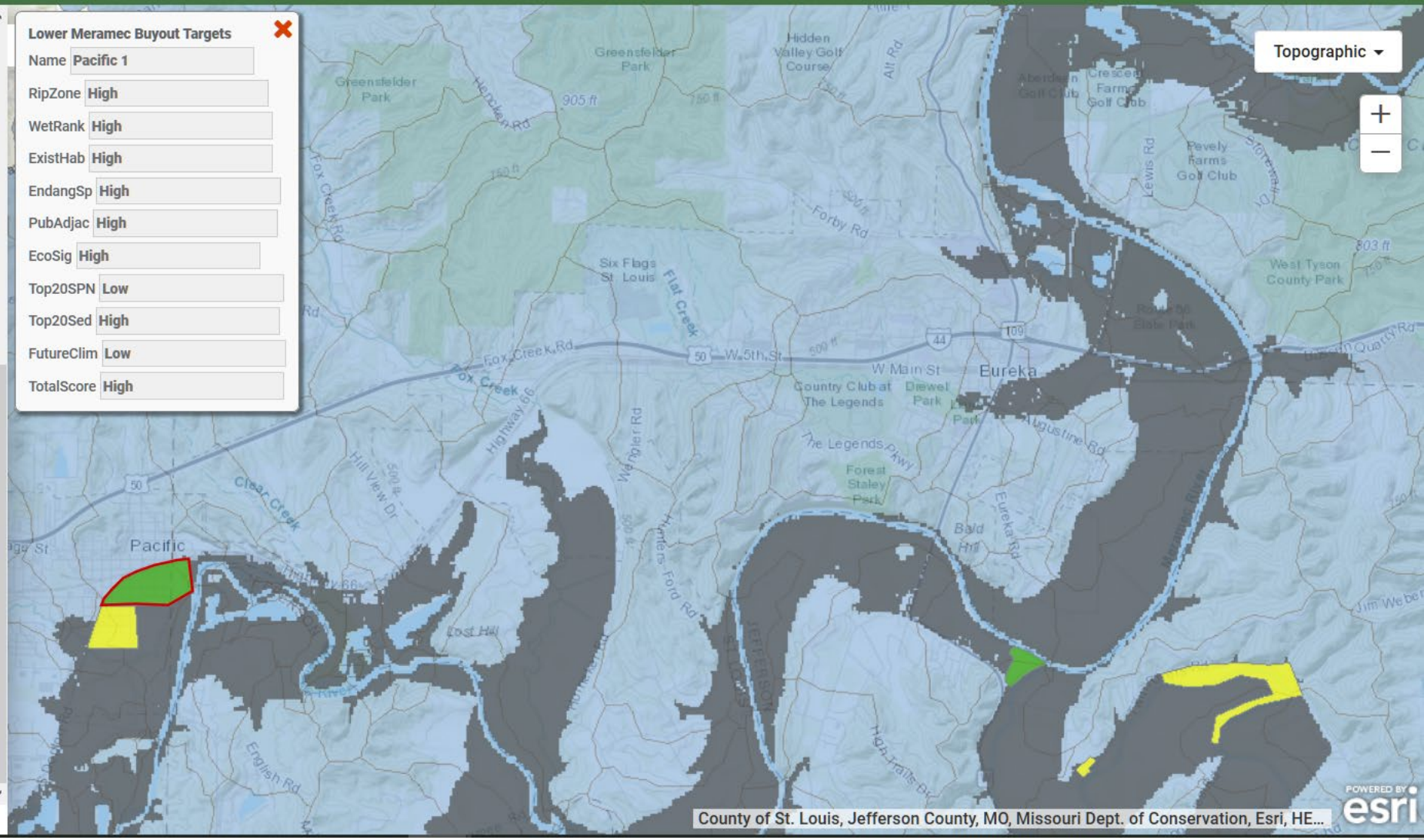
Social Vulnerability

Supporting Layers

- [ ] Structures in the 1% Annual Exceedance Probability Floodplain
- [x] Environmental Hub Analysis

Lower Meramec Buyout Targets

Name	Pacific 1
RipZone	High
WetRank	High
ExistHab	High
EndangSp	High
PubAdjac	High
EcoSig	High
Top20SPN	Low
Top20Sed	High
FutureClim	Low
TotalScore	High



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Structures in the 1% Annual Exceedance Probability Floodplain

Freshwater Network – Lower Meramec Floodplain Tool

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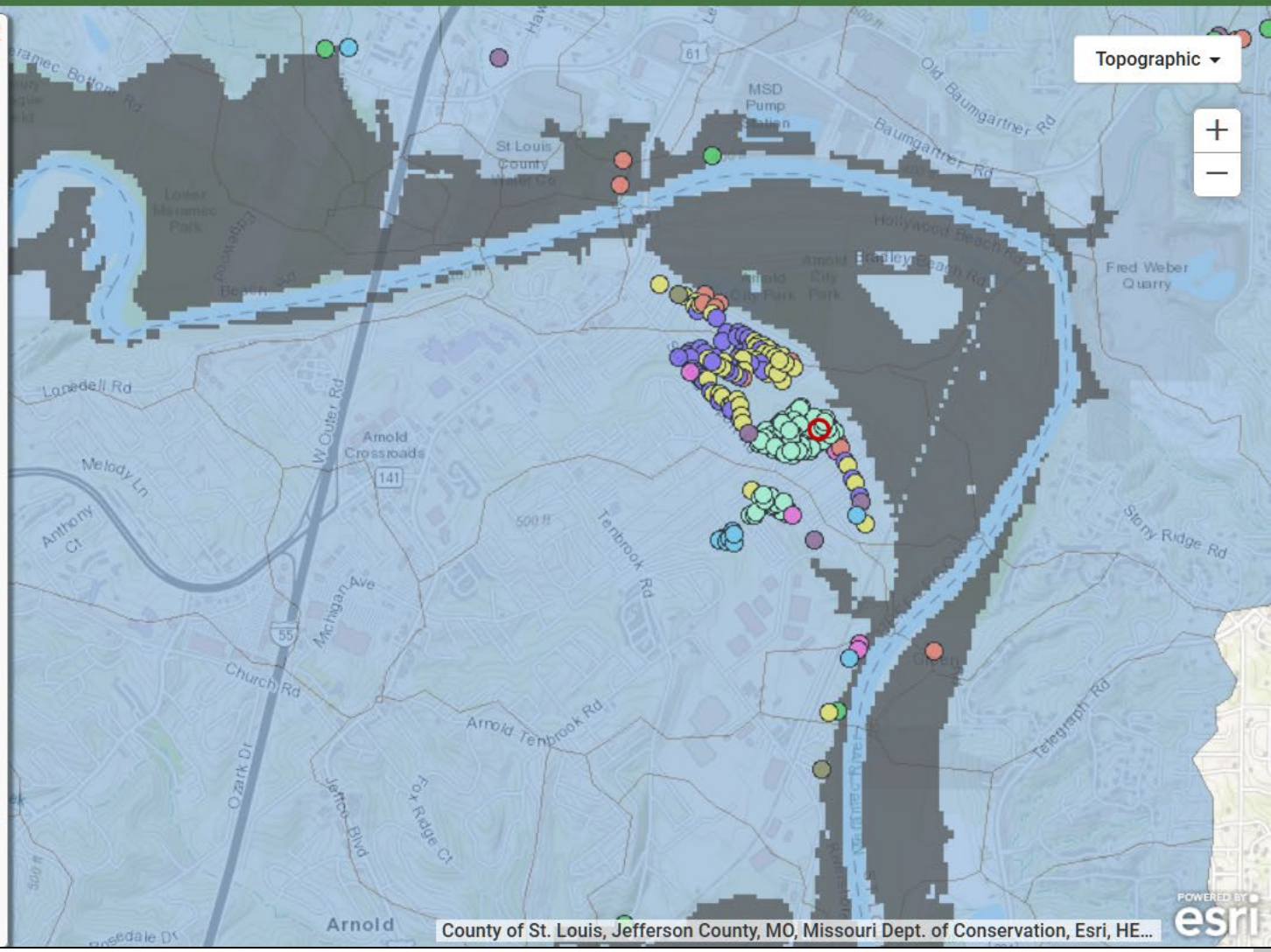
Social Vulnerability

Supporting Layers

- [x] Structures in the 1% Annual Exceedance Probability Floodplain
- [ ] Environmental Hub Analysis

USACE TNC Meramec Structures 100YR

Found_HT	2.66
Site_Addre	1 STARLING COMMUNITY T
Sq_Ft	0.00
Year_Bui_1	0.00
OccType	RES
Land_Val	0.00
Struc_Val	12,628.00
Tot_Val	12,628.00
Found_Type	Mobile Home
MUNICIPALI	ARNOLD
County	Jefferson
GSE_ft	415.81
FFE	418.47
F10YR_Dep	-9,999.00
F25YR_Dep	-9,999.00
F50YR_Dep	1.69
F100YR_Dep	3.95
F500YR_Dep	8.86
EnvroHub	Arnold1
EnviroRank	2.00
Recom_Cost	19.83
Recommen_1	Relocation
Recom_Co_1	7,200.00
F100YRDEP	1.29



The Nature Conservancy

The Nature Conservancy
Missouri

Link to the Lower Meramec Floodplain Prioritization Tool:

https://maps.freshwaternetwork.org/meramec-floodplain/

Barbara Charry
Strategy Manager: Floodplains & Nature-Based Solutions
Barbara.Charry@tnc.org

QUESTION AND ANSWER PERIOD

Ground rules:

1. No questions pertaining to pending litigation.
2. Ask questions pertaining to the whole community; individual property questions can be addressed one-on-one with the Partners after the Q&A portion of the meeting.
3. Q&A will end in 25 minutes so that there is time to speak with the Partners individually.

END OF PRESENTATION

Additional Public Engagement

- Partners in the Room
- Summary of Findings Sheet
- FAQ Sheet

Lower Meramec Multi-Jurisdictional

Floodplain Management Plan

Summary:

The purpose of developing the Floodplain Management Plan (FMP) is to enhance the community's flood resilience. An effective FMP offers options to lessen the impacts of flooding to the community's economy and the lives of those living near the many waterways. Once adopted, the FMP, maintained as a living document, is continually updated as new information arises, or as additional goals and strategies are developed. The goals of an FMP include:

- Reducing loss of life, injury, and hardship due to floods;
- Reducing flood-related damages;
- Reducing public expenditures for construction of additional flood damage reduction measures, emergency response actions, and post-disaster assistance; and,
- Preserving and enhancing natural floodplain functions for fish and wildlife habitat along with their attendant benefits of groundwater recharge, moderation of floods, water quality improvement, and reduced erosion and sedimentation.

The FMP focused on the 1-percent Annual Exceedance Probability (AEP), which refers to flood events that have a one percent probability of occurring in any given year, using existing Flood Insurance Rate Maps (FIRMS), where available. The hydraulic model used FIRMS throughout the study is the same model used for the Federal Emergency Management Agency's (FEMA) Flood Insurance Study.

Potential Measures Studied:

Nonstructural measures	Nonstructural and Nonphysical Measures
Elevation	Flood Warning Systems
Relocation	Flood Insurance
Buyout/Acquisition	Floodplain Mapping (FIRM)
Dry Floodproofing	Flood Emergency Preparedness Plans
Wet Floodproofing	Land Use Regulations
	Evacuation Plans
	Risk Communication

Silver Jackets Program

Silver Jackets teams across the United States bring together multiple state, federal, and local agencies, as well as non-governmental agencies, to leverage resources and learn from one another.

By applying their shared knowledge, the teams enhance response and recovery efforts when such events do occur.

The Lower Meramec Multi-Jurisdictional Floodplain Management Plan (FMP) was developed as an interagency Flood Risk Management (FRM) study via the Silver Jackets team funded under the Flood Plain Management Services (FPMS) program.

Lower Meramec Multi-Jurisdictional

Floodplain Management Plan

TOOLS	EVALUATION	
tions	EFFECTIVE	RECOMMENDED
stem	EFFECTIVE	RECOMMENDED
Media	EFFECTIVE	RECOMMENDED
ss Plans (or EAP)	EFFECTIVE	RECOMMENDED
orium	EFFECTIVE	NOT RECOMMENDED
	EFFECTIVE	RECOMMENDED
Acquisition)	EFFECTIVE	RECOMMENDED
	EFFECTIVE	RECOMMENDED
vocacy	EFFECTIVE	RECOMMENDED
e Measures	EFFECTIVE	RECOMMENDED
	EFFECTIVE	RECOMMENDED
	EFFECTIVE	RECOMMENDED
RS)	EFFECTIVE	RECOMMENDED
tection	EFFECTIVE	FURTHER EVALUATION NEEDED
	EFFECTIVE	FURTHER EVALUATION NEEDED
es	EFFECTIVE	RECOMMENDED
an Protection and Restoration	EFFECTIVE	RECOMMENDED
nd Education Opportunities	EFFECTIVE	RECOMMENDED
	EFFECTIVE	FURTHER EVALUATION NEEDED
	EFFECTIVE	FURTHER EVALUATION NEEDED

AMEC
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NAGEMENT
PLAN:
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Appendix E
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the existing
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Rating System

Implement Nonstructural Recommendations:

After the USACE's National Nonstructural Committee visited the Lower Meramec communities and performed visual assessments of the properties and structures, the Committee identified potential mitigation measures to reduce flood risk, decrease flood damages, and to potentially eliminate life-loss. These findings were then further analyzed to include regulatory and economic criteria, which resulted in final recommendations, which is described below.

Of the structures located within the 1% AEP floodplain in the Lower Meramec Basin, 17% (162) are recommended to be elevated, 13% (122) to be acquired, 27% (254) to be relocated, 38% (357) to be floodproofed, and the rest (5% or 47 structures) had inundation below the first floor, and therefore only required either a sewer check valve or relocation of utilities.

Lower Meramec Multi-Jurisdictional FMP Partners:

U.S. Army Corps of Engineers, U.S. Geological Survey, Federal Emergency Management Agency—Region VII, Missouri State Emergency Management Agency, Missouri Department of Natural Resources, City of Arnold, City of Eureka, City of Fenton, City of Pacific, City of Sunset Hills, City of Union, City of Valley Park, City of Wildwood, Franklin County, Jefferson County, St. Louis County, The Nature Conservancy, East-West Gateway Council of Governments, and Wichita State University Environmental Finance Center

https://www.mvs.usace.army.mil/missions/programs-project-management/lower-meramec-basin/