2012 TANEY COUNTY

DRAFT

Multi-Jurisdictional Natural Hazard Mitigation Plan

July 2012

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Multi-Jurisdictional Natural Hazard Mitigation Plan

For Taney County, Missouri and its Incorporated Communities, School and Other Special Districts

July 2012

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Table of Contents

List of Tables

List of Figures

Executive Summary

Overview

Natural hazard events in Taney County have historically caused injury, death, damages to property, and economic loss to the people and communities of Taney County. The *Taney County Natural Hazard Mitigation Plan* represents a collaborative effort between Taney County, its municipalities, and other public sector entities organizations to establish a guide for actions that can be undertaken to help reduce vulnerability to natural disasters and make Taney County safer.

The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires, that as of November 1, 2004, all local governments must adopt a natural hazard mitigation plan to be eligible for federal hazard mitigation funding. The DMA 2000 provides for the preparation of multi-jurisdictional plans by local governments to meet these requirements. The *Taney County Natural Hazard Mitigation Plan* is developed in conformance with the requirements of the DMA 2000 and is a multi-jurisdictional plan that has involved the participation of Taney County and all incorporated communities.

This Plan only addresses natural hazards that may affect Taney County; man-made or technological hazards are not discussed. The natural hazards addressed in the Plan include:

- Tornado and Severe Thunderstorm
- Riverine and Flash Flood
- Severe Winter Weather
- Drought
- Heat Wave
- Earthquake
- Dam Failure
- Wildfire

Plan Organization and Content

The *Natural Hazard Mitigation Plan* is presented in seven parts, including:

Part 1: Introduction
Part 2: Community Profile
Part 3: Risk Assessment
Part 4: Capability Assessment
Part 5: Mitigation
Part 6: Plan Maintenance
Part 7: Appendices
- Appendix A: Signed Adoption Resolutions
- Appendix B: Repetitive Losses
- Appendix C: Taney County Theatres
- Appendix D: Acronyms
- Appendix E: Glossary
- Appendix F: References

Participants in Plan Development

This Plan was developed by the Southwest Missouri Council of Governments (SMCOG) with the assistance and participation of the local governments in Taney County. A Plan Advisory Committee was established to encourage community participation in the planning process and to provide review to the development of the Plan. The Plan Advisory Committee includes representatives from the participating jurisdictions and emergency services at the county and municipal levels. Representatives from medical services, utilities, businesses, and area residents also served on the Committee.

Information contained in the Plan was collected by both SMCOG and the participating jurisdictions and organizations through various formats, including survey forms that were distributed to all communities.

On January 20, 2004, citizens were invited to an advertised public hearing to review the draft plan and develop goals, objectives and mitigation actions to address the identified hazards. Following this meeting, the goals, objectives and mitigation actions developed through the public hearing process were further refined and distributed for review. The final Plan was further refined and updated for presentation to the participating jurisdictions for adoption. Copies of resolutions adopting the Plan are contained in Appendix A.

Plan Goals and Mitigation Actions

The goals of the Taney County Natural Hazard Mitigation Plan include:

1. Protect lives and minimize injuries to the people of Taney County.

2. Ensure continued operation of government and emergency functions in a disaster.

3. Increase public awareness of natural hazards in the county in order to make the public a partner in hazard mitigation.

4. Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

5. Ensure that future development in the county is as “hazard proof” as possible.

The objectives and mitigation actions to achieve these goals fall within the following broad categories of mitigation:

- Prevention
- Property Protection
- Emergency Services
- Natural Resource Protection
- Structural Mitigation
- Public Information

The goals, objectives and mitigation actions are outlined in Part 5, Mitigation, of this Plan. Part 5 includes a five-year action matrix that summarizes the following categories of information:

- Identified Hazard - The specific natural hazard addressed by each mitigation action is indicated in the matrix.

- Plan Goals and Objectives - Each goal and the objectives or specific desired result to achieve the goal is indicated.

- Mitigation Actions - Specific mitigation actions (steps, tasks, activities and/or projects) identified by the plan participants to mitigate the effects of natural hazards in their communities.
- Communities - The political subdivisions to which the objectives and specific mitigation actions apply.

- Lead Organizer - The lead organizer(s) are those entities with either the government responsibility or capability to initiate and manage the implementation of the hazard mitigation action.

- Priority Rank and Target Date - Mitigation actions are listed as high, medium or low priority. High priorities are those actions that generally should be implemented within two years. Medium priorities are those that may be implemented within two to four years, and low priority actions are those which can or may have to wait longer than four years. The degree of need and the capability of implementation were considered in determining priority rankings.

- Evaluation - Evaluation summarizes the review measure by which status of implementation of the mitigation action may be reviewed.

Implementation, Monitoring and Evaluation

Natural hazard mitigation planning is an on-going, dynamic process. The success of the Plan is dependent on implementation, monitoring, and evaluation of the outcomes. The viability of the Plan as an effective action guide will require that the Plan be periodically reviewed and updated or revised as necessary. All of the Taney County political subdivisions participated in the development of the *Natural Hazard Mitigation Plan* and the county has developed a method to ensure regular review and update of the Plan. Continued collaborative efforts, cooperation and communications between the county and municipal governments will enhance long term sustainability of the planning process and implementation activities to reduce the impacts of natural disasters on the Taney County community.

Part 1: Introduction

Purpose of Plan

The Taney County Multi-Jurisdictional Natural Hazard Mitigation Plan, hereon referred to as the *Plan*, represents a collaborative effort between Taney County, its municipalities, school districts and other public sector entities and organizations to establish a guide for actions that can be undertaken to help make Taney County safer.

Mitigation is action taken to reduce or eliminate long-term risk from hazards and their effects. The purpose of the *Plan* is to describe vulnerability of local governments and other public entities combined with probability and severity to assess the risk for each identified natural hazard that impacts the county and to each jurisdiction participating in the *Plan*. The risk assessment guided the development of goals, objectives and a comprehensive list of mitigation actions. All actions were prioritized based on a review of potential benefits and costs.

The *Plan* only addresses natural hazards that may affect Taney County; man-made or technological hazards are not discussed other than in reference to cascading damages that could result from a natural hazard event. During the planning process, Emerging Infectious Diseases were identified as a natural hazard due to the county's heightened vulnerability as a major tourism and recreation destination. The natural hazards addressed in the Plan include:

- Tornado and Severe Thunderstorm
- Flooding (Riverine and Flash)
- Drought
- Heat Wave
- Earthquake
- Dam Failure
- Wildfire
- Severe Land Subsidence (Sinkholes)
- Emerging Infectious Disease

Branson, Missouri, located in west-central Taney County, is a fourth class city with a permanent population of approximately 10,000. The Branson area is an internationally renowned tourist destination, being the number one motor coach destination for the past decade, number one tour bus destination in the continental United States for outlet mall shopping excursions, and the number two tour bus destination in the continental United States for music entertainment shows. The city of Branson includes approximately 340 restaurants, 50 theaters, three shopping malls, 200 lodging facilities and three lakes.

Approximately seven million guests per year visit this area. The average stay is two and a half days. Branson is within a one-day drive for 50 percent of the United States population. The busiest tour bus time occurs during the last week in November, with the day after Thanksgiving for shopping and the first week in December with Christmas music shows, lighting displays, and the Adoration parade (TCHD,2012).

On February 29, 2012, an EF-2 tornado touched down near Highway 76 in Branson and tracked through the strip of music entertainment theaters, restaurants, hotels and amusement establishments before hitting the downtown Branson Landing where it blew out or cracked windows in 219 of the hotel rooms in the Hilton Branson Convention Center. This tornado impacted Kimberling City and Indian Point in Stone County destroying marinas and damaging over 170 watercraft before moving through Branson and continuing through Powersite and Kissee Mills in Taney County leaving 15,000 homes and businesses without power.

In Branson, this event resulted in $900,000 in damages to public property. In addition, 11 commercial properties, including nine hotels, and 70 other structures were heavily damaged. Estimates of the damages from the leap day tornado have yet to be fully determined although they should be considered quite great. There were a total of 32 injuries and no fatalities in the Branson area. These injuries and possible loss of life would have been much greater during peak spring and summer months when on any given night there may be 20,000 individuals in motels, theaters, restaurants and stores within this tornado's path.

Since 2005, there have been nine (9) federal disaster declarations that have included Taney County. The description of declarations includes: three (3) severe storm, flooding and tornado events; two (2) severe storm and flooding events; and four (4) severe winter storm events. Hazard events such as flooding, tornadoes, severe thunderstorms, and severe winter weather have resulted in losses throughout urban and rural areas of the county. These events will continue to occur in the future as well as other less severe hazards. However, the impacts of natural hazard events can be lessened and injuries, loss of life and damages to properties can be reduced through the application of prudent actions and strategies. The *Plan* is developed in conformance with the requirements of the Disaster Mitigation Act of 2000 which requires that local governments develop and approve a natural hazards mitigation plan to be eligible after November 1, 2004 for federally funded mitigation assistance. Mitigation plans will be required to receive mitigation assistance for all federally declared disasters.

Basis for Planning Authority

Section 322 of the Robert T. Stafford Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165, as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Tribes and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning. FEMA has implemented the various hazard mitigation planning provisions through regulations at 44 CFR Part 201.

These reflect the need for States, Tribal and local governments to closely coordinate mitigation planning and implementation efforts and describes the requirement for a State Mitigation Plan as a condition of pre- and post-disaster assistance, as well as the mitigation plan requirement for local and Tribal governments as a condition of receiving FEMA hazard mitigation assistance.

The Missouri State Emergency Management Agency (SEMA) provided funding for the development of this Plan. SEMA requested the regional planning commissions in Missouri to work with local governments to develop the hazard mitigation plans. With the agreement of Taney County, SEMA contracted the hazard mitigation planning effort to the Southwest Missouri Council of Governments (SMCOG). SMCOG worked in collaboration with the county, municipalities, school districts, other special districts and community organizations to develop the *Plan*.

Assurance Statements of Compliance with FEMA

The regulations governing the mitigation planning requirements for local mitigation plans are published under 44 CFR §201.6. Under 44 CFR §201.6, local governments must have a FEMA approved Local Mitigation Plan in order to apply for and receive project grants under the following hazard mitigation assistance programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Severe Repetitive Loss (SRL)

FEMA may require a Local Mitigation Plan under the Repetitive Flood Claims (RFC) program. SMCOG staff relied on FEMA's July 1, 2008 publication Local Multi-Hazard Mitigation Planning Guidance to meet the mitigation planning requirements. The Local Multi-Hazard Mitigation Planning Guidance is an interpretation and explanation for the Local Mitigation Plan regulations at 44 CFR §201.6 and is FEMA's official source for defining the requirements of original and updated Local Mitigation Plans. Additional FEMA resources frequently consulted include State and Local Mitigation Planning How-to Guides (FEMA 386-1 through 8).

Plan Organization and Content

Following the Executive Summary, the Plan is divided into seven parts, including Introduction, Community Profile, Risk Assessment, Capability Assessment, Mitigation, Plan Maintenance, and Appendices:

- Part 1 - Introduction. The Introduction provides an overview of the *Plan's* planning process, public involvement, participating jurisdictions, a description of what was updated from the *2005 Plan* and list of meeting attendees.

- Part 2 - Community Profile. This element provides a description of the political, natural, cultural, demographic, socio-economic and developmental characteristics of Taney County and its municipalities. It also includes identification of critical facilities and infrastructures, vulnerable populations, and resources that may be affected by a natural hazard event.

- Part 3 - Risk Assessment. The Risk Assessment provides an analysis of the natural hazards addressed in the *Plan*, including past occurrences, vulnerability assessment and impact analysis estimating losses in dollar amounts.

- Part 4 - Capability Assessment. The Capability Assessment discusses the current capabilities of Taney County and its municipalities to mitigate disaster events.

- Part 5 - Mitigation. This part describes the range of mitigation categories and activities that may be employed by a community, outlines the mitigation goals, objectives and mitigation strategies developed by Taney County and its communities, and provides a matrix that summarizes the mitigation strategies, priorities, responsibilities for implementation, and assessment.

- Part 6 - Plan Maintenance. The Plan Maintenance section notes the process and procedures outlined by Taney County and its municipalities to review and monitor progress of plan implementation and actions taken to reduce the risks of future disaster events that may affect the county. It also contains provisions for update of the Plan.

- Part 7 - Appendices. The Appendices includes the resolutions of plan adoption by Taney County and each city, repetitive losses incurred by the National Flood Insurance Program, acronyms, glossary of terms, and references.

Public Involvement

In accordance with Missouri's "sunshine law" (RSMo §610.010, 610.020, 610.023, and 610.024), input from the general public was solicited through media outlets, including public meeting notices published in local newspapers and "Notice of Public Meeting" flyers distributed to county and city clerks to post in places visible to the public in government buildings. All meeting dates and times were posted on the SMCOG website. The public was notified of all but one Plan Review and Advisory Committee meetings subsequent to the Kick-Off meeting through a legal advertisement in the Branson Tri-Lakes News print publication.

The preliminary draft of the plan was posted on the SMCOG website and the public was invited to comment on the draft plan through press release to local media, legal notice and "public flyers." The comment period extended for a period of three weeks prior to being submitted to SEMA for approval. The draft was posted on the SMCOG website on July 7, 2012, where all meeting dates and the draft plan elements were posted for public viewing and comment. Input from city and county officials was solicited through distribution of drafts of plan elements for discussion and review at scheduled meetings and through meetings and other communications with individual community representatives and elected officials.

Neighboring jurisdictions were notified via email and letters, a notification was sent to the Branson Convention and Visitors Bureau, Hollister, Forsyth and Rockaway Beach Chambers of Commerce and local and regional agencies, such as; OACAC, U.S. Army Corps of Engineers, Emergency Management Directors from neighboring counties and the University of Missouri Extension office. A complete listing of neighboring agencies invited to participate in the planning process and what meetings they were invited to attend is included in Appendix F.

Plan Adoption

To be eligible for mitigation funding, local governments must adopt the FEMA-approved update of the Plan. The participation of the local government stakeholders in the planning process is considered critical to successful implementation of this plan. Each jurisdiction that is seeking approval for the plan must have its governing body adopt the updated plan, regardless the degree of modifications. SMCOG collaborated with the local governments in Taney County to assure participation in the planning process and the development of a plan that represents the needs and interests of Taney County and its local jurisdictions. Appendix A contains local jurisdiction resolutions adopting the *Plan*.

Participating Jurisdictions and Participation Requirements

In order to be included in the plan as a participating jurisdiction each jurisdiction was required to send a representative to multiple mitigation planning meetings as a minimum requirement. If, however, a representative was not able to attend at least two meetings they were encouraged to arrange for a one-to-one meeting with SMCOG staff or contact the SMCOG offices to obtain information presented at any of the planning meetings. Although not required, a set of standards for participation were developed in order for each jurisdiction to participate in the planning process and account for the variability of resources within each jurisdiction. This set of standards included; reviewing and commenting on plan draft materials, submitting insured replacement values and information relating to critical facilities and completing community or district hazard mitigation surveys. Jurisdictions that met the minimum requirement and any combination of three standards are considered to have satisfactorily participated in the planning process. Table 1-1 provides a record of participation in the planning process.

Table 1-1: Record of Participation

Jurisdiction	Plan Update Status	Nature of Participation			
		Attended Meetings	Review and Comment on Draft Materials	Submitted Asset Inventory	Completed Surveys
Taney County	Continuing	X	X		
Municipalities					
Branson	Continuing	X	X	X	X
Bradleyville	Dissolved	-	-	-	-
Bull Creek	Continuing	X	X		
Forsyth	Continuing	X			X
Hollister	Continuing	X			X
Merriam Woods	Continuing	X		X	
Kirbyville	Continuing	X		X	
Rockaway Beach	Continuing	X			X
Taneyville					
School Districts					
Bradleyville R-I	New	X	X		X
Taneyville R-II	New	X	X	X	X
Forsyth R-III	New	X			X

Table 1-1: Record of Participation					
		Nature of Participation			
Jurisdiction	Plan Update Status	Attended Meetings	Review and Comment on Draft Materials	Submitted Asset Inventory	Completed Surveys
Branson R-IV	New				X
Hollister R-V	New	X	X	X	X
Kirbyville R-VI	New	X	X	X	X
Mark Twain R-VIII	New				
Colleges & Other Special Districts					
OTC-Table Rock	New	X	X	X	X
Taney County Sewer District	New	X			
Taney County Ambulance District	New	X		-	X

The *Plan* is a multi-jurisdictional plan including the participation of the following local jurisdictions:

- Taney County
- City of Branson
- Village of Bull Creek
- City of Forsyth
- City of Hollister
- Village of Kirbyville
- Village of Merriam Woods
- City of Rockaway Beach
- Bradleyville R-I School District
- Taneyville R-II School District
- Forsyth R-III School District
- Hollister R-V School District
- Kirbyville R-VI School District
- Taney County Rural Sewer District
- Taney County Ambulance District
- Branson R-IV School District
- Mark Twain R-III School District

The following Jurisdictions did not participate:

- Taneyville

Plan Preparation Methodology and Schedule

In February 2012, SMCOG entered into cooperative agreements with SEMA and Taney County to prepare this multi-jurisdictional plan for public entities in Taney County. Discussions on the development of the Taney County Multi-Jurisdictional Natural Hazard Mitigation Plan began in early February of 2012 with a meeting attended by SMCOG staff and the County Emergency Management Director. This meeting was conducted to discuss the timeline for developing the hazard mitigation plan, the planning process, identification of stakeholders and community organizations to include in the planning process and a date for the Kick-Off meeting to initiate participation of jurisdictions and public entities in the planning process.

SMCOG began conducting research and updating demographic and community profile information in advance of the Kick-Off meeting on February 28. At the Kick-Off meeting the plan update process was discussed with representatives from the local jurisdictions and emergency services. Meeting attendees were informed of participation requirements for the Plan, in-kind match documentation and the online repository of Plan materials on that could be viewed and downloaded from the SMCOG website; such as, the capability survey instruments and full version of the 2005 Taney County Natural Hazard Mitigation Plan. The distinction between the 2005 Plan and the updated version that requires that school districts in particular and other entities participate as stand-alone jurisdictions to maintain eligibility for FEMA mitigation grant programs was emphasized.

SMCOG staff led the development of the plan under the direction of the emergency management director and the Plan Review and Advisory Committee, which included local elected officials, municipal government staff, county government staff, emergency services personnel, school officials, and employees from the health and social services organizations in the county. The Plan Review and Advisory Committee met with SMCOG on several occasions from February through June 2012 to collaborate on the development of the Plan update. Participants assisted in data collection; reviewed and revised the Plan's goals, objectives and mitigation strategies; and provided reviews and comments on the plan throughout the update process.

Significant dates in the planning process for preparation of the *Plan* are noted below:

February 2012	Initial meeting with Taney County Emergency Management and SMCOG staff: • Prospective participants and stakeholders identified, EMD to prepare and review contact list • Schedule Kick-Off meeting date and venue • SMCOG staff to draft invitation letters and to begin update of community profiles and storm event data
February 2012	Agreements executed between the Taney County Commissioners, SMCOG and SEMA to update the Natural Hazard Mitigation Plan.
February 28, 2012	Plan Update Kick-Off Meeting: • Presented information on the planning process and

	plan elements • Distributed community and district capability surveys • Discussed minimum participation requirements and project timeline • Plan review and advisory committee meeting schedule established
April 10, 2012	Plan Advisory Committee Meeting: • Updated Community Profile Chapter distributed for review • Hazard profiles presented and vulnerability scales for probability, severity and functional loss distributed • Completed vulnerability assessment for each participating jurisdiction
May 8, 2012	Plan Advisory Committee Meeting: • Updated Risk Assessment Chapter distributed for review • Review of Goals, Objectives and actions from the 2005 Plan • Assessed progress towards 2005 actions and discussed actions to be revised, deleted, deferred or added
May 22, 2012	Plan Advisory Meeting: • Continued discussion and final review of actions for the Plan update • Discussed STAPLEE criteria for cost/benefit review of revised action items • Discussion of lead agencies and funding sources for each of the action items, timelines for implementation and measurable outcomes
June 12, 2012	STAPLEE Meeting: • Revised actions ranked and prioritized according to STAPLEE with simple scores method
July 7, 2012	Draft Plan posted on the SMCOG Website, paper copy delivered to Taney County EMA, public notified and public comment period begins
July 28, 2012	Completed draft of the Taney County Multi-Jurisdictional Natural Hazard Mitigation Plan submitted to SEMA for review

The individuals in Table 1-3 participated in the development of the *Plan*. Many of these individuals represented community and the various interests on the Plan Review and Advisory Committee. Participation in the development of the plan was also accomplished through telephone, fax and email communications to individual communities and through meetings with community representatives.

Plan Review and Update Process

The plan update process for all sections of the plan began with a review of each section from the approved *2005 Plan* and updating information presented in the original plan. For example, demographic information was updated using data from the 2010 Census and data from the most recent American Community Survey. Original source material for the Community Profile and Risk Assessment sections were reviewed and or updated. For example, hypertext links for the Economic and Agricultural Census web pages and MDC wildfire statistics were tested to see if they were up to date and operational. In most cases they were and information available for the period between the *2005 Plan* preparation and the date of the 2012 update preparation was incorporated into tables and narratives.

A significant amount of information presented in the plan has been updated and revised based on the review and incorporation of existing plans, studies, reports and technical information. Appendix E contains a listing of references to plans, studies, reports and technical information to incorporate into hazard profiles, risk assessment and capability sections. A few examples of information incorporated from the review of existing plans, etc. include:

- National Climactic Data Center Storm Events updated to include events from 2006 to 2011
- Information describing the impacts of natural hazards from the *State of Missouri Hazard Analysis, 2011* was added to hazard profiles in the Plan update.
- The County Emergency Management Director incorporated information from the Emergency Operations Plan into revisions to the Capability Assessment.

In most cases, SMCOG staff was responsible for the review and incorporation of revised and updated material in the Plan. As new information was incorporated into the Plan, updated draft materials were distributed for review and comment at Plan Review and Advisory Committee meetings.

The bulk of revised material was developed from local jurisdiction reviews of initial section drafts and community and school district mitigation surveys. Table 1-2 below describes the revisions and updates incorporated into each section of the plan.

Table 1-2: Updates by Section of the 2010 Taney County Hazard Mitigation Plan

Plan Section	Updated Material
Part I-Introduction	• Added public involvement section describing advertised public meetings and opportunity for neighboring communities and agencies to be involved in the planning process • Added minimum participation requirements for local jurisdictions • Included a record of participation describing how each jurisdiction participated in the process • Updated list of plan participants

Table 1-2: Updates by Section of the 2010 Taney County Hazard Mitigation Plan	
Plan Section	**Updated Material**
	• Updated planning methodology and plan timeline • Added table of local officials who attended meetings • Added plan review and update process section
Part II-Community Profile	• Updated demographic information • Updated critical, vulnerable and government facilities information • Incorporated building code, ordinance and mitigation measures based on community surveys • Incorporated revisions to community profiles as draft sections were reviewed by local officials
Part III-Risk Assessment	• Included events for each hazard that occurred from 2006-2011 • Updated probability and severity rankings • wildland urban interface hazard area map for wildfire • Included new profile for sinkhole hazard and emerging infectious disease • Added likely locations subsections for each hazard • Added overall summary of hazard vulnerability by jurisdiction • Added vulnerability assessment tables for each hazard and each participating jurisdiction
Part IV-Capability Assessment	• Incorporated new information from community surveys and reviews by local officials
Part V-Mitigation	• Updated mitigation actions development process • Included actions eliminated and reason for removal • Updated progress made towards mitigation goals from earlier plan • Updated cost benefit review method using STAPLEE and simple scores • Discussed funding sources, lead agencies and status of continuing, revised and new actions
Part VI-Maintenance	• Plan monitored at Emergency Managers Meeting every two months

Acknowledgements

Several county and municipal officials provided valuable assistance throughout the planning process. Special thanks to the Taney County Commission for their participation and guidance in establishing the Plan Advisory Committee. Thank you also to all the municipal and county officials, residents, and the representatives from local business, utilities, health care and other emergency management personnel who participated on the Plan Advisory Committee, reviewed and commented on the drafts of the Plan, and contributed their time and ideas to the county-wide workshop for developing the Mitigation component of the Plan. A special thank you also to the staff from the incorporated communities in Taney County and other public and private sector institutions and organizations that provided input, data, and other resource material used in the development of the Plan. A very special thank you to Chris Berndt, Taney County Emergency Management Director, for his input throughout the process of completing the *Plan*.

Table 1.3 Taney County Hazard Mitigation Plan Meeting Attendance							
Organization	**Representative**	**2/28/2012**	**4/10/2012**	**5/8/2012**	**5/22/2012**	**6/12/2012**	**Arranged**
Taney County							
GIS Manager	Patsy Alexander	x	x				
Office of Emergency Management	Melissa Duckworth	x	x	x	x	x	
Taney County EMD	Chris Berndt	x	x	x	x	x	
Planning & Zoning Administrator	Bob Atchley	x	x			x	
City of Branson							
Mayor	Raeanne Presley	x	x				
Planning Director	Jim Lawson	x	x				
Planning and Development	Stephenie Schultz	x					
Branson Fire and Rescue Chief	Ted Martin	x		x	x	x	
Bull Creek Village							
Bull Creek Emergency Management	James Felton		x	x	x	x	
City of Forsyth							
Chief Building Inspector	Richard Melton	x	x				
Fire Department Chief	Nathan Bower	x	x				
City of Hollister							
Building Official	Trent Bowers	x	x	x	x	x	
EMD	Ed Zielonka		x				
Kirbyville							
Kirbyville Trustee	Richard Jones				x		5/17/2012
Merriam Woods							
Village Administrator	Angela Leist		x			x	
Police Department	Mark Trog				x		
City of Rockaway Beach							
Mayor	Lawrence Cline	x	x	x	x	x	

Table 1.3 Taney County Hazard Mitigation Plan Meeting Attendance							
Organization	**Representative**	**2/28/2012**	**4/10/2012**	**5/8/2012**	**5/22/2012**	**6/12/2012**	**Arranged**
Alderman	Gary Judd		x	x	x		
P & Z Commissioner	Judy Daniel		x				
P & Z Commissioner	Harriet Leenerts		x				
Alderman	Jerry Simms			x			
Branson R-IV School District							
Asst. Superintendent	Dr. Don Forrest						6/27/12
Kirbyville R-VI School District							
Superintendent	Carless Osbourn	x	x	x	x	x	
Kirbyville R-VI Schools	Gary Rickman	x					
Forsyth R-III School District							
Superintendent	Brent Belvins	x					
Asst. Superintendent	Jeff Mingus	x	x				
Bradleyville R-I School District							
Bradleyville R-I Schools	Bob Comer					x	
Hollister R-V School District							
Hollister R-V Schools	Debbie Redford	x	x	x	x	x	
Taneyville R-II School District							
Taneyville R-II Schools	Scott Ewing		x	x		x	
Ozarks Technical Community College							
Branson Education Center Director	Robert Griffith		x				
Director of Safety & Security	Pete Rothrock		x	x	x	x	
Staff	Bill Carpenter		x				
Staff	Bill Dowdy			x			
Staff	JD Landon					x	
Taney County Regional Sewer District							
Administrator	Eddie Coxie		x	x		x	

Table 1.3 Taney County Hazard Mitigation Plan Meeting Attendance							
Organization	**Representative**	**2/28/2012**	**4/10/2012**	**5/8/2012**	**5/22/2012**	**6/12/2012**	**Arranged**
Community Organizations							
Taney County Health Department	Robert Niezgoda	x	x		x	x	
Taney County Health Department	Kim Foster		x	x	x	x	
Taney County OACAC	Peggy Golden	x	x			x	
Taney County Ambulance District	Darryl Coontz	x		x			
White River Valley Electric Cooperative	Cindy Rains	x					

Part 2: Community Profile

Location

Taney County is located in Southwest Missouri and is bordered by Christian County to the north, Stone County to the west, Douglas and Ozark counties to the east, and the Arkansas counties of Boone and Marion to the south. Taney County covers 632 square miles. Of this territory, the county's incorporated cities and villages cover approximately 25 square miles.

Incorporated communities include the villages of Bull Creek, Kirbyville, Merriam Woods, and Taneyville and the cities of Branson, Forsyth, Hollister, and Rockaway Beach. There are also several unincorporated settlement areas in the county, including Bradleyville, Brown Branch, Kissee Mills, McClurg, Powersite, and Walnut Shade in the northern section of the county and Cedar Creek, Protem, Ridgedale, and Rueter in the southern portion. The City of Forsyth is the county seat.

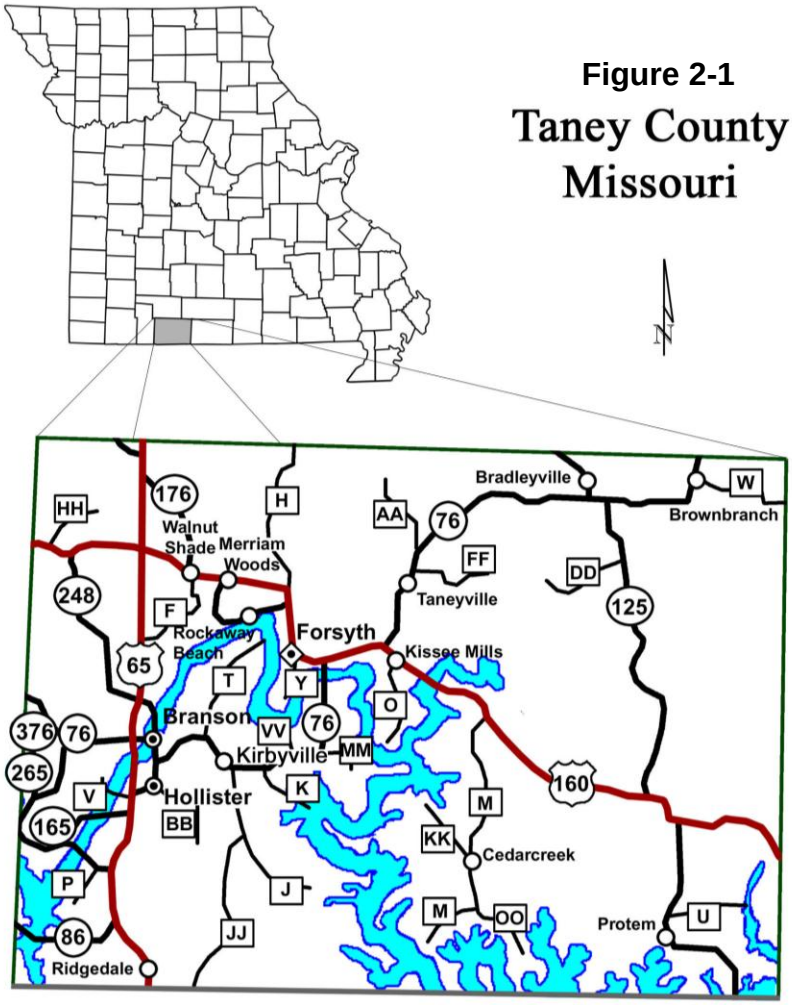


Figure 2-1
Taney County Missouri

Development History

Historically a rural, agrarian-based community, many changes have occurred since Taney County's organization as a Missouri county in 1837. The county has seen its primary economy change from one of labor intensive agricultural production of fruits, vegetables and other cash crops, lumbering, and manufacturing of goods from the area's natural resources to one heavily dependent on service and retail sector jobs created by the tourism industry.

The year 1909 brought about a proposal that would have long lasting impact on the economic future of Taney County. It was proposed that a dam be constructed across the White River for hydroelectric power generation. The Amhursen Hydraulic Construction Company began construction on the Powersite Dam in 1911. The dam was to be 70 feet tall and over 1000 feet in length and would inundate over 2,000 acres of prime farmland. The reservoir created was named Lake Taneycomo. The dam was completed in 1913 and provided power for Springfield, Joplin, Carthage, Forsyth, and many other towns. With the creation of Lake Taneycomo, the Hollister area quickly became an outdoor recreation destination, attracting vacationers from the St. Louis and Kansas City areas as well as throughout the region.

The evolution of the tourism industry was further spurred by the publication of Harold Bell Wright's book, *Shepherd of the Hills*, in 1907. Thousands of visitors from around the country traveled to the area to see the sites made famous in Wright's novel. The first Shepherd of the Hills pageant was held in 1960. Another important attraction contributing to tourism growth in Taney County was the opening of the Silver Dollar City theme park in neighboring Stone County in 1960.

By the early 1960s, the focus of the tourism activity in Taney County shifted to the Branson area, spurred by improvements to Highway 65, the creation of Table Rock Lake, and the growing popularity of attractions such as Silver Dollar City and the Shepherd of the Hills pageant. Branson's first music show, the Baldknobbers, opened in 1959. National recognition of the Branson area and the opening of many new music theatres in the early 1990s have made tourism the economic mainstay in Taney County. Today, Branson has over 40 theaters with more than 60,000 theater seats, 207 lodging facilities with over 18,000 rooms and 200 restaurants with over 38,000 seats. At any given night, there may by up to 20,000 visitors and employees located in the various hotels and theaters on State Highway 76 / Country Music Boulevard.

Form of Government

Missouri is divided into 114 counties and the City of St. Louis by the Revised Statutes of Missouri (RSMo) §46.040. Counties are political subdivisions of the State "for governmental, political, and public purposes" (Freyermuth, n.d) and have a wide range of governmental responsibilities. The Missouri legislature has established four classes of counties, based on the assessed valuation of real and personal property (Freyermuth, n.d.; RSMo §48.820). Taney County is classified as a first class county and is governed by a three-member Commission. Under the provisions of RSMo §49.010, counties are divided into two districts of nearly equal population (in Taney County, the eastern district and the western district). Each district elects one commissioner and the presiding commissioner is elected by the county as a whole. Commissioners serve four-year terms.

There are currently two classes of cities in Missouri--third and fourth class cities, as well as villages and home rule charter cities (Freyermuth, n.d.). Fourth class cities are those with populations greater than 500 but less than 3,000 inhabitants. Villages/towns are incorporations with less than 500 inhabitants (RSMo §72.050). There are eight incorporated communities in Taney County, four of which are fourth class cities and four which are villages. Bull Creek, Kirbyville, Merriam Woods, and Taneyville are villages and Branson, Forsyth, Hollister, and Rockaway Beach are fourth class cities.

Villages are regulated under RSMo §80 and are governed by a board of trustees. The board elects a presiding officer (chair) and a clerk, and appoints the village's officers. Fourth class cities are regulated by RSMo §79. Such cities may have the mayor/board of aldermen or mayor/city administrator/board of aldermen form of government. The mayor presides over the board but may vote only to break a tie. Table 2-1 lists the local governments in Taney County, Class of county/municipality, form of government, and regular meeting dates of the governing bodies.

Table 2-1: Taney County Local Government

Local Government	Class	Form of Government	Meeting Schedule
Taney County	First	Commission	Monday
Branson	Fourth	Mayor/City Administrator/ Board of Aldermen	2nd and 4th Mon, 7:00 p.m.
Bull Creek	Village	Chair/Board of Trustees	1st Tues, 7:00 p.m.
Forsyth	Fourth	Mayor/Board of Aldermen	3rd Mon, 7:00 p.m.
Hollister	Fourth	Mayor/City Administrator/ Board of Aldermen	1st and 3rd Thurs, 7:00 p.m.
Kirbyville	Village	Chair/Board of Trustees	3rd Thurs, 7:00 p.m.
Merriam Woods	Village	Chair/Board of Trustees	2nd and 4th Tues, 7:00 p.m.
Rockaway Beach	Fourth	Mayor/Board of Aldermen	2nd Mon, 6:30 p.m.
Taneyville	Village	Chair/Board of Trustees	2nd Tues, 7:00 p.m.

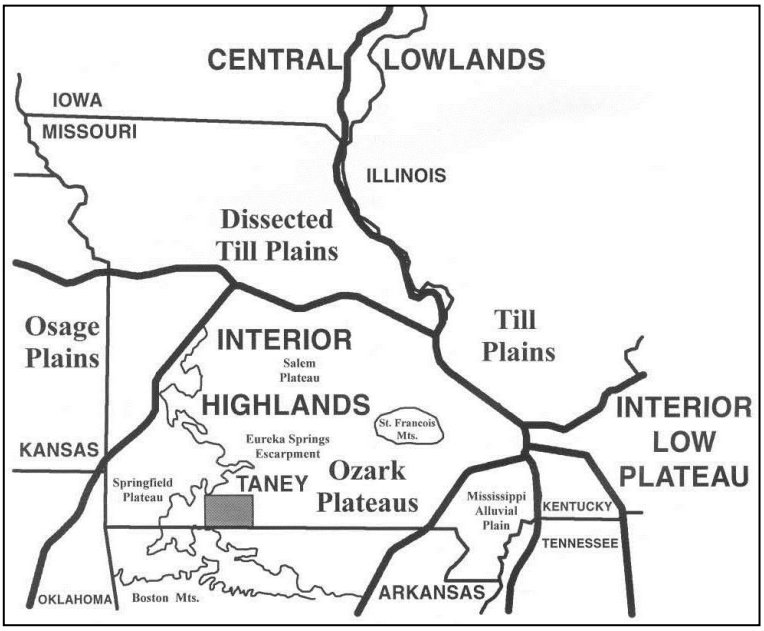
In addition to these incorporated communities, several smaller unincorporated settlements are scattered throughout the county. Some of these larger settlement areas include Protem, Kissee Mills and Walnut Shade. The county is also divided into eight townships including Branson, Beaver, Big Creek, Cedar Creek, Jasper, Oliver, Scott, and Swan.

Physical Characteristics

Physiography and Geography

Taney County is located in the southwestern Ozarks Plateau region of the Interior Highlands physiographic province. The county is situated on the Salem Plateau portion of the Ozarks Plateau. Rugged hills, steep ridges, and deep, narrowly entrenched stream valleys characterize the Salem Plateau. Topographic relief in Taney County is over 800 feet, ranging from high elevations of approximately 1,480 feet above mean sea level (msl) in the northeastern section of the county to 654 feet at Bull Shoals Lake (normal pool elevation). Much of the county is characterized by moderate to very steep slopes. Approximately 50 percent of the county has slopes of 10 percent or greater.

Figure 2-2: Regional Physiography



Source: Taney County Master Plan, 1999.

Taney County is primarily underlain by Mississippian and Ordovician age limestones and dolomites. The county's topographic surface features reflect an advanced stage of the geological erosion cycle. Surface features are primarily a result of the Ozark uplift and subsequent erosion of the limestone bedrock. Taney County is known for its panoramic vistas. Outliers, which are rock outcrops that have become detached from the main body of bedrock, extend in length from one to twelve miles and create long, panoramic vistas. Rock outcrops are found throughout the county and are particularly noticeable around the lakes areas (Dodd, J.A., and E.J. Dettman, 1996).

Karst topographic features are common throughout the county. Karst features develop in areas of bedrock with high carbonate content. The bedrock is easily dissolved by a dilute carbonic acid found in the atmosphere, vegetation, and shales. Water infiltrates the bedrock and is channelized through natural cracks, joints, faults, and bedding planes. The dissolution of the bedrock and channelization of water results in caves, sinkholes, losing streams, springs, and other karst features. Caves are particularly prevalent throughout Taney County (Southwest Missouri Council of Governments, *Taney County Master Plan*, p. 6.2).

Hydrology and Drainage

Taney County's water system is comprised of a complex and interconnected system of perennial and intermittent streams, impoundments, and subsurface water. The county is located in the White River Basin, which eventually flows to the Mississippi River. Taney County contains approximately 12,945 acres of surface water. One of the county's' defining features and important economic resources is the surface reservoir system. Lake Taneycomo, Bull Shoals Lake, and Table Rock Lake, created from the construction of dams on the White River, account for approximately 10,480 acres of surface water in

the county. All three lakes provide for hydroelectric power generation and flood control as well as recreation.

Lake Taneycomo, located completely in Taney County, was created in 1913 by the construction of the Powersite Dam (Ozark Beach Dam) near Forsyth. Originally constructed for hydroelectric power generation, the lake's surface water covers approximately 2,080 acres (Branson USA Online, 1996).

Lake Taneycomo is privately owned, but Bull Shoals and Table Rock Lakes are managed by the U.S. Army Corps of Engineers. Bull Shoals Lake was formed in 1952 by the construction of the Bull Shoals Dam on the White River, about 10 miles west of Mountain Home, Arkansas. Approximately 5,200 acres of the total surface water area at the conservation pool (45,440 acres) are located in Taney County.

Table Rock Lake was formed in 1959 from the construction of the Table Rock Dam on the main stem of the White River, about six miles south of the City of Branson along the Stone County/Taney County line. Of the 43,100 acre conservation pool surface area of the lake, 3,200 acres are in Taney County.

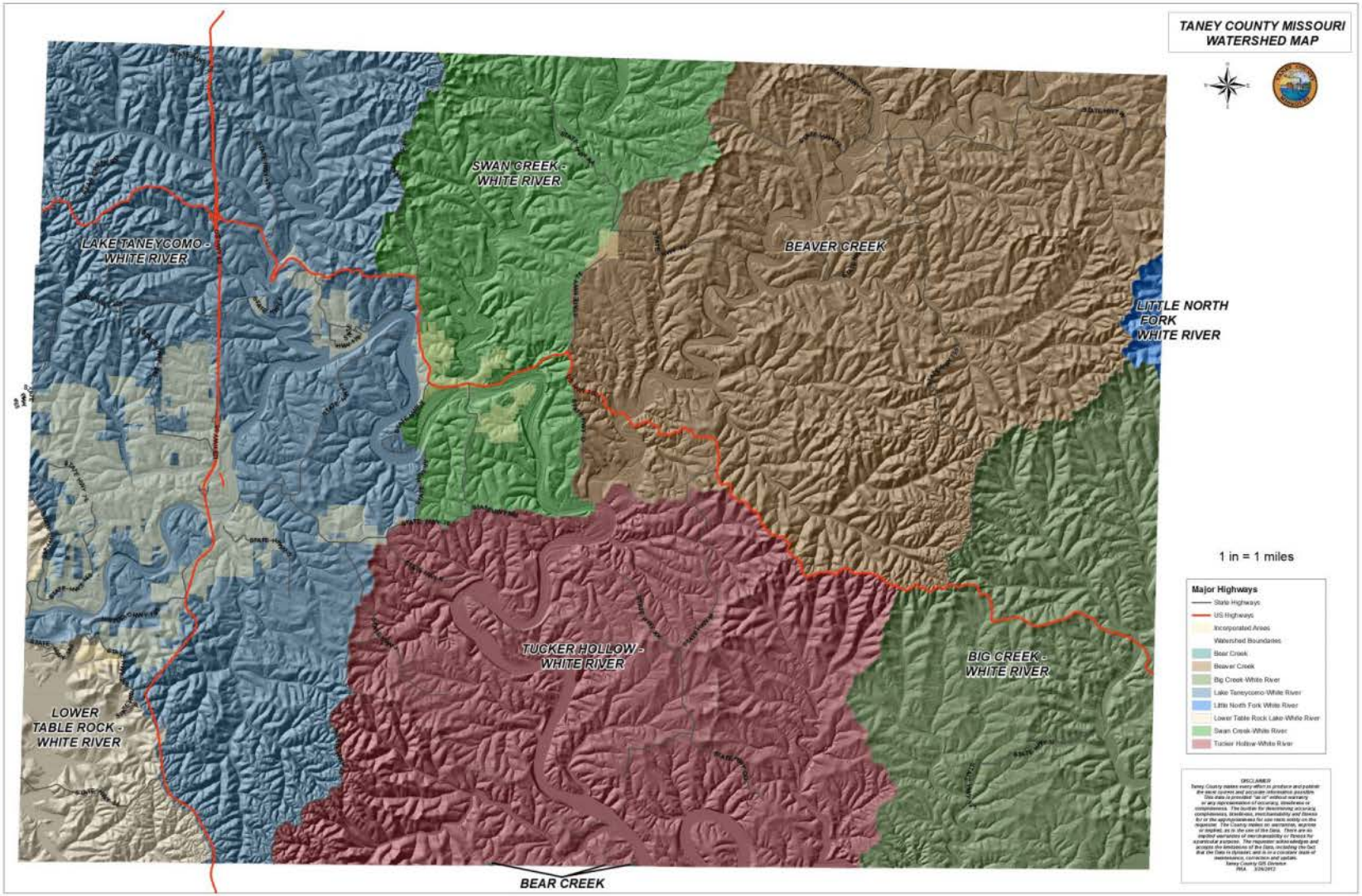
Table Rock Lake has a substantial influence on the county and region. Water released from Table Rock Dam into Lake Taneycomo comes from a depth of 140 feet below the surface of Table Rock Lake. This very cold water is ideal for trout. With the Missouri Department of Conservation's construction of the Shepherd of the Hills Hatchery on Lake Taneycomo, Lake Taneycomo is considered one of the best trout fishing lakes in the Mid-West (*Taney County Master Plan*, p. 6.5).

Taney County also has approximately 950 acres of ponds and 500 acres of perennial streams. All streams in the county either flow into Lake Taneycomo, Bull Shoals Lake, or Table Rock Lake. Most of Taney County lies within the Bull Shoals watershed which includes Lake Taneycomo and Bull Shoals Lake. The southwestern corner of the county, including Table Rock Lake, lies within the Beaver Reservoir watershed.

Major perennial streams originating outside of Taney County include Beaver, Swan and Bull Creeks. Beaver Creek, the largest perennial stream, originates in Douglas County. It drains eastern portions of the county and flows into Bull Shoals Lake. Swan Creek originates in Christian County and drains the central portion of Taney County before flowing into Bull Shoals Lake. Western portions of the county are drained by Bull Creek, which originates in Christian County and flows into Lake Taneycomo.

Bradleyville is located in the Beaver Creek sub-watershed, with Caney Creek to the east of the Village, and Beaver Creek located to the south. Branson, Hollister, Kirbyville, and Merriam Woods are located in the Taneycomo sub-watershed. Roark Creek flows to the north of Branson, and Lake Taneycomo is located to the south and east of Branson. Turkey Creek flows through the middle of Hollister and Coon Creek flows along the city's northeastern boundary. No creeks or rivers flow through Kirbyville or Merriam Woods. Bull Creek and Rockaway Beach are located in the Lower Bull Creek sub-watershed. Bull Creek runs along the western edge of the Village of Bull Creek. Bull Creek also runs along the southwestern boundary of Rockaway Beach. The Village of Taneyville is located in the Swan Creek sub-watershed, but contains no creeks or rivers.

Figure 2-3: Taney County Watersheds



Groundwater is the primary source of water for human consumption in Taney County. With the exception of the City of Branson, which now draws most of its water supply from Lake Taneycomo, other water systems draw water from wells drilled in the Ozark aquifer. The Ozark aquifer consists of dolomites, limestones, and sandstones of late Cambrian through Devonian age (U.S. Department of the Interior, Water Resources Investigations Report 98-4164, 1998). Wells drilled in the Ozark aquifer generally produce good quality water and can yield more than 1,000 gallons per minute.

While the county generally has an abundant supply of groundwater, potential contamination of the groundwater from surface pollutants is a concern. Karst features, including sinkholes, caves, springs, losing streams and fractures in the bedrock, allow for the rapid movement of water between the surface water and groundwater systems. Surface pollutants, such as nitrates, phosphorus, and fecal coliform bacteria, can enter the groundwater system relatively easy with little filtration. The primary sources of these nutrient and bacterial contaminants are animal manure, wastewater treatment plants, septic tanks and fertilizers. In general, shallow wells (drilled to less than about 300 feet) and springs are more susceptible to contamination from surface pollutants (U.S. Department of the Interior, USGS Circular 1158, 1998).

There is growing concern for degradation of reservoir water quality due to nutrient loads, particularly nitrates and phosphorus, which can result in algae blooms, oxygen depletion and fish kills. Taney County's lakes are critical economic assets for water recreation, sport fishing, and the general tourism industry. The cities of Branson and Hollister have installed phosphorus removal systems at their wastewater treatment facilities on Lake Taneycomo to reduce nutrient loads; the Rockaway Beach Regional Treatment Facility also has stringent controls for phosphorous removal.

Climate and Weather

Taney County has a humid continental climate with mild winters and hot, humid summers. The climate data show that the average precipitation is about 40 inches per year. The average monthly rainfall is about three to five inches per month in the spring while it is only one to three inches per month in the late fall and winter. The mean annual air temperature is about 58° Fahrenheit, with average summer temperatures of 87° Fahrenheit and average winter temperatures of 34° Fahrenheit. The climate of Southwest Missouri, including Taney County, is characterized by thunderstorm events that are often sudden and intense in nature. Such storm events frequently result in flash flooding in low-lying areas.

Soils

The *Taney County Soil Survey* identifies twenty soils units in the county (Dodd, J.A., and E.J. Dettman, 1996). The soils are highly variable and range in thickness from thin to none on steep slopes to over 60 inches on ridge tops, foot slopes, stream terraces, and floodplains.

Of the approximate 19,100 acres classified as prime farmland soils, most are generally not suited to intensive crop cultivation due to severe flooding potential, slope, and susceptibility to erosion. Approximately 8,300 acres or 2.8 percent of the county's total acres are generally suited for more intensive crop cultivation. Soils suited for cultivated crops are found on the bottomlands, terraces, and a few gently to moderately sloping

upland areas. Actual acreage used for small grain crops and row crops in Taney County is quite limited. Stream terraces and the floodplains along the creeks and the lakes are used to produce winter wheat, grain sorghum and soybeans (*Taney County Master Plan*, p. 6.7). Most cleared areas in the county are used for pasture and hay production. The livestock industry includes dairy and beef cattle and the raising of hogs for the feeder pig market. Most of the county's soils have low soil fertility, requiring the addition of plant food for maximum production of crops and hays for the livestock industry.

Soil types and geologic features have a significant impact on the development of Taney County. Most soils have severe limitations for use of on-site sewage disposal systems. Conditions that affect the ability of the soils to adequately absorb the effluent discharge from septic systems include soil permeability, depth to bedrock, high water table, and flooding. Improperly designed, installed or maintained septic systems can result in the discharge of poorly treated or untreated wastes into the groundwater system through the underground conduits characteristic of karst topography.

Building site development in Taney County is also impacted by soils characteristics and geologic structure. Thin soils, depth to bedrock, wetness, slope, shrink-swell and low strength are common features of many of the soils associations which either severely restrict development or require increased building site preparation. Soil erosion in areas of thin soils and extreme slope is also a concern.

Significant Natural Communities

Significant natural communities in Taney County include chert savannas, dolomite and limestone glades, balds, caves, and creeks/small rivers. These natural communities provide habitats for several sensitive and endangered species, some of which are found only in Taney County. Glades and caves are predominant natural communities in Taney County. The Hercules Glades wilderness area and the Thorpe Creek Glade, located south of Hollister, are the largest and highest quality glades in the county. The Skaggs-Keeter Ranch, located near the Drury Refuge, is considered a significant savanna habitat. Other significant habitats in Taney County include the Hollister Tower Site and the White River Balds Natural Area, located in the Henning State Forest.

Both Hercules Glades and the White River Balds Natural Area are significant habitat-managed natural communities. The Hercules Glades Wilderness Area is designated by the U.S. Congress as a Wilderness Area. No motorized vehicles are allowed access and no timber harvesting or other similar type of environmental disturbance is allowed in Hercules Glades. The White River Balds is a state-designated Natural Area. The Missouri Department of Conservation and the Missouri Department of Natural Resources will not permit any use or diversion of this area for a use which is not compatible with the area's preservation objectives, unless there is a critical need and no other feasible alternative.

There are at least 130 known caves in Taney County (Missouri Speleological Survey, Inc., 1999). One of the more significant caves is Tumbling Creek Cave, located in the Protem area. Tumbling Creek Cave houses the Ozarks Underground Laboratory, the only such underground hydrogeology laboratory in the United States. This cave is also home to endangered species, including the Gray bat the Indiana bat, as well as Antrobia culveri, an aquatic snail which is a candidate for classification as a federally endangered

species. The Antrobia culveri is a unique species and genus found in no other place in the world. Tumbling Creek Cave is further noted as containing the greatest diversity of fauna in any cave located west of the Mississippi River. It has been designated as a Natural National Landmark by the Department of the Interior and is listed as a significant cave by the U.S. Forest Service.

Demographics

Population Trends

Taney County's population increased from 39,703 in 2000 to 51,675 in 2010 a 30 percent increase in ten years. This rapid population increase resulted from continued in-migration of persons attracted by employment opportunities in the booming Branson area entertainment industry as well as in-migration of retirees attracted by the area's lower cost of living and natural environment.

Although the percentage share of population living in the incorporated communities in Taney County has increased since the 1970s, the majority of the population resides in the unincorporated areas of the county. In 2010, 57% of the population lived in unincorporated areas. Two settlement areas have incorporated since the 2000 Census—Bradleyville and Kirbyville. Bradleyville has since unincorporated prior to the 2010 Census. In addition, Table Rock Village was incorporated into the City of Branson in 2004.

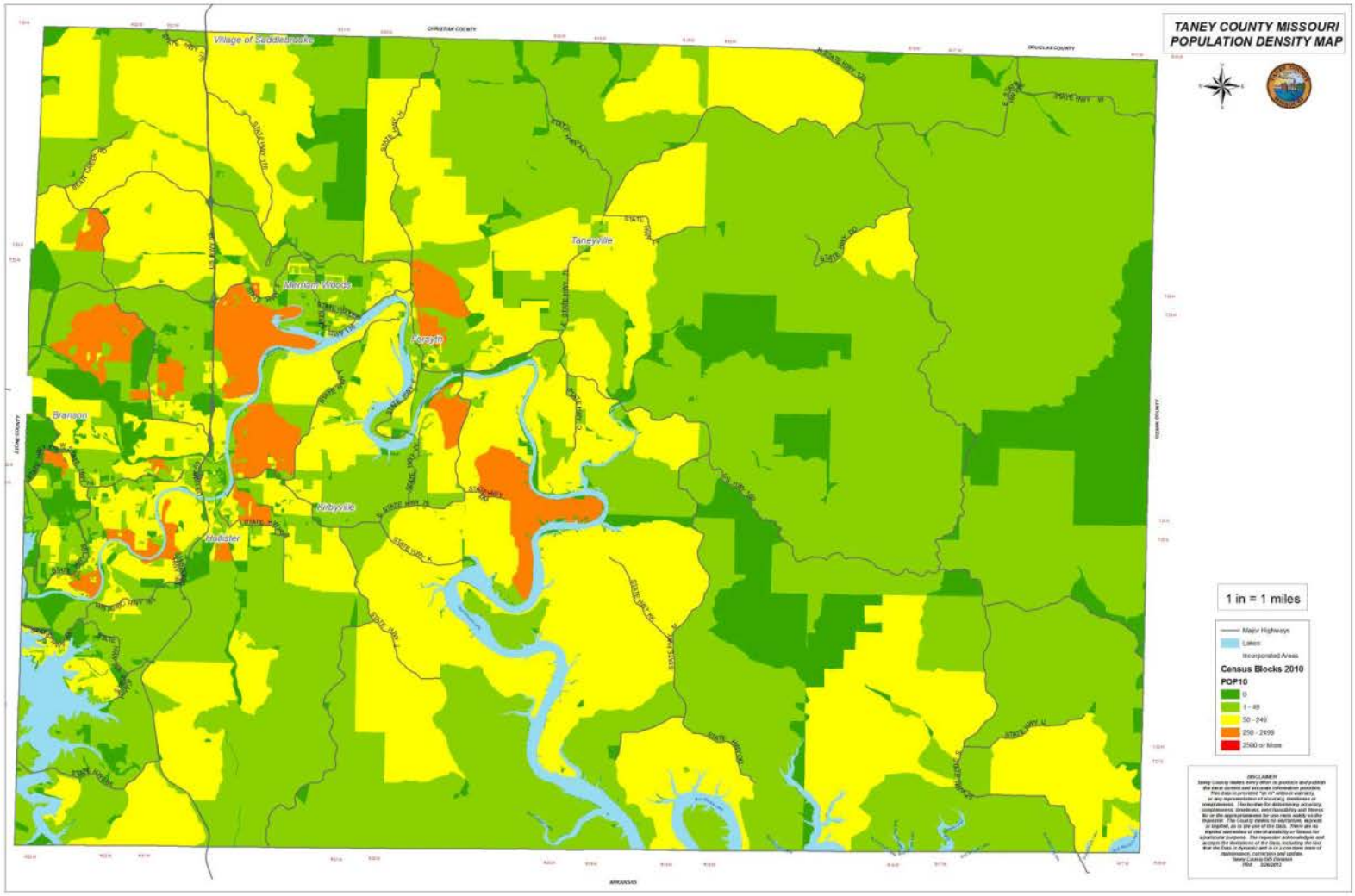
Table 2-2: Population Growth, 2000-2010

Jurisdiction	2000 Population	2010 Population	Change 2000-2010	% Change 2000-2010
Taney County Total	39,703	51,675	11,972	30.1%
Branson	6,050	10,520	4,470	73.8%
Bull Creek	225	603	378	168%
Forsyth	1,686	2,255	569	33.7%
Hollister	3,867	4,426	559	14.4%
Kirbyville	-	207	-	-
Merriam Woods	1,142	1,761	619	54.2%
Rockaway Beach	577	841	234	45.7%
Taneyville Village	359	396	37	10.3%
Incorporated Total	13,906	21,009	6,866	51%
Unincorporated Total	25,797	30,666	4,869	18.9%

Source: U.S. Census Bureau. 2010 Census

The spatial distribution of population is significantly influenced by the county's topography, lakes, highway network, and location of public lands. Population in Taney County is primarily concentrated in the west half of the county, located along the major transportation corridors and in proximity to the lakes. The cities of Branson and Hollister — bordering on Table Rock Lake and Lake Taneycomo— form the population center located in the western section of the county.

Figure 2-4: Taney County Population Density, 2010



Age Characteristics

Table 2-3 provides age specific data by five year age group for Taney County's population in 2010. Taney County's youth represented 22.1 percent of the total population in 2010, while working aged citizens (19-64 years) accounted for 60.2 percent of the population. The retirement-aged population (65 years and over) constitutes 17.7 percent.

Trends in the median age of the population for Taney County reflect the in-migration of younger working aged adults and families and the increase in retirees to the region. Taney County's 2000 median age was 38.8 years. In 2010, the median age increased to 40.7 years.

Table 2-4 shows the percentage of population by age cohort and jurisdiction in Taney County. Forsyth has the largest percentage of people 65 years and older, while Bull Creek Village has the highest percentage of younger population (under 18 years).

Table 2-3: Taney County Age Specific Population, 2010

Age Cohort	Population	% of Total
Under 5 years	3,175	6.1
5 to 9 years	3,012	5.8
10 to 14 years	3,279	6.3
15 to 19 years	3,489	6.8
20 to 24 years	3,537	6.8
25 to 29 years	3,026	5.9
30 to 34 years	2,934	5.7
35 to 39 years	2,983	5.8
40 to 44 years	3,173	6.1
45 to 49 years	3,542	6.9
50 to 54 years	3,563	6.9
55 to 59 years	3,396	6.6
60 to 64 years	3416	6.6
65 to 69 years	3111	6
70 to 74 years	2388	4.6
75 to 79 years	1689	3.3
80 to 84 years	1090	2.1
85 years and over	872	1.7
Total	51,675	100

Source: U.S. Census Bureau, 2010 Census.

Table 2-4: Taney County and Municipalities, Age, 2010

Jurisdiction	Total Population	Percent Under 18	Percent 19 - 64	Percent 65 and over	Median Age
Taney County	51,675	22.1	60.2	17.7	40.7
Bradleyville	--	--	--	--	--
Branson	10,520	18.8	61.7	19.6	41.2
Bull Creek	603	43.3	53.1	3.6	21.5
Forsyth	2,255	16.4	51	32.6	51.7
Hollister	4,426	23.2	60.5	16.3	36.6
Kirbyville	207	28	60.4	11.6	38.8
Merriam Woods	1,761	27.8	59.3	12.9	34.7
Rockaway Beach	841	21	60.5	18.4	45.3
Taneyville	396	33.3	53.8	12.9	33.6

Source: U.S. Census Bureau. Profile of General Demographic Characteristics. Age Groups and Sex, QTP1. 2010.

Race and Ethnicity

Taney County's population is primarily White, with minority populations representing 6.4 percent of the total population in 2010, a 2.6 percent increase from 2000. The Hispanic population has been growing rapidly in Southwest Missouri since 2010, particularly in counties located west of Taney County. Hispanics represented 4.8 percent of Taney County's total population in 2010. The number of individuals identified as Hispanic increased from in 962 in 2000 to 2,494 in 2010, an increase of 259 percent.

Table 2-5: Race and Hispanic Population, 2010

Jurisdiction	Percent of Total Population							
	One Race						Other	
	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic and Latino (any race)
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Taney County	93.6	0.9	0.8	0.7	0.1	1.8	2.2	4.8
Branson	89	2	0.9	1.5	0.1	3.9	2.6	8.8
Bull Creek	88.7	1.3	0.2	0.7	0.8	4.8	3.5	10.1
Forsyth	96.1	0.3	0.9	0.4	0	0.5	1.8	3
Hollister	92.5	0.9	1.2	0.5	0.2	2.8	1.9	6.4
Kirbyville	88.4	0.5	0	2.4	0	7.2	1.4	6.8
Kissee Mills CDP	97.1	0.1	0.6	0	0	0	2.2	1.1
Merriam Woods	94.1	0.3	1.2	0.1	0	1.1	3.2	3.4
Rockaway Beach	96.1	0.7	1	0	0.6	0.4	1.3	2
Taneyville	96.7	0	0	0	0	1.5	1.8	3

Source: U.S. Census Bureau. Race and Hispanic or Latino Origin. QTP3, Census 2010.

Income Characteristics

In 2010, 15 percent of the county's households had incomes of less than $15,000 per year; 75.4 percent between $15,000 and $99,999; and 9.6 percent had income of $100,000 or more. Taney County's 1009 median household income was $39,026, lower than that of the State of Missouri ($46,262) and the Nation ($51,914). The 2009 per capita income for the Taney County was also lower than the state and national figures.

Table 2-6: Taney County Household Income and Benefits, 2010

Household Income	Number of Households	Margin of Error (MOE)	Percent of Total
Less than $10,000	1,762	+/- 315	8.7
$10,000 to $14,999	1,283	+/- 249	6.3
$15,000 to $24,999	3,112	+/- 379	15.3
$25,000 to $34,999	3,029	+/- 378	14.9
$35,000 to $49,999	3,511	+/- 405	17.3
$50,000 to $74,999	3,750	+/- 394	18.5
$75,000 to $99,999	1,905	+/- 315	9.4
$100,000 to $149,999	1,233	+/- 226	6.1
$150,000 to $199,999	280	+/- 127	1.4
$200,000 or more	416	+/- 175	2.1
Median household income	$39,026	+/- $ 1,933	--
Total households	20,281	+/- 617	100

Source: ACS 2006-2010. Selected Economic Characteristics. DP03.

The actual poverty rate in the county decreased from 12.4 percent to 10.5 percent over the between 2000 and 2010. Poverty is most acute for children under the age of 18. In 2009 for persons for whom poverty level could be determined, 22.7 percent of children under the age of 18 lived below the poverty level.

Educational Attainment

The educational and skills level of the workforce is a critical factor influencing opportunities for attracting new business development to Taney County and achieving greater economic diversification. American Community Survey 2006-2010 indicates that 86.6 percent of the population 25 years and older are high school graduates or higher, an increase of 5.2 percent over 2000; 20 percent have a bachelor's degree or higher, an increase of 4.6 percent from 2000. The percentage of the county's adults with a high school diploma falls short of nearby Greene and Christian Counties however, is slightly above the State of Missouri according to the American Community Survey 2006-2010. Many of those who have not graduated from high school are older adults who completed their education a number of years ago when educational attainment rates were significantly lower overall.

Table 2-7: Educational Attainment, Population 25 Years and Older, 2010

Jurisdiction	Less than 9th grade	9th to 12th grade, no diploma	High school graduate, includes equivalency	Some college, no degree	Assoc. degree	Bachelor's degree or higher	Percent high school graduate or higher	Percent bachelor's degree or higher
Taney County	1,442 +/- 260	3,085 +/- 411	11,968 +/- 621	4,532 +/- 440	1,727 +/- 275	5,928 +/-700	86.6% N/A	20% N/A
Branson	3.7% +/-1.6	6.1% +/-2.8	33.1% +/-4.4	27.4% +/-4.3	7.0% +/-2.6	22.8% +/-6.1	90.2% +/-3.4	22.8% +/-4.4
Bull Creek	4.7% +/-6.7	19.7% +/-13.3	45.7% +/-15.2	13.4% +/-10.0	7.9% +/-8.7	8.7% +/-6.2	75.6% +/-14.2	8.7% +/-6.2
Forsyth	8.0% +/-6.5	8.7% +/-4.0	38.0% +/-5.6	26.3% +/-6.5	1.3% +/-1.5	17.7% +/-9.0	83.3% +/-8.0	17.7% +/-6.6
Hollister	7.6% +/-3.2	12.7% +/-4.4	44.2% +/-8.2	18.7% +/-5.3	5.8% +/-3.5	10.8% +/-7.1	79.6% +/-5.2	11.0% +/-5.6
Kirbyville	1.9% +/-3.9	15.1% +/-11.6	59.4% +/-16.2	13.2% +/-10.8	4.7% +/-9.0	5.7% +/-8.0	83.0% +/-11.5	5.7% +/-8.0
Kissee Mills CDP	0.8% +/-1.0	23.2% +/-13.4	40.3% +/-9.2	19.5% +/-7.4	3.7% +/-4.0	12.6% +/-10.6	76.0% +/-13.5	12.6% +/-7.6
Merriam Woods	1.9% +/-1.2	13.8% +/-5.1	44.5% +/-6.8	24.4% +/-5.7	3.5% +/-2.0	11.9% +/-5.4	84.3% +/-5.2	12.0% +/-4.3
Rockaway Beach	3.0% +/-3.6	14.7% +/-6.2	40.0% +/-9.1	28.8% +/-7.2	4.5% +/-3.3	8.9% +/-5.8	82.3% +/-7.7	8.9% +/-5.8
Taneyville	5.4% +/-5.2	15.7% +/-10.1	34.7% +/-10.8	26.9% +/-10.6	8.3% +/-4.8	9.1% +/-9.2	78.9% +/-11.5	9.1% +/-6.8

Source: ACS 5-Year Estimates, 2006-2010. Educational Attainment, S1501.

Household Characteristics

In 2010, the number of households in Taney County was 20,755. Of these, 67 percent were family households, and 33 percent were non-family households. The traditional married couple with children under 18 years represented only 17 percent of the total households in the county, while single person households represented 26 percent. The most populated areas of the county, Branson, Hollister, and Forsyth, had, in general, higher percentages of single person household and lower percentages of family households than other jurisdictions. The average household size for Taney County is 2.41 persons per household, which is lower than the State (2.45) and the nation (2.58).

Table 2-8: Taney County Household Characteristics, 2010

Jurisdiction	Total House-holds	Family Households			Non-Family Household	Single Person Household	Average Household Size
		Total Family	Married Couple w/children under 18	Single Parent w/children under 18			
Taney County**	20,755	13,897	3,526	1,800	6,858	5,445	2.41
Branson	3,790	2,191	657	43	1,599	1,333	2.03
Bull Creek	75	35	19	2	40	30	2.28
Forsyth	852	526	154	61	326	309	2.18
Hollister	1,871	1,219	280	79	652	547	2.02
Kirbyville	52	29	3	5	23	19	2.31
Merriam Woods	713	503	95	111	210	140	2.26
Rockaway Beach	315	180	29	22	135	118	1.96
Taneyville	143	115	35	24	28	25	2.4

Source: U.S. Census Bureau. American Community Survey 2005-2009, 5-Year Estimates. DP02. Selected Social Charactersitics in the United States.
**U.S. Census Bureau. Summary File 1, Census

Economy, Employment, and Industry

Labor Force Characteristics

Taney County's continued population growth since the between 2000 and 2010 is reflected in the characteristics of its labor force. The county's civilian labor force increased from 20,927 persons in 2000 to approximately 27,938 persons in 2010, a 33.5 percent increase. This increase is less than that from 1990 to 2000 during which the labor force for Taney County increased by 43.3 percent. In 2000, 22,932 persons or 82 percent of the labor force were employed, an eight percent decrease since 2000.

Seasonal variation in unemployment rates reflects the dominance of the tourism industry in Taney County. Unemployment rates ranged from a low of 3.4 percent in October 2003 to a high of 21 percent in January 2003, with an average annual unemployment

rate of 7.7 percent. Over the past several years, the tourist season has lengthened to include events and activities during the fall and early winter months.

The greatest numbers of Taney County's labor force are employed in the *Arts, Entertainment, & Recreation* industrial sector, accounting for 29 percent of the employed labor force in 2000. Data in Table 2-9 reflect employment of Taney County residents by industry and not by actual place of employment.

Table 2-9: Employment by Industry, Taney County, 2009

Industry	Number Employed	Percent of Total
Agriculture, Forestry, Fishing and Hunting, and Mining	44	1.2
Construction	728	3.2
Manufacturing	499	2.2
Wholesale Trade	240	1.0
Retail Trade	5,106	22.3
Transportation and Warehousing, and Utilities	290	1.3
Information	348	1.5
Finance, Insurance, Real Estate, and Rental and Leasing	2,069	9.0
Professional, Scientific, Mgmt., Admin., and Waste Mgmt. Services	2,022	8.8
Education, Health, and Social Services	1,299	5.7
Arts, Entertainment, Recreation, Accommodation, & Food Services	7,869	34.4
Other Services (except Public Administration)	944	4.1
Public Administration	--	--
Total	22,932	100.0

Source: U.S. Census Bureau. County Business Patterns, 2009.

Primary Industries

Table 2-10 lists businesses by industrial sector located in Taney County and the number of employees. *Retail* and *Accommodation and Food Services* industries account for the largest number of businesses and employees, reflecting the importance of the tourism industry to the county.

Table 2-10: Taney County Businesses and Employees, 2009

Business	Number of Businesses	% of Total	Number of Employees	% of Total
Agricultural Services	0	--	0	--
Mining	6	0.3	44	0.2
Utilities	6	0.3	--	--
Construction	143	7.8	728	3.2
Manufacturing	50	2.7	499	2.2
Transportation & Warehousing	28	1.5	290	1.3
Wholesale	38	2.1	240	1
Retail	421	23	5,106	22.3
Information	26	1.4	348	1.5
Finance	63	3.4	412	1.8
Real Estate	115	6.3	1,309	5.7
Professional	108	5.9	556	2.4
Management of Companies & Enterprises	6	0.3	--	--
Admin/Support, Waste Mgt/Remediation Srvs	107	5.9	1,466	6.4

Table 2-10: Taney County Businesses and Employees, 2009				
Business	Number of Businesses	% of Total	Number of Employees	% of Total
Educational Services	14	0.8	--	--
Health Care and Social Assistance	120	6.6	1,299	5.7
Arts, Entertainment, and Recreation	105	5.7	1,919	8.4
Accommodation & Food Services	298	16.3	5,950	25.9
Other Services (except Public Admin)	156	8.5	944	4.1
Unclassified Establishments	17	0.8	--	--
Total	1,827	100	22,932	100
Source: U.S. Census Bureau. County Business Patterns, 2009.				

Access to Employment: In-commuting and Out-commuting

Approximately 87.9 percent (20,341) of the county's workers older than 16 years work in Taney County. The remaining 10.4 percent of the workforce commutes outside of the county. The average travel time to work for Taney County residents decreased slightly from 21.7 minutes in 2000 to 20.3 minutes in 2010. However, travel time to work for county residents is still low when compared to other counties and the State, possibly because of the low percentage of out-commuting and better road development.

Table 2-11: Place of Employment, 2010		
Taney County Employed	Number	Percent of Total
Work in County of Residence	20,341	87.9
Work Outside County of Residence	2,385	10.4
Work Outside of State	390	1.7
Total Employed	22,932	100.0
Source: American Community Survey 2006-2010. Means of Transportation to Work by Selected Characteristics. S0802.		

Land Use

Existing Land Use Patterns

The historical patterns of land development in Taney County have changed and intensified as a result of growth in the tourism industry and rapid in-migration of new population. The county's population is projected to increase by nearly 21,000 persons by the Year 2020, and if current land development trends continue, a majority of the population will reside in the incorporated communities.

The spatial distribution of land uses in Taney County are clearly influenced by the major transportation system, elements of the natural environment, and the substantial amount of land in federal and state ownership. Limited by the very steep topography throughout much of the county, development has occurred along the highways that tend to follow ridgelines. The major lakes also affect development patterns. Concentrations of residential and commercial development are located along Table Rock Lake and Lake Taneycomo and to a lesser extent along Bull Shoals Lake in eastern Taney County.

According to the *Taney County Master Plan*, adopted in 1999, developed land uses in Taney County account for over 14 percent of the county's total land area. This includes the incorporated cities and villages and developed uses in the unincorporated areas. Most residential development in Taney County is located in the cities, along the Highway

65, Highway 160 and Highway 76 corridors, and around the lakes in the western half of the county. Overall, residential land uses in the unincorporated area account for approximately 4.3 percent of total land area in the county. Single family residences are the primary residential use. Multi-family development, including duplexes, apartments, condominiums and time-share developments, are generally located in the urbanizing area of the county near the cities and in close proximity to the lakes.

The vast majorities of commercial land uses in Taney County are located in the cities or in the urbanizing areas along the major roads. Commercial strip development in the unincorporated areas is most pronounced in the western townships, particularly along (1) Highway 65 through and south of Hollister, (2) Highway 76 between Hollister and northeast of Forsyth, and (3) along Highway 160 between Highway 65 and Forsyth (*Taney County Master Plan*, 1999, p.7.5).

Industrial activity is one of the most underrepresented land use activities in the county, due in part to the historical rural nature of the area and the rugged terrain that limits suitable industrial sites and transportation access for shipment of raw materials and products. Rock quarries account for a significant majority of total industrial acreages. Most industrial uses and quarries are located near Branson and Hollister. Since 2000, there has been an increase in light industrial uses, particularly in the City of Hollister along the Highway 65 corridor.

Public and semi-public land uses in the unincorporated areas include schools, churches, government facilities and institutional uses. Most such uses are located in close proximity to the cities and in unincorporated settlement areas in the eastern section of the county.

Approximately 82,000 acres are designated as farmland, or 19.4 percent of the county. Most agricultural uses are located in the northern, eastern and southern sections of the county. The farmland acreage does not include the nearly 70,000 acres of farm woodlands. Of farm woodlands, approximately 48,000 acres are used for animal grazing (*Taney County Master Plan,* 1999, p.7.7). There has been a decrease in undeveloped forest lands in the county over the past decade, a trend that is expected to continue. The greatest loss in forest lands has occurred in the urbanizing areas in the western section of the county as land is cleared for new development.

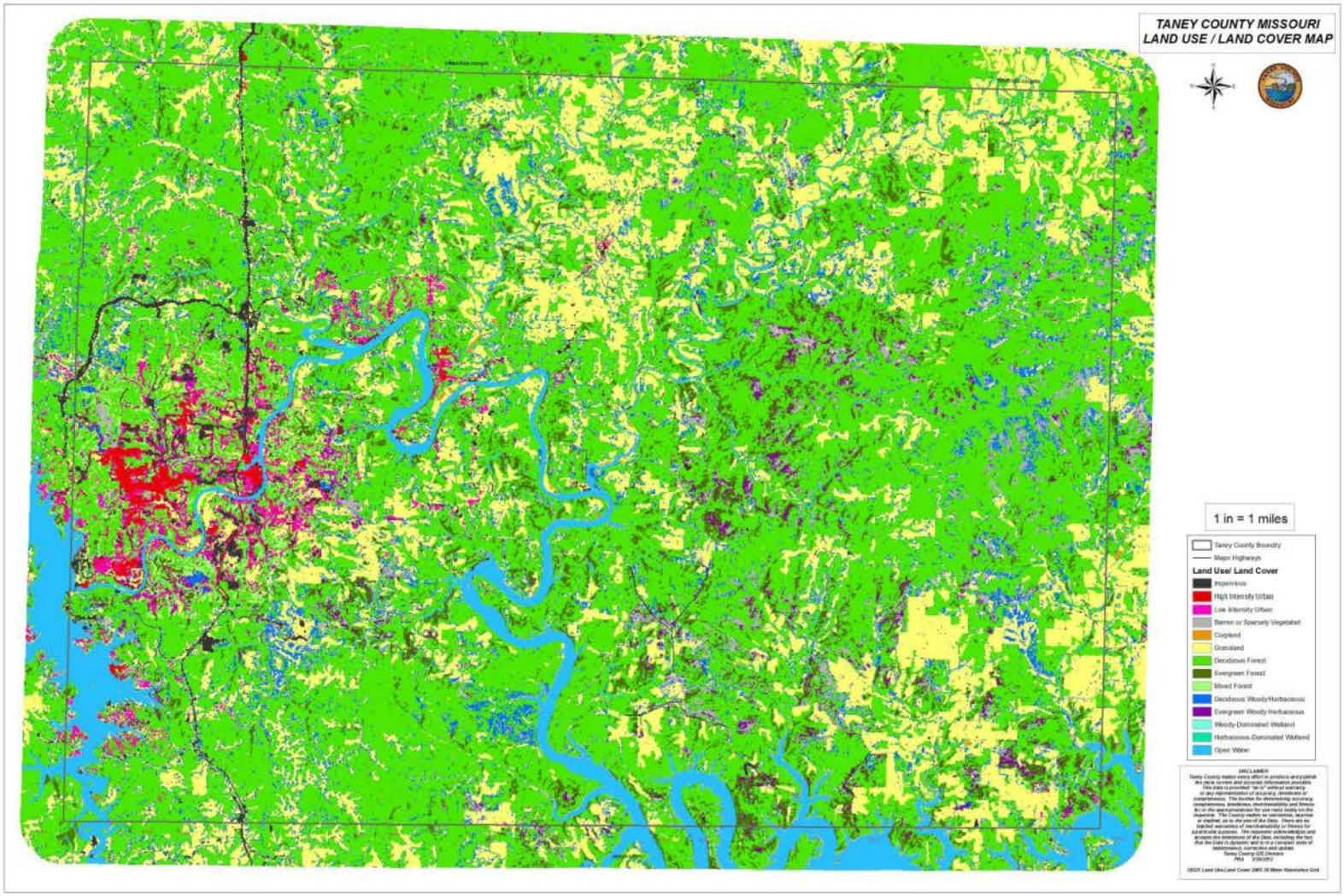
Public Lands/Use Areas

Taney County itself does not own or operate any parks and recreation areas. However, there are nearly 7,770 acres of state owned parks and recreation lands in the unincorporated areas of the county. These sites include Table Rock State Park, Drury Refuge, the Mincy Public Hunting Area, and the Henning Conservation Area. Table 2-12 lists State and Federal by agency and acreage of managed lands.

Table 2-12: Public Lands in Taney County		
Management Areas	**Ownership**	**Acres**
Boston Ferry Conservation Area	MDC	180.96
Branson Forestry Office	MDC	4
Cooper Creek Access	MDC	29.43
Drury-Mincy Conservation Area	MDC	4,089
Empire District Electric Company (Ozark Beach Recreation Area)	MDC	1
Henning Conservation Area	MDC	1,534
Hollister Towersite	MDC	177.08
Mark Twain National Forest	USFS	65,300
Rockaway Beach Access	MDC	1
Shepherd of the Hills Fish Hatchery	MDC	155
Table Rock/Taneycomo Lake Area	USACE	26,516
MDC	Missouri Department of Conservation	
USACE	United States Army Corps of Engineers	
USFS	United States Forest Services	
Source: Missouri Department of Conservation, U.S. Forestry Service, U.S. Army Corps of Engineers.		

A notable recreation area in the eastern section of Taney County is the Hercules Glade Wilderness area located in the Mark Twain National Forest. This 12,315-acre area allows for hiking, camping and horseback riding. Forested lands, most of which are undeveloped, represent the predominant land use in the unincorporated area of Taney County. Overall, forested land covers nearly 241,150 acres, representing 57.2 percent of land use in the county. Of these forest lands, the Mark Twain National Forest accounts for approximately 65,300 acres in the eastern and northeastern portion of the county and is the primary land use in Beaver Township.

Figure 2-5: Taney County Land Cover



Development Trends

The western Taney County area contains the greatest concentration and density of urbanized land uses, particularly in and around the larger cities of Branson and Hollister and the smaller communities of Bull Creek, Forsyth, Merriam Woods, and Rockaway Beach.

Substantial new development has occurred over the past decade along the major highway corridors in this part of the county, including U.S. Highway 65, Highway 76 and Highway 160. While most major commercial developments are located in the cities, much of the new development in the unincorporated areas is residential development, including both single family residential uses and multi-family. Condominium development is also included in the multi-family category.

Scattered residential uses are also located along the major and secondary roads, with increasing levels of development occurring in the Merriam Woods and Bull Creek areas as well as north of Branson.

Within the past few years, significant new commercial development has occurred in the City of Hollister, with many new retail and service businesses located along the Highway 65 corridor. Planned improvements to Highway 65 between Hollister and the Arkansas State line will increase development potential along this corridor. The Branson Landing, a mixed use developed that opened in 2006, includes a shorefront boardwalk, anchor stores, specialty shops, restaurants, a convention center, hotels, condominium residences, entertainment and recreation. Its popularity attracts thousands of people every day.

Today, Branson has over 40 theaters with more than 60,000 theater seats, 207 lodging facilities with over 18,000 rooms and 200 restaurants with over 38,000 seats. At any given night, there may by up to 20,000 visitors and employees located in the various hotels and theaters on Branson's main arterial road.

Housing

Taney County's housing stock increased from 19,699 units in 2000 to 29,255 units in 2010, a 49 percent increase over the decade. The continued growth of Branson area tourism during the 2000s served to promote new housing construction to meet the demands for new resident housing as well as seasonal housing for vacationers. Of the incorporated communities, Hollister in particular experienced a significant increase in new housing construction during the 1990s to serve the needs of the Branson tourism industry workforce.

Table 2-13: Taney County Housing Characteristics

	Estimate
Total housing units	29,255
Occupied housing units	20,755
Owner-occupied	13,259
Renter-occupied	7,496
Vacant housing units	8,500
For Sale	782
For Rent	1,715
For Seasonal, Recreational, or Occasional use	4,899
Population living in owned homes	32,051
Population living in rental homes	17,880

Source: Census 2010. Profile of General Population and Housing Characteristics, DP01.

Vacancy rates provide an indicator of housing availability. The county's overall housing vacancy rate was up from 17.9 percent in 2000 to 29.1 percent in 2010, including vacant units for seasonal use. A large increase in the number of vacant seasonal units is the cause of this drastic change. The vacancy rate for owner-occupied units was 3.2 percent, indicating that there is a moderate availability of housing for purchase. In 2010, slightly over 50 percent of the housing units in Taney County were single family detached units. The second largest type of housing units in the county is mobile homes accounting for 15 percent of all housing units.

Table 2-14: Taney County Housing Units in Structure, 2010

Housing units (including Vacant)	Estimate	Margin of Error
Total housing units**	29,255	
Single Family Units	15,425	+/- 577
Single Unit, detached	14,734	+/- 548
Single Unit, attached	691	+/- 182
Duplexes	448	+/- 168
3 or 4 units	858	+/- 267
5 to 9 units	1,611	+/- 355
10 to 19 units	2,816	+/- 410
20 or more units	1,640	+/- 432
Mobile home	4,373	+/- 395
Boat, RV, van, etc.	64	+/- 52

Source: American Community Survey 2006-2010. Selected Housing Characteristics, DP04.
**Census 2010. Profile of General Population and Housing Characteristics, DP01.

The greatest concentrations of manufactured housing developments are located along the major highways, such as Highways 76 and 160, in close proximity to the cities. Individual mobile home lots or tracts are scattered along primary and secondary roads throughout the county, with clustering north of Branson, around Table Rock Lake, and in the fringe areas around Hollister, Merriam Woods, Taneyville, and Forsyth.

Table 2-15: Taney County Mobile Home Parks and Subdivisions

Name	Address	City	Telephone
Country Living Mobile Home Park	Hwy 248	Branson	417-334-3794
The Yacht Club	Yacht Club Lane	Branson	417-334-5594
Misty Mountain Acres Mobile Home Park	N Hwy 65	Branson	417-443-3357
Smokey Mountain Estates	220 Cedar Park Rd	Branson	417-335-8043
Branson View Estates	2543 State Hwy F	Branson	417-561-2255
Carsons Country Court	Hwy 248 & Expressway	Branson	417-334-3084
Hidden Ridges Estates	370 Salem Rd	Branson	417-334-4926
Lakeview Mobile Home Park	3147 State Hwy YY	Branson	417-858-2027
Northwoods Mobile Home Park	154 Wintergreen Rd	Branson	417-334-3232
Summit Ridge Mobile Home Park	3 Cardinal Course	Forsyth	417-546-2141
Wall Eye Haven Court & Mobile Homes Park		Forsyth	417-546-5142
Justmoore Inc. Rolling Meadows Park	241 Rolling Meadows Rd	Forsyth	417-546-5182
Rolling Meadows Mobile Home Park	241 Rolling Meadows Rd	Forsyth	417-546-5182
Gobblers Knob Mobile Home Park	237 Early Lane	Hollister	417-334-3753
Whispering Oaks Mobile Home Park	Hwy BB	Hollister	417-335-2370
Yacht Club		Hollister	417-334-0990

Transportation Infrastructure

Roads

Several key roads are responsible for moving traffic in Taney County. The primary north-south arterial is U.S. Highway 65. Highway 65 links Branson with Springfield to the north and Harrison, Arkansas to the south. Highway 65 is Taney County's primary access route for bringing tourists, goods, and services into the region. Highway 65 also provides a linkage with other major routes outside of the county, including Interstate 44 and Highway 60. Highway 65 is also a primary link between Southwest Missouri and Little Rock, Arkansas. Because of the tremendous increase in traffic on Highway 65 caused by a greater number of tourists and residents, the road has been expanded to a four-lane limited access highway between Branson and Springfield and has been expanded to a four-lane divided highway south to the Arkansas State line and further on to the city of Harrison, Arkansas.

Highway 76 serves as a primary east-west route for Taney County. Highway 76 enters Taney County on the western border near Branson, and exits the county's northeast corner near Brownbranch. Highway 76 has a major concentration of tourist attractions in the Branson area, and serves as the primary link from Branson to Forsyth. Another significant east-west highway is U.S. Highway 160. Highway 160 connects western Springfield with Stone County, and enters Taney County near its northwest corner. The road then intersects with Highway 65, proceeds through Forsyth, and provides the only major access to Ozark County to the east. Both Highway 160 and Highway 76 are two-lane facilities. These routes lack shoulders in most areas, especially where the terrain is uneven.

Taney County is divided into two road districts, each responsible for the county roads, with the Eastern and Western County Commissioners presiding over their own districts. Both districts are currently placing an emphasis on maintenance, road surfacing, and replacement of deteriorating bridges. In addition, the western district is redeveloping the road network for Branson and the surrounding area. The strain of maintaining the county road system is significant. Taney County has stopped accepting local roads for county maintenance.

Airports

There are three airports that serve Taney County. The M. Graham Clark Airport (general aviation), located west of U.S. Hwy 65 in the northwestern portion of Hollister, provides passenger services for smaller private planes and charter jets as well as limited freight shipment. Taney County recently took over operation of the M. Graham Clark Airport from the College of the Ozarks.

The Branson Airport (commercial airport) is located approximately six miles south of Hollister on Branson Creek Boulevard, off of Highway 65. The airport was opened in 2009 and serves general aviation as well as regular commercial passenger service. This limited service airport offers service with AirTran, Frontier, and Branson AirExpress.

The Springfield-Branson Regional Airport (commercial airport), located an hour away in Springfield, provides regular commercial air service for the region. Visitors to Branson rely on motor coaches, shuttle vans, or rental vehicles to get from the Springfield-

Branson Regional Airport to the Branson area. Taney County is also served by a seabase airport outside of Rockaway Beach as well as two private airstrips southwest of Kirbyville.

There are two heliports registered with the FAA (Federal Aviation Administration) in Taney County; one in the City of Branson at Skaggs Community Hospital and the other privately owned. There are other non-listed heliports throughout the county.

Public Transportation

Taney County is serviced by OATS, Inc. (Older Americans Transportation System) for public transportation needs. OATS transportation is available to anyone regardless of age or income. Days of the week and times of transit to specific towns are available through the internet or by calling an OATS driver in the county. There are two available vehicles in Taney County that run by caller demand. Appointments for pick-up may also be made by contacting the driver (http://www.oatstransit.org). Other transportation services are also provided by the Disabled American Veterans bus and Skaggs Hospital.

Railroads

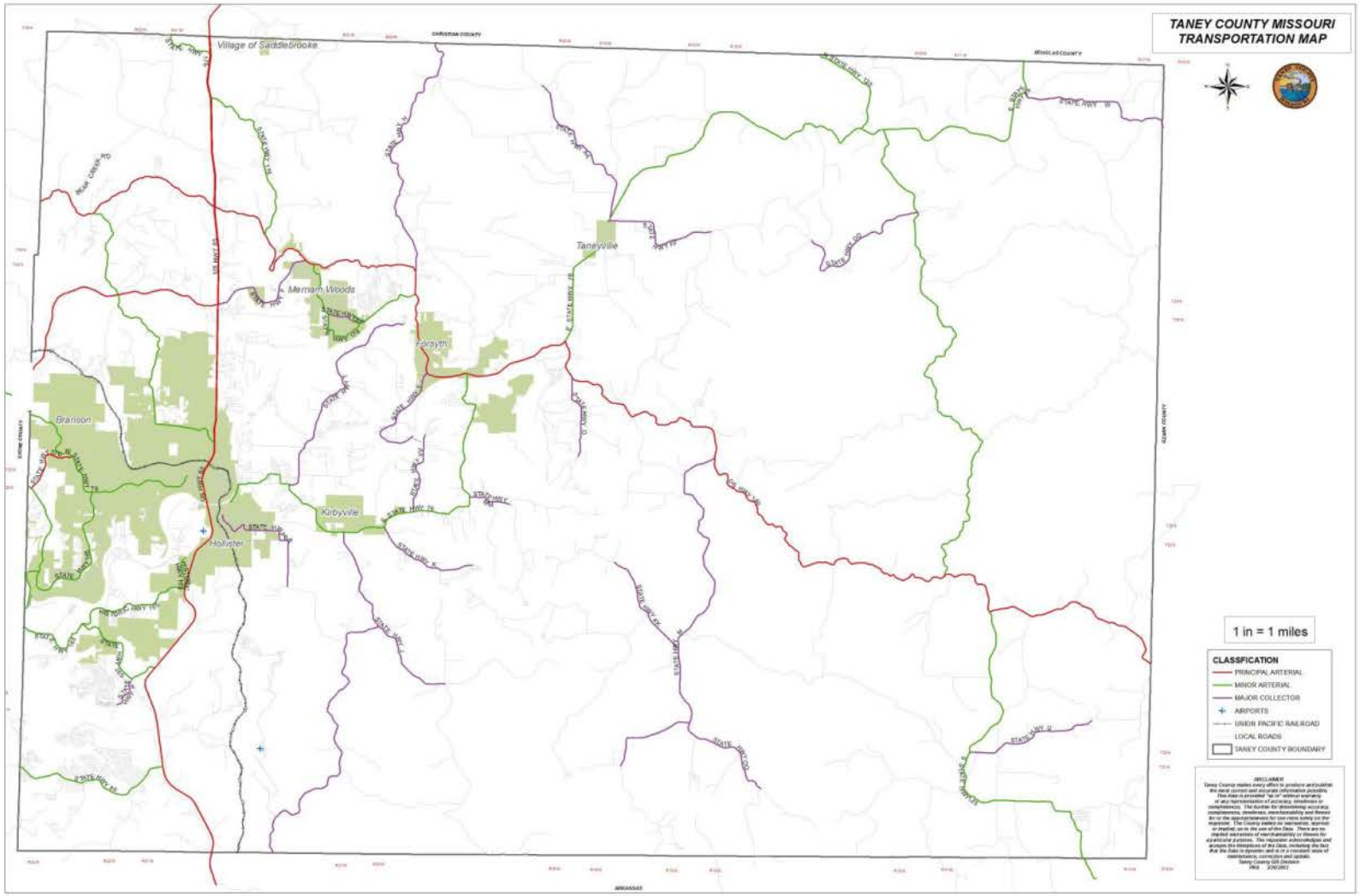
Freight rail service is provided by the Missouri and North Arkansas Railroad, which links Branson with Aurora and beyond. There is no passenger rail system in Taney County, although there is an excursion railway based in Branson. This is a 40-mile roundtrip tourist excursion route that runs through Branson, Reeds Spring and Galena, with return on the same track. The train currently does not stop at any of the communities along the route. There have also been trains chartered to the Branson area in past years.

MoDOT Maintenance Facilities

The Missouri Department of Transportation has four maintenance facilities in Taney County. One facility is located in Branson, at 275 West Outer Road, approximately 0.2 miles west of Highway 65. The second facility is located in Bradleyville at Route 76, 4.5 miles east of Route AA in Taneyville. The third facility is located in Reuter at Route 160, 2.75 miles west of 125, in Kissee Mills. The Hollister facility is located on Route 76,1.25 miles east of Business 65.

The Branson facility includes two concrete block buildings (6 bays each), a salt shed and another out building. Major equipment for road maintenance includes five extra heavy duty trucks, three heavy duty trucks, one 1ton pickup, one ½ ton pickup, one front end loader, one road grater. The Bradleyville facility includes one concrete block structure (6 bays), two dump trucks, and one front end loader. The Hollister facility includes one concrete block building (5 bays), one metal storage shed, two dump trucks, two pickup trucks, and one front end loader. The Reuter facility includes one concrete block building (6 bays), two dump trucks, and one front end loader. All vehicles in these facilities have snow removal capabilities.

Figure 2-6: Taney County Transportation System



Utilities

Water Supply/Services

The communities of Branson, Bull Creek, Forsyth, Hollister, Merriam Woods, Rockaway Beach, and Taneyville all provide municipal water service. In addition to these community water systems operated by the municipalities, there are 52 other community water systems serving 32,802 people, 54 transient non-community water systems serving 8,653 people, and ten non-transient non-community water systems serving 2,902 people in Taney County. Almost all of these systems utilize ground water. The City of Branson and College of the Ozarks derive their water from surface water, and one private development serving 65 people derives its water from groundwater under the direct influence of surface water (UDI). In addition to these water systems, many residents in rural areas derive their water from private wells. See Appendix E for definitions of water systems listed in the MDNR's *Safe Drinking Water Information System.*

Maintaining the quality of groundwater is of particular concern for Taney County. Features of karst topography which allow for the relatively easy movement of surface contaminants into the groundwater system, along with soils characteristics which limit the functioning of septic tank systems, increase the potential for groundwater contamination. Also, several of the more rural systems do not provide adequate pressure and the fire districts must obtain water from other sources for fire fighting purposes (Missouri Department of Natural Resources, http://www.dnr.mo.gov/wpscd/).

Wastewater Treatment Systems

Wastewater treatment in Taney County is provided through numerous public wastewater treatment systems and individual on-site wastewater systems (septic tank systems). The communities of Branson, Forsyth, Hollister, Rockaway Beach, Merriam Woods, and Taneyville provide municipal wastewater treatment to their residents and businesses. The Rockaway Beach Regional Treatment facility also serves the Village of Bull Creek. Bradleyville is currently seeking funding to build a wastewater treatment plant. Septic tanks are the primary method of wastewater treatment in the rural areas of the county, as well as in Kirbyville.

Many of the larger developments, including hotels and resorts, are served by on-site wastewater treatment systems. The terrain is such in Taney County, that if the system was not on-site, the cost would likely be prohibitive due to the number of lift stations that would be required. Missouri Department of Natural Resources currently regulates 69 open discharge wastewater treatment facilities according to the Taney County Wastewater Master Plan, Addendum 1 (MDNR, Taney County Regional Sewer District, taneycounty.org).

Currently, the City of Branson has two wastewater treatment facilities. The facilities in Rockaway Beach and Hollister serve a larger regional area. The City of Hollister has a Sewer Services and Exclusive Territorial Agreement with the Taney County Sewer District, allowing the city to collect and treat wastewater for areas including Coon Creek, Table Rock, Turkey Creek, Short Creek, Poverty Point, Lake Shore, Long Beach, College of the Ozarks, and Oak Grove. The Rockaway Beach Regional Treatment

Facility provides wastewater treatment to Bull Creek, Merriam Woods, and will potentially serve unincorporated areas of the county.
The Taney County Regional Sewer District's *Taney County Wastewater Master Plan* (April 1999) addresses the current and projected wastewater treatment needs in sixteen of the twenty-one watersheds in Taney County, excluding the watershed areas within the cities of Branson, Hollister, and Forsyth. The Master Plan notes that Taney County's soils are generally not well suited for septic tank use. If Taney County is to maintain the quality of its water resources as population continues to grow over the next 20 years, the extension of centralized sanitary sewers and further regionalization of wastewater treatment facilities in the urbanizing area is considered essential.

Solid Waste Disposal

Taney County is a member of Solid Waste District "N" which also includes the counties of Stone, Barry, Lawrence, and Dade. American Disposal Company serves the cities of Branson, Forsyth, Hollister, and Rockaway Beach and the villages of Bradleyville, Bull Creek, and Kirbyville. Approximately 85 percent of the county's solid wastes are hauled by this company. The Village of Taneyville has its own disposal service. Solid waste disposal in other communities is provided by independent trash haulers located in the county and in Arkansas.

Taney County does not have a permitted solid waste landfill. An old landfill is located in the central section of the county, southeast of the Highway 76-Mildred area (T23N, R20W, and Sec22). This landfill has been closed for many years. Most solid wastes are taken to a permitted landfill in Kansas. The county has one solid waste transfer station, located outside of the City of Branson.

Taney County has two public recycling centers in operation. One is located at the county's maintenance facility in Forsyth, where tin, aluminum, glass and plastics are accepted. The other recycling center is operated by the City of Branson, which accepts a variety of fibers and can products, and is one of the highest volume recycling centers in Solid Waste District "N". Nearly 65 percent of the recycled materials handled at the Branson facility are brought in from county residents living outside of the City of Branson (*Taney County Master Plan*, p. 9.15; http://www.co.taney.mo.us/TaneyCo/default.htm).

Electric Service

Three companies provide electric service to Taney County: the White River Valley Electric Cooperative, the Empire District Electric Company, and the Carroll Electric Cooperative. The White River Valley Electric Cooperative serves residential and commercial customers from the communities of Bradleyville, Bull Creek, Kirbyville, Merriam Woods, Rockaway Beach and Taneyville. The Empire District Electric Company serves customers in the western communities of Branson, Forsyth, Hollister, and part of Kirbyville. Empire District owns one power generation facility on Lake Taneycomo. The Powersite Dam facility, located near Forsyth, generates approximately 16,000 kilowatts of power, or 2 percent of the company's power generation.

The Carroll Electric Cooperative, headquartered in Berryville, Arkansas, serves the extreme southwestern corner of Taney County located between the Arkansas state line and the center line of Table Rock Lake.

Telephone Service

Telephone service in Taney County is provided by Century Tel. Century Tel provides internet access to areas of Taney County and the White River Valley Electric Cooperative is also using its infrastructure to run high-speed internet into many portions of the county. Currently, the age of the telephone system precludes many people from accessing medical care, internet services, as well as other important services because a call outside a person's prefix is automatically a long distance call. Cox Communications may soon be offering another alternative to the current phone service, but the benefits are yet undetermined.

Natural Gas Service

At the current time, Taney County does not have natural gas service.

Underground Utilities

Century Tel, the primary provider of telecommunications in Taney County, and White River Valley Electric Cooperative have underground lines in the county. For security purposes, the locations of utility lines are not disclosed in this Plan.

Table 2-16: Taney County Utility Service Providers

Utility Provider	Address	Telephone
Electric Service		
Carroll Electric Cooperative Corporation	920 Hwy. 62 Spur Berryville, AR 72616	870-423-2161
Empire District Electric Company	215 W. Main Branson, MO 65615	800-206-2300
White River Valley Electric Cooperative	State Highway 14 Ozark, MO 65721	417-485-6012
Natural Gas Service		
None Available		
Telephone Service		
Century Tel of Missouri, LLC	Jefferson City, MO 65101	573-636-4261
Cox Communications	310 Walnut Extension Branson, MO 65616	417-334-7897

Key Community Facilities and Services

Law Enforcement

The Taney County Sheriff's Department provides law enforcement and protection services to the unincorporated areas of the county and to incorporated communities that do not have their own police departments, including Bull Creek, and Taneyville. The cities of Branson, Forsyth, Hollister, Rockaway Beach and the Village of Merriam Woods have police departments providing law enforcement services to their respective communities. The Sheriff's Department also provides assistance to the municipal police departments as needed. The Sheriff's Department offices and jail facilities (constructed in 1981) are located in Forsyth. The Department has fifty employees, including dispatch, jail personnel and deputies. In addition to law enforcement and protection services, the Department provides the DARE Program, K-9 units to search residences and schools, Neighborhood Watch Program, Cub Scout and Boy Scout drug education program, Children ID photo and fingerprinting, and participates in various community fundraising events.

Fire Protection

Fire protection services in Taney County are provided by six fire departments and two fire protection districts. All of the districts or fire departments have mutual aid agreements with nearby departments. In addition to basic fire prevention and fire protection services, many of the fire departments and districts also have rescue units and/or provide first responders for emergency care situations

The fire protection departments and districts with facilities in Taney County are listed below. For security purposes, information on the location of facilities, fire fighting vehicles, equipment, and number of firefighters is contained in the Taney County Emergency Management Director's Manual.

- Branson Fire and Rescue
- Bradleyville Rural Fire Department
- Cedar Creek Fire Protection District
- Central Taney County Fire Protection District
- Forsyth Fire Department
- Point Lookout Fire Department
- Protem Fire Protection District
- Western Taney County Fire Protection District

The Western Taney County Fire Protection District serves a 212 square mile area in the western section of the county, including unincorporated areas and the communities of Bull Creek, Hollister, Kirbyville, Merriam Wood and Rockaway Beach. The Central Taney County Fire Protection District serves unincorporated areas in the central portion of the county and the community of Taneyville.

911 Emergency Communications

The E-911 Service in Taney County is located in Forsyth and is dispatched through the Sheriff's Office. It is the main dispatcher of calls for the municipal law enforcement and fire departments/districts. All emergency calls placed within the city limits of Branson are answered at the Branson Police Department. Any call requiring medical assistance is forwarded to the Taney County Ambulance District Dispatch Center, also in Forsyth.

Medical Facilities

Taney County is served by Skaggs Community Health Center located in Branson. Skaggs is a 132-bed facility offering a wide range of medical services to residents and visitors. Residents are also served by St. John's Regional Health Center and Cox Medical Center located in Springfield and North Arkansas Regional Medical Center in Harrison, Arkansas. Most medical clinics within Taney County are located in Branson, Forsyth, and Hollister, although a new medical clinic opened in May 2005 in Bradleyville in the northeastern section of the county. Medical facilities located in Taney County are listed in Table 2-17.

The Taney County Health Department, located in Forsyth, provides a wide range of public health services to Taney County residents, such as the WIC program, blood pressure clinics, influenza shots, school athletic physicals and various other health services.

Under cooperative agreement with the Taney County Health Department, the Branson Health Department provides environmental health services to the City of Branson and Taney County at large. Some of the services offered include environmental health and pollution control services, inspections of food preparation establishments, swimming pools, etc.

Table 2-17: Medical Facilities in Taney County

Facility Name	Address	City	Telephone
Jordan Valley Health Clinic	25861 E. State Hwy 76	Bradleyville	417-796-2081
Branson Health Department	110 W. Maddux	Branson	417-334-3354
Burrell Behavioral Health	155 Corporate Place	Branson	417-269-2476
Cox Health Center	890 State Hwy 248	Branson	417-335-2299
Ferrell-Duncan Clinic	101 Skaggs Rd, Ste 102	Branson	417-875-3246
Skaggs Community Health Center	N. Bus 65 & Skaggs Rd	Branson	417-335-7733
Skaggs Family Health Clinic	545 N. Bus Hwy 65	Branson	417-335-7540
Skaggs Urgent Care	454 N. Bus. Hwy 65	Branson	417-335-7587
Skaggs Wound Care and Hyperbaric Medicine	101 Skaggs Rd, Ste 103	Branson	417-335-7792
Smith-Glynn-Callaway Clinic-Branson	101 Skaggs Rd, Ste 101	Branson	417-334-7647
St. John's Clinic	260 Terrace Rd	Branson	417-336-2273
St. John's Clinic	1065 State Hwy 248	Branson	417-337-9808
St. John's Clinic Urgent Care	1940 State Hwy 165	Branson	417-337-5000
Bridges Clinic	256 Hwy Y	Forsyth	417-546-4200
Forsyth Medical Center	517 Coy Blvd	Forsyth	417-546-2447
Skaggs Clinic	13852 State Hwy 160	Forsyth	417-546-3500

Table 2-17: Medical Facilities in Taney County			
Facility Name	**Address**	**City**	**Telephone**
Taney County Health Department	15479 State Hwy 160	Forsyth	417-546-4725
Agape Primary Care	2331 S. Bus Hwy 65	Hollister	417-339-3033
Skaggs Community Hollister Clinic	590 Birch Rd	Hollister	417-239-3400
Skaggs Family Clinics	590 Birch Rd	Hollister	417-335-7726
Southside Family Clinic	590 Birch Rd	Hollister	417-239-3400
St. John's Hollister Medical Center	151 Birch Rd	Hollister	417-336-4355
Tri Lakes Primary Care	2460 S. Bus Hwy 65	Hollister	417-334-8271

Ambulance Service

Emergency ground transportation service for all of Taney County is provided by the Taney County Ambulance District. The dispatch center and headquarters are located in Hollister. The district includes four permanent stations, and ambulances are strategically located throughout the county, based on call volume in those areas. One ambulance is a Critical Care Unit and the district has an MCI trailer that is used for Mass Casualty Incidents.

Air ambulance services are available through Cox Air Care (Cox Health Systems) and Hammons Life Line Air Ambulance (Mercy Regional Health Center) in Springfield.

Table 2-18: Ambulance Services in Taney County		
Ambulance Service	**Address**	**Telephone**
Ground Ambulance		
Taney County EMS Ambulance District	18 Industrial Park Rd. Hollister	417-334-6586
Air Ambulance		
Cox Air Care	1423 N. Jefferson Springfield	800-333-5269
Mercy (Saint John's) EMS Life Line	1235 E. Cherokee Springfield	417-820-2300 800-433-5433

Other Key Facilities/Services

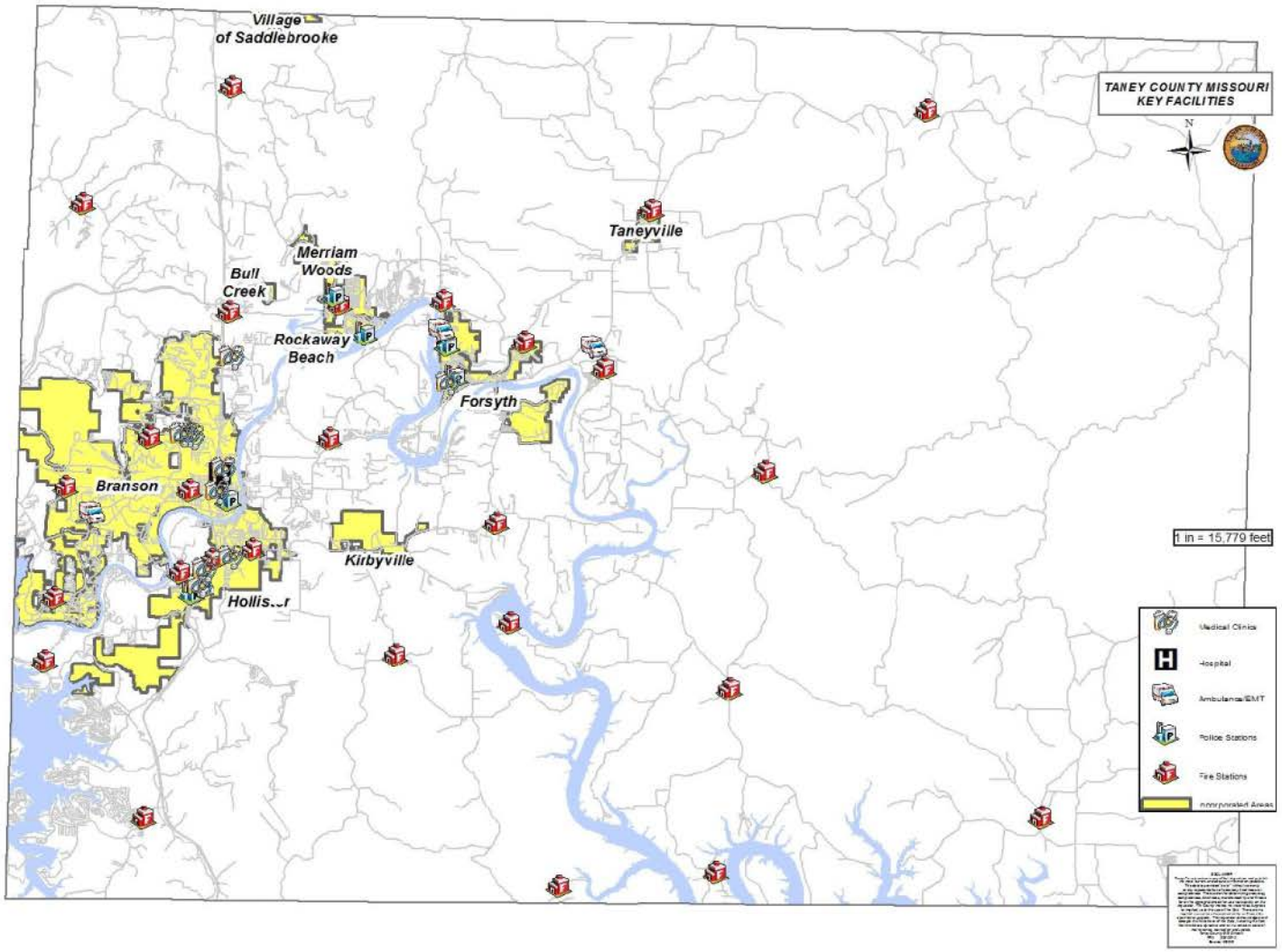
Other key services essential during natural disasters include the services provided by the American Red Cross-Greater Ozarks Chapter and Christian Associates of Table Rock Lake. Christian Associates, serving Stone County and part of Taney County, is located in the Kimberling City Shopping Center on Highway 13 in Stone County. Christian Associates provides various services that would assist in disaster recovery, including a domestic violence hotline, thrift shop, and assistance with rent and utilities. Individuals served through Christian Associates must first obtain possible assistance through the Red Cross.

The American Red Cross--Greater Ozarks Regional Chapter is located at 1545 N. West Bypass in Springfield, Missouri. The Chapter's Disaster Action Team is available 24 hours a day, every day, to respond to disasters. Disaster relief focuses on disaster-caused emergent needs of shelter, food, clothing, and health. The Greater Ozarks Chapter also works with city, county, and state emergency management agencies on disaster preparedness and training. The Chapter has ongoing efforts to recruit and train

volunteers as well as secure resources for shelter, communications and supplies (American Red Cross, Greater Regional Ozarks Chapter, http://www.redcross-ozarks.org).

To secure shelter resources, the Chapter maintains records of institutions and organizations in each county that would be willing to enter into an agreement for use of the facility for a designated need as determined by the Red Cross following a disaster event. These entities have completed and filed forms with the Chapter that provide information on the physical facility and capabilities to function as an emergency shelter. When a disaster occurs, the Red Cross contacts these entities as may be necessary to arrange for use of the facility. The communities in which these potential Red Cross emergency shelters are located are noted on Figure 2-7.

Figure 2-7: Taney County Key Facilities



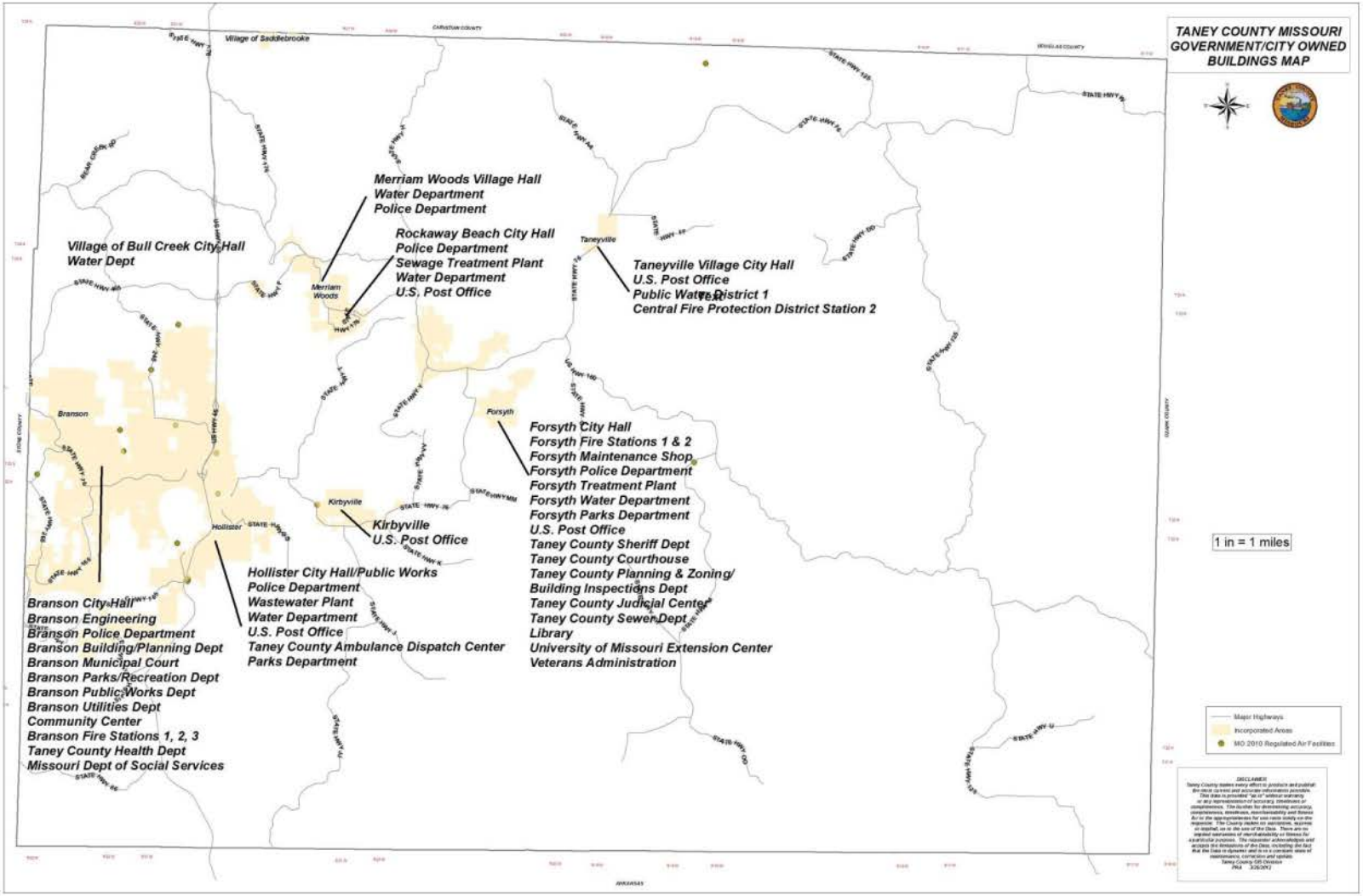
Government Owned Buildings

Government structures include county and municipal government facilities, judicial facilities, post offices, and state and federal facilities. The greatest concentration of government structures in Taney County is located in the county seat of Forsyth. The following table lists the locations of government facilities.

Table 2-19: Government Buildings in Taney County	
Structure	**Location**
Taney County	
Courthouse	132 David Street, Forsyth
County Commission	139 David Street, Forsyth
County Clerk's Office	266A Main Street, Forsyth
Animal Control	255 Critter Trail, Hollister
Health Department	15479 State Highway 160, Forsyth
Taney County Juvenile Office	211B Main Street, Forsyth
Road & Bridge #1/TS Station	274 Buchanan Road, Branson
Road & Bridge #2	195 Gilbert Lane, Hilda
Road & Bridge Superintendent	248 Main Street, Forsyth
Sheriff/Road & Bridge Storage (2), Salt Shed	3937 State Hwy F, Rockaway Beach
Salt Shed	865 Tate Road, Ridgedale
Salt Shed	15370 N. State Hwy 125, Bradleyville
Bradleyville	
Post Office	25856 State Highway 76
Fire Station	N. State Highway 125
Branson	
City Hall/Police Department	110 W Maddux
City of Branson Office Building	112 College
Fire Station #1	103 W. Hwy 76
Fire Station #2	251 Branson Meadow Dr
Fire Station #3	3500 Keeter Street
Community Building	210 Compton
Recreation/Aquatic Centers	1500 Branson Hills Parkway
Facilities Maintenance Building	Stockstill Park
Health Department	125 Gateway Drive
Public Works Garage	601 Compton Drive
Post Office	320 S. Commercial
Library	200 S. 4th Street
Bull Creek	
City Hall	1886 State Highway F
Cedarcreek	
Post Office	6589 State Highway M
Forsyth	
City Hall/Police Station/Fire Station	15405 US Highway 160
Post Office	240 Main Street
City Shop	Blair Boulevard
Community Building	Panther Road
Wastewater Treatment Plant	Hwy 76, Shoals Bin Property
Hollister	
City Hall	290 Esplanade
Police Station	14848 S State Highway 65

Table 2-19: Government Buildings in Taney County	
Structure	**Location**
Post Office	1980 Business Highway 65
Post Office – Branson Annex	141e Industrial Park Drive
Public Works Department	1393 V Highway
Kirbyville	
Post Office	4202 E State Highway 76
Fire Station	8118 E State Highway 76
Kissee Mills	
Post Office	21423 US Highway 160
Merriam Woods	
City Complex	4417 State Hwy 176
Point Lookout	
Post Office	99980 Academic Avenue
Powersite	
Post Office	1885 State Highway Vv
Protem	
Post Office	5242 S State Highway 125
Ridgedale	
Post Office	3234 Ridgedale Road
Rockaway Beach	
City Hall	588 Boys Camp Road
Post Office	2578 State Highway 176
Rueter	
Post Office	149 N State Highway 125
Taneyville	
City Hall	227 Central Avenue
Post Office	310 Grand Avenue
Sewer Plant	485 Hulls Ford Road
Other	
MO Department of Social Services	2720 Shepherd of the Hills Expwy, Branson
MoDOT Maintenance Facility	20907 E. Hwy 76, Taneyville
MoDOT Maintenance Facility	33279 Hwy 160, Kissee Mills
MoDOT Maintenance Facility	275 West Outer Road, Branson
MoDOT Maintenance Facility	Hwy 76, Hollister

Figure 2-8: Taney County Government Buildings



Centers of Large Population Concentration

Facilities or other sites that concentrate large numbers of people within a defined area may require special attention for pre-disaster mitigation, advance notification of possible disaster, or disaster response. Examples of such facilities include schools, large employment centers, commercial centers, major recreation attractions, and facilities that serve special needs populations.

Schools

Nine public school districts serve Taney County. School districts with facilities in the county include Bradleyville R-I, Branson R-IV, Forsyth R-III, Hollister R-V, Kirbyville R-VI, Mark Twain R-VIII, and Taneyville R-II (Figure 2-10). The Branson School District serves the greatest number of students with a total enrollment of 4,471 during the 2010-2011 year. The remaining two school districts serving Taney County are Galena R-II and Spokane R-IV. These districts do not have school facilities in Taney County. There are also two private schools in Taney County. Riverview is a Baptist-affiliated K-12 school in Forsyth, and New Life Academy is a Pentecostal-affiliated K-12 school in Hollister.

College of the Ozarks

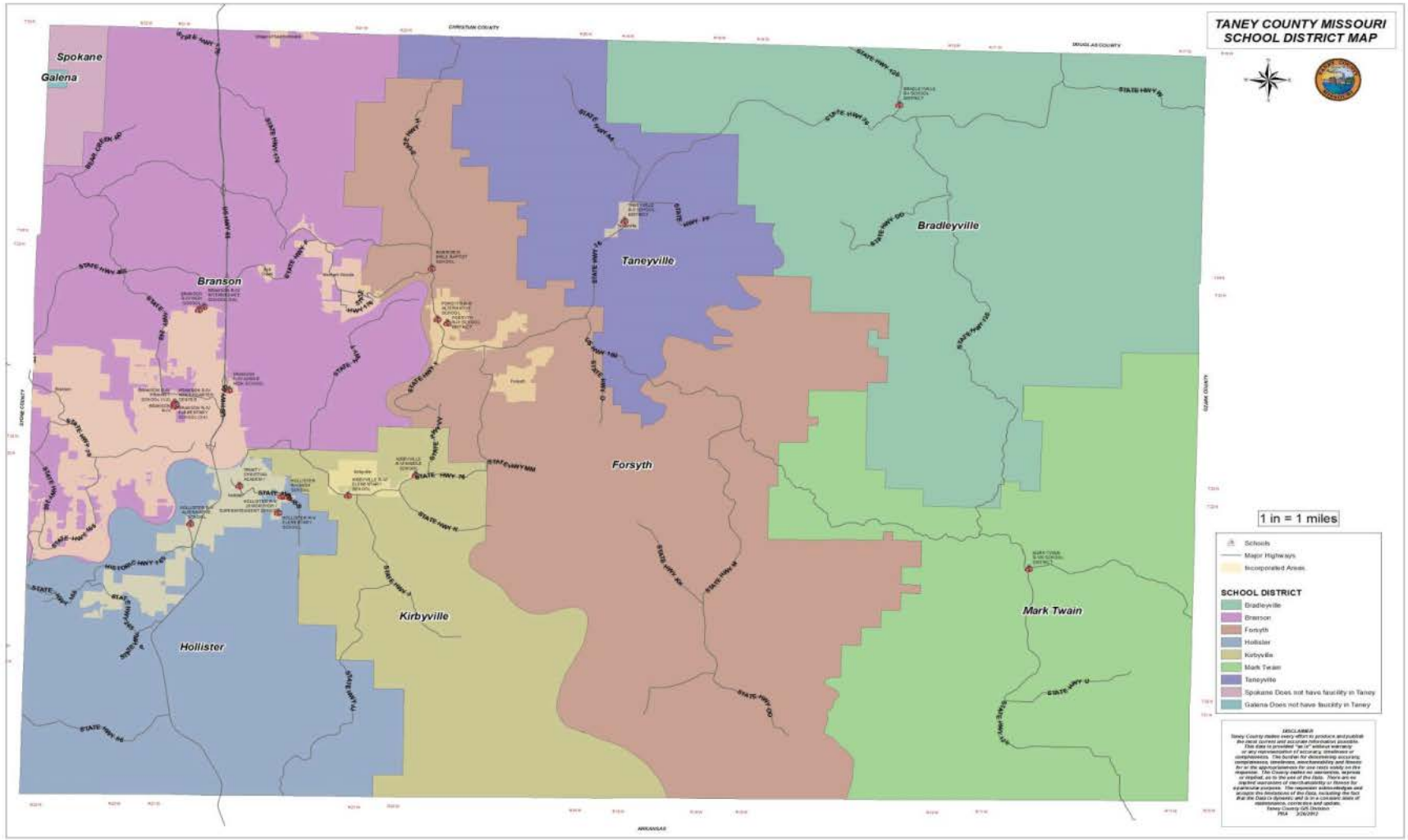
The College of the Ozarks is located in Taney County at Point Lookout. Established in 1906, it is now a private, accredited four-year institution situated on 1,000 acres with a student enrollment of 1,500 and 280 faculty and staff. The college has a work program for its students, which has created a wide range of facilities on the campus including a farm, feed mill, sale barn, post office, chapel, power plant, firehouse, restaurant, motel, and a new conference center. During the tourist season, approximately a thousand visitors a day visit the college. It hosts the NAIA Division II National Basketball Tournament in March, which draws over 10,000 during the week. Each June, it sponsors the Honor America event for the Fourth of July, which draws over 2,000. The Ralph Foster Museum is also located at the college, which draws thousands of visitors each week.

Table 2-20: Schools in Taney County

School Facility	Address	Staff	Enrollment
Public Schools			
Bradleyville R-I	**16474 N. State Hwy 125**	**35**	**239**
Bradleyville High	16474 N. State Hwy 125	18	156
Bradleyville Elementary	16474 N. State Hwy 125	17	83
Branson R-IV	**400 Cedar Ridge Dr**	**343**	**4,470**
Branson High	935 Buchanan Blvd	96	1,377
Branson Jr. High	308 Cedar Ridge Drive	50	677
Branson Elementary Schools		***197***	***2,489***
Branson Primary	402 Cedar Ridge Dr.		
Branson Elementary East	308 Cedar Ridge Dr.		
Branson Intermediate	766 Buchanan Rd.		
Branson Elementary West	396 Cedar Ridge Dr.		
Forsyth R-III	**178 Panther St.**	**108**	**1,213**
Forsyth High	178 Panther St.	36	396
Forsyth Middle	178 Panther St.	37	393
Forsyth Elementary	178 Panther St.	35	424

Table 2-20: Schools in Taney County			
School Facility	**Address**	**Staff**	**Enrollment**
Hollister R-V	**1798 State Hwy BB**	**209**	**1,477**
Hollister High	2112 State Hwy BB	44	489
Hollister Middle	1798 State Hwy BB	35	293
Hollister Elementary	1794 State Hwy BB	48	404
Early Childhood Center	1792 State Hwy BB	50	195
Kirbyville R-VI	**6225 State Hwy 76 E**	**39**	**321**
Kirbyville Middle	6225 State Hwy 76 E	21	184
Kirbyville Elementary	4278 State Hwy 76	18	137
Mark Twain R-VIII	**37707 US Hwy 160**		
Mark Twain Elementary	37707 US Hwy 160	8	59
Taneyville R-II	**302 Myrtle St.**		
Taneyville Elementary	302 Myrtle St.	22	200
Private Schools			
Riverview Bible Baptist Christian School	13901 US Hwy 160		
New Life Academy	P.O. Box 380		
*Occupants include students and staff. Source: Missouri Department of Elementary and Secondary Education.			

Figure 2-9: Taney County School Districts



Ozarks Technical College

Ozarks Technical College (OTC) was founded in 1990 and operates primarily in Springfield, MO at the 40 acre main campus. As of 2012, fall enrollment reached over 15,000 students and continues to grow. To keep up with this growth OTC, has recently opened a temporary facility in the Meadows Shopping Center at 4440 Gretna Road, in Branson, MO. However, a new facility, OTC Table Rock Campus, is being constructed on State Highway 165, approximately one-half mile southwest of the College of the Ozarks campus. OTC purchased a total of 8.25 acres located between Highways 65 and 165, including the empty restaurant, in December of 2010. In addition to the purchased land, the City of Hollister donated a contiguous .83 acres, bringing the total land now owned by the College to 9.08 acres. Completion of the facility as depicted below is expected by fall of 2013, at which point the temporary facility will be closed. This new facility is estimated to cost around eight million dollars, will be fully insured, and includes one building with two anticipated safe rooms. The building itself is approximately 53,560 square feet.

Figure 2-10: Artist Rendering of Planned OTC Table Rock Campus

Child Care Centers

Child care centers in Taney County are listed in the following table. The table includes only licensed and license-exempt child care centers. A general location listing of licensed family home care centers is also provided. In all probability, child care is also provided in many private residences in the county that have not been licensed by the State.

Table 2-21: Licensed and License Exempt Child Care Centers in Taney County*

Name	Address	City	Telephone
1st General Baptist Church & Learning	5th and College	Branson	417-334-7124
First Baptist Learning Center	400 S Sunshine	Branson	417-336-2139
Frances Rittenhouse Learning Center	212 Hwy. T	Branson	417-334-0586
Head Start: Branson	829 S Falls Ave.	Branson	417-332-0003
Lambs for Life Learning Center	2193 State Highway F	Branson	417-561-2098
Little Ones Learning Center	414 Buchanan Rd.	Branson	417-334-5628
Our Shepherd's Child Care Center	221 Malone St.	Branson	417-332-1922
Presbyterian Preschool	420 W Main St.	Branson	417-334-3468
Prime Time: Branson	402 Cedar Ridge Rd.	Branson	417-336-1887
Prime Time: Branson East	396 Cedar Ridge Rd.	Branson	417-332-1909
Tree House Day Care	862 Lost Tree Dr.	Branson	417-334-7315
Prime Time: Forsyth	178 Panther St.	Forsyth	417-332-1909
Head Start: Hollister	178 Jessica St.	Hollister	417-334-7515
Prime Time: Hollister	1794 State Hwy BB	Hollister	417-335-4607
Head Start: Kissee Mills	415 Staake Spur	Kissee Mills	417-546-4635
College of the Ozarks Child Development Center	1 Opportunity Drive	Point Lookout	417-334-6411
Mark Twain Preschool	37707 US Highway 160	Reuter	417-785-4323

Source: Child Care Resource and Referral, Springfield, MO.
* Child care centers in churches are license exempt.

The number of licensed family home care centers in Taney County and general geographic location are listed below. Site specific location information is not disclosed here for security purposes.

- Branson 6
- Forsyth 4
- Hollister 2
- Taneyville 1

Residential Care Facilities

Residential care facilities serving special needs adults and seniors in Taney County are located in Branson, Forsyth, Hollister, and Walnut Shade. Two facilities provide adult day care. The DCO Senior Focus ADC of Taney County, located at 1533 E. State Highway 76 in Branson, is a free-standing adult day care facility with a capacity of 20. The Forsyth Care Center provides adult day care in addition to its main operation as a skilled nursing facility.

Table 2-22: Residential Care Facilities in Taney County

Facility	Address	Telephone	Licensed Beds
Skilled Nursing Facility			
Golden Living Center	996 W. Highway 248, Branson	417-334-6431	100
Forsyth Care Center	477 Coy Blvd., Forsyth	417-546-6337	120
Point Lookout Nursing and Rehab	11103 Historic Highway 165, Hollister	417-334-4105	130
Residential Care Facility II			
Culpepper Place at Branson Meadows	5351 Gretna Rd., Branson	417-334-3336	104
Life Enhancement Village of Branson	421 Oakridge Rd., Walnut Shade	417-561-5395	18
Residential Care Facility I			
Summerhouse	2163 Round Mountain Rd Walnut Shade	417-561-4544	7
Lakeside Mountain Manor	238 Harmony Heights, Forsyth	417-546-5595	40

Source: Missouri Department of Health and Senior Services.

Senior Centers

Two senior centers are located in Taney County. These facilities provide a wide range of services to the senior population, including caregiver assistance, congregate meals, enrichment classes, health screenings, and home delivered meals.

Table 2-23: Senior Centers in Taney County

Senior Center	Address	Telephone
Branson Senior Center	201 Compton Drive Branson	417-335-4801
Forsyth Senior Friendship Center	13879 US Hwy 160 N Forsyth	417-546-6100

Commercial/Recreation Centers

The greatest concentrations of commercial activities in Taney County are in the downtown areas of Branson, Forsyth and Hollister and along the highways through these communities, including Highway 76, Highway 248 and Shepherd of the Hills Expressway in Branson, Highway 65 in Hollister and Highway 160 through Forsyth. These commercial clusters include retail and service establishments, hotels, resorts, shopping centers, theatres and other recreation and entertainment establishments. In

2006, a new mixed use shopping, entertainment and residential development opened along the Taneycomo waterfront in Branson. Branson Landing has become a highly dense commercial center.

Taney County offers numerous entertainment and recreation activities, such as caves, family entertainment centers, historical properties, lake cruises, miniature golf courses, movie theatres, museums, theme parks, tours, water rides, and several live entertainment shows. The tourism industry in the county draws millions of visitors each year. The busiest months are June, July, August, October and November.

There are over 40 theatres in Branson with a total of 56,797 seats. The Grand Palace is one of the largest theatres with 4,000 seats. Both the Tri-Lakes Center and the Welks Center have about 2,700 seats apiece. The Shoji Tabuchi Theatre holds about 2,500 people. Remington Theatre holds 2,600 people, while the Ray Steven's seats about 2,200. Many of the smaller theatres hold about 900 people.

From Taney County, visitors can also access three major lakes: Table Rock Lake, Lake Taneycomo, and Bull Shoals Lake. Recreation opportunities include hiking, sightseeing, water sports, hunting and fishing, camping, and picnicking.

Major Employers

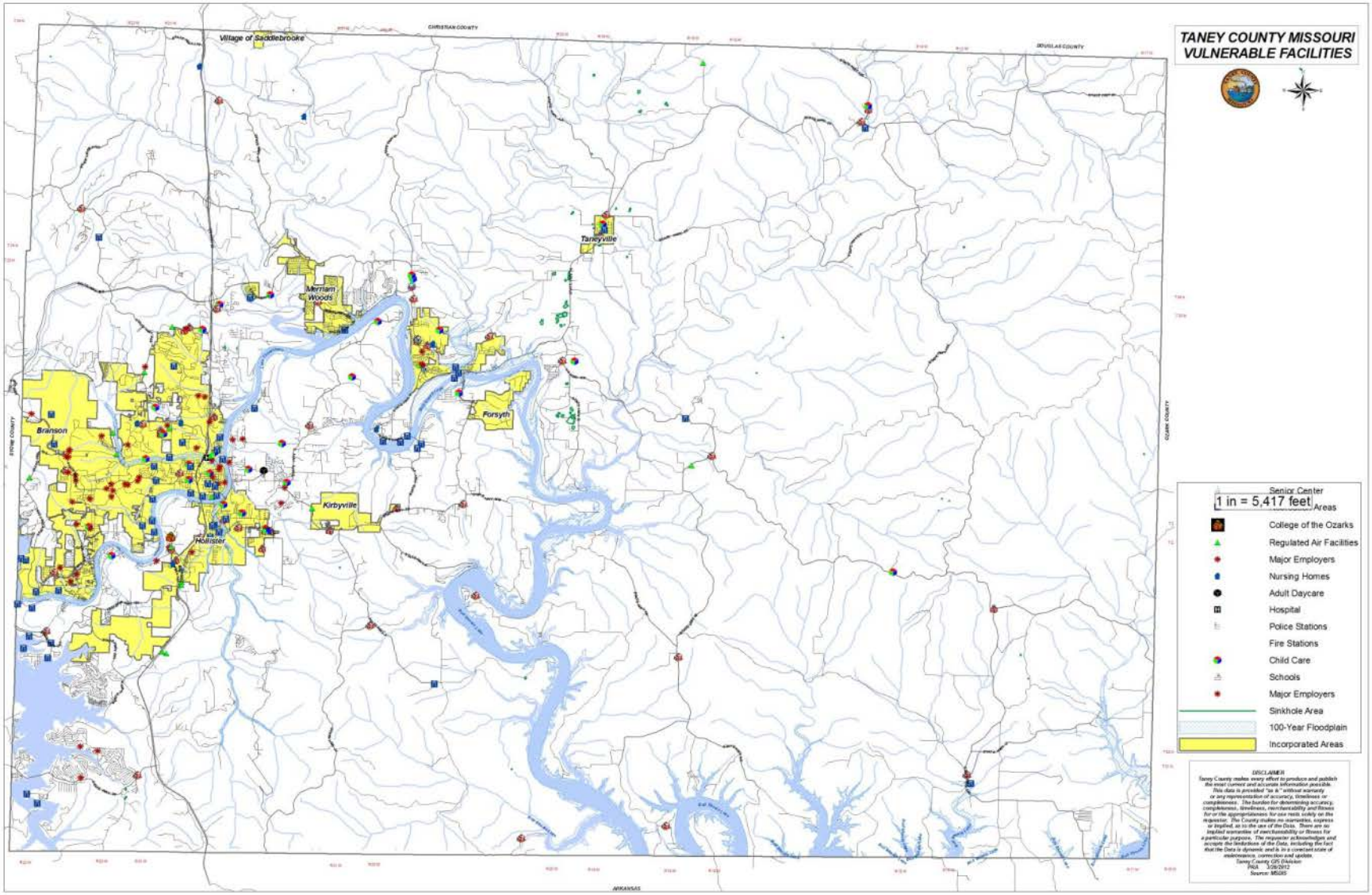
Industries and businesses in Taney County that employ 50 or more persons are listed in Table 2-24. The two largest employers in Taney County are located in Branson. These are Skaggs Community Health Center with 549 employees and Herschend Family Entertainment with approximately 675 employees located at four different tourist attractions in the Branson area.

Table 2-24: Major Employers

Company Name	City	Number of Employees
127 Inc	Branson	250
Bass Pro Shops	Branson	300
Best Buy	Branson	125
Big Cedar Lodge	Ridgedale	400
Big Cedar Wilderness Club	Ridgedale	300
Branson Variety Theater	Branson	100
Cantina Laredo	Branson	120
College Of The Ozarks	Point Lookout	239
Country Mart	Branson	200
Country Mart	Forsyth	200
Cracker Barrel Old Country Store	Branson	150
Days Inn	Branson	120
Devil's Pool Restaurant At Big Cedar	Ridgedale	500
Dolly Parton's Dixie Stampede	Branson	250
Fall Creek Resort	Branson	100
Falls Village	Branson	100
Grand Country Market	Branson	200

Table 2-24: Major Employers		
Company Name	**City**	**Number of Employees**
Grand Country Music Hall	Branson	100
Hilton-Promenade Hotel	Branson	180
Holiday Hills Resort & Golf Club	Branson	115
Home Depot	Branson	120
Jubilee Foods	Branson	100
K-Kountry-Branson	Branson	200
Kandakuk Kamps	Branson	2500
Keeter Center	Point Lookout	200
Kohl's Department Store	Branson	130
Kriter Tracks LLC	Branson	100
Lodge Of The Ozarks	Branson	130
Lowe's Home Improvement	Hollister	130
Marriott's Willow Ridge Lodge	Branson	200
Olive Garden Italian Restaurant	Branson	120
Outback Steak & Oyster Bar	Branson	150
Ozark Mountain Bank	Branson	75
Pointe Lookout	Hollister	120
Radisson	Branson	165
Red Lobster	Branson	140
Shepherd Of The Hills Outdoor	Branson	200
Shorty Small's	Branson	100
Skaggs Community Health Ctr	Branson	549
Stormy Point Village	Branson	100
Summerwinds Resort Svc LLC	Branson	400
Surrey Inn	Branson	1000
Table Rock Asphalt Co	Branson	130
Table Rock Asphalt Co	Branson	100
Target	Branson	100
Target	Branson	160
Target	Forsyth	160
Tom Boyce Excavating Inc	Branson	100
Track Family Fun Parks	Branson	200
Wal-mart	Branson	235
WELK Resort	Branson	160
WELK Resort Hotel Branson	Branson	160
Westgate Branson Woods	Branson	250
White River Valley Electric	Branson	130
White Water	Branson	200
Wyndham-Branson Meadows	Branson	220

Figure 2-11: Taney County Vulnerable Facilities



Flood Plain Management/Wetlands

Wetlands

Wetlands are defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."" (U.S. EPA, Section 404). Wetlands are not a primary natural feature in Taney County. Wetland habitats that existed in the White River floodplain were inundated with the impoundment of Table Rock Lake. However, wetland habitat does exist along streams and their tributaries and in low-lying areas in the county. In general, there are areas of associated forested and emergent wetland habitat along Bull Creek, Bear Creek, Beaver Creek, Roark Creek and Swan Creek (Burns & McDonnell, 1995, p. 3-15).

National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP is self-supporting for the average historical loss year, which means that operating expenses and flood insurance claims are not paid for by the taxpayer, but through premiums collected for flood insurance policies. Taney County and the communities of Branson, Bull Creek, Hollister, and Rockaway Beach participate in the NFIP. These jurisdictions have adopted floodplain management regulations as a requirement for participation in the NFIP.

Table 2-25: National Flood Insurance Program Participation

Community	NFIP Participation	Date of Entry (Emergency or Regular)	Current Effective Map
Taney County	Yes	04/01/2004 (r)	03/15/2012
Branson	Yes	10/26/1976 (r)	03/15/2012
Bull Creek	Yes	09/30/1997 (r)	03/15/2012
Forsyth	Yes	09/29/2006	03/15/2012
Hollister	Yes	03/18/1985 (r)	03/15/2012
Kirbyville	No	-	-
Merriam Woods	Yes	09/26/2006 (r)	03/15/2012
Rockaway Beach	Yes	03/01/2000 (r)	03/15/2012
Taneyville	No	-	-

Source: Federal Emergency Management Agency, Federal Insurance Administration.

Table 2-26 notes the flood insurance policies in force in Taney County. Of the 573 policies currently in-force, nearly half are for properties located in the City of Branson.

Table 2-26: Taney County Flood Insurance Policies

Jurisdiction	Policies in-force
Taney County (Unincorporated)	206
Branson	266
Hollister	31
Rockaway Beach	55
Bull Creek	15
Total	573

Source: http://bsa.nfipstat.com/reports/1011.htm

Environmental Concerns

A primary environmental concern for Taney County is protection of its surface water resources. Taney County's economy is heavily dependent on not only its live performance entertainment industries, but also on its water-based recreation industries. Lake Taneycomo and Table Rock Lake in particular are nationally known for fishing and the environments provided for other outdoor recreation activities. Several actions have already been taken by the county and its municipalities to address degradation of water quality, including installation of phosphorus removal systems at wastewater treatment plants, development of regional wastewater treatment facilities and expansion of wastewater collection systems into urbanizing areas of the county.

Maintenance of groundwater quality is also a significant concern. The county's geologic structure and soils characteristics significantly impact the use of septic tanks for wastewater disposal. It is relatively easy for surface contaminants as well as materials from failing septic systems to enter the groundwater with little filtration. Groundwater and surface water quality is a concern for human health as well as the animal husbandry industry which contributes to the economy in eastern Taney County.

Water quality in the White River Basin is an economic and quality of life concern for Missouri, Arkansas, and numerous local governments throughout the region, as well as area businesses and residents. Numerous local governments, state agencies, private citizens, business organizations and educational research institutions in Missouri and Arkansas are already collaborating or engaging in discussion on strategies to maintain and improve water quality in the tri-lakes. Any natural hazard event which significantly impacts surface water quality in Taney County would have adverse effects beyond the borders of the county.

Hazardous Materials Sites

Records of the Missouri Department of Natural Resources indicate seven hazardous waste generators located in Taney County. Five of these waste generators are located in Branson and two are located in Hollister. All facilities are small quantity waste generators with the exception of one large quantity waste generator in Branson. The specific locations of these facilities are not provided here for security reasons.

Endangered Species

There are forty-five sensitive species listed on the Missouri Department of Conservation Heritage Program for Taney County. The sensitive species range from Critically Imperiled (< 5 occurrences) to Vulnerable (21 to 1000 occurrences). Three of these sensitive species, the Indiana Bat, the Gray Bat, and the Tumbling Creek Cavesnail, are designated as endangered by the federal government. Three more of these species are designated as endangered by the state government: the Bachman's Sparrow, Swainsons's Warbler, and the Plains Spotted Skunk.

Table 2-27: Threatened and Endangered Species in Taney County			
Common Name	**Scientific Name**	**State**	**Federal**
Gray Bat	Myotis sodalis	Endangered	Endangered
Indiana Bat	Myotis grisescens	Endangered	Endangered
Tumbling Creek Cavesnail	Antrobia culveri	Endangered	Endangered
Bachman's Sparrow	Aimophila aestivalis	Endangered	
Swainsons's Warbler	Limnothlypis swainsonii	Endangered	
Plains Spotted Skunk	Spilogale putorius interrupta	Endangered	
Source: Missouri Dept of Conservation. Missouri Fish and Wildlife Information System, Natural Heritage Database. http://mdc.mo.gov/landwater-care/heritage-program/results/county/Taney			

Historic Properties and Archaeological Sites

There are 593 recorded archaeological sites in Taney County. Most of these sites are privately owned and are not identified to protect the physical location of the sites. Six properties in Taney County are listed on the National Register of Historic Places. These include:

- The Bonniebrook Homestead is located off of U.S. Highway 65 near Walnut Shade. It was added in 1997 and is privately owned. Its area of significance is in Literature and Art. The periods of significance are 1875-1899, 1900-1924, and 1925-1949. Its historic function was Domestic and Funerary, and its current function is Funerary and Landscape.

- The Downing Street Historic District is located at Downing Street, Hollister. It was added in 1978, and is owned privately, by local government, and Federal. Its area of significance is in Community Planning and Development, Commerce, and Architecture. The period of significance is 1900-1924. Its historic and current functions are Commerce/Trade, Government, and Religion.

- The John Ross House is located at Missouri Highway 76, Branson. It was added in 1983 and is privately owned. Its area of significance is Industry, Literature, Architecture, and Social History. The periods of significance are 1875-1899 and 1900-1924. Its historic function was Domestic and its current function is Recreation and Culture.

- The Sammy Lane Resort Historic District is located at 320 E. Main Street, Branson. It was added in 2003 and is privately owned. Its area of significance is Commerce, Architecture, and Social History. Its period of significance is 1925-1949. Its historic and current functions are Domestic, Recreation, and Culture.

- The Swan Creek Bridge is located north of Forsyth. It was added in 1983 and is owned by the local government. Its area of significance is Architecture. The periods of significance are 1900-1924 and 1925-1949. Its historic and current functions are Transportation.

Ralph Foster Museum

The Ralph Foster Museum is located on the campus of the College of the Ozarks. Established by the president of the school in the 1920s, the museum has gradually increased in size and exhibit volume. It is now primarily focused on collecting and preserving items connected to the Ozarks region. It contains 40,000 square feet of exhibits including antiques, weapons, dolls, etc. from the Ozarks and around the world, as well as 20,000 square feet used for offices, storage, and a research library.

Community Plans

Taney County Master Plan: Taney County adopted an updated *Master Plan* in December 1999. The Plan focuses on several elements that provide an overview of the characteristics and conditions of Taney County - its people, natural resources, economy, housing, public infrastructure, transportation and land development. Overall, the goals, objectives and recommendations set forth within these elements focus on protecting and maintaining the quality of the natural environment that is critical to the county's economic future, while recognizing private property rights.

Taney County Development Guidance Code: Adopted by the Taney County Commission in November 1984, the purpose of these codes is to manage the growth and development of the unincorporated areas of Taney County so as to achieve the objectives authorized by law according to RSMo 64.815, RSMo 64.825, and RSMo 64.850. The *Development Guide Code* is a performance-based zoning and subdivision regulation; the Code is reviewed on an annual basis and updated as determined necessary. The most recent update was in May 2012.

Taney County Emergency Operations Plan*:* The *Taney County Emergency Operations Plan* (EOP) establishes the organizations and procedures to enable Taney County and its municipalities to "save lives, minimize injuries, protect property, preserve functional civil governments and maintain economic activities essential to Taney County's survival and recovery from natural, technological, terrorism and war-related disasters" (Taney County EOP). The Plan establishes functional lines for operation and also identifies line of succession for continuity of government during a disaster.

Taney County Wastewater Master Plan (April 1999): The *Taney County Wastewater Master Plan*, developed for the Taney County Regional Sewer District, addresses the current and projected wastewater treatment needs in sixteen of the twenty-one watersheds in Taney County, excluding the watershed areas within the cities of Branson, Hollister, and Forsyth.

Community Health Assessment for Taney County (2008): The purpose of the 2008 assessment process was to provide a report to the community regarding progress that has been made on previously identified priorities and to review current trends that may require action to protect the health of the public. The previous health assessment, in 2005, identified three priority areas that were presented to the community to increase awareness and stimulate public health efforts. The priority areas focused on tobacco use, obesity and family/domestic violence. From these priorities, community meetings and groups met and early progress toward addressing these issues was observed.

State Transportation Improvement Plan (STIP): The STIP is the Missouri Department of Transportation's plan outline for transportation system improvements programmed for a five year period. Programmed improvements in the 2011-2015 relevant to Taney County include various pavement improvements on Rte. 76, at the Rte. 65/Rte. 160 interchange, and on the ramps at interchanges with Rtes. 106, F, Bee Creek Road, 248 and 76. There will be a replacement of interchange ramps at Rte. 248 (Shepherd of the Hills Expressway/ Branson Landing Blvd. as well as bridge improvements over Bull Shoals Lake.

Community Plans: Several of Taney County's incorporated communities have adopted comprehensive plans or master plans as guides for the future growth and development of their respective communities. The largest community with a comprehensive plan is Branson. As of March 2012, they are in the final review stage for their 2030 Comprehensive Plan. Forsyth also has a Comprehensive Plan that was adopted January 2003 and updated for 2010/2011. This plan is used as a guide and as a legal basis in making land use and zoning decisions. Rockaway Beach adopted a 2010 Comprehensive Plan in November. The purpose of the plan is to provide a policy guide for the growth and future development of the city. Hollister adopted their most recent Comprehensive Plan in 2005.

Building and Fire Codes

Table 2-28 lists building codes, fire codes and other codes adopted by municipalities within Taney County. The fire codes adopted by the Western Taney County Fire Protection District, the 2006 International Fire Prevention Code (IFC) for commercial buildings, are used within the unincorporated areas within the District's jurisdiction as well as some of the municipalities. The Central Taney County Fire Protection District also use the 2006 International Fire Prevention Codes for commercial building construction within its service area which is unincorporated areas only.

Table 2-28: Adopted Codes in Taney County

Community	Building Code	Fire Code	Mechanical Code	Plumbing Code	Other Codes
Branson	2009 IBC/IRC	2009 IFC	2009 IMC	2009 IPC	2009 NEC 2009 IFGC 2009 IPMC IEEC IECC IEBC ICCEC
Bull Creek	--	2006 IFC	--	--	--
Forsyth	2006 IBC/IRC	2006 IFC	2006 IMC	2006 IPC	2006 NIEC 2006 IFGC 2006 ICC
Hollister	2012 IBC/IRC	2012 IFC	2012 IMC	2012 IPC	2011 NEC 2012 IFGC 2012 IPMC
Kirbyville	--	2006 IFC	--	--	--
Merriam Woods	2003 IBC	2006 IFC	--	--	2003 IRC--1 & 2 Family Dwellings
Rockaway Beach	2008 IBC	2008 NFC	2008 IMC	2008 IPC	
Taneyville	--	--	--	--	--

Table 2-28: Adopted Codes in Taney County

Community	Building Code	Fire Code	Mechanical Code	Plumbing Code	Other Codes

Codes:

IBC	International Building Code	IFGC	International Fuel Gas Code
ICC	Electric Code	IMC	International Mechanical Code
ICCEC	International Code Council Administrative Provisions	IPC	International Plumbing Code
IEBC	International Existing Building Code	IPMC	International Property Maintenance Code
IECC	International Energy Conservation Code	IRC	International Residential Code
IFC	International Fire Prevention Code	NEC	National Electric Code

ICC/ANSI A117.1 Handicap Accessibility

CTCFPD	Central Taney County Fire Protection District	2000 IFC (Commercial Buildings only)
WTCFPD	Western Taney County Fire Protection District	1999 BOCA National Fire Prevention Code (Commercial Buildings only)

Community Partnerships

Several community partnerships bring together the public sector, private sector and the citizens of Taney County. Although each of these partnerships has a specific mission and focus, all organizations engage in programs and activities supportive of quality of life and enhancement of the built and natural environment.

Taney County Business Development Partnership: The organization's goals are to retain existing businesses, help small businesses and startups, workforce development, market the county and attract new businesses. Its primary stated focus is on non-tourism-related industries.

Ozarks Regional Economic Partnership: Communities and Chambers of Commerce in Taney County are members of the Ozarks Regional Economic Partnership, an organization of the Springfield Area Chamber of Commerce, which focuses on activities to promote economic development opportunities and job creation in the region.

Southwest Missouri Council of Governments (SMCOG): Taney County and several communities are also members of the Southwest Missouri Council of Governments and the Council's economic development district as designated by the U.S. Economic Development Administration. SMCOG's mission is to provide a forum for local governments to discuss issues of regional concern and to provide services in community development and planning to its membership.

Upper White River Basin Foundation: This foundation works with many different public and private organizations in Southwest Missouri and Northwest Arkansas to reduce pollution on the Upper White River and therefore improve the water quality of Beaver, Table Rock, Taneycomo and Bull Shoals Lakes. Some of the activities include water quality monitoring in the watershed, identifying the most effective on-site wastewater treatment systems for the Ozarks, assisting willing communities to find the resources to design and install appropriate centralized wastewater treatment systems in order to eliminate standard septic tanks, and promoting programs to eliminate nutrient rich agricultural run-off (http://www.whiteriverbasin.org/).

Friends of Lake Taneycomo: This group of citizens and some private companies in the Branson Area is a watch dog group that addresses environmental issues that affect Lake Taneycomo.

Downtown Branson Main Street Association: This association sponsors six annual festivals in the historic business district and hosts two annual parades.

Significant Cultural/Social Issues

Taney County has historically been a rural county with a culture based on individualism and limited government control. The growth of the area's tourism industry and the rapid in-migration of population from outside of the region and the State have brought increased economic prosperity to Taney County. However, growth has changed the urban and rural landscape and brought substantial challenges to the county and its municipalities to meet the infrastructure and public services needs of the resident and tourist population. Preserving and protecting the quality of the natural environment, particularly the quality of the water reservoirs, is also a significant social and economic issue for the county. Balancing the interests of the various stakeholders and private investment with public interests and investments in Taney County is essential to Taney County's on-going effort to maintain quality of life and ensure sustainable economic growth.

Public Awareness

An initial meeting on the hazard mitigation planning process was held with stakeholders in Taney County in December 2002. Representatives from the county and incorporated communities were invited to this meeting to learn about the benefits of developing hazard mitigation plans, the planning process, and SEMA's intent to contract with the Southwest Missouri Council of Governments to develop the hazard mitigation plan for Taney County. This information was further distributed to community officials through individual meetings and to the public through presentations at meetings of the governing bodies in the various communities. Notices of public hearing to obtain public input on the Plan were published in local newspapers in Taney County, and information on the planning process and draft elements of the Plan were posted on SMCOG's website for public view and comment.

Media Relations

Several broadcast media serve the Taney County area. Television media routinely broadcast weather reports and warnings with detailed information on cities and counties at risk as well as news segments including information on actions to reduce risks to life and property. Weather reports and warnings are also broadcast from several radio stations in the area. Media resources that provide news and weather coverage in Taney County include:

Table 2-29: Media Resources Serving Taney County			
Media	**Address**	**Telephone**	**Fax**
Newspapers			
Branson Daily News	PO Box 1900, Branson, MO 65615	417-334-3161	417-334-4299
Springfield News-Leader	651 Boonville, Springfield, MO 65806	417-836-1100	417-837-1381
Taney County Times	P.O. Box 220, Forsyth, MO 65653	417-334-2285	417-334-4789
Television			
KDEB 27 KOLR 10	2650 E. Division, Spfld, MO 65801	417-862-6397	417-866-6397
KSPR 33	1359 St. Louis, Springfield, MO 65801	417-831-1333	417-831-9358
KWMB (WB31)	118 State Drive, Hollister, MO 65672	417-336-0031	417-336-3199
KYTV 3	999 W. Sunshine, Spfld, MO 65808	417-268-3000	417-268-3364
Radio			
KADI 99.5 FM	5431 W. Sunshine, Spfld, MO 65619	417-831-0995	417-831-4026
KHOZ 102.9 FM	752 S. Hwy 165, Branson, MO 65616	417-334-6750	417-334-6756
KLFC 88.1 FM	205 W. Atlantic, Branson, MO 65616	417-334-5532	417-335-2437
KOMC 1220 AM, 100.1 FM KRZK 106.3 FM	1220 Courtney, Branson, MO 65616	417-334-1200	417-334-7141
KTTS 94.7 FM KSPW 96.5 FM KSGS 104.1 FM	2330 W. Grand, Springfield MO 65802	417-865-6614	417-866-8537
KTOZ 95.5 FM	PO Box 3273, Springfield MO 65808	417-890-5555	417-890-5050
KTXR 101.3 FM	PO Box 3925, Springfield MO 65808	417-862-5600	417-869-7576
KOSP 105.1 FM	319-B. E. Battlefield, Spfld, MO 65807	417-886-5677	417-886-2155
KOZO 89.7 FM	Hollister, MO 65672	417-339-3388	

City/Village Profiles

The following list provides a summary profile of the characteristics of the incorporated communities in Taney County.

Branson

Total Population - 2010	10,520
Classification	City-fourth class
Leadership	Mayor/City Administrator/Board of Aldermen
Median household income, 1999	$31,997
Total housing units	3,455
Housing unit, median year built	1983
Median gross rent	$510
Median owner-occupied housing value	$111,800
Master plan - land use plan only	Yes
Zoning regulations	Yes
Building regulations	Yes
Including earthquake design	No
Subdivision regulations	Yes

Branson (Continued)

Stormwater regulations	Yes
Floodplain management regulations	Yes
Water service	City of Branson
Sewer service	City of Branson
Electric service	Empire District Electric Company
Law enforcement	City of Branson
Fire protection service	City of Branson
Ambulance service	Taney County Ambulance District
Solid waste disposal	American Disposal

Bull Creek

Total Population - 2010	603
Classification	Village
Leadership	Chair/Board of Trustees
Median household income, 1999	$21,667
Total housing units	97
Housing unit, median year built	1988
Median gross rent	$442
Median owner-occupied housing value	$27,100
Master plan	No
Zoning regulations	No
Building regulations	No
Including earthquake design	No
Subdivision regulations	Yes
Stormwater regulations	No
Floodplain management regulations	Yes
Water service	Village of Bull Creek
Sewer service	Rockaway Regional Sewer District
Electric service	White River Valley Electric Cooperative
Law enforcement	Taney County Sheriff's Department
Fire protection service	Western Taney County Fire Protection District
Ambulance service	Taney County Ambulance
Solid waste disposal	American Disposal

Forsyth

Total Population - 2010	2,255
Classification	City-fourth Class
Leadership	Mayor/Board of Aldermen
Median household income, 1999	$31,801
Total housing units	913
Housing unit, median year built	1977
Median gross rent	$436
Median owner-occupied housing value	$90,200
Master plan	Yes
Zoning regulations	Yes
Building regulations	Yes
Including earthquake design	No
Subdivision regulations	Yes
Stormwater regulations	Yes
Floodplain management regulations	Yes
Water service	City of Forsyth
Sewer service	City of Forsyth
Electric service	Empire District Electric Company
Law enforcement	City of Forsyth
Fire protection service	Forsyth Fire Department
Ambulance service	Taney County Ambulance
Solid waste disposal	American Disposal

Hollister

Total Population - 2010	4,426
Classification	City-fourth class
Leadership	Mayor/City Administrator/Board of Aldermen
Median household income, 1999	$24,535
Total housing units	1,958
Housing unit, median year built	1986
Median gross rent	$456
Median owner-occupied housing value	$66,700
Master plan	Yes
Zoning regulations	Yes
Building regulations	Yes
Including earthquake design	No
Subdivision regulations	Yes
Stormwater regulations	Yes
Floodplain management regulations	Yes

Hollister (Continued)

Water service	City of Hollister
Sewer service	City of Hollister
Electric service	Empire District Electric Company
Law enforcement	City of Hollister
Fire protection service	Western Taney County Fire Protection District 2
Ambulance service	Taney County Ambulance Service
Solid waste disposal	American Disposal

Kirbyville

Total Population-2010	207
Classification	Village
Leadership	Chair/Board of Trustees
Median household income, 1999	N/A
Total housing units	N/A
Housing unit, median year built	N/A
Median gross rent	N/A
Median owner-occupied housing value	N/A
Master plan	No
Zoning regulations	Yes (adopted Taney County's regulations)
Building regulations	No
Including earthquake design	No
Subdivision regulations	Yes (adopted Taney County's regulations)
Stormwater regulations	No
Floodplain management regulations	No
Water service	Taney County Water (part), Private Wells (part)
Sewer service	Private Septic Tanks
Electric service	White River Valley Electric Cooperative and Empire District Electric Company
Law enforcement	Taney County Sheriff's Department
Fire protection service	Western and Central Taney County Fire Protection Districts
Ambulance service	Taney County Ambulance District
Solid waste disposal	American Disposal

* Kirbyville incorporated in 2002

Merriam Woods

Total Population - 2010	1,761
Classification	Village
Leadership	Chair/Board of Trustees
Median household income, 1999	$24,132
Total housing units	600
Housing unit, median year built	1980
Median gross rent	$462
Median owner-occupied housing value	$42,200
Master plan	No
Zoning regulations	Yes
Building regulations	Yes
Including earthquake design	Yes
Subdivision regulations	No
Stormwater regulations	No
Floodplain management regulations	No
Water service	Village of Merriam Woods
Sewer service	Village of Merriam Woods
Electric service	White River Valley Electric Cooperative
Law enforcement	Village of Merriam Woods
Fire protection service	Western Taney County Fire Protection District
Ambulance service	Taney County Ambulance District
Solid waste disposal	Private haulers

Rockaway Beach

Total Population - 2010	841
Classification	City-fourth Class
Leadership	Mayor/Board of Aldermen
Median household income, 1999	$33,359
Total housing units	356
Housing unit, median year built	1977
Median gross rent	$442
Median owner-occupied housing value	$69,200
Master plan	Yes
Zoning regulations	Yes
Building regulations	Yes
Including earthquake design	No
Subdivision regulations	Yes
Stormwater regulations	Yes
Floodplain management regulations	Yes

Rockaway Beach (Continued)

Water service	City of Rockaway Beach
Sewer service	City of Rockaway Beach
Electric service	White River Valley Electric Cooperative
Law enforcement	City of Rockaway Beach
Fire protection service	Western Taney County Fire Protection District
Ambulance service	Taney County Ambulance Service
Solid waste disposal	American Disposal

Taneyville

Total Population - 2010	396
Classification	Village
Leadership	Chair/Board of Trustees
Median household income, 1999	$23,500
Total housing units	160
Housing unit, median year built	1972
Median gross rent	$380
Median owner-occupied housing value	$50,000
Master plan	No
Zoning regulations	Yes
Building regulations	No
Including earthquake design	No
Subdivision regulations	Yes
Stormwater regulations	No
Floodplain management regulations	No
Water service	Village of Taneyville
Sewer service	Village of Taneyville
Electric service	White River Valley Electric Cooperative
Law enforcement	Taney County Sheriff's Department
Fire protection service	Central Taney County Fire Protection District
Ambulance service	Taney County Ambulance District
Solid waste disposal	Village of Taneyville

Part 3: Risk Assessment

Natural Hazard Identification/Elimination Process

A variety of sources were researched for data on natural hazards. Primary sources included FEMA, SEMA, National Climate Data Center (NCDC) and National Oceanic and Atmospheric Administration (NOAA). The U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were major sources for earthquake information. The Missouri Department of Natural Resources (MDNR) Dam Safety Division provided information concerning dams and the Missouri Department of Conservation (MDC) provided most of the wildfire information relevant to Taney County. Other information sources included county officials; existing city, county, regional and state plans; and information from local officials and residents.

Hazards relevant to Taney County were identified by researching the above noted data sources for incidences of natural hazards occurring in the county. In addition, hazards that are regional in scope and that have or may affect Taney County are also included in this risk assessment.

Community-wide Hazard Profile and Hazards Identified

Historical records indicate Taney County and its communities have been adversely affected by natural hazards. In September 1993, flash flooding along Bull Creek severely damaged or destroyed 150 mobile homes in the Rockaway Beach (Bull Creek) area, resulting in $5 million in property damage. Taney County has also experienced loss from tornado and thunderstorm winds. In May 1957, an F2 tornado caused $250,000 in property damages over a 15-mile long path through the county and in March 1996 thunderstorm winds damaged two boat docks and destroyed 20 boats on Lake Taneycomo in Rockaway Beach, resulting in $200,000 in property loss.

A natural disaster can result in other hazards, such as interruption of water supply, power supply, business operation and transportation. These emergencies can trigger civil disturbance, a loss of records through computer failure, and health hazards resulting from water contamination and unsanitary conditions. Economic loss can affect the area in several ways, depending on the duration of interruption. A natural disaster may also trigger another natural hazard event. The following diagram provides an example of cascading natural hazards while Table 3-1 notes cascading hazards that may result from individual natural hazard events.

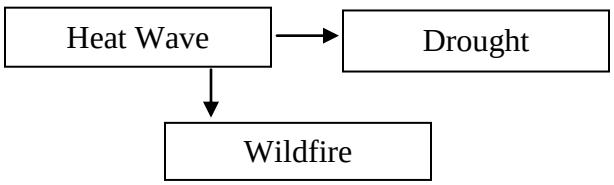


Table 3-1: Cascading Hazards Resulting from Natural Disasters							
Natural Disaster	Power and Communications Interruption	Water Supply Interruption	Business Interruption	Civil Unrest	Computer Failure and/or Loss of Records	Transportation Interruption	Health and/or Environmental Hazards
Tornado/Storm	X	X	X	X	X	X	X
Flood	X	X	X		X	X	X
Severe Winter	X	X	X		X	X	X
Drought		X					X
Heat Wave		X		X			X
Earthquake	X	X	X	X	X	X	X
Dam Failure	X	X	X	X	X	X	X
Wildfire	X	X	X			X	X
Sinkholes	X	X				X	
Public Health			X	X			X

Hazards not Included and Reasons for Elimination

Landslides occur in all 50 states; however, this hazard is not likely to have much of a notable impact on Taney County due to soil profile, geology, and climate factors. Also, the risk of coastal storms, hurricanes, tsunamis, avalanche, and volcanic activity does not exist in Taney County due to the county's location, geologic structure and soil profile. Additionally, Levee failure was omitted due to the fact that there are no levees in Taney County. Therefore, these hazards are not included in this risk assessment for Taney County.

Hazard Event Probability and Severity Ratings

The Hazard event severity and probability ratings assess various risks facing Taney County and local jurisdictions in order to evaluate and rank them. It estimates the probability of occurrence and the severity of consequences for each hazard and provides a method of comparison. The evaluation ratings are utilized in the Missouri Hazard Analysis prepared by SEMA dated November of 2011. The State Hazard Analysis involves many interrelated variables (toxicity, demographics, topography, etc.), and is to be used by state and local officials in planning and prioritizing allocation of resources.

The hazards presented here are those that have been experienced by, or pose a potential threat to, the people of Taney County. However, local or isolated problems that constitute potential disasters within the county should not be overlooked. Although the hazard event ratings are general statements, further definition was added to these values to develop the multi-jurisdictional risk assessment presented later in this chapter. The following definitions explain the ratings for each hazard:

Probability: The likelihood that the hazard will occur.

Low: The hazard has little or no chance of happening.

Moderate: The hazard has a reasonable probability of occurring.

High The probability is considered sufficiently high to assume that the event will occur.

Severity: The deaths, injuries, or damages (property or environmental) that could result from the hazard.

Low: Few or minor damages or injuries are likely.

Moderate: Injuries to personnel and damages to property and the environment are expected.

High: Deaths, major injuries and damages will likely occur.

Hazard Profile Format

The Hazard Profiles contained in this Risk Assessment are designed to better inform the reader of the natural hazards that affect the planning area, where those hazards occur, what damages those hazards might cause, past occurrences of the hazard, and the probability of the hazard occurring again. The Hazard Identification section contains a description of the hazard and a basic overview of how the event occurs in nature. The location section describes where the hazard is likely to occur, including a discussion of floodplains or Wildland-Urban Interface. The Extent section describes what damages officials can expect from each hazard as well as a discussion of the impact of the hazard on the planning area. The Past Occurrences section provides a discussion of recorded occurrences of the hazard as well as information on the severity of the events and the damages cause to property and life. The Probability section includes estimated probabilities for each hazard based on the frequency of past occurrences.

Tornado

Hazard Identification

A tornado is air. It is a violently rotating column of air associated with the updraft of a severe thunderstorm. The visible appearance can vary greatly depending in its strength and what it is passing over. Many tornadoes often appear as a funnel shaped cloud that extends to the ground, although the cloud does not have to touch the ground. Many tornadoes are often identified by rotating debris under the funnel cloud. If there is no rotating debris under a funnel cloud, there is no tornado yet. There has to be rotating debris occurring to be called a tornado. Weather conditions which are conducive to tornadoes also often produce a wide range of other dangerous storm activities, including severe thunderstorms, downbursts, straight line winds, lightning, hail, and heavy rains.

Essentially, tornadoes are a rotating column of air with two components of winds. The first is the horizontal, rotational winds that can measure up to 300 miles an hour, and the second is an uplifting current. It is the force of the horizontal wind that is responsible for the majority of damage that occurs with tornadoes. Although tornadoes have been documented in all 50 states, most of them occur in the central United States. The unique geography of the central United States allows for the development of thunderstorms that can spawn tornadoes. Warm, moist air flowing north from the Gulf of

Mexico collides with cold, dry air flowing south from Canada. This collision forces the warm, moist air to rise, often in concentrated currents called updrafts. These updrafts can become showers
and thunderstorms.

Most tornadoes spawn from a thunderstorm know as a supercell. A supercell thunderstorm has a very strong updraft. The unique thing about the supercell is that the updraft also rotates in a counter clockwise direction. The rotation is caused by the change of the wind in speed and direction with height, which is called vertical wind shear. On days that supercells can form, the surface wind is typically from the south, but as you go up in height, the wind changes to a more southwest or westerly direction and it increases in speed. It is this particular change of the wind in speed and direction with height that generates the rotating updraft in a supercell. While the supercell is responsible for most tornadoes in the United States, other types of thunderstorms also occasionally produce tornadoes. Multi-cell line storms, multi-cell cluster storms can also produce tornadoes, but it is not as common. (SEMA*, Missouri Hazard Analysis 2011*, p. A-1).

Location

There are no likely locations for future occurrences as the threat from this hazard is county-wide.

Extent (*Magnitude/Severity****)***

The extent of damage caused by a tornado depends of the strength of the storm. Possible damage can vary from branches broken off of trees and sign boards being damaged to well built structures being blown off of their foundations and completely leveled and automobiles being thrown through the air for over 100 meters. The scale used to measure the strength and destructive power of tornadoes is the Enhanced Fujita Scale (EF-Scale), which is a revised version of the original Fujita Scale developed by Dr. Theodore Fujita in 1971.

The EF-Scale was developed by a group of engineers and meteorologists in 2007 to better depict the actual winds speeds and their degree of damage. The EF-Scale found that wind speeds necessary to cause a certain level of damage were slower than the original F-Scale. The F-Scale and the EF-scale rank tornadoes according to wind speed and the severity of damage caused (*A Recommendation for an Enhanced Fujita Scale EF-Scale)*. These estimates vary with the height of the structure and exposure. Table 3-2 notes the F-Scale, Enhanced F-Scale, and examples of typical damage.

Table 3-2: Fujita and Enhanced Fujita Tornado Damage Scale					
FUJITA SCALE			OPERATIONAL EF SCALE		
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	Typical Damage
0	40-72	45-78	0	65-85	**Light damage -** Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	73-112	79-117	1	86-110	**Moderate damage** - Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	113-157	118-161	2	111-135	**Considerable damage** - Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	158-207	162-209	3	136-165	**Severe damage** - Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	208-260	210-261	4	166-200	**Devastating damage** - Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
5	261-318	262-317	5	Over 200	**Incredible damage** - Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.
Source: Enhanced Fujita Tornado Damage Scale					

Every tornado is a potential killer, and many are capable of great destruction. Tornadoes can topple buildings, roll mobile homes, uproot trees, hurl people and animals through the air for hundreds of yards, and fill the air with lethal, windblown debris. Sticks, glass, roofing material, and lawn furniture all become deadly missiles when driven by tornado winds. In 1975, a Mississippi tornado carried a home freezer for more than a mile. Once, a tornado in Broken Bow, Oklahoma, carried a motel sign 30 miles and dropped it in Arkansas. Tornadoes do their destructive work through the combined action of their strong rotary winds and the impact of windblown debris. In the simplest case, the force of the tornado's winds pushes the windward wall of a building inward. The roof is lifted up, and the other walls fall outward. Until recently, this damage pattern led to the incorrect belief that the structure had exploded as a result of the atmospheric pressure drop associated with the tornado (SEMA, *Missouri Hazard Analysis 2011*, p. A-1).

The EF-scale takes an additional step by determining the tornado's three-second gusts by estimating the point of damage based on a judgment of the amount of damage, or the degrees of damage (DOD), to 28 different types of structures, or damage indicators (DI), listed in table 3-3.

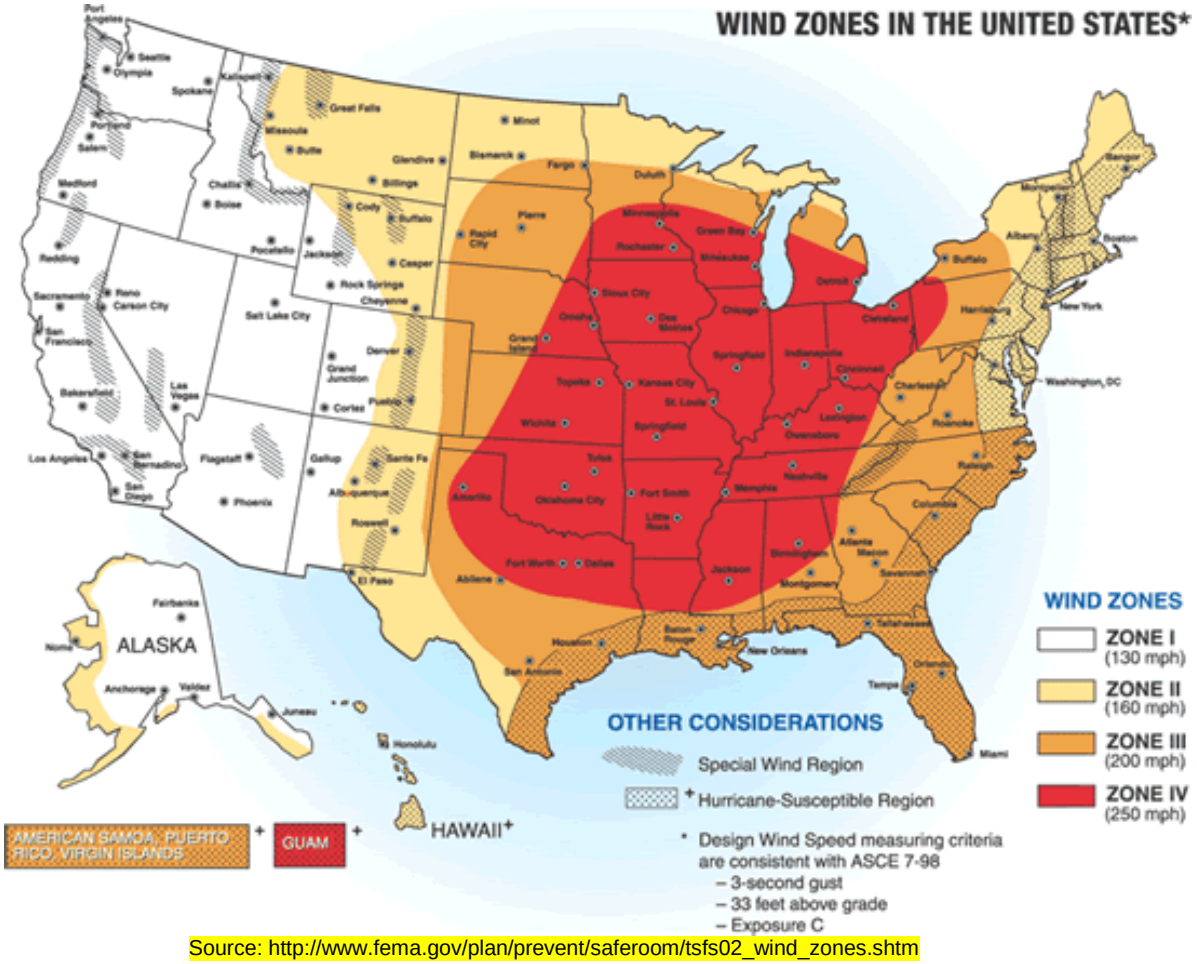
Table 3-3: Enhanced Fujita Damage Indicators and Degrees of Damage

DI No.	Damage Indicator (DI)	Degrees of Damage (DOD)	DI No.	Damage Indicator (DI)	Degrees of Damage (DOD)
1	Small Barns or Farm Outbuildings (SBO)	8	15	Elementary School [Single Story; Interior or Exterior Hallways] (ES)	10
2	One- or Two-Family Residences (FR12)	10	16	Junior or Senior High School (JHSH)	11
3	Manufactured Home – Single Wide (MHSW)	9	17	Low-Rise Building [1–4 Stories] (LRB)	7
4	Manufactured Home – Double Wide (MHDW)	12	18	Mid-Rise Building [5–20 Stories] (MRB)	10
5	Apartments, Condos, Townhouses [3 stories or less] (ACT)	6	19	High-Rise Building [More than 20 Stories] (HRB)	10
6	Motel (M)	10	20	Institutional Building [Hospital, Government or University Building] (IB)	11
7	Masonry Apartment or Motel Building (MAM)	7	21	Metal Building System (MBS)	8
8	Small Retail Building [Fast Food Restaurants] (SRB)	8	22	Service Station Canopy (SSC)	6
9	Small Professional Building [Doctor's Office, Branch Banks] (SPB)	9	23	Warehouse Building [Tilt-up Walls or Heavy-Timber Construction] (WHB)	7
10	Strip Mall (SM)	9	24	Electrical Transmission Lines (ETL)	6
11	Large Shopping Mall (LSM)	9	25	Free-Standing Towers (FST)	3
12	Large, Isolated Retail Building [K-Mart, Wal-Mart] (LIRB)	7	26	Free-Standing Light Poles, Luminary Poles, Flag Poles (FSP)	3
13	Automobile Showroom (ASR)	8	27	Trees: Hardwood (TH)	5
14	Automobile Service Building (ASB)	8	28	Trees: Softwood (TS)	5

Source: http://www.depts.ttu.edu/weweb/Pubs/fscale/EFScale.pdf

Figure 3-1 shows Wind Zones in the United States. All of Missouri is in Zone IV, and is therefore at risk for 250 mph winds. This wind speed is an important factor in the construction of tornado safe rooms.

Figure 3-1: Wind Zones in the United States



Source: http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm

Past Occurrences

During the 62 year period from 1950 through 2012, the National Climatic Data Center's (NCDC) Storm Event database records 10 tornadoes affecting Taney County. The most costly event occurred on February 29, 2012. An EF-2 tornado hit the city of Branson. Damage occurred along the Hwy 76 Strip as well as the Branson Landing. Although, damages occurred in surrounding communities and unincorporated parts of the county, initial reports from the City of Branson included 37 properties that suffered major damages or were destroyed and another 41 that suffered minor to major damage. Hardest hit was the Hilton Branson Convention Center in the Branson Landing which had an estimated $1,000,000 to $1.5 million in damage. This event produced no fatalities, however, there were 33 injured countywide.

Another costly event occurred on May 8, 2009 when an F-1 tornado touched down in rural sections of the county and caused damage to a home and numerous outbuildings on Essray Road. Intense tree damage also occurred as the tornado tracked into southeastern Christian County (NCDC). The tornadoes caused approximately $500,000 in property damage. Another major event occurred on May 21, 1957 when an F2 tornado

touched down, carving a 15-mile long path through the county. Although no specific damages are reported in the NCDC database, this event resulted in $250,000 in property losses. Table 3-4 contains information for recorded tornado events in the NCDC storm events database.

Table 3-4: Tornado History – Taney County, 1950-2012

Location	Date	Magnitude	Death	Injury	Property Damage
Taney	05/21/1957	F2	0	0	$250,000
Taney	05/18/1960	F0	0	0	$300
Taney	04/05/1965	F1	0	0	$25,000
Forsyth	04/27/1994	F0	0	0	$500
Forsyth	06/08/1995	F0	0	0	$0
Branson	03/11/2006	F0	0	0	$0
Branson Memorial Airport	01/08/2008	F0	0	0	$75,000
Swan	05/08/2009	F1	0	0	$500,000
Branson Memorial Airport	04/24/2010	F0	0	0	$20,000
Day	5/22/2011	F1	0	0	$50,000
Branson	2/29/2012	F2	0	0	$1,500,000*
Total			0	0	$2,420,800

Source: NCDC: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Probability and Severity Rating

According to the NCDC storm event records there have been 11 tornado events from 1954 to 2012. Based on the past occurrence of tornadoes in Taney County, there is an 19 percent probability that the county will experience a tornado in any given year. Table 3-5 lists the probability of future tornado occurrence by F-Scale rating. Of the 11 recorded tornado events for Taney County, 6 are classified as F0 magnitude. The probability of occurrence for an F0 magnitude is roughly once every ten years and one in twenty years for an F1 magnitude tornado. Table 3-5 contains the risk percentages for probability of occurrence of a tornado event by F-Scale magnitude for Taney County.

The potential severity of effects from tornadoes will continue to be high. Taney County will continue to experience injuries, property damages and possible fatalities from tornadoes. However, technological advances will facilitate earlier warnings than previously available. This, combined with a vigorous public education program and improved construction techniques, provides the potential for significant reductions deaths and injuries, as well as reduced property damage. See Table 3-6 for severity rating of tornado in Taney County by F-Scale.

Table 3-5: Probability of Future Tornado Occurrence by F-Scale			
F Scale	**# of Events**	**% Risk**	**Probability Rating**
F0	6	10.3	High
F1	3	5.2	Moderate
F2	1	3.4	Moderate
F3	0	0.0	Low
F4	0	0.0	Low
F5	0	0.0	Low

Table 3-6: Severity Rating of Tornado for Taney County by F-Scale	
F0	Low
F1	Moderate
F2	High
F3	High
F4	High
F5	High

Severe Thunderstorm (high wind, hail, lightning)

Hazard Identification

Tornadoes are usually associated with severe thunderstorms, which by themselves possess destructive potential. Such storms most often occur in the spring and summer, during the afternoon and evenings, but can occur at any time. In addition to tornadoes, other hazards associated with thunderstorms include the following (Heavy rain and flash flooding are discussed in the flood section):

- High winds
- Hail
- Lightning

The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least three-quarters of an inch in diameter, has winds of 58 miles per hour or higher, or produces a tornado. Thunderstorms may occur singly, in clusters or in lines. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time. Lightning is a major threat during a thunderstorm. Lightning is very unpredictable, which increases the risk to individuals and property. In the United States, 75 to 100 people are killed each year by lightning, although most lightning victims do survive (National Disaster Education Coalition, Talking About Disaster, p. TS-2).

High Winds

A severe thunderstorm can produce winds that can cause as much damage as a weak tornado and these winds can be life threatening. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per

hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour. (*State of Missouri Hazard Analysis*, November 2010)

The National Weather Service in Springfield, Mo uses the following scale, as represented in Table 3-7, to warn residents and emergency managers of thunderstorm wind risk.

Table 3-7: National Weather Service Thunderstorm Wind Gust Legend

Risk Level	Definition
None	**No thunderstorm wind risk**
Limited	**Risk for sub-severe wind gusts (less than 58 mph)** Or Probability of severe wind gusts (58 mph or greater) within 25 miles of a point: **Less than 15%**
Elevated	Probability of severe wind gusts (58 mph or greater) within 25 miles of a point: **Equal to or greater than 15%**
Significant	Probability of severe wind gusts (58 mph or greater) within 25 miles of a point: **Equal to or greater than 45%**
Extreme	Probability of severe wind gusts (58 mph or greater) within 25 miles of a point: **Equal to or greater than 60%**
Source: National Weather Service	

Hail

Hail is precipitation in the form of lumps of ice that form in some storms. They are usually round and typically vary from .25 inch to 3 inches in diameter. Hail generally forms in thunderstorms between strong currents of rising air called updrafts and the current of air descending toward the ground or downdraft. Hail develops when updrafts carry water droplets to a height where freezing occurs. Ice particles grow in size, finally becoming too heavy to be supported by the updraft and fall to the ground. Large hailstones indicate strong updrafts in storms. Large hailstones fall at speeds faster than 100 mph and account for significant damage (*Denver Regional Natural Hazard Mitigation Plan*, 2010 Draft).

Lightning

Lightning is caused when turbulent air inside a thundercloud creates positively and negatively charged areas, with the negative charges clustering at the bottom of the cloud. Because opposite charges attract each other, positive charges on the ground collect beneath the cloud and follow it. When the positive and negative charges finally meet, they complete an electrical circuit, and create lightning. Not all lightning forms in the negatively charged area low in the thunderstorm cloud. Some lightning originates in the cirrus anvil at the top of the thunderstorm. This area carries a large positive charge. Lightning from this area is called positive lightning.

Location

All of Taney County is at equal risk for severe thunderstorm hazards.

Extent (*Magnitude/Severity****)***

Thunderstorms frequently occur in the planning area and residents need to be prepared for the types of damages that each aspect of the hazard can cause.

High Winds

The Beaufort Wind Scale was developed in 1805 by Sir Francis Beaufort of England to better understand the effects of high winds not only over land but over water. Table 3-8 depicts the Beaufort Wind Scale. The scale classes wind speeds in knots or mph by 12 descriptions of conditions ranging from calm to hurricane. Descriptions of observable effects to land and water are defined for each class allowing for estimating wind speeds across a surface.

Table 3-8: Beaufort Wind Scale

Force	Wind (MPH)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	13-18	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	32-38	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	47-54	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Very high waves (20-30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	Violent Storm	Exceptionally high (30-45 ft) waves, foam patches cover sea, visibility more reduced	Extensive widespread damage
12	73+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	Extreme destruction, devastation

Source: http://www.spc.noaa.gov/faq/tornado/beaufort.html, http://www.orcadian.co.uk/weather/beaufort.htm

Hail

The Tornado and Storm Research Organization (TORRO) has developed a scale to better understand the effects of various size hail stones. The TORRO Hail Storm

Intensity Scale in Table 3-9 is similar to the Beaufort scale and classifies hail events by intensity category, diameter and typical damage impacts.

Table 3-9:TORRO Hailstorm Intensity Scale

	Intensity Category	Typical Hail Diameter (mm)*	Typical Damage Impacts
H0	Hard Hail	5	No damage
H1	Potentially Damaging	5-**15**	Slight general damage to plants, crops
H2	Significant	10-**20**	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**	Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

*Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

Lightning

Positive lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as five or 10 miles from the storm, in areas that most people do not consider to be a lightning risk area. The other problem with positive lightning is it typically has a longer duration, so fires are more easily ignited. Positive lightning usually carries a high peak electrical current, which increases the lightning risk to an individual. (*Denver Regional Natural Hazard Mitigation Plan*, 2010 Draft) Nationwide, lightning kills 75 to 100 people each year. During the period of 1992 through 1996, seven people died in Missouri as a result of lightning strikes, compared to two deaths from tornadoes during the same period (*State of Missouri Hazard Analysis*, November 2010)

Past Occurrence

High Winds

There are 103 thunderstorm wind events recorded in the NCDC database. Of those 103 events, thirty have resulted in a total of $1,263,000 in damages. The most severe thunderstorm event occurred on May 08, 2009. Fifty to eighty mph gusts downed thousands of trees across much of Taney County. The northern half of the county experienced the greatest impact with structural damage occurring to a modular home in Forsyth after a large tree fel on the structure. Several power poles across the northern

half of the county were downed and resulted in power outages (NCDC). On March 24, 1996 in Rockaway Beach, thunderstorm winds damaged 2 boat docks and destroyed 20 boats, resulting $200,000 in damages. Two events caused property damage totals of $100,000 each. The first event occurred on April 15, 2001 three miles west of Branson when 70-90 mph winds damaged trees and two homes under construction, destroyed a boat dock, and knocked down power lines. The number of trees and power lines knocked down in southeast Taney County were so numerous that county roads were completely blocked for two days. The loss of power left 3,000 people without electricity for more than 18 hours. A woman was injured when the shed she occupied blew over. The second event occurred on July 4, 2004. Straight line winds damaged several structures in Branson and numerous trees and power lines were downed in the county Table 3-10 records those thunderstorm wind events that have resulted in damages.

TABLE 3-10: Thunderstorm Winds History – Taney County, 1955-2012

Location	Date	Death	Injury	Property Damage
Taney	08/17/1988	0	1	$0
Branson	09/13/1993	0	0	$50,000
Branson	04/11/1994	0	0	$50,000
Branson	06/08/1995	0	0	$3,000
Rockaway Beach	03/24/1996	0	0	$200,000
Chestnutridge	04/28/1996	0	0	$2,000
Branson	07/22/1996	0	0	$5,000
Rockaway Beach	07/09/1997	0	0	$1,000
Hollister	03/27/1998	0	0	$90,000
Forsyth	07/20/1998	0	0	$5,000
Forsyth	07/22/1998	0	0	$1,000
Branson	04/03/1999	0	0	$30,000
Ridgedale	05/17/1999	0	0	$3,000
Taneyville	08/11/1999	0	2	$50,000
Protem	01/03/2000	0	0	$5,000
Branson	03/26/2000	0	0	$4,000
Kirbyville	07/28/2000	0	0	$10,000
Branson	04/15/2001	0	1	$100,000
Taney	07/04/2004	0	0	$100,000
Ridgedale	06/06/2005	0	0	$7,000
Forsyth	11/12/2005	0	0	$5,000
Protem	06/22/2006	0	0	$5,000
Rockaway Beach	06/01/2007	0	0	$15,000
Branson	6/01/2007	0	0	$2,000
Day	05/08/2009	0	0	$500,000
Point Lookout Apartments	04/24/2010	0	0	$1,000
Branson	08/08/2011	0	0	$10,000
Forsyth	08/08/2011	0	0	$2,000
Forsyth	08/20/2011	0	0	$1,000
Hollister	08/20/2011	0	0	$1,000
Totals		0	4	$1,263,000

Source: NCDC, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Hail

The NCDC Storm Event database includes records of 128 hail events in Taney County since 1962, five of which reported property damages totaling $555,100. The most damaging hail event occurred on March 12, 2006 when baseball size hail damaged roofs and vehicles in Branson. Damage from this event totaled $500,000. On May 9, 1998, golf ball sized hail fell in an area from Table Rock State Park northeast to the Highway 76 strip in Branson, damaging numerous vehicles. This event resulted in $50,000 in property damages. The second recorded hail event, resulting in $100 in damages, occurred in the Forsyth area on April 4, 1994. In addition to these five events, a thunderstorm wind event five miles north of Taneyville on August 11, 1999 resulted in slight injuries to two people hit by golf ball size hail as they ran for shelter from the storm. Table 3-11 lists those events that resulted in damage or injuries.

Table 3-11: Hail History – Taney County, 1955-2012

Location	Date	Death	Injury	Property Damage
Forsyth	04/15/1994	0	0	$100
Branson	05/09/1998	0	0	$50,000
Taneyville	08/11/1999	0	2	N/A
Branson	03/12/2006	0	0	$500,000
Ridgedale	10/01/2009	0	0	$5,000
Totals		0	2	$555,100

Source: NCDC, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Lightning

There are 2 lightning events recorded in the NCDC Storm Events database. On July 4, 2001, a lightning strike caused a house fire northwest of Branson, near the old Shepherd of the Hills Lumber Company. The fire caused $25,000 in damage. The most recent event occurred on November 14, 2005. Lightning struck a cupola on the roof of a four story condominium in Branson. The fire only caused damage to the cupola and did not spread to the building. Table 3-12 lists the two lightning strikes that have been recorded for Taney County.

Table 3-12: Lightning History – Taney County, 1993-2012

Location	Date	Death	Injury	Property Damage
Branson	07/04/2001	0	0	$25,000
Branson	11/14/2005	0	0	$5,000
Totals		0	0	$30,000

Source: NCDC, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Probability and Severity Rating

The county is highly likely to experience high wind, hail and lightning due to the frequency of severe thunderstorms in the spring and summer months in Taney County. The probability of occurrence for high wind, hail and lightning is extremely High and likely to occur several times in the same year. Table 3-13 notes the probable risk of hazards due to severe thunderstorm events.

Table 3-13: High Wind, Hail and Lightning Probability of Occurrence			
Event	**# of Events**	**% Risk**	**Probability Rating**
High Winds	103	180.7	High
Hail	128	224.6	High
Lightning	2	10.5	Moderate
Source: NCDC: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms * Lightning events have occurred in Taney County but have not been tracked and recorded in the NCDC database. The actual probable risk of future occurrence is considered High.			

Severe thunderstorms losses are usually attributed to associated hazards of hail, winds, lightning and heavy rains. The severity of high wind, hail and lightning is shown in Table 3-14.

Out of the 103 thunderstorm wind events, 30 have resulted in property damage and injury. A damaging wind event has the probability of occurring in one out of every two years in Taney County with average damages to property of $42,100. The severity of thunderstorm winds will remain high for the county.

In terms of hail, of 128 recorded events only five occurrences have caused property damage. The probability for damaging hail occurrences are approximately once every eleven years with an average cost to property of $111,020. The severity of hail events in the county is moderate.

There is no record of a damaging lightning event in the NCDC storm event data; therefore, the severity rating from lightning damage is considered low.

Table 3-13: High Wind, Hail and Lightning Severity Ratings	
Event	**Severity Level**
High Winds	High
Hail	Moderate
Lightning	Low

Flood (Riverine and Flash)

Hazard Identification

A flood is a partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid melting of snow and/or ice. There are several types of riverine floods including headwater, backwater, interior drainage, and flash flooding. Flash flooding is the most common type of flooding that has affected Taney County.

Flash flooding is characterized by rapid accumulation or runoff of surface waters from any source. This type of flooding can occur within a few hours of a rain event, or after a dam or levee failure, or following a sudden release of water held by an ice or debris jam. Flash floods can catch people unprepared because they can develop in just a matter of hours. Most flood-related deaths result from this type of flood event.

The areas adjacent to rivers and stream banks that serve to carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowlands and relatively flat areas adjoining rivers and streams. The term "base flood," or 100-year flood, refers to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year, based on historical records. Floodplains are a vital part of a larger entity called a basin which is defined as all the land drained by a river and its branches (SEMA, *Missouri Hazard Analysis 2011*, p. B-1).

Location

Taney County has 3 lakes and 25 rivers/creeks. This equates to 141 miles of stream, 494 acres of stream, and 11,853 acres of lake (the acres denotes standing water). There are several likely locations that can be affected by flooding,

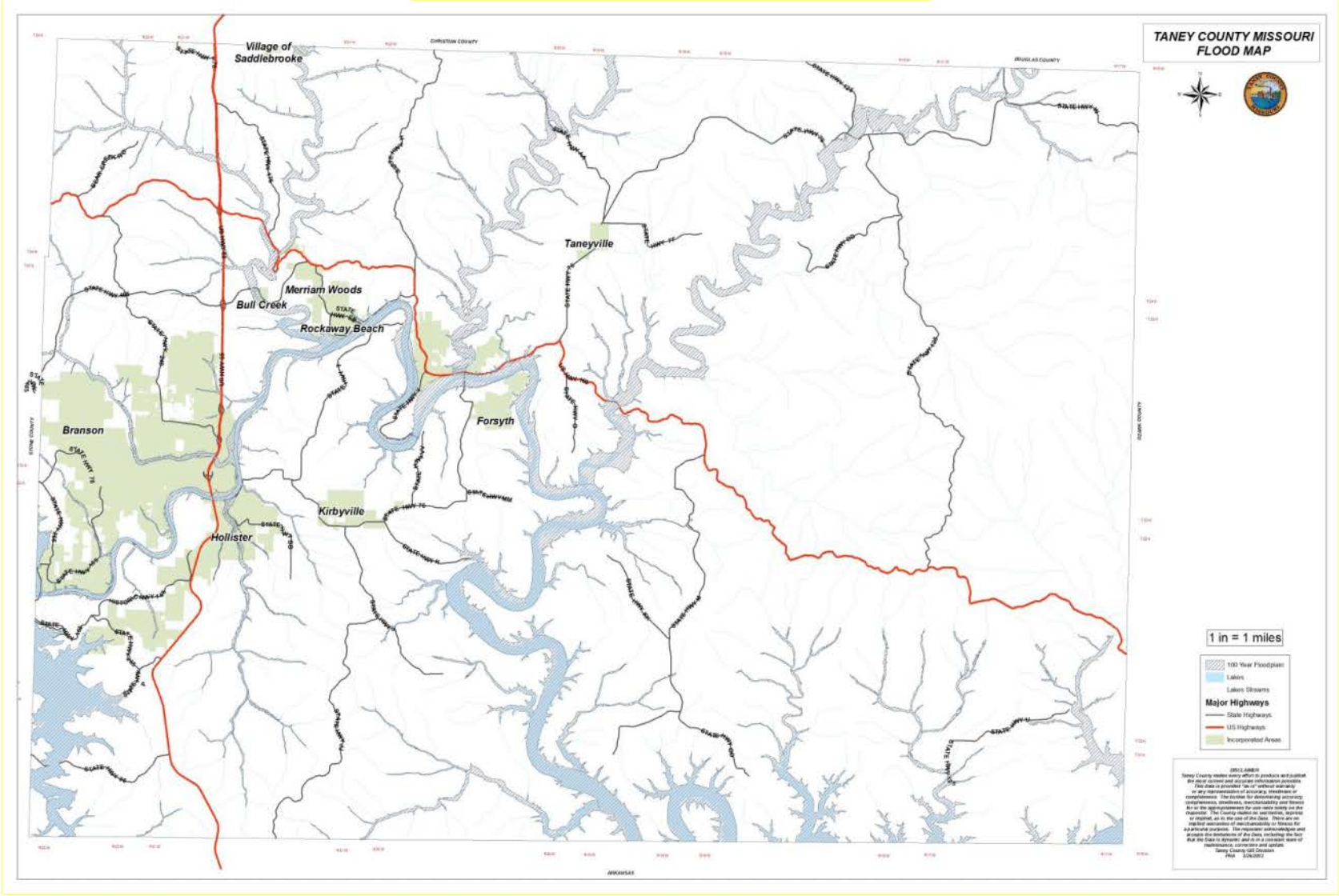
The majority of incorporated jurisdictions within Taney County lie adjacent to Lake Taneycomo. Specifically, Branson, Hollister, Kirbyville, Merriam Woods, and Rockaway Beach are within the Lake Taneycomo watershed. Bull Creek is within the Lower Bull Creek watershed. Bradleyville and Taneyville are both in the Big Creek watershed. The Swan Creek watershed contains the City of Forsyth, as well as another portion of Taneyville. Specifically, historical records show Branson, Rockaway Beach and Bull Creek have been affected by flood events. Low lying areas throughout the rural areas of the county are also at risk for flash flooding.

According to the data available on the NOAA website, many areas in Taney County are prone to experience flooding. The following is a list of locations identified in the NOAA event reports:

- Hwy F along Bull Creek
- Bull Creek in the Village of Bull Creek
- Hwy 176 and Hwy 160 near Rockaway Beach
- Honey Ln and Sundown Ln in Rockaway Beach
- Hwy 176 near Sundown Ln
- Hwy H north of Forsyth
- Middleton Rd near Taneyville and Bradleyville
- Hwy 125 north of Protem
- Hwy 176 and Molly Ln
- Hwy 160 east of Kissee Mills
- Old Cheese Plant Rd near Little Beaver Creek
- Hwy 76 in Bradleyville
- Hwy J northwest of Mincy
- Hwy K near Bull Shoals Lake
- Hwy H and Columbus Rd north of Forsyth
- Old Road in Hollister
- Hidden Valley Trailer Park in Hollister
- Kimberling Creek Rd
- Cedar Point Hill Rd
- Hwy 125 S of Hercules
- Shepard of the Hills Expressway near the charcoal plant in Branson
- Fall Creek Rd by the Thousand Creek Golf Course

- Stockstill Park in Branson
- Sycamore Church Rd 5 miles northwest of Branson
- Airport Rd near Hwy 248

Figure 3-2: Taney County 100-Year Floodplain



Extent **(**Magnitude/Severity**)**

The Federal Emergency Management Agency estimates that more than 216,000 households are within designated floodplains in Missouri. In addition, thousands of other Missouri residents are at risk to the dangers of flash flooding from rapidly rising creeks and tributaries, storm water runoff, and other similar flooding events. Nationwide, most flood deaths are from flash floods, and nearly half of these fatalities are auto related, according to the National Weather Service. Of the 49 deaths recorded during the floods of 1993, 35 (71 percent) were from flash floods. In that same category, 20 deaths (77 percent) were related to motor vehicles caught in flash floods. Missouri's river flooding in 1993 claimed 14 lives, with 6 deaths (23 percent) attributed to motor vehicles.

Flash floods represent different forecast and detection challenges because they are not always caused by meteorological phenomena. Flash floods result when favorable meteorological *and* hydrological conditions exist together. Although heavy rainfall is necessary, a given amount and duration of rainfall may or may not result in a flash flood.

- how much water runs off (as well as where it runs to),
- how strong the stream is flowing,
- how wide an area is getting rain,
- how hard and fast it is raining,
- how long it has been raining in a particular drainage basin,
- where the storm is located and how it fast or slow it is moving,
- how porous the soil is and how much water it already holds,
- the amount of vegetation covering the soil,
- how much surface is paved,
- whether there are storm drains or closely space buildings,
- general geography and slope of the land.

Inundation is not the only risk of flooding. Floods can damage property but six inches of fast-moving water can knock you off your feet and water 24 inches deep can carry away most automobiles. Flash floods can roll boulders, tear out trees, destroy buildings, and obliterate bridges. Walls of water can reach heights of 10 to 20 feet and generally are accompanied by a deadly cargo of debris.(National Severe Storms Laboratory)

Urbanization further aggravates the flooding potential by increasing runoff two to six times over what would occur on natural terrain. As land is converted from fields or woodlands to urban uses, it loses its ability to absorb rainfall. During periods of urban flooding, streets can become swift moving rivers, while basements and viaducts can become death traps as they fill with water.

In order to warn residents about the many risks of flooding, the National Weather Service has created the following watches and warnings:

Table 3-14: Flood Related Watches and Warnings	
Type	**Description**
FLASH FLOOD or FLOOD WATCH	Flash flooding or flooding is possible within the designated watch area - be alert.
FLASH FLOOD or FLOOD WARNING:	Flash flooding or flooding has been reported or is imminent - take necessary precautions at once!
URBAN and SMALL STREAM ADVISORY	Flooding of small streams, streets and low-lying areas, such as railroad underpasses and urban storm drains is occurring.
FLASH FLOOD or FLOOD STATEMENT:	Follow-up information regarding a flash flood/flood event.

Past Occurrences

A total of 30 flood events are recorded by the NCDC for Taney County between September 1993 and December 2004. The majority of these floods represent flash flooding causing road closures and minimal property and crop damages in the county. However, the NCDC records indicate fourteen events which caused damage in Taney County. These events are listed in Table 3-10 and those more significant events for which specific damages are known are discussed below.

On September 24 of 1993, a flash flood affected the Rockaway Beach area and damaged or destroyed 150 mobile homes along Bull Creek, causing $5 million in damages. Extensive flooding also occurred statewide in 1994. Taney County was affected by flash flooding, but the NCDC database contains no specific information on damages incurred in the county. Taney County was also impacted by flood events of May 2002 that caused over $14 million in damages statewide. Flash flooding along Roark Creek on May 7, 2002 moved a large trailer 300 feet downstream and more than 30 homes were evacuated in the Village of Bull Creek as the creek overflowed its banks.

The spring of 2008 was extremely wet. In mid-February, the upper White River Basin received three and a half inches of rain in the overnight hours of February 16 into February 17. A second round of rain, up to four inches, came through the area on March 3-4. The area received a third major round of storms and another five to six inches rain on the 18th and 19th of March. In response to the large amounts of rain, the US Corps of Engineers began releasing large amounts of water from Table Rock Dam, flooding the downstream area. This band of showers resulted in $4 million in damages. Another band of showers hit the county at the end of March. The Corps of Engineers were forced to open the flood gates even wider and release a record 48,000 CFS into Lake Taneycomo. As a result, even more flooding occurred along Lake Taneycomo and into Bull Shoals Lake. Nearly $10 million in damage resulted from the release and the related flooding during the end of March. A fifth band a rain struck the county on the 10th of April, dropping three to four more inches of rain. The Corps of Engineers were still working to lower lake levels and were force to increase the flow to 46,500 CFS. During the spring of 2008, Table Rock Lake crested at a record 933.25 feet, 18.25 feet over power pool. All totaled an estimated $14.01 million in damaged occurred during the spring.

The spring of 2011 was another very wet spring. By the end of April, lake levels were again very high. Then during the week of April 23, multiple bands of storms dropped nearly a foot on the region. As a result, Table Rock Lake crested at 935.5 feet. Because

of the rapid rise of lake levels, the Corps of Engineers were forced to release a record 68,000 CFS from the dam. Like the spring of 2008, massive flooding occurred downstream from Table Rock. Damages reach $10 million during the spring of 2011.

Table 3-15: Flood History – Taney County, 1993-2012

Location	Date	Type	Death	Injury	Property Damage*	Crop Damage*
Rockaway Beach	09/24/1993	Flash Flood	0	0	$5,000,000	$0
Branson	11/13/1993	Flash Flood	0	0	$50,000	$0
Central and Southern MO	04/11/1994	River Flood	0	0	$63,300 *($5,000,000 79 Counties)*	$63,300 *($5,000,000 79 Counties)*
Southwest MO	05/07/2002	Flood	0	0	$420,600 *($14,300,000 34 Counties)*	$5,900 *($200,000 34 Counties)*
Southwest MO	05/12/2002	Flood	0	0	$20,600 *($700,000 34 Counties)*	$0
Branson	09/02/2005	Flash Flood	0	0	$5,000	$0
Taney County	03/18/2008	Flash Flood	0	0	$4,000,000	$0
Taney County	03/31/2008	Flash Flood	0	0	$10,000,000	$0
Taney County	04/10/2008	Flash Flood	0	0	$10,000	$0
Rockaway Beach	06/23/2008	Flash Flood	0	0	$30,000	$0
Taney County	06/28/2008	Flash Flood	0	0	$5,000,000	$0
Taney County	09/14/2008	Flash Flood	0	0	$100,000	$0
Taney County	04/25/2011	Flash Flood	0	0	$10,000,000	$0
Totals			0	0	$34,699,500	$69,200

Source: NCDC, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

* NCDC lists a total monetary value of damage caused in all affected counties, not for individual counties. In order to find an individual county level total damage estimate for each classification of winter weather events, a simple average was taken by dividing the total damage for each type of weather event by the largest number of affected counties in a single event.

Flood events occur most frequently in Taney County in the months of April, May, and June. Although flood events are less frequent during the rest of the year, there is the possibility of occurrence year round as at least one event has been recorded in every month except December, see Table 3-16.

Table 3-16: Flood Event by Month, 1993-2012			
January	3	July	5
February	2	August	4
March	8	September	4
April	14	October	2
May	9	November	2
June	9	December	1
Source: NCDC Storm Events-Missouri			

Table 3-17: Federal Disaster Declarations, Taney County Flood Events, 1993-2004		
Date	**DR#**	**Type of Assistance**
April – June 2011	1980	Individual Assistance Public Assistance
September 2008	1809	Individual Assistance Public Assistance
June- August 2008	1773	Individual Assistance Public Assistance
March- May 2008	1749	Individual Assistance Public Assistance
March 2006	1631	Individual Assistance
May 2003	1463	Individual Assistance
May 2002	1412	Public Assistance
Summer and Fall 1993	995	Individual Assistance
Source: Federal Emergency Management Agency. Federally Declared Disasters by Calendar Year. http://www.fema.gov/library/drcys.shtm Missouri State Emergency Management Agency. Missouri Hazard Analysis.		

Probability and Severity Ratings

The probability that Taney County will experience a riverine flood event in any given year is 84% according to the NCDC storm event data. The probability of flash flood events is nearly three times greater and indicates a high probability for multiple events in any given year, see Table 3-17. Flood events have been a problem in Taney County in the past and will likely continue to be a problem in the future. As communities in Taney County grow, impermeable surfaces will increase the amount of runoff. Table 3-18 depicts the probable risk of occurrences for each type of flood event in the county.

Table 3-18: Probability of Riverine and Flash Flood Events in Taney County			
Flood Type	**Events**	**% Risk**	**Probability Rating**
Riverine	16	84.2%	High
Flash	44	231.6%	High

The NCDC storm event data contain 14 records of damaging flood events for Taney County equaling a 74% probability of a damaging event occurring in any given year. Three of those events caused damage to many counties in the state of Missouri. Monetary damages for those three events are a combined total of damages suffered in affected counties. In order to calculate a reasonable, albeit flawed, estimate of damages occurring in only Taney County, a simple average was calculated based on the number of affected counties. Using those estimates along with the other totals provided in the

NCDC database, a damaging flood event resulted in an average of $757,959 of property damage and $4,897 of crop damage.

Table 3-19: Severity Rating for Riverine and Flash Flood Events in Taney County	
Flood Type	**Hazard Severity Rating**
Riverine	High
Flash	High

National Flood Insurance Program Participation and Repetitive Losses

Taney County as well as Branson, Bull Creek, Forsyth, Hollister, Merriam Woods, and Rockaway Beach belong to the National Flood Insurance Program. Forsyth and Merriam Woods joined the NFIP in 2006. All communities current effective map date is March 15, 2012 (see Part 2, Floodplain Management/Wetlands, page 2-42 for detailed information on NFIP participation). Information on repetitive losses to the NFIP in Taney County is listed in Appendix B. Figures 3-1 through 3-4 represent the 100-year floodplain areas within Taney County.

Severe Winter Weather

(snow, ice, extreme cold)

Hazard Identification

Severe winter weather, including winter storm, heavy snow, ice storms and extreme cold, can affect any area of Missouri. Severe weather, such as snow, ice storms and extreme cold can cause injuries, deaths and property/crop damage in a variety of ways. Winter storms are considered deceptive killers. This is because most deaths are indirectly related to the storm. Causes of death range from traffic accidents due to adverse driving conditions, to heart attacks caused by overexertion while shoveling snow and other related activities. Hypothermia or frostbite may be considered the most direct cause of death and injuries which can be attributed to winter storms and/or severe cold. Economic costs are difficult to measure.

Winter Storm

A winter storm can range from a moderate snow over a few hours to blizzard conditions with blinding wind-driven snow that lasts several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely reduce visibility. Communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians. A Winter Storm is a winter weather event containing a mixture of snow, cold, wind, sleet and freezing rain. They can cause driving to be dangerous and can cause power outages.

Heavy Snow

A heavy snow event contains large amount of just snowing falling over a period of time. Large amounts of snow can cause travel to become dangerous and the sheer weight of the snow can cause roofs and structures to collapse.

Sleet/Ice/ Freezing Rain

There are varying kinds of frozen precipitation during winter storms. Sleet is raindrops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects; however, it can accumulate like snow and cause a hazard to motorists. An ice storm occurs when freezing rain falls onto a surface with a temperature below freezing; this causes it to freeze to surfaces, such as trees, cars, and roads, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard. Heavy accumulations of ice can bring down trees, electric power lines and poles, telephone lines and communications towers. Such power outages create an increased risk of fire, as home occupants seek the use of alternative fuel sources (wood, kerosene, etc. for heat, and fuel burning lanterns or candles for emergency lighting). Crops, trees and livestock can be killed or injured due to deep snow, ice or severe cold. Buildings and automobiles may be damaged from falling tree limbs, power lines and poles, or collapse. Local governments, home and business owners and power companies may be faced with spending millions of dollars for restoration of services, debris removal, and repair.

Extreme Cold

In addition to severe winter weather such as snow and ice, Wind Chill factor can also be dangerous for any community. Wind Chill is defined by National Weather Service as the temperature it “feels like” outside and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin temperature to drop. Wind Chill does not impact inanimate objects like car radiators and exposed water pipes, because these objects cannot cool below the actual air temperature. Table 3-20 shows the risk levels for extreme cold according to the National Weather Service in Springfield, MO.

Table 3-20: National Weather Service Extreme Cold Risk Legend

Risk Level	Definition
None	Minimum apparent temperature greater than or equal to 10 degrees F
Limited	Minimum apparent temperature -9 to 9 deg. F
Elevated	Minimum apparent temperature -10 to -24 deg. F
Significant	Minimum apparent temperature -25 to -34 deg. F
Extreme	Minimum apparent temperature less than or equal to -35 degrees F
Source: National Weather Service	

Location

There are no likely locations for future occurrences of the severe winter weather hazards of ice storms, heavy snow and extreme cold as the onset of winter storms are a regional phenomenon and affect the entire county with little variability from place to place.

Extent (*Magnitude/Severity****)***

All types of winter weather will affect Taney County. Although Taney County has experienced several severe winter weather events that caused significant damages and economic loss, the overall severity of events is limited. There has been no past loss of life in Taney County. Primary roads are generally not closed for more than 24 hours. Schools may close for several days, but are not critical to the day-to-day operations of the county or municipalities. Most major business and government offices/services

essential for day to day life continue to function. Since severe winter weather typically has not caused major disturbances in day to day life, future events statistically will not either. Types of the different watches and warnings during severe winter weather are listed below:

Winter Weather Advisory:	Winter weather conditions are expected to cause significant inconveniences and may be hazardous. If caution is exercised, these situations should not become life-threatening. Often the greatest hazard is to motorists.
Winter Storm Watch:	Severe winter conditions, such as heavy snow and/or ice are possible within the next day or two.
Winter Storm Warning:	Severe winter conditions have begun or are about to begin.
Blizzard Warning:	Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts and life threatening wind chill.

Source: NWS http://www.erh.noaa.gov/er/iln/winter/PSA4.htm

Prolonged exposure to Wind Chill conditions can cause frostbite or hypothermia for an individual. Frostbite, according to the Centers for Disease Control and Prevention is an injury to the body caused by freezing body tissue. The most susceptible parts of the body are the extremities such as fingers, toes, ear lobes, or the tip of the nose symptoms include a loss of feeling in the extremity and a white or pale appearance. Medical attention is needed immediately for frostbite. The area should be SLOWLY re-warmed. Figure 3-3 on the following page, shows possible wind and temperature conditions and the real temperature effect on the skin due to the heat loss from exposed skin. The chart includes three shaded areas of frostbite danger. Each shaded area shows how long (30, 10 and 5 minutes) a person can be exposed before frostbite develops.

Another possible condition of severe winter weather is Hypothermia. Hypothermia is defined as an abnormally low body temperature (below 95 degrees Fahrenheit) by the Centers for Disease Control and Prevention. Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Medical attention is needed immediately. If it is not available, begin warming the body SLOWLY. Due to the danger of Wind Chill conditions, The National Weather Service will inform residents when Wind Chill conditions reach critical thresholds. A Wind Chill Warning is issued when wind chill temperatures are life threatening. A Wind Chill Advisory is issued when wind chill temperatures are potentially hazardous.

Table 3-20 provides information about wind chill advisory and warning definitions. The Excessive Cold Threat Level in Table 3-22 defines various levels of warnings of possible wind chill or extreme temperatures effect on a given area (NWS).

Table 3-21: Wind Chill Advisory and Warning Definitions	
Wind Chill Advisory:	Wind chills are expected to be between -20 and -34.
Wind Chill Warning:	Wind chills are expected to be 35 degrees below zero or colder.
Source: NWS http://www.erh.noaa.gov/er/iln/winter/PSA4.htm	

Figure 3-3: National Weather Service Windchill Chart

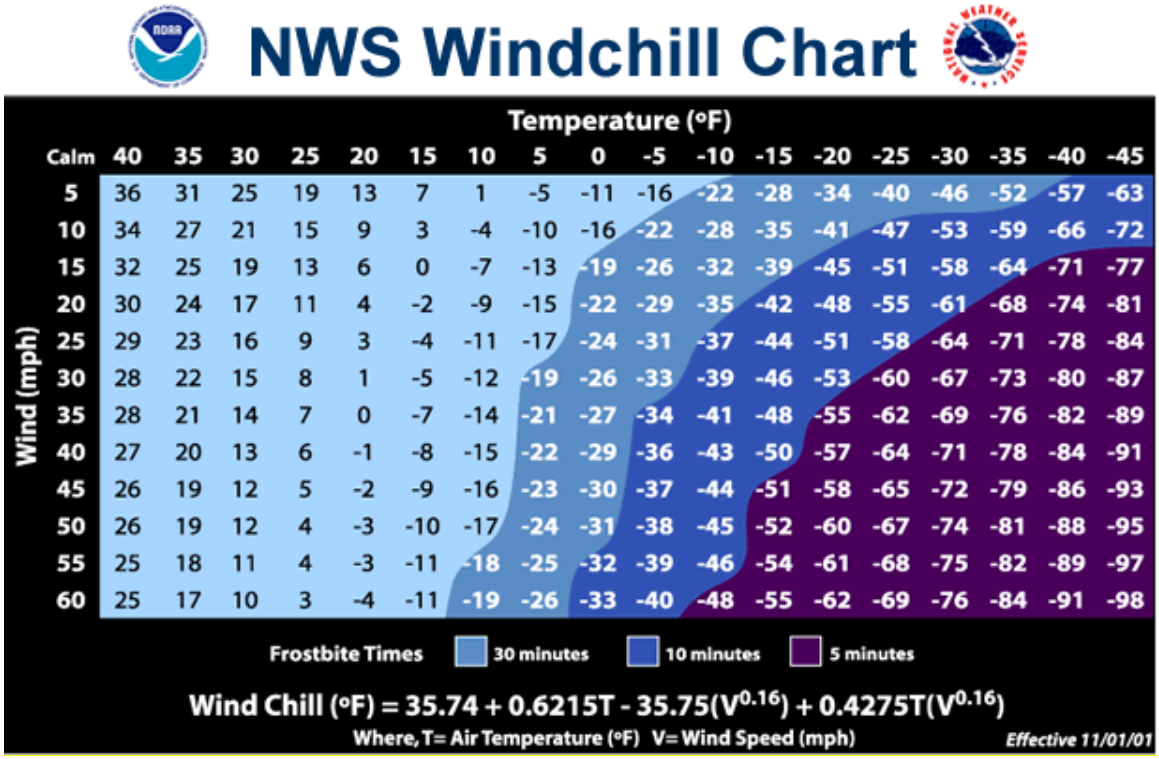


Table 3-22: Excessive Cold Threat Level	
Excessive Cold Threat Level	**Threat Level Descriptions**
Extreme	**"An Extreme Threat to Life and Property from Excessive Cold."** It is likely that wind chill values will drop to -35° F or below for 3 hours or more. Or, lowest air temperature less than or equal to -20° F.
High	**"A High Threat to Life and Property from Excessive Cold."** It is likely that wind chill values will drop to -28° F to -35 ° F for 3 hours or more. Or, lowest air temperature -15° to -20° F.
Moderate	**"A Moderate Threat to Life and Property from Excessive Cold."** It is likely that wind chill values will drop to -20° F to -28 ° F or below for 3 hours or more. Or, lowest air temperature -10° to -15° F.
Low	**"A Low Threat to Life and Property from Excessive Cold."** It is likely that wind chill values will drop to -15° F to -20 ° F or below for 3 hours or more. Or, lowest air temperature -5° to -10° F.
Very Low	**"A Very Low Threat to Life and Property from Excessive Cold."** It is likely that that wind chill values will drop to -10° F to -15 ° F or below for 3 hours or more. Or, lowest air temperature zero to -5° F.

Table 3-22: Excessive Cold Threat Level	
Excessive Cold Threat Level	**Threat Level Descriptions**
Non-Threatening	**"No Discernable Threat to Life and Property from Excessive Cold."** Cold season weather conditions are non-threatening.
Note: Cold season weather conditions become hazardous when the associated cold is considered to be "excessive" according to local standards. Cold temperatures may support the occurrence of a freeze, low wind chills, freezing/frozen precipitation, and/or frost.	

Past Occurrences

The NCDC Storm Events database contains a total of 20 winter weather events impacting Taney County. Table 3-23 contains a listing those winter weather events. Table 3-24 is a detailed listing of events that resulted in damages. Narratives describing the events can be found following the tables.

Table 3-23: Winter Storm History – Taney County, 1994-2011					
Event Type	**# of Occurrences**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
Winter Storm	5	0	0	$84,800	$0
Heavy Snow	10	0	0	$180,300	$0
Ice Storm	3	0	0	$400,000	$0
Extreme Cold	2	0	0	$3,700	$3,100
Totals	20	0	0	$668,800	
Source: NCDC. Storm Events Database. http://www.ncdc.noaa.gov/stormevents/					

Table 3-24: Severe Winter Weather History – Taney County, 1994-2011					
Event Type	**Date**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
Winter Storm					
Southern Missouri	01/01/1999	0	0	$84,800 *($2,800,000 33 counties)*	0
Heavy Snow					
Southern Missouri	03/08/1994	0	0	$128,200 *($5,000,000 39 counties)*	0
Southwest Missouri	01/18/1995	0	0	$4,500 *($100,000 22 counties)*	$0
SW & Central MO	01/01/1996	0	0	$800 *($10,000 13 counties)*	0
Central & Southern MO	01/08/1997	0	0	$22,300 *($670,000 30 counties)*	0
SW & SC MO	03/13/1999	0	0	$11,300 *($260,000 23 counties)*	0
Southern Missouri	12/12/2000	0	0	$13,200 *($450,000 34 counties)*	0
Ice					

Table 3-24: Severe Winter Weather History – Taney County, 1994-2011					
Event Type	**Date**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
Winter Storm					
Taney County	11/24/96	0	0	$400,000	0
Extreme Cold					
Southern Missouri	12/12/2000	0	0	$3,700 ($125,000 34 counties)	$3,100 *($105,000 34 counties)*
Totals				$668,800	$3,100
Source: NCDC. Storm Events Database, http://www.ncdc.noaa.gov/stormevents/					

Winter Storm

Of the five winter storms, the most damaging event to affect the region and Taney County occurred on January 1, 1999. This winter storm covered the larger region with freezing rain, sleet and snow, causing $2.8 million in property damages. The event's negative impact was mainly to downed power lines and trees from ice accumulation. Several counties were left without power and the more rural schools were closed for several days after the Christmas holiday. No deaths or injuries were directly related to these winter storm events.

Ice Storm

Two ice storm occurrences in Taney County are recorded in the NCDC database. Of these, the ice storm of November 24, 1996 caused substantial damages in the county ($400,000 in property damages). This ice storm, the worst in 20 years, layered the ground with ice up to two inches thick, downed power lines and trees, created dangerous driving conditions, and closed schools and businesses in rural areas for up to a week.

Heavy Snow

The county has experienced 10 heavy snow events since 1994, six of which caused an estimated $180,300 in damages. The three most damaging events are described below. The most costly even occurred on March 8, 1994. A major winter storm dumped heavy snow across much of southern Missouri. The city of Branson received 18 inches of snow. Several boat docks in the Branson area collapsed and damaged several houseboats. The damages total for this event was approximately $128,200. Another costly event occurred on January 8, 1997 when 6 to 10 inches fell on Taney County. Damages related to this event reached an estimated $22,300, mainly due to snow removal. The third most costly event occurred on December 12, 2000. A mixture of heavy snow, sleet and freezing rain fell on Taney County as a large storm moved across the Missouri Ozarks. Damages reached an estimated $13,200.

Extreme Cold

Two extreme cold events occurred in recent years in Southwest Missouri counties, including Taney County. One event beginning on December 12, 2000 and lasting until December 31, 2000, was described as having temperatures 10 to 20 degrees below normal. Snow conditions and cold weather made it difficult for farmers to feed their animals, and several calves in southwest Missouri died due to the stress of the cold. Total recorded loss to agriculture around the region from this event was $105,000.

Probability and Severity Rating

While severe winter weather is more prevalent north of the Missouri River, it frequently strikes all of Taney County during its seasonal pattern. No parts of the county are exempt from this natural hazard. Rural areas may see the effects of severe winter weather more than cities. For example, lower traffic volumes allow snow or ice to accumulate on rural roads, making it difficult to plow. It is highly likely that Taney County will experience a severe winter weather event in any year. The risk of individual severe weather events is shown in Table 3-25.

Table 3-25: Probability of Severe Winter Weather Event Occurrence

Event Type	# of Events	% Risk	Probability Rating
Winter Storm	5	27.7	High
Heavy Snow	10	55.6	High
Ice Storm	3	16.7	Moderate
Extreme Cold	2	11.1	Moderate

According to the Missouri Hazard Analysis, November 2010, snowstorms, ice storms, and extreme cold can interact to cause many hazards. Only a few degrees may be the difference between rain, ice, or snow. Duration and intensity of any of these events will determine the overall impact of a particular event. Wind speed may be the difference between a minor snow and a blizzard. These events cannot be prevented. Preparedness for these events may be the greatest single factor to reduce loss of life, injury, and property damage.

The Missouri Hazard Analysis states that areas south of the Missouri River have a low probability of a snowstorm, ice storm, or extreme cold due to their lower average snowfalls and temperatures. However, such events in these areas have a moderate potential severity.

(The probability in the table is high but the narrative says low. Which do we want to use?)

Drought

Hazard Identification

Drought's impact on society results from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand development places on groundwater reservoirs. A drought situation often is exacerbated by development practices that decrease the percolation of surface water into groundwater reservoirs. Recent droughts in both developing and developed countries and resulting economic and environmental impacts underscore society's vulnerability to this hazard.

The dictionary defines drought as a period of prolonged dryness. The Missouri Drought Response Plan distinguishes between five "categories" of drought, as follows:

- **Agricultural Drought**, defined by soil moisture deficiencies
- **Hydrological Drought**, defined by declining surface and groundwater supplies
- **Meteorological Drought**, defined by precipitation deficiencies
- **Hydrological Drought & Land Use,** defined as a meteorological drought in one area that has hydrological impacts in another area
- **Socioeconomic Drought,** defined as drought that impacts supply and demand of some economic commodity.

Each of these definitions relates the occurrence of drought to water shortfall in some component of the hydrological cycle. Each affects patterns of water and land use, and each refers to a repetitive climatic condition. In urban areas, drought can affect those communities that depend on reservoirs for water, and decreased water levels due to insufficient rain can lead to restricted water use. In agricultural areas, drought during the planting and growing season can have a significant impact on yield.

Regardless of the specific definition, droughts are difficult to predict or forecast, both as to when they will occur and how long they will last. According to Dr. Grant Darkow, Department of Atmospheric Science, University of Missouri-Columbia, there is a recognizable "upper air-flow pattern and simultaneous surface pattern associated with abnormal dryness over Missouri." When the upper air-flow pattern is typified by air flowing in a broad arc over the central plains with higher speeds in southern Canada than over the U.S., then the air over the southern plains will be "characterized by a weak clockwise circulation." Storm systems coming off the Pacific Ocean will cross the extreme northwestern states and southern Canada, thus bypassing the midwestern states. When this flow pattern persists, the result can be a prolonged period of drought (Missouri Hazard Analysis, November 2010).

Location

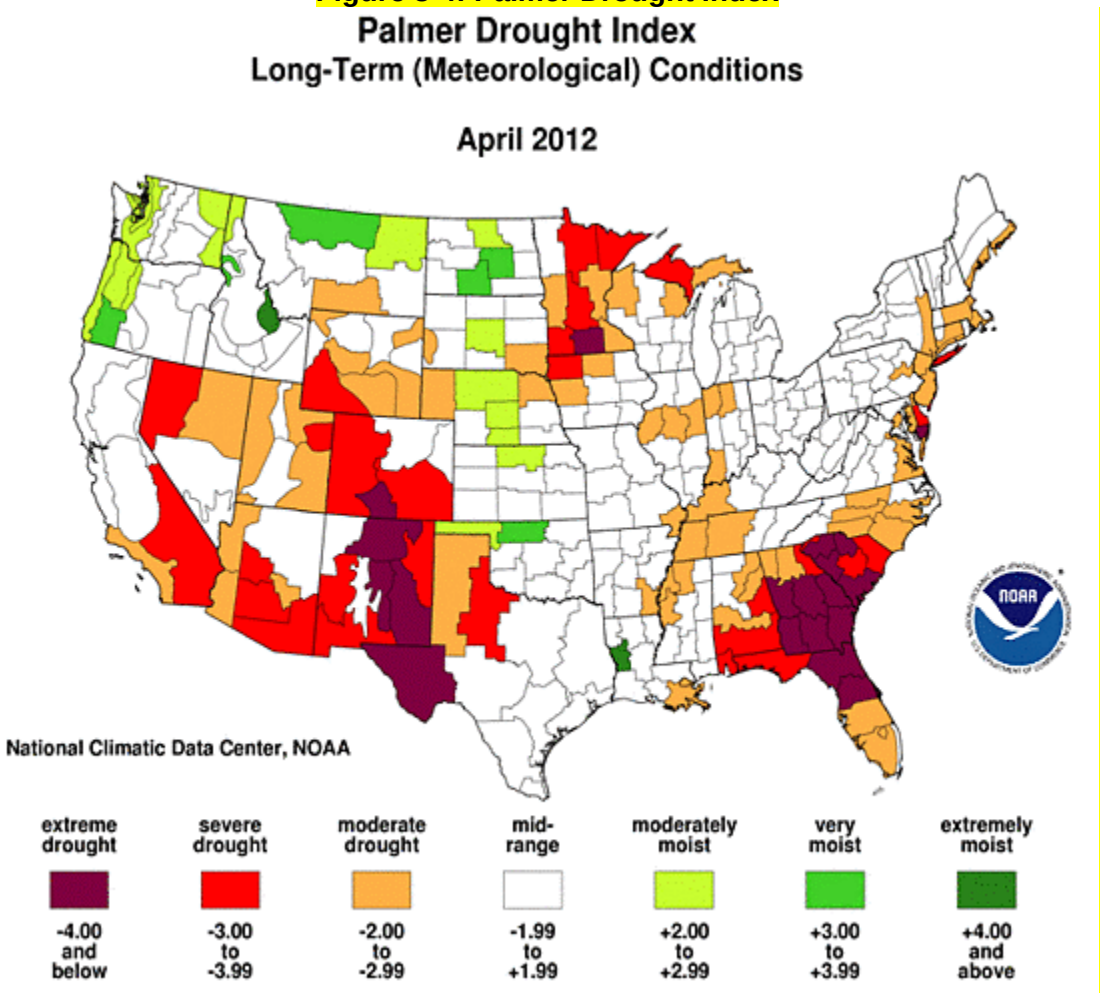
There are no likely locations for future occurrences of drought as they are a regional phenomenon and affect the entire county with little variability from place to place.

Extent (*Magnitude/Severity****)***

Crops are the first to show the impact of drought. As drought increases, livestock water supplies become scarce and, finally, deep wells begin to fail. When good water becomes a scarce commodity and people must compete for the available supply, the importance of drought severity and duration increases dramatically.

The most commonly used indicator of drought and drought severity is the Palmer Drought Severity Index (PDSI), jointly published by NOAA and the U.S. Department of Agriculture. The PDSI measures the departure of water supply (in terms of precipitation and stored soil moisture) from demand (the amount of water required to recharge soil and keep rivers, lakes and reservoirs at normal levels). The result is a scale from +4 to -4, ranging from an extremely moist spell to extreme drought. By relating the PDSI number to a regional index, long-term wet or dry tendencies can be discerned.

Figure 3-4: Palmer Drought Index



Source: http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/palmer.html

Regional indicators such as the PDSI are limited in that they respond slowly to deteriorating conditions. However, observing surface conditions and groundwater

measurements may provide only a snapshot of a very small area. Therefore, the use of a variety of drought indicators is essential for effective assessment of drought conditions, with the PDSI being the primary drought severity indicator. Figure 3-4 displays the PDSI for the month of April 2011.

Missouri's Drought Response System is divided into four phases:

- **Phase I: Advisory Phase**—Requires a drought monitoring and assessment system to provide enough lead time for state and local planners to take appropriate action;

- **Phase II: Drought Alert**—When the PDSI reads -1.0 to -2.0, and stream flows, reservoir levels, and groundwater levels are below normal over a several month period, or when the Drought Assessment Committee (DAC) determines that Phase II conditions exist based on other drought determination methods;

- **Phase III: Conservation Phase**—When the PDSI reads -2.0 to -4.0, and stream flows, reservoir levels, and groundwater levels continue to decline, along with forecasts indicating an extended period of below-normal precipitation, or when the DAC determines that Phase III conditions exist based on other drought determination models;

- **Phase IV: Drought Emergency**—When the PDSI is lower than -4.0, or when the DAC determines that Phase IV conditions exist based on other drought determination methods.

The American Water Works Association has outlined the phases of drought, see Table 3-26. This outline shows how severe Taney County's water shortage was during the droughts of 1999-2000 (Phase II). It also shows how a small percentage of a water shortage could have had an even larger affect on the economy.

Table 3-26: Stages of Drought

Phase I – Watch	5-10 % shortage (voluntary reductions)
Phase II – Warning	10-20 % shortage (voluntary or mandatory reductions)
Phase III – Emergency	20-35% shortage (mandatory reductions)
Phase IV – Critical	35-50% shortage (mandatory reductions)

Source:http://www.drinktap.org/consumerdnn/Home/WaterInformation/Conservation/DroughtFactSheet/tabid/199/Default.aspx

Precipitation-related impacts on time scales ranging from a few days to a few months can include effects on wildfire danger, non-irrigated agriculture, topsoil moisture, pasture conditions, and unregulated stream flows. Lack of precipitation over a period of several months or years adversely affects reservoir stores, irrigated agriculture, groundwater levels, and well water depth.

In addition to damage to crops, produce, livestock, and soil, and the resulting economic consequences, the arid conditions created by drought pose an increased risk of fire. The danger is especially high for brush fires, grass fires, and fires in wooded areas, which can threaten homes and other structures in their path. Lack of water resources in rural areas can complicate the firefighting efforts. During the spring 2000 drought, brush and wildfires erupted in numerous counties, resulting in a Governor's declared State of Emergency.

Past Occurrences

There are seven recorded drought events in the NCDC storm events data. The earliest instance recorded was in 1999. The query results from the NCDC indicate that the seven records for drought cover the period between January 1, 1950 and April 30, 2011. The drought record for the 1999 event states that this was the most severe drought since a 1980 drought; therefore, there were certainly instances of drought prior to 1999. However, for the purposes of the drought hazard profile the NCDC storm event data will be used to rate probability and severity of drought in Taney County. The drought events from the NCDC storm data are presented in Table 3-27.

Table 3-27: Drought Events for Taney County from 1996 - 2012

County	Date	Death	Injury	Property Damage	Crop Damage
Taney	10/01/1999	0	0	$0	*$19,400 ($660,000 34 counties)*
Taney	08/10/2000	0	0	$0	$0
Taney	09/01/2000	0	0	$0	$0
Taney	01/01/2006	0	0	$0	$0
Taney	02/01/2006	0	0	$0	$0
Taney	03/01/2006	0	0	$0	$0
Taney	04/01/2006	0	0	$0	$0
Total		0	0	$0	$19,400

Source: http://www.ncdc.noaa.gov/stormevents/

In Missouri, the 1999-2000 droughts began in July of 1999 and developed rapidly into a widespread drought just three months later. The entire state was placed under a Phase I Drought Advisory level by MDNR and the Governor declared an Agricultural Emergency. Agriculture reporting showed a 50 percent crop loss from 50 of Missouri's 114 counties, with severe damage to pastures for livestock, corn crops, and soybean. In October of 1999, the U.S. Agriculture Secretary declared a federal disaster, making low-interest loans available to farmers in Missouri and neighboring states. The drought intensity increased through autumn and peaked at the end of November 1999. That five-month period was the second driest period since 1895.

A wetter than normal winter diminished dry conditions in central and southern Missouri, but long-term moisture deficits continued. Overall dry conditions returned through much of the state in March 2000, and costly wildfires and brush fires (26 total Missouri wildfires were reported in 1999-2000, National Climatic Data Center) erupted in many counties. By May the entire state was under a Phase II Drought Alert level. By mid-July 2000, there was some relief for parts of the state but not enough. Several counties were still in

a Phase II or were upgraded to Phase III Drought Conditions. Taney County was not upgraded to Phase III.

In 2006, a drought occurred over a four month period beginning in January of that year. This drought was classified as severe in Taney County. All time record dry conditions were experienced at both Springfield and Joplin in southwest Missouri. Although this drought was severe it did not result in reported damages as it occurred outside of the growing season.

Probability and Severity Rating

It is possible for Taney County and the State of Missouri to experience a drought at any time throughout any given year. The Missouri Department of Natural Resources rates Taney County for moderate drought susceptibility. Six of the seven recorded drought events for Taney County have had little to no impact on property, crops or people. However, the record for the 1999 drought indicates that $19,400 crop damages occurred in Taney County during that event. Based on the NCDC storm event data, the probability of a damaging drought event in Taney County equates to 6% or approximately one occurrence every fifteen years, which again would be moderate. The severity of drought should be considered moderate as well; albeit $19,400 in crop damage is significant, there was no other associated harm to property or people.

Heat Wave

Hazard Identification

According to NOAA, heat is the number two killer among natural hazards. In contrast to the visible, destructive, and violent nature of floods, hurricanes, and tornadoes, a heat wave is a silent killer. Heat kills by overloading the human body's capacity to cool itself. In the disastrous heat wave of 1980, more than 1,250 people died nationwide. In a normal year, about 175 Americans succumb to the bodily stresses of summer heat.

Air temperature is not the only factor to consider when assessing the likely effects of a heat wave. High humidity, which often accompanies heat in Missouri, can increase the harmful effects of heat. Relative humidity must also be considered, along with exposure, wind, and activity. The Heat Index devised by the NWS combines air temperature and relative humidity. Also known as the *apparent* temperature, the Heat Index is a measure of how hot it really feels. For example, if the air temperature is 102 degrees and the relative humidity is 55 percent then it feels like 130 degrees; 28 degrees hotter than the actual ambient temperature. A heat index chart is depicted in Figure 3-5. Table 3-27 defines the likelihood of heat disorders with prolonged exposure to heat index values in Figure 3-5.

Figure 3-5: Heat Index Chart (Temperature & Relative Humidity)

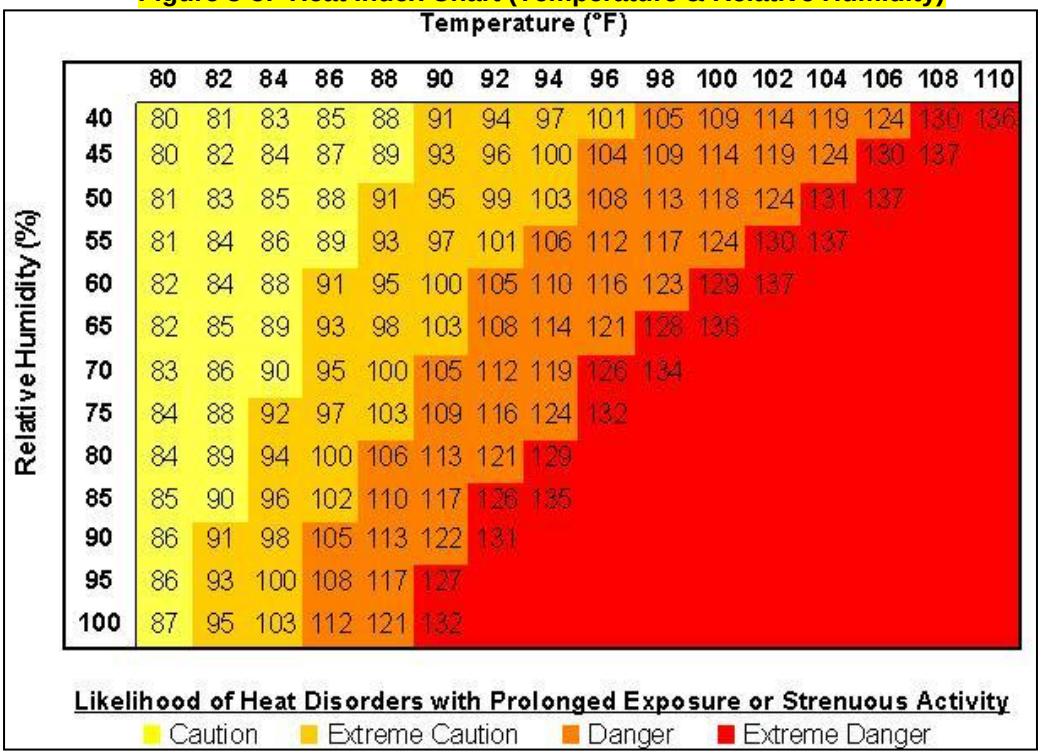


Table 3-28: Risk Level for Possible Heat Disorders	
Caution	Fatigue possible with prolonged exposure and physical activity.
Extreme Caution	Sunstroke, heat cramps and heat exhaustion possible.
Danger	Sunstroke, heat cramps, and heat exhaustion likely, and heat stroke possible.
Extreme Danger	Heat stroke highly likely with continued exposure.

Location

Heatwave is a regional event and its occurrence affects all jurisdictions within Taney County equally.

Extent (Magnitude/Severity)

Based on 30-year statistics from the National Weather Service indicating the state's mean number of days above 90 degrees during the summer months, Missouri is vulnerable to heat waves ranging from high to moderate risk in the July and August months. The NWS has developed a Heat Index/Heat Disorder Chart that relates ranges of Heat Index with specific disorders, particularly for people in higher risk groups presented in Table 3-29.

Table 3-29: Heat Index/Heat Disorder	
Heat Index (°F)	**Heat Disorder**
130° or higher	Heat stroke/sunstroke likely with continued exposure
105° to 129°	Sunstroke, heat cramps or heat exhaustion likely and heat stroke possible with prolonged exposure and/or physical activity
90° to 104°	Sunstroke, heat cramps and heat exhaustion possible with prolonged

Table 3-29: Heat Index/Heat Disorder	
Heat Index (°F)	**Heat Disorder**
	exposure and/or physical activity
80° to 89°	Fatigue possible with prolonged exposure and/or physical activity
Source: NWS: http://www.nws.noaa.gov/om/heat/index.shtml	

The National Weather Service has designated three response levels, based upon the Heat Index, in order to alert the public to potential heat hazard presented in Table 3-30.

Table 3-30: Heat Wave Response Levels	
Heat Index	**Response Level**
Heat Index 115+ F for 3+ hours w/minimum Heat Index mid-70s F for 24 hours or Heat Index 105+ F w/minimum Heat Index mid-70s F for more than 3 days	Warning
Heat Index 105+ F for 3+ hours w/minimum Head Index mid-70s F for 24 hours	Advisory
Potential for Excessive Heat Warning	Watch
Source: NOAA. National Weather Service Forecast Office-Springfield, MO.	

There are several risk factors associated with heat-related death and illnesses, such as lack of air conditioning, age, or outdoor activities. Heat-related death and illness can occur with exposure to intense heat in just one afternoon, as well as continuous exposure. Heat stress caused by continuous exposure has a cumulative effect. In addition to the human toll, the MCC, in a paper on the 1999 heat wave, points out the other possible impacts on our environment. These impacts include infrastructure damage and failure, highway damage, electrical brownouts, crop damage, water shortages, livestock deaths, fish kills, and lost productivity among outdoor-oriented businesses. Government authorities report that civil disturbances and riots are more likely to occur during heat waves, likely to occur during heat waves, as well as incidents of domestic violence and abuse. The extreme heat can also have an adverse impact on animals, including livestock and other farm animals.

According to the Missouri State Hazard Mitigation Plan, updated in July 2010, the following types of people are at risk for heat related illness and would be severely impacted:

- Those vulnerable to heat stress due to physical condition
  - Older people
  - Children
  - People overweight or underweight
- People with limited independence due to physical or mental disorders
  - People in institutional settings without air conditioning
  - People working in heat under stress (firefighters, police, emergency medical technicians)
  - People in urban environments where heat retention in asphalt, concrete, and masonry is a factor (heat island effect)
  - People with low income who lack resources for air conditioning, transportation, medical care, etc.
- Those with increased risk from work or leisure activities
  - People who work outdoors (utility crews, construction crews, etc.)

  - Military personnel and trainees
  - Athletes
- Those more difficult to reach through normal communications
  - People who live alone
  - People who are homeless
  - People who do not speak English
  - People who cannot read
  - People who are culturally, socially, or geographically isolated

The State Hazard Plan addresses warning signs that the heat is beginning to have an impact on animals. The warning signs are as listed below:

- Restlessness and crowding under shade or at water tanks/areas
- Open-mouthed breathing or panting and increased salivating
- Increased respiration rates
- Gasping and lethargic demeanor

Past Occurrences

Table 3-31 shows the most recent heat waves to hit in and around Taney County and their effects. These seven occurrences spanned several counties throughout southern Missouri. At least 120 people reported heat-related illnesses during these events. Although none of the 16 deaths occurred in Taney County, it is possible that death or illness from a heat wave event could occur in the future. The event of 1994 also caused $50,000 in crop damages within the region. None of these heat waves have happened within the last nine years, but never the less they could still happen at any time.

Table 3-31: Regional Heat Waves, 1993-2011

Date	Heat Index (°F)	Deaths
June 12, 1994	100+	4
July 23,1999	105-115	6
August 1, 1999	100+	2
August 27, 2000	100-110	1
September 1, 2000	100	0
July 17, 2001	100-110	1
August 1, 2001	100-110	2

Source: http://www.ncdc.noaa.gov/stormevents/

Probability and Severity Rating

The National Weather Service defines a heat wave as three consecutive days of 90°F plus temperatures. These high temperatures generally occur from June through September, but are most prevalent in the months of July and August. Missouri experiences about 40 days per year above 90 degrees, based on a 30-year average compiled by the NWS from 1961-1990. July leads this statewide mean with 15 days above 90 degrees, followed by August with an average of 12 days over 90. June and September average 6 days and 4 days respectively for temperatures above 90 during the same 30-year period. In the Southwest region of Missouri, including Taney County, days with temperatures of 90 degrees and above generally occur during the month of July. A review of the data for 1999-2002 shows Taney County could experience a brief

heat wave every year. The probability of heat wave in Missouri is moderate and severity is moderate, but could be upgraded to severe.

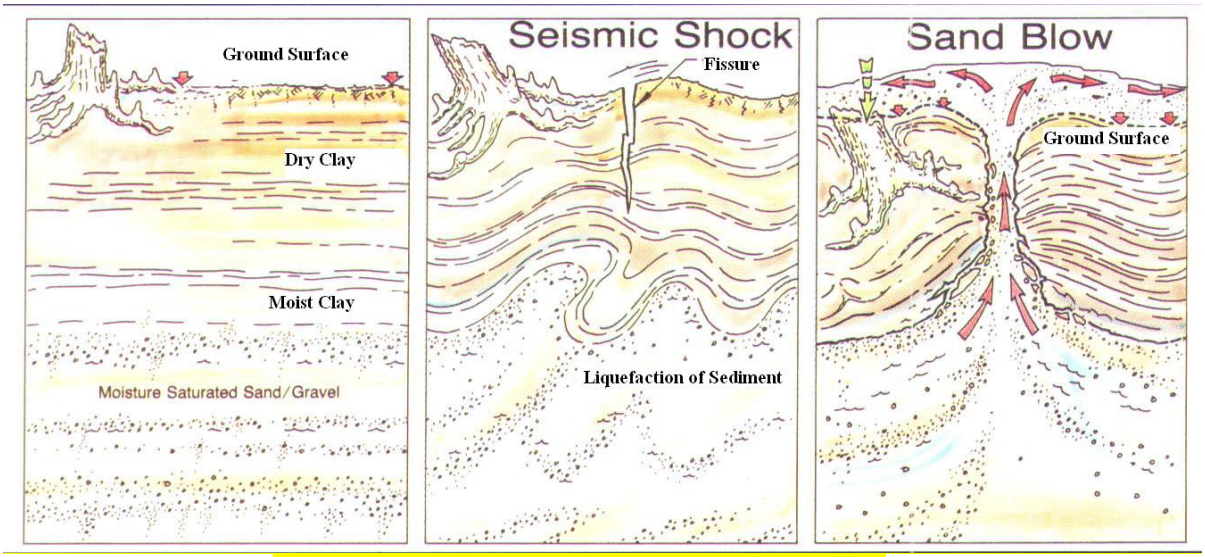
Earthquake

Hazard Identification

According to SEMA, earthquakes can be defined as shifts in the Earth's crust causing the surface to become unstable. This instability can manifest itself in intensity from slight tremors to large shocks. The duration can be from a few seconds up to five minutes. The period of tremors and shocks can last up to several months. The larger shocks can cause ground failure, landslides, uplifts, and liquefaction and sand blows. Figure 3-6 shows the ground as normal and how the shock of an earthquake can create liquefaction and sand blows.

The earth's crust is made up of gigantic plates, referred to as tectonic plates. These plates form the lithosphere and vary in thickness from $6^1/_2$ miles (beneath oceans) to 40 miles (beneath mountain ranges) with an average thickness of 20 miles. These plates "float" over a partially melted layer of crust called the athenosphere. The plates are in motion and where a plate joins another, they form boundaries. Plates moving toward each other are called a convergent plate boundary. Plates moving away from each other are called a divergent plate boundary. The San Andreas Fault in California is a horizontal motion boundary, where the Pacific plate is moving north while the North American plate is moving west. These movements release built up energy in the form of earthquakes, tremors, and volcanism (volcanoes). Fault lines such as the San Andreas come all the way to the surface and can be readily seen and identified. There are also fault lines that do not come all the way to the surface (subterranean faults), yet they can store and release energy when they adjust (SEMA, *Missouri Hazard Analysis*, F-1).

Figure 3-6: Earthquake Shock



Source: http://www.gsa.state.al.us/gsa/EQ2/newmad.html

The subterranean faults were formed many millions of years ago on or near the surface of the earth. Subsequent to that time, these ancient faults subsided, while the areas adjacent were pushed up. As this fault zone (also known as a rift) lowered, sediments filled in the lower areas. Under pressure, the sediments hardened into limestones, sandstones, and shales – thus burying the rifts. The pressures on the North American plate and the movements along the San Andreas Fault by the Pacific plate have reactivated the buried rift(s) in the Mississippi embayment. This rift system is called the Reelfoot Rift.

Location

The entire planning area is at risk for an earthquake occurring at New Madrid Fault, Wabash Valley Fault, Illinois Basin and the Nemaha Uplift.

Extent

Since Taney County is located a distance away from the New Madrid Fault, it is likely that the impacts of an earthquake will be negligible. However, many people are unaware of earthquake hazards and the possible damages that could occur from a higher magnitude earthquake. Including information on earthquake risk in education programs on natural hazards could be beneficial to Taney County residents.

In 2003, the United States Geological Survey (USGS) and the Center for Earthquake Research and Information at the University of Memphis (CERI) updated forecasts of earthquake probability in the New Madrid fault zone. The probability of a magnitude 6.0 or greater earthquake is 25 to 40 percent through the year 2053. The probability of a repeat of the 1811-1812 earthquakes, estimated at a 7.5 to 8.0 magnitude, is seven to 10 percent through the year 2053 (USGS, *Scientists Update New Madrid*). With almost 12.5 million people living in the area, steps are being taken to reduce the hazard to the citizens and property in the area. Based on the information from CERI, the probability of an earthquake is rated as moderate and the severity is rated high.

New Madrid earthquake damage covers over more than 20 times the area of the typical California earthquake because of the underlying geology in the Midwest. Ground shaking affects structures close to the earthquake epicenter but also can damage structures far away. Certain types of buildings at a significant distance from the earthquake epicenter, such as unreinforced masonry structures, tall structures without adequate lateral resistance, and poorly maintained structures are specifically susceptible to large earthquakes.

While the Richter Scale is a measurement of the energy released by an earthquake, the effects of an earthquake will vary from place to place. The Modified Mercalli Intensity Scale is used by seismologists to describe the effects of an earthquake, at a given place, on the natural environment, the built environment and people. An abbreviated description of the Modified Mercalli Intensity Scale is noted below:

I. Not felt except by a very few under especially favorable conditions.
II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

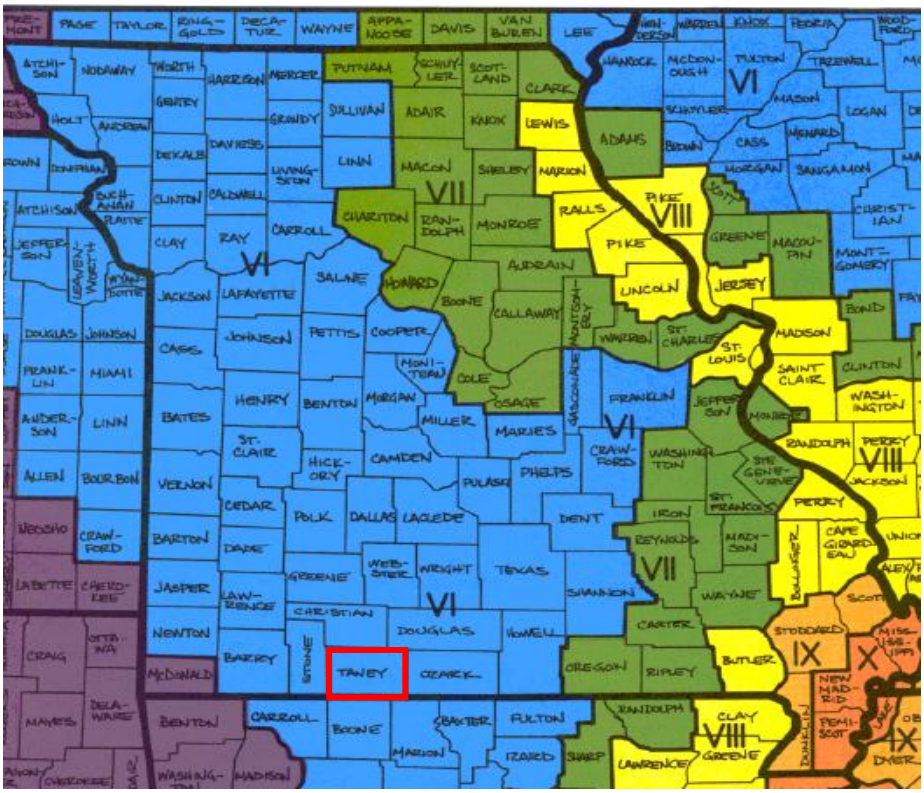
Source: Abridged from *The Severity of an Earthquake*. U. S. Geological Survey Series General Interest Publication. http://pubs.usgs.gov/gip/earthq4/severitygip.html

Indirect hazards may also occur at great distances from large earthquakes. Liquefaction (disintegration of alluvial soils), landslides and life-line disruptions will most affect areas closest to the epicenter, but may occur at significant distances. Secondary effects of such an earthquake could include fire, building collapse, utility disruption, flooding, hazardous materials release, environmental impacts and economic disruptions/losses.

SEMA's Projected Earthquake Intensities indicate Taney County is at risk for a Level VI impact on the Modified Mercalli Intensity Scale from a 6.7 magnitude earthquake; Level VI from a 7.6 magnitude earthquake; or Level VII in the event of an 8.6 magnitude earthquake centered within the New Madrid Fault.

Figure 3-7 shows the highest projected Modified Mercalli intensities by county from a potential earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

Figure 3-7: Projected Earthquake Intensities, 7.6 Magnitude



The future probable severity for earthquakes at each level on the Modified Mercalli Scale is shown in Table 3-32.

Table 3-32: Earthquake Probable Severity

Modified Mercalli Levels	Future Probable Severity
I-V	Low
VI	Low
VII	Moderate
VIII-XII	High

The impact on the general public, businesses, life-line services, and the infrastructure may be radically lessened if precautions are undertaken at multiple levels. Increased education and subsequent action can reduce the potential effects of earthquakes, and this can be done in conjunction with preparations for other natural hazards. A public information program that educates the public on the risks and potential impacts of earthquake would be the most beneficial to Taney County residents and businesses.

Individuals and all levels of government have roles in reducing risk to earthquake hazards. Individuals can reduce their own vulnerability by taking some simple and inexpensive actions within their own households. Local government can take action to lower the threat through the proper regulation of at risk sites, assuring that vital or important structures (police, fire, medical) resist hazards, and developing infrastructure

in a way that decreases risk. State agencies and the legislature can assist other governmental levels by providing incentives for minimizing hazards.

Past Occurrences

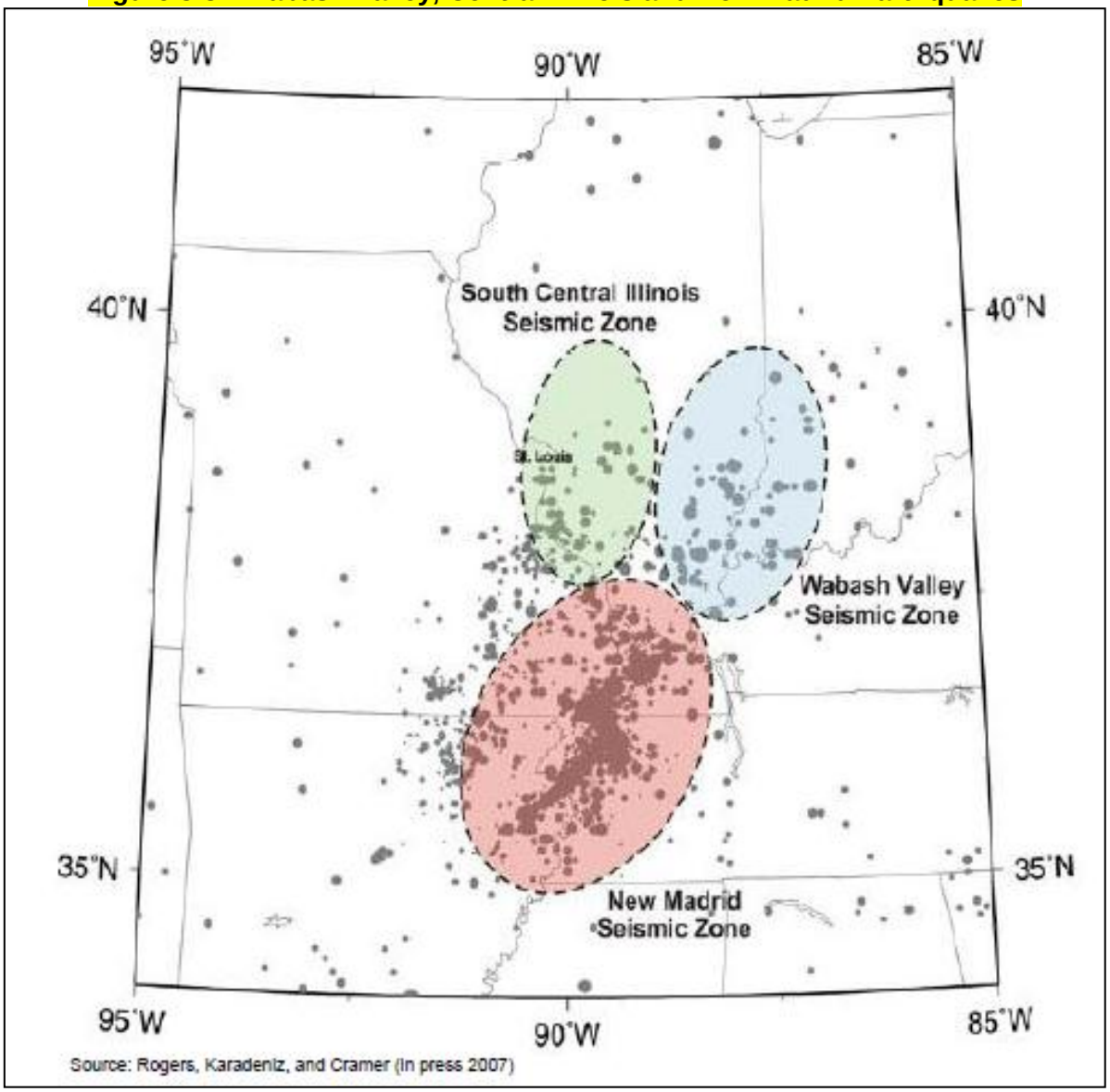
Four earthquake source zones -- the New Madrid Fault, the Wabash Valley Fault, the Illinois Basin and the Nemaha Uplift -- could affect Taney County because of their close proximity. The New Madrid fault poses the greatest threat and has the longest history of activity. This fault runs from north Arkansas through southeast Missouri, western Tennessee and Kentucky to the Illinois side of the Ohio River Valley. During the winter of 1811-1812, three earthquakes estimated to have been of a magnitude 7.5 or greater were centered on the New Madrid fault in southeast Missouri. Thousands of aftershocks continued for years. Since 1811, 35 events of magnitude 5.0 or greater have affected Missouri and several surrounding states.

Significant earthquakes, each about magnitude 6, occurred in 1843 near Marked Tree, Arkansas, and on October 31, 1895 near Charleston, Missouri. In November 1968, a magnitude 5.5 earthquake centered in southeastern Illinois caused moderate damage to chimneys and walls at Hermann, St. Charles, St. Louis, and Sikeston, Missouri. The afflicted areas included all or portions of 23 states. Smaller earthquakes have occurred throughout southeastern parts of Missouri. While the magnitude of the earthquakes may not be as great, they are still destructive and dangerous. Several smaller earthquakes can weaken structures and foundations, placing such structures in danger of collapse during an earthquake of greater magnitude.

The following figure was taken from the Missouri State Hazard Mitigation Plan and shows the Taney County's, the red star, geographical relationship to the Wabash Valley, South Central Illinois and the New Madrid Seismic zones. The dots represent historic seismic activity and the diameter of the dot represents the strength of the activity.

Figure 3-9 was taken from the Kansas Geological Survey and shows the location of the Nemaha Uplift. Although the location of Taney County is not depicted in the figure, the Nemaha uplift is prone to seismic activity, which may affect the planning area. The center of the Humbolt fault zone near the Nemeha Uplift is approximately 180 to 220 mile east northeast of Taney County in Missouri.

Figure 3-8: Wabash Valley, Central Illinois and New Madrid Earthquakes



Source: Missouri State Hazard Mitigation Plan, 2010

Figure 3-9: Nemaha Uplift

Source: http://www.kgs.ku.edu/Publications/GeoRecord/2001/vol7.3/Page1.html

Probability and Severity Rating

Earthquake hazards would be a non-historical event as there is no record of a an earthquake occurrence in Taney County. In terms of the New Madrid fault, current estimates of the recurrence intervals of a 6.0 or greater magnitude earthquake is approximately 100 years and the recurrence interval for a higher magnitude earthquake similar to the 1811-1812 earthquakes is about 500 years. Small quakes along the New Madrid fault occur in Missouri about every eight days, but are usually not noticeable. The probability of an appreciable earthquake in Taney County is low.

Based on the history of seismic activity in the New Madrid Fault zone and the forecasts developed by the USGS and CERI, there is a 25-40 percent chance that an earthquake of magnitude 6.0 or greater will occur within the next 50 years. Taney County lies a distance from the New Madrid Fault, and the impact of a low level earthquake would be low. The more severe threat stems from an earthquake producing Modified Mercalli impact levels of VII-XII.

Dam Failure

Hazard Identification

A dam is defined by the National Dam Safety Act as an artificial barrier that impounds or diverts water and (1) is at least 6 feet high and stores at least 50 acre-feet of water, or (2) is at least 25 feet high and stores at least 15 acre-feet. Of the 80,000-plus dams in the United States, less than 5 percent are under the control of the federal government.

According to the Missouri Department of Natural Resources Dam and Reservoir Safety Program, Missouri had some 5,239 recorded dams in October 2009, the largest number of man-made dams of any state in the country. Missouri's topography allows lakes to be built easily and inexpensively, which accounts for the high number of dams. Despite such a large number, only about 620 Missouri dams (20 percent) fall under state regulations, while another 85 dams are federally controlled. A non-federal dam can be anything from a large farm pond to Bagnell Dam which created the Lake of the Ozarks. The great majority of non-federal dams are privately owned structures that were built either for agriculture or for recreational use. Missouri also has some 600 dams which were built as small watershed projects under Public Law-566 (Watershed Protection and Flood Prevention Act of 1953).

These dams serve many functions, including flood control, erosion control, recreation, fish and wildlife habitat, water supply, and water quality improvement. Many are nearing the end of their 50-year lifespan and are in need of repair. Another group of older dams in the state was originally built by railroads to create drinking water reservoirs for the towns where the railroads were built.

Within the State of Missouri, the Department of Natural Resources maintains a Dam and Safety Program within the Division of Geology and Land Survey. The objective is to ensure that the dams are safely constructed, operated, and maintained pursuant to Chapter 236 Revised Statutes of Missouri. Under state statute, a dam must be 35 feet or higher to be state regulated. These dams are surveyed by state inspectors at least every five years. However, the majority of Missouri dams are less than 35 feet high and thus, not regulated. While the State has for many years encouraged dam owners to do owner inspections for those dams not under the law, the condition of many of these dams is deteriorating.

The Department of Natural Resources Geological Survey and Resources Assessment Division resumed inspecting regulated dams effective July 1, 2004. Because of budget cuts in 2003, dam owners were required to hire private professional engineers to conduct dam surveys for required permits.

While the state has ultimate responsibility for public safety, dam owners have primary responsibility for the safe design, operation and maintenance of their dams. They are responsible for providing early warning of problems at the dam, for developing an effective emergency action plan, and for coordinating that plan with local officials. MDNR's Dam Safety Division maintains a database of all dams regardless of federal, state, local or private ownership.

Oversight is extremely valuable to the owners as well as those people living downstream of the dam who could be flooded in the event the dam should fail. Dams can fail for many reasons. The most common are:

- Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.
- Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.
- Structure Failure: caused by an earthquake, slope instability or faulty construction.

These failure types often are interrelated. For example, erosion, either on the surface or internal, may weaken the dam or lead to structural failure. Additionally, a structural failure may shorten the seepage path and lead to a piping failure.

Location

There are eight dams in Taney County (see Figure 3-10 and Table 3-29). The most significant is the Table Rock Dam. Built in 1958, the dam created Table Rock Lake and is managed by the Corps of Engineers out of Little Rock, Arkansas. Dams over 35 feet high are regulated by the State. In Taney County, though 4 dams are higher than 35 feet, two are federally regulated while Silver Creek Lake Dam and Cross Creek Dam remain State regulated. The majority of the dams in Taney County are used for recreational purposes, though Table Rock and Ozark Beach are used for hydroelectric power. Table Rock Dam is also used for flood control.

Figure 3-10: Taney County Dam Location

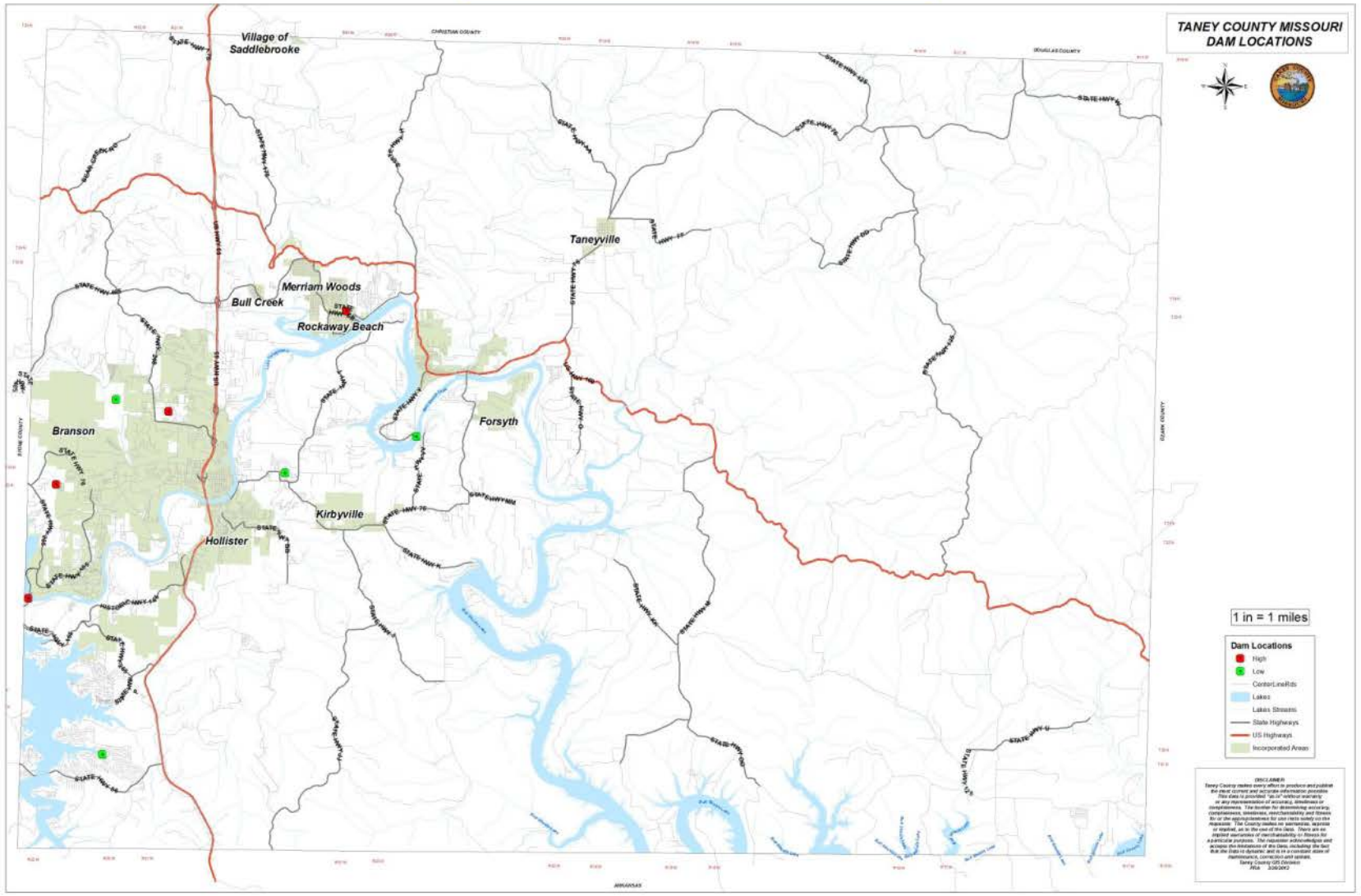


Table 3-33: Taney County Dams							
Dam #	**Official Name**	**River/Stream**	**Year Built**	**Ht.**	**Res. Area**	**State Reg.**	**Hazard Level**
1	Oakmont Resort Dam	Unnamed Tributary to White River	0	34	1	No	L
2	Fall Creek Dam	Fall Creek	0	32	20	No	H
3	Silver Creek Lake Dam	Silver Creek	1982	41	30	Yes	S
4	Shepard of the Hills Historical Society Dam	Roark Creek	1971	33	4	No	L
5	Rockwood Hills Lake Dam	Bee Creek	1972	25	3	No	H
6	Table Rock Dam	White River	1959	252	0	Federal	H
7	Ozark Beach Dam	White River	1913	58	3,020	Federal	L
8	Cross Creek Dam	Unnamed Tributary to White River	2004 A	40	2.8	Yes	L
Source: Missouri Department of Natural Resources. Dam Safety Program.							

The Missouri Dam and Reservoir Safety Council Rules and Regulations uses three classes of downstream environmental zone used when considering permits. The downstream environment zone is the area below the dam that would become inundated should the dam fail. Inundation is defined as water two feet or more over the submerged ground outside of the stream channel. These classes are based on the number of structures and types of development contained within the inundation area as presented in Table 3-34. The downstream environment zone classification is also used to prescribe the frequency of inspection.

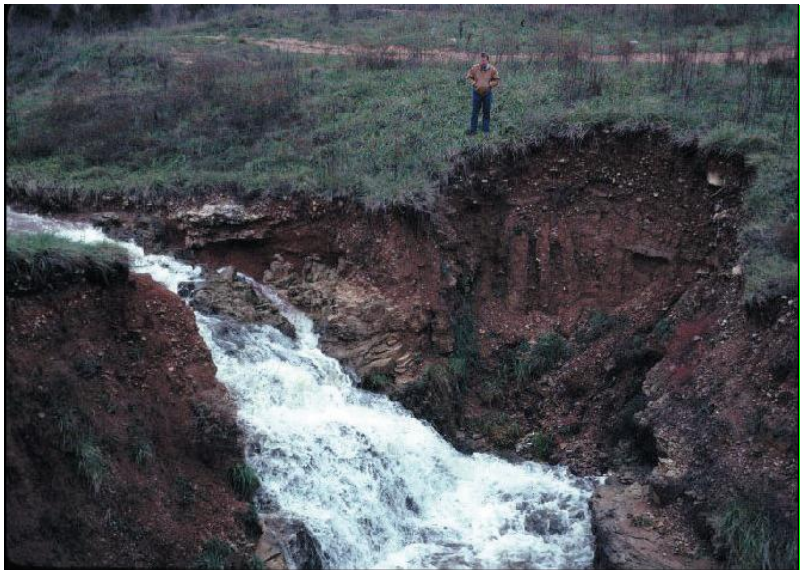
Table 3-34: Classes of Downstream Environment Zone	
Class I	The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspection of these dams must occur every two years
Class II	The area downstream from the dam that would be affected by inundation contains one to nine permanent dwelling, or one (1) or more campgrounds with permanent water, sewer and electrical services or one (1) or more industrial buildings. Inspection of these dams must occur once every three years.
Class III	The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspection of these dams must occur once every five years
Source: http://floodplain.sema.dps.mo.gov/MitPlan/docs.aspx?link=modamreg94	

Past Occurrences

Dam failures in the United States have resulted in death, injuries and billions of dollars in property damage. Dam failure events in Missouri include dams in Lawrenceton in 1968, Washington County in 1975, Fredericktown in 1977, a near failure in Franklin County in 1978, and Lesterville in 2005. There has not been a reported incident of dam failure in Taney County thus far.

Figure 3-10 is an image of the erosion and failure of the Silver Creek Dam near Rockaway Beach in 2004. The dam was identified both by SEMA and the Association of State Dam Safety Officials as unsafe and in need of immediate repair. The dam was heavily eroded due to an improperly located spillway discharge channel on the east end of the dam. The failure of this dam threatened the safety of one permanent residence, reduce property values of those residences located adjacent to the lake shoreline, as well as take out a section of Missouri 176 while dumping tons of silt into Lake Taneycomo. One of the biggest barriers to repairing the Silver Creek Dam was its status as abandoned. Today there is new ownership of the dam who is working with state agencies to maintain Silver Creek Dam.

Figure 3-11: Erosion at Silver Creek Dam



Source: http://www.damsafety.org/documents/pdf/Missouri.pdf

The most recent example of a dam failure in Missouri happened in 2005, when the stone retaining wall around a huge mountaintop reservoir around the town of Lesterville collapsed before daybreak, releasing a billion-gallon torrent of water that swept away at least two homes and several vehicles and critically injured three children, according to authorities. After the breach opened up, within minutes the 50-acre reservoir had emptied itself out with terrifying effect, turning the surrounding area into a landscape of flattened trees and clay-covered grass and temporally evacuating the city of Lesterville. (National Weather Service)

Probability and Severity Rating

The age and ownership of dams are the most significant factors affecting risk of dam failure. The likelihood of a dam failure is always possible. However, the risk of dam failure is considered unlikely for the federally maintained dams that could affect Taney County.

According to Stanford University's National Performance of Dams Program, between 1975 and 2001 there were 17 dam failures in Missouri. These data translate into a 65%

probability that there will be a dam failure in any given year statewide. However, with over 5,000 dams across the state the probability that a dam failure would occur at one of the eight dams in Taney County is very low; therefore, it is unlikely that an event of this type will happen in the county.

Aerial photography from the National Agricultural Imagery Program was utilized along with a digital assessor's parcel file from the Taney County GIS database were used to inspect the downstream environmental zones or likely inundation areas coincident with the dam location in the county. Using this method it was determined that the Vollenweider Lake Dam classified as a Class III dam indicating the severity of failure would be low.

Wildfire

Hazard Identification

Forest and grassland fires can and have occurred on any day throughout the year. However, the majority of fires and the greatest acreage loss will occur during the spring fire season, which is normally between February 15 and May 10. The length and severity of this burning period depends on weather conditions. Spring in Missouri is noted for its low humidity and high winds. Spring is also the time of the year when rural residents normally burn their garden spots and brush piles. Many landowners believe it is necessary to burn the woods in the spring of the year in order to get more grass, kill ticks, and get rid of the brush. These conditions, together with below normal precipitation and high temperatures, result in extremely high fire danger. Depending on weather conditions, a sizable number of fires also can occur between mid-October and late November. In 2009, there were a total of 3,779 wildfires reported and a total of 42,486 acres burned. (MDC) Figure 3-12 notes types of wildfires that may occur.

Table 3-35: Missouri Fire Statistics 2009: Causes

Lightning	>1%
Camping	1%
Smoking	4%
Debris Burning	58%
Arson	20%
Equipment Use	3%
Railroads	1%
Children	1%
Miscellaneous Causes	12%

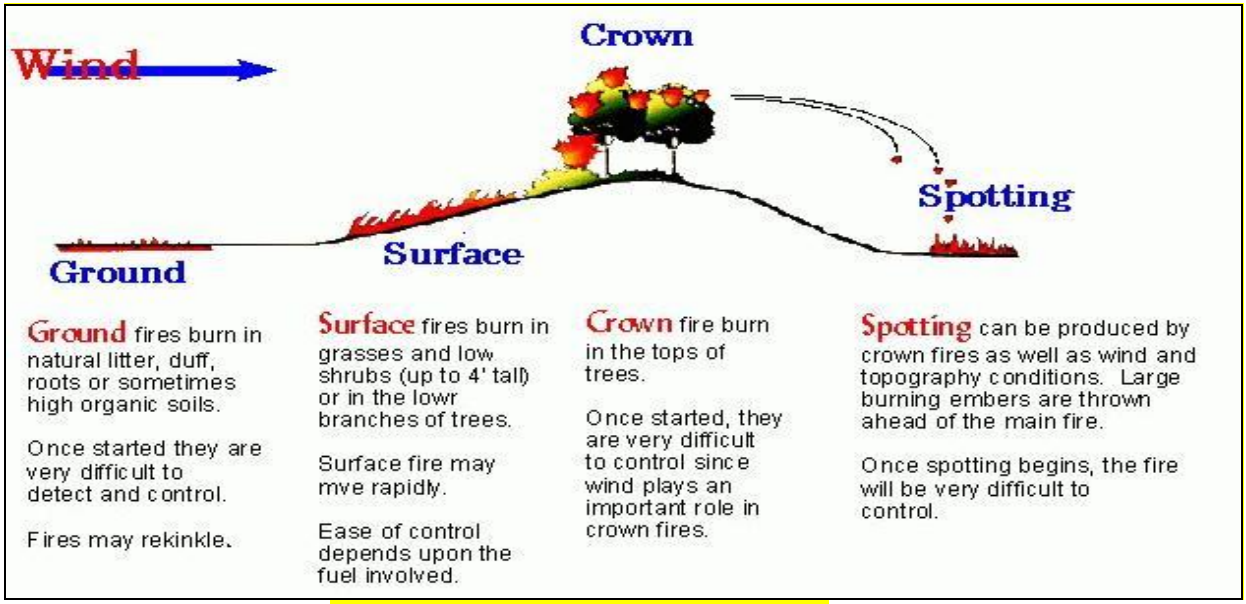
Source: MDC: http://mdc.mo.gov/forest/fire/stats.htm

According to SEMA's *2000 Hazard Analysis*, wildfires are most common in the more heavily-timbered southern part of the state. While wild forest fires are not common in Taney County, it is possible for wildfires to occur due to drought, debris burning, and incendiary fires. Debris burning is consistently the number one cause of wildfires in Missouri. Fire caused by lightning is rare despite 50 to 70 thunderstorm days per year. Wildfire fuel includes combustible material in the form of vegetation such as grass, leaves, ground litter, plants, shrubs and trees. Over 88 percent of the county's land cover is grasslands and forests, increasing the risk for wildfire.

The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from the destructive effects of wildfires. To accomplish this task, eight forestry regions have been

established in the State to assist with the quick suppression of fires. The Forestry Division works closely with volunteer fire departments and federal partners to assist with fire suppression activities. Currently, a cooperative agreement between the Mark Twain National Forest and Taney County is renewed annually.

Figure 3-12: Types of Wildfire



Source: Missouri Department of Conservation.

Table 3-36: Land Cover in Taney County

Land Cover Type	Acres	% Coverage of County
Non-Native, Cool-Season Grasslands	259,174.72	51.2
Deciduous Upland Mixed Oak Forest	131,242.64	26.0
Mixed Evergreen-Deciduous Red Cedar Hardwood Forest	31,565.13	6.2
Grassland, General	23,643.44	4.7
Land cover type - includes top four types of estimated land coverage.		
Source: Missouri Watershed Information Network (MoWIN)		

Location

Wildland Urban Interface

According to the SILVIS Lab, in the Department of Forest & Wildlife Ecology at the University of Wisconsin- Madison, the Wildland-Urban Interface (WUI) is defined as the area where structures and other human development meet and intermingle with undeveloped wildland. The SLVIS lab uses thresholds of housing density and a percent of vegetative coverage in an area to model where development and fuel meet and map the threat of wildfire events. The data used to create this model is gathered from the 2000 U.S. Census, at the Census block level, and the National Land Cover Dataset (NLCD), satellite data based on 1992/93 imagery. From the 2000 Census data, housing

densities are derived for all Census blocks and are measured as the number of housing units per square kilometer. Data from the NLCD is used to identify wildlands, which are defined as forests, native grasslands, shrubs, wetlands, and transitional lands, most often clear-cuts.

The SILVIS Lab then defines two types of Wildland-Urban classes; interface and intermix. The interface class is an area were housing is in the vicinity of contiguous vegetation. The area must have more than one house per 40 acres, have less than 50% vegetation, and be within 1.5 miles of a area over 1,325 acres that is more than 75% vegetated. The model specifies 1.5 miles because, according to the California Fire Alliance, that is the distance a firebrand can be blown from a wildland fire to a home and catch the home on fire. The intermix class is an area where housing and vegetation intermingle. The area must have at least one house per 40 acres, have continuous vegetation, and be more than 50% vegetation. For each type of WUI, there are three subtypes: low density, medium density and high density. Each subtype is defined in the Table 3-37.

Application of WUI

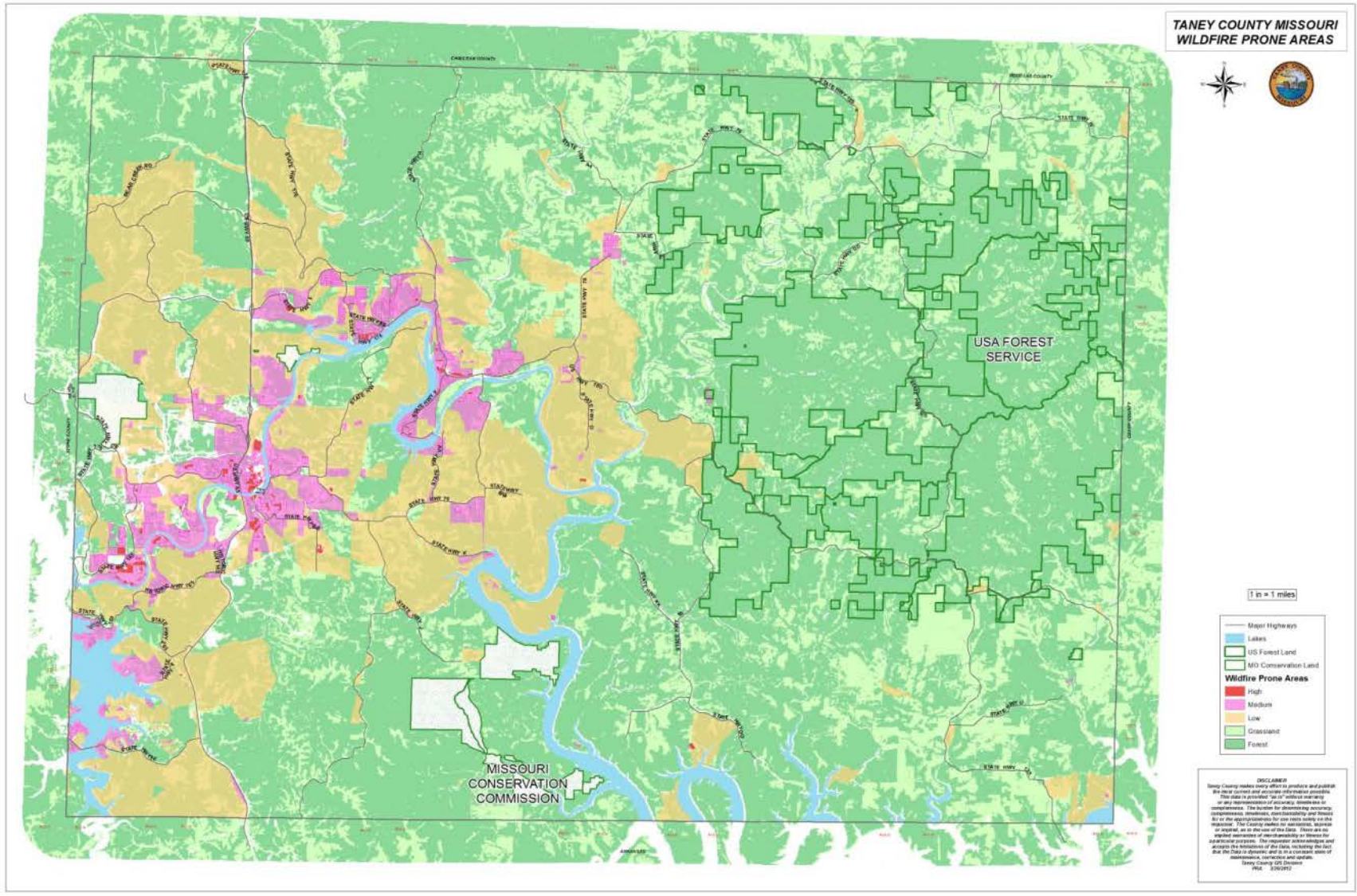
The map in Figure 3-13 is meant to illustrate the likely locations of wildfire in Taney County. The map is a combination of land classified as either forest or grassland in the 2005 USGS Land Use Land Cover 30 meter resolution grid and an overlay of 2000 census blocks classified by SILVIS Lab's Wildland Urban Interface methodology. Although the threat of wildfire is countywide, the WUI demonstrates where this hazard would most likely present a danger to people and property. The WUI classes of interface and intermix for each level were combined creating three levels of high, medium and low density development in largely vegetated areas.

Table 3-37: Classification of Wildland Urban Interface

Sub Type	Description
Low Density Interface	Housing Density ≥ 6.2 housing units/km^2 and < 49.4 housing units /km^2 Vegetation ≤ 50% within 2.4km of an area with ≥75% vegetation
Medium Density Interface	Housing Density ≥ 49.4 housing units/km^2 and < 741.3 housing units /km^2 Vegetation ≤ 50% within 2.4km of an area with ≥75% vegetation
High Density Interface	Housing Density ≥ 741.3 housing units/km^2 Vegetation ≤ 50% within 2.4km of an area with ≥75% vegetation
Low Density Intermix	Housing Density ≥ 6.2 housing units/km^2 and < 49.4 housing units /km^2 Vegetation > 50%
Medium Density Intermix	Housing Density ≥ 49.4 housing units/km^2 and < 741.3 housing units /km^2 Vegetation > 50%
High Density Intermix	Housing Density ≥ 49.4 housing units/km^2 and < 741.3 housing units /km^2 Vegetation > 50%

Source: http://silvis.forest.wisc.edu/old/Library/WUIDefinitions.php

Figure 3-13: Wildfire Hazard Areas



Extent (*Magnitude/Severity****)***

Wildfires can flare out of control, often with catastrophic results. Grass grows back quickly with little damage, but fires in forests and croplands are costly. A major wildfire can leave large areas of scorched and barren land which may not return to pre-fire conditions for decades. If ground cover has been burned away, little is left to hold soil in place on steep slopes and hillsides and heavy rains could result in increased soil erosion and siltation of area streams and creeks. Fatalities occasionally can result from wildfires, usually due to overexertion or heart attack.

Past Occurrences

No Missouri fires are listed among the significant wildfires in the U.S. since 1825. Each year, about 3,700 wildfires burn more than 55,000 acres of forest and grassland on average in Missouri. On April 5, 2000, dry conditions and wind gusts carrying sparks from other wildfires resulted in the outbreak of 88 wildfires throughout several southwest Missouri counties, including Taney County. These wildfires caused $5,000 in damages in the region; however, any specific damages in Taney County are not documented.

The Missouri Department of Conservation wildfire reporting data for Taney County contain records for 515 events from 2002 through 2011 that burned a total of 6,475 acres.
The record indicates that on average there are 57 wildfires each year in Taney County. Of the 28 structures damaged or destroyed, 12 were the result of debris burning.. There is no injury or fatality information associated with the data. Table 3-38 summarizes the MDC data by cause.

Table 3-38: Taney County Wildfire Statistics by Cause 2002-2011

Cause	# of Fires	Structures Damaged 0r Destroyed	Structures Threatened	Acres Burned
Arson	21	0	25	1,040
Campfire	6	0	2	5
Children	2	0	1	2
Debris	150	12	112	2,997
Equipment	10	0	4	43
Lightning	2	0	0	1
Miscellaneous	212	13	55	1,272
Not Reported	2	0	1	1
Railroad	1	0	0	5
Smoking	0	0	0	0
Unknown	109	3	73	1109
Total	515	28	273	6,475

Source: http://mdc4.mdc.mo.gov/applications/FireReporting/Report.aspx

Probability and Severity Rating

Based on the MCD fire reporting data, the probability of wildfire and grass fire occurrence is extremely high with multiple events occurring in any given year. The risk

percentage calculation for these events is equal to 2,837%. However many of the majority of these events have occurred between the months of November through March. The likelihood of these events increases during extremely dry periods and tend to occur during certain periods, such as spring, late fall, or under conditions of excessive heat, dryness, and/or drought. Table 3-39 describes the probability of wildfire occurrence based on the Missouri Department of Conservation's fire danger index levels.

Table 3-39: Probability of Wildfire Occurrence by Danger Level

Danger Level	Probability Rating
Low Fire Danger	Low
Moderate Fire Danger	High
High Fire Danger	High
Extreme Fire Danger	High

Source: MDC: http://www.mdc.state.mo.us/forest/fire/adject.htm

Although the probability of wildfire is very great in Taney County, only 23 events have resulted in a damaged or destroyed structure. The severity of wildfire based on MDC records would be considered low in Taney County. However, as residential areas expand into relatively undeveloped rural lands, people living in these communities are increasingly threatened by wildfires. Protecting structures in isolated locations can stretch firefighting resources to the limit. The grasslands and forested areas in Taney County combined with certain weather conditions create the potential risk for a wildfire within the county.

Sinkhole Hazard

(bowl-shaped, collapse)

Hazard Identification

A sinkhole is an area of ground that has no natural external surface drainage—when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres and from less than 1 to more than 100 feet deep (USGS, Sinkhole Fact Sheet, p. 1). Some are shaped like shallow bowls whereas others have vertical walls; some hold water and form natural ponds, while others do not hold water. Typically, sinkholes form so slowly that little change is seen in one's lifetime, but they can form suddenly when a collapse occurs. Such a collapse can have a dramatic effect if it occurs in an urban setting.

Sinkholes form in karst terrain, which is a region where the bedrock can be dissolved by ground water. Bedrock in a karst area typically is composed of carbonate (limestone/dolomite) or evaporite (gypsum) rock. Topographic features such as springs, caves, and sinkholes all form because water that is slightly acidic, from absorbing carbon dioxide from the air and soil, dissolves the bedrock along horizontal and vertical cracks and crevices, and forms pathways and channels in the rock. These pathways are like underground plumbing that carries water from the surface to springs located in valleys. Eventually, these cracks and crevices, which are the beginning of a conduit system, become large enough to start transporting small soil particles, see Figure 3-14. As these small particles of soil are carried off, the surface of the soil above the conduit starts slumping down gradually, and a small depression forms on the surface of the ground. This small depression acts like a funnel and gathers even more water, which makes the conduit larger and washes more soil into the conduit, making the depression both wider and deeper.

There are two general types of sinkholes – collapse and bowl-shaped. Collapse sinkholes are much less common than the bowl-shaped type. Collapses form in essentially the same way as the more common bowl-shaped sinkholes. However, when the soil particles start washing into the conduit, the soil closer to the ground surface does not slump down, but starts forming a bridge, see Figure 3-15. A void forms where the soil keeps washing into the conduit and, eventually, several things can happen that can cause the bridge to collapse to form a sinkhole. One, the void can grow large enough that the soil above it can no longer bridge it. Two, the soil bridge dries out and collapses due to loss of cohesion. Three, the bridge collapses due to an excess load applied on top of it. Or four, vibration in the adjacent area due to traffic, construction, or even weather can loosen the soil in the bridge.

The process of forming a conduit and a soil bridge can take many years to decades to even centuries to form and can be aggravated by human activities. Since the process of forming a sinkhole depends on water to carry away soil particles, anything that increases the amount of water flowing into the subsurface can facilitate this process. Parking lots, streets, altered drainage from construction, and roof guttering are some things that can increase runoff; even weather can make a difference.

Between 1970 and 2007, MDNR examined more than 160 collapses statewide that were reported by the public. Most of these collapses were small—less than 10 feet in diameter and 10 feet deep (USGS, Sinkhole Fact Sheet, p. 1); some, however, are quite large and

spectacular. Sinkhole collapses drained a lake in the St. Louis, Missouri, area (St. Louis Post Dispatch, June 11, 2004), drained the West Plains, Missouri, sewage lagoon (Gillman et al, 2007), partially drained the Springfield, Missouri, treated sewage lagoon (Vineyard and Feder, 1982), and another in Nixa, Missouri swallowed a car along with the garage it was parked in (Gouzie and Pendergrass, 2009).

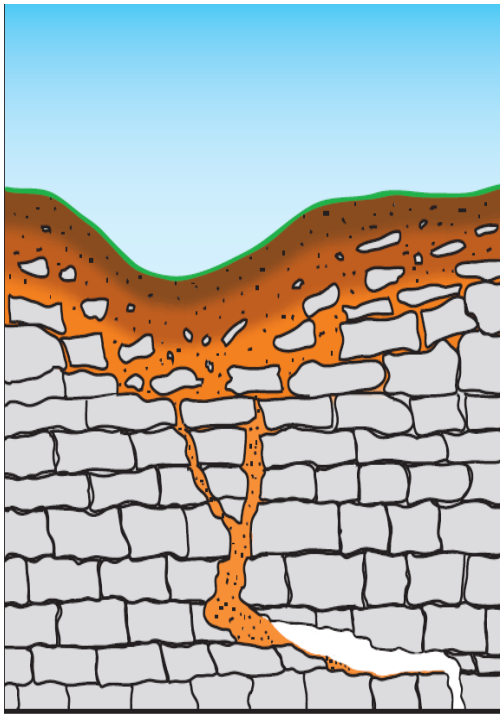


Figure 3-14: Bowl-shaped sinkhole

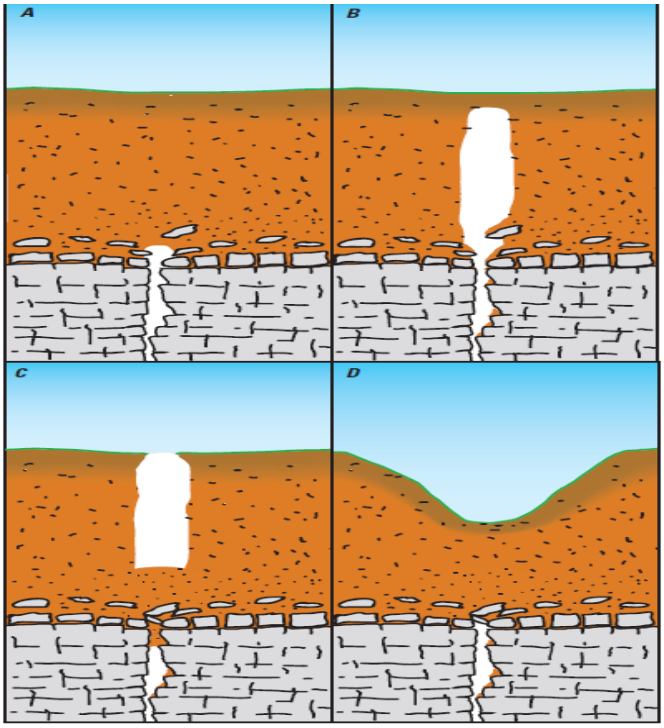


Figure 3-15: Formation of collapse—Soil bridges gap where sediment has been washing into a solution enlarged fracture, A. Over time, the void migrates upward through the soil, B. After the bridge thins, a sudden collapse, C, often plugs the drain and erosion will, after many years, transform the collapse into a more bowl-shaped sinkhole, D.

Location

Taney County is underlain primarily by carbonate rocks containing mainly limestone and some dolomite bedrock. These types of bedrock are extremely sensitive to water dissolution along joints and fractures within the rock. Areas along natural drainage paths tend to be more susceptible to sinkhole formation as well, due to increased water flow into the subsurface.

Figure 3-16: Taney County Geologic Map Showing Locations of Sinkholes (CARES)

Extent (*Magnitude/Severity****)***

Formation of sinkholes can and will affect Taney County. However, the impact of past sinkholes is statistically negligible. Since sinkhole formation occurs on a localized scale, property damage is limited to negligible depending on structures immediately within or adjacent to the sinkhole area.

An occurrence of a bowl-shaped sinkhole is unlikely to cause much damage, if any; to structures since it is a very slow process that occurs over many years. Structures can be altered or relocated as necessary during the formational process. However, an occurrence of a collapse sinkhole could cause significant damage to structures in the localized area.

Past Occurrences

Since 1879, when the USGS first began topographic mapping, there have been 64 sinkholes reported in Taney County. The sinkhole locations are widely scattered throughout the county, however, there seems to be a trend of sinkholes between the town of Taneyville and the unincorporated area of Kissee Mills along State Hwy 76. Many of these sinkholes may have been reported during the construction of the highway, which would explain their linear trend. But there are also a significantly higher number of sinkholes reported within Kissee Mills and Taneyville, as shown in Figure 3-16.

Probability and Severity Rating

Although Taney County has bedrock that is very conducive to sinkhole damage, the risk of sinkhole formation in Taney County is low based on the number of existing sinkholes reported throughout the county. Since map-based record keeping began, only 64 sinkholes have formed and have been mapped in Taney County according to the USGS. This means that over the past 133 years, there has been around 1 sinkhole report every 2 years.

In addition, using a buffer of 30 feet (9 meters) around existing reported sinkhole locations, this total buffer area currently comprises only around 0.00001% of the total land area in the county, which can be considered negligible. Therefore, the probability of sinkholes in Taney County can be considered relatively low. However, this doesn't mean that the severity of the existing sinkholes is low. An occurrence of a collapse sinkhole could cause significant localized damage.

Sinkhole formation in urban areas compared to rural areas has the potential to be expedited due to human interaction with the subsurface through construction of facilities and infrastructure. Natural drainage patterns are altered, which can increase water volume and flow to areas more susceptible to sinkhole formation, thus increasing the potential for mobilization of sediment in the subsurface or increasing amount of dissolution of the underlying bedrock.

A secondary problem that can arise once sinkhole formation has already occurred is flooding. During periods of excessive rainfall in the watershed of an existing sinkhole can cause water levels to rise faster than it can infiltrate into the ground through the soil of the sinkhole. When this happens, water can temporarily "back-up" to fill the sinkhole and may even "spill-over" into surrounding low-lying areas. In some cases, homes with

"walk-out" basements are built along the sides of a sinkhole and, in those cases, the walk-out basement may become the low-lying "spill-over" area.

The likelihood of future sinkhole hazards is shown in Table 3-40.

Table 3--40: Probability Rating for Sinkhole Occurrence in Taney County	
Event Type	Future Occurrence
Bowl-shaped Sinkhole	Low
Collapse Sinkhole	Low

There have been no recent reports of sinkholes that have caused property damage in Taney County.

Public Health Emergencies

Hazard Identification

Any alteration to the environment that creates or has potential to create increased morbidity and mortality either by unforeseen changes in the climate, air quality, soil quality and/or food quality that requires Public Health, EMS, and/or clinic and hospital services beyond status quo.

High profile events include but are not limited to: Excessive Heat Emergencies, Excessive Cold Emergencies, Extensive and long lasting power disruption, toxic chemical releases, landslides, mudslides, and / or polluted water runoff impacting water quality, wildfires affecting air quality, toxic chemical releases and pollution affecting air quality, contamination and recalls of food affecting food quality.

Public health emergencies have the potential to adversely impact a large number of people and those impacts can range from local disasters to worldwide epidemics. Specifically, public health emergencies can take the form of disease epidemics, food or water contamination, disruption of water and sewer services, or infestations of disease-carrying insects or rodents. They can occur as either stand-alone events or be the result of tornadoes, floods, or other incidents (MHA, 2011).

Approximately 1500 diseases can affect people and half of those diseases can be transmitted between animals and humans. These diseases are called zoonotic diseases or zoonoses. Zoonotic diseases are a growing concern for public health due to human and animal population living in closer proximately, climate change and advances in transportation.

Public health has begun to focus on two major causes of public health emergencies: biohazard terrorism and disease outbreaks (disease outbreaks will be the focus of this hazard profile). Disease outbreaks are of an area of concern because a virulent strain could quickly be spread around the world due to the interconnectedness of the global economy. Of particular interest is the risk of pandemic influenza, similar to the Spanish Flu epidemic of 1918-1919 which killed 20 million people worldwide. Influenza is not the only disease of concern to public health officials. Diseases such as small pox, meningitis, tick-borne illnesses, West Nile Virus, Tetanus and Severe Acute Respiratory Syndrome (SARS) are also monitored (MHA, 2011).

An influenza pandemic would be the result of a type A influenza virus that has mutated or shifted into a form to which the general population has no immunities. In order for a pandemic to occur, it is key that this new type A virus is easily transmitted from person to person. Because the general population has no immunity to this new virus, the virus will attack young and old, healthy and sick (MHA, 2011).

Public health also monitor water and air for chemicals and pollutants that are known to cause illness, and track where hazardous chemicals are stored. Sources of these pollutants can range from routine industrial activities, automobile use, accidents, or natural disasters. Floods, for example, can overwhelm wastewater treatment facilities and result in the release of raw sewage. It is also important for emergency responders to

know the locations of hazardous waste so they can be properly equipped and prepared during disaster responses (MHA, 2011).

Location

The entire County is at risk for a public health emergency. Specifically, Branson, Missouri is a Class IV city with a permanent population of approximately 9,000 located in the west-central area of Taney County. Taney County is located in the southwest portion of Missouri. The Branson area's predominant industry is tourism, being the Number 1 Motorcoach destination for the past decade, Number 1 tour bus destination in the continental United States for outlet mall shopping excursions, and the Number 2 tour bus destination in the continental United States for music entertainment shows. The city of Branson includes approximately 340 restaurants, 50 theaters, 3 shopping malls, 200 lodging facilities and 3 lakes.

Approximately 7 million guests per year visit this area. The average stay is 2.4 days. Branson is within a one-day drive for 50 percent of the United States population. The busiest tour bus time occurs during the last week in November, with the day after Thanksgiving for shopping and the first week in December with Christmas music shows, lighting displays, and the Adoration parade (TCHD,2012).

Extent (*Magnitude/Severity****)***

For planning purposes, it is reasonable to assume a rapid movement of a pandemic flu virus from major metropolitan areas to rural areas of the county. The effect of a pandemic on individual communities would likely be relatively prolonged—weeks to months. The impact of the next pandemic could have a devastating effect on the health and well being of Taney County citizens and the American public. For such an outbreak in the future, if planning and preparations were inadequate, CDC estimates that in the U.S. alone:

- Up to 200 million persons will be infected.
- Between 40 and 100 million persons will become clinically ill.
- Between 18 and 45 million persons will require outpatient care.
- Between 300,000 and 800,000 persons will be hospitalized.
- Between 88,000 and 300,000 people will die nationwide.
- Effective preventive and therapeutic measures, including vaccines and antiviral agents, likely will be in short supply, as well as some antibiotics to treat secondary infections.
- Based on the CDC's preliminary estimates, economic losses from the next pandemic may range from $71 to $166 billion, depending on the attack rate (MHA, 2011).

The US Center for Disease Control (CDC) has created a Pandemic Severity Index to help communicate with the general public. The index is based on 5 categories representing the percentage of those infected that die. The highest category of the index

assumes that over 2% of those infected will day. Based on the US population in 2006, an estimated 1.8 million or more people would die during a category 5 pandemic.

Table 3-41: Pandemic Severity Index

Category	Case Fatality Ratio	Projected Number of Deaths, US Population, 2006*
Category 1	<0.1%	<90,000
Category 2	0.1% - <0.5%	90,000 - <450,000
Category 3	0.5% - <1.0%	450,000 - <900,000
Category 4	1.0% - < 2.0%	900,000 - <1,800,000
Category 5	≥2.0%	≥1,800,000

Source: Center for Disease Control- http://www.cdc.gov/media/pdf/MitigationSlides.pdf
* assumes 30% illness rate

The CDC also provides information that illustrated the types of actions that a community may need to enact during times of pandemic. These actions are based on the goal of reducing contact between individuals.

Table 3-42: Community Strategies by Pandemic Flu Severity

Interventions by Setting	Pandemic Severity Index		
	1	2 and 3	4 and 5
Home			
Voluntary isolation of ill at home; combine with use of antiviral treatments as available and indicated	Recommended	Recommended	Recommended
Voluntary quarantine of household members in homes with ill persons; consider combining with antiviral prophylaxis is effective, feasible, and quantities sufficient	Generally Not Recommended	Consider	Recommended
School: Child Social Distancing			
Dismissal of students from schools and school-based activities, and closure of child care programs	Generally Not Recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks
Reduce out-of-school contacts and community mixing	Generally Not Recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks
Workplace/Community: Adult Social Distancing			
Decrease number of social contacts (e.g., encourage teleconferences, alternatives to face-to-face meetings	Generally Not Recommended	Consider	Recommended
Increase distance between persons (e.g., reduce density in public transit, workplace)	Generally Not Recommended	Consider	Recommended
Modify, postpone, or cancel selected public gatherings to promote social distance (e.g., stadium events, theater performances)	Generally Not Recommended	Consider	Recommended
Modify workplace schedules and practices (e.g., telework, staggered shifts)	Generally Not Recommended	Consider	Recommended

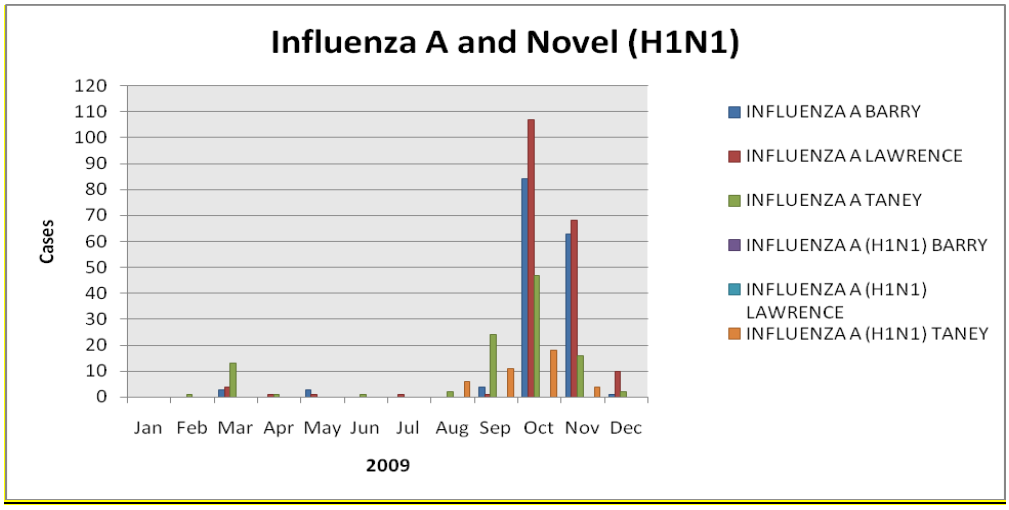
Source: Center for Disease Control- http://www.cdc.gov/media/pdf/MitigationSlides.pdf

Past Occurrences

Epidemic influenza, an age-old infectious disease, results in over 30,000 deaths in the United States every year and is a significant disease. Since the early 1900s, four influenza pandemics have swept the globe, although none have compared to the infamous Spanish Flu event of 1918-1919, which killed more than 20 million people. The 1957 Asian Flu, the 1968 Hong Kong Flu, and the 2009 H1N1 pandemics all saw increased illnesses and deaths compared to seasonal outbreaks, although they weren't nearly as virulent as the 1918 strain. The 1957 epidemic killed about 70,000 people in the United States, mostly the elderly and chronically ill. Another 34,000 Americans died from the 1968 epidemic. While both of these latter epidemics cost many lives, neither was as severe as the Spanish Flu of 1918, which claimed from 500,000 to 700,000 lives in the U.S alone. The impact from this pandemic was felt especially hard in society as its primary victims were mostly young, healthy adults. In addition to those three pandemics, several "pandemic scares" have occurred (MHA, 2011.)

H1N1, commonly known as the swine flu, is a new virus that was first detected in the United States in April of 2009 and declared a pandemic by the World Health Organization on June 11, 2009. This virus has been referred to as swine flu because laboratory testing showed that many of the genes in this new virus were very similar to flu viruses that normally occur in pigs. However, further study has shown that it is very different from the virus that normally circulates in pigs. It has two genes from flu viruses that normally circulate in pigs, but it also has genes from flu viruses that normally circulate in birds and other genes from flu viruses that normally afflict humans (TCHD,2010). Figure 3-17 below illustrates the confirmed cases of Influenza in three counties in 2010.

Figure 3-17: Influenza Confirmed Cases

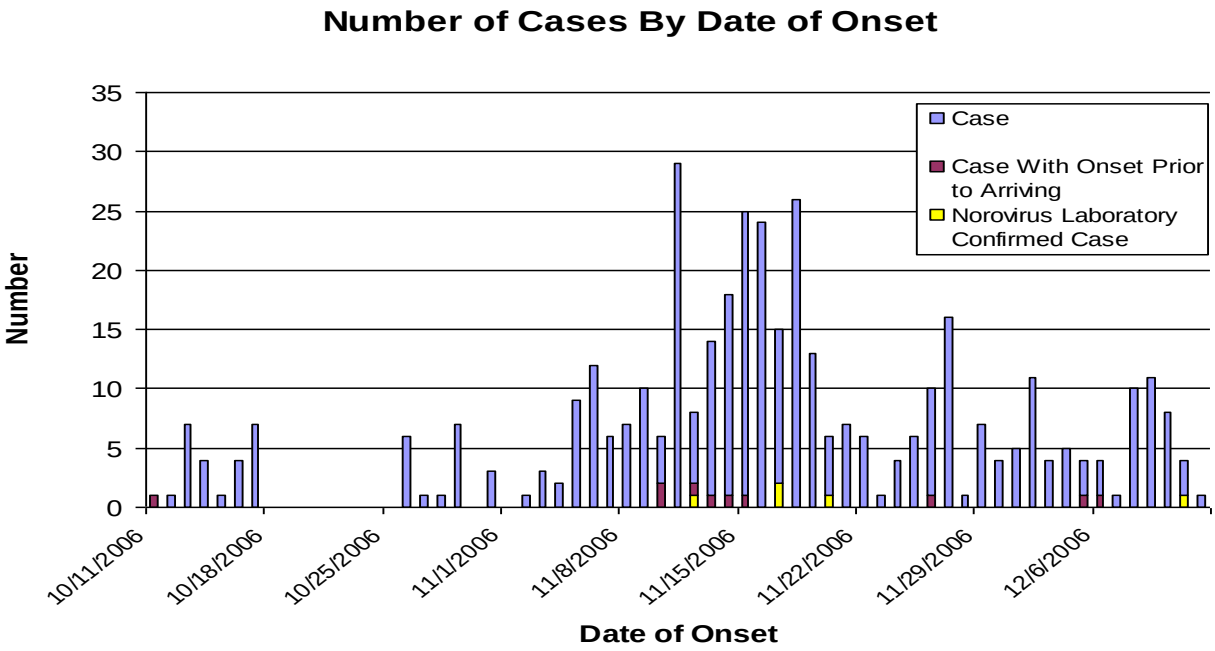


Another communicable disease outbreak that commonly affects this community due to the influx of tourists from all around the world, is Norovirus. There have been numerous Norovirus outbreaks in Taney County within the last ten years that has impacted many other jurisdictions. For instance, in 2006, an outbreak of Norovirus sickened 524 individuals, an attack rate of 20.8 per 100 individuals. It involved 47 bus tour groups and

10 family tour groups. Among those ill, were local first responders, theater employees, hotel employees and attraction employees. Twelve bus groups reported illnesses prior to arriving in Branson. Ten different states and two Canadian provinces were affected by this outbreak (TCHD,2006).

Norovirus is a very contagious virus that can infect anyone. You can get it from an infected person, contaminated food or water, or by touching contaminated surfaces. The virus causes your stomach or intestines or both to get inflamed. This leads you to have stomach pain, nausea, and diarrhea and to throw up. These symptoms can be serious for some people, especially young children and older adults (CDC, 2012).

Figure 3-18: Cases of Norovirus by Date of Onset



Probability and Severity Rating

Health officials agree there is a high probability we will see another pandemic influenza virus emerge sometime in the future. In fact, a worldwide influenza outbreak on the scale and severity of the Spanish Flu is potentially possible. Should such a virulent virus strike today, the results in Missouri and elsewhere could be catastrophic without adequate planning and resources. Today, a much larger percentage of the world's population is clustered in cities, making them ideal breeding grounds for epidemics. Additionally, the speed of air travel means the virus literally could be spread around the globe within hours. Under such unique conditions, there may be very little warning time. Most experts believe we will have just a few days, possibly a few weeks, between the time that a dangerous new influenza strain is identified and the time that outbreaks begin to occur in the U.S. Outbreaks are expected to occur simultaneously throughout much of the nation, preventing shifts in human and material resources that normally occur with other natural disasters. These and many other aspects make influenza pandemic unlike any other public health emergency or community disaster (MHA, 2011).

Environmental concerns are also on the rise, with recent scientific data emphasizing the long-term impacts that air and water pollution can have on the ecology of the affected

areas. With continued enforcement of regulatory standards for airborne releases and discharges to waterways, routine emissions by industrial facilities are relatively easy to monitor and control. However, the potential always remains for unauthorized dumping and releases, and for failure of systems to control industrial discharges, resulting in potential environmental emergencies (MHA, 2011).

Federal Disaster Declarations

Between 2002 and 2011 there were 12 disaster declarations in Taney County, see Table 3-43. Reviewing the disaster declarations allows the county to be better prepared for natural disasters in the future by learning what damage each event may cause. All of these declarations covered multiple counties; therefore, the damage assessment reflects damage done to all counties

Table 3-43: Federal Disaster Declarations--Taney County 2002-2012

Number	Type of Assistance	Description	Date Declared	Damage Assessment
1980	Individual and Public Assistance	Severe Storms, Tornadoes and Flooding	05/09/2011	Damage Assessment
3317	Public Assistance	Severe Winter Storms	02/03/2011	
1822	Public Assistance	Severe Winter Storms	02/17/2009	
3303	Public Assistance	Severe Winter Storms	01/30/2009	
1809	Individual and Public Assistance	Severe Storms, Flooding, & Tornadoes	11/13/2008	Damage Assessment
1773	Individual and Public Assistance	Severe Storms and Flooding	06/25/2008	Damage Assessment
1749	Individual and Public Assistance	Severe Storms & Flooding	03/19/2008	Damage Assessment
3281	Public Assistance	Severe Winter Storms	12/12/2007	
1631	Individual Assistance	Severe Storms, Tornadoes, & Flooding	03/16/2006	
3232	Public Assistance	Hurricane Katrina Evacuation	09/10/2005	
1463	Individual Assistance	Severe Storms, Tornadoes, & Flooding	05/06/2003	
1412	Individual and Public Assistance	Severe Storms & Tornadoes	05/06/2002	

Source: http://www.fema.gov/femaNews/disasterSearch.do

Figure 3-19: Taney County Hazard Composite Map

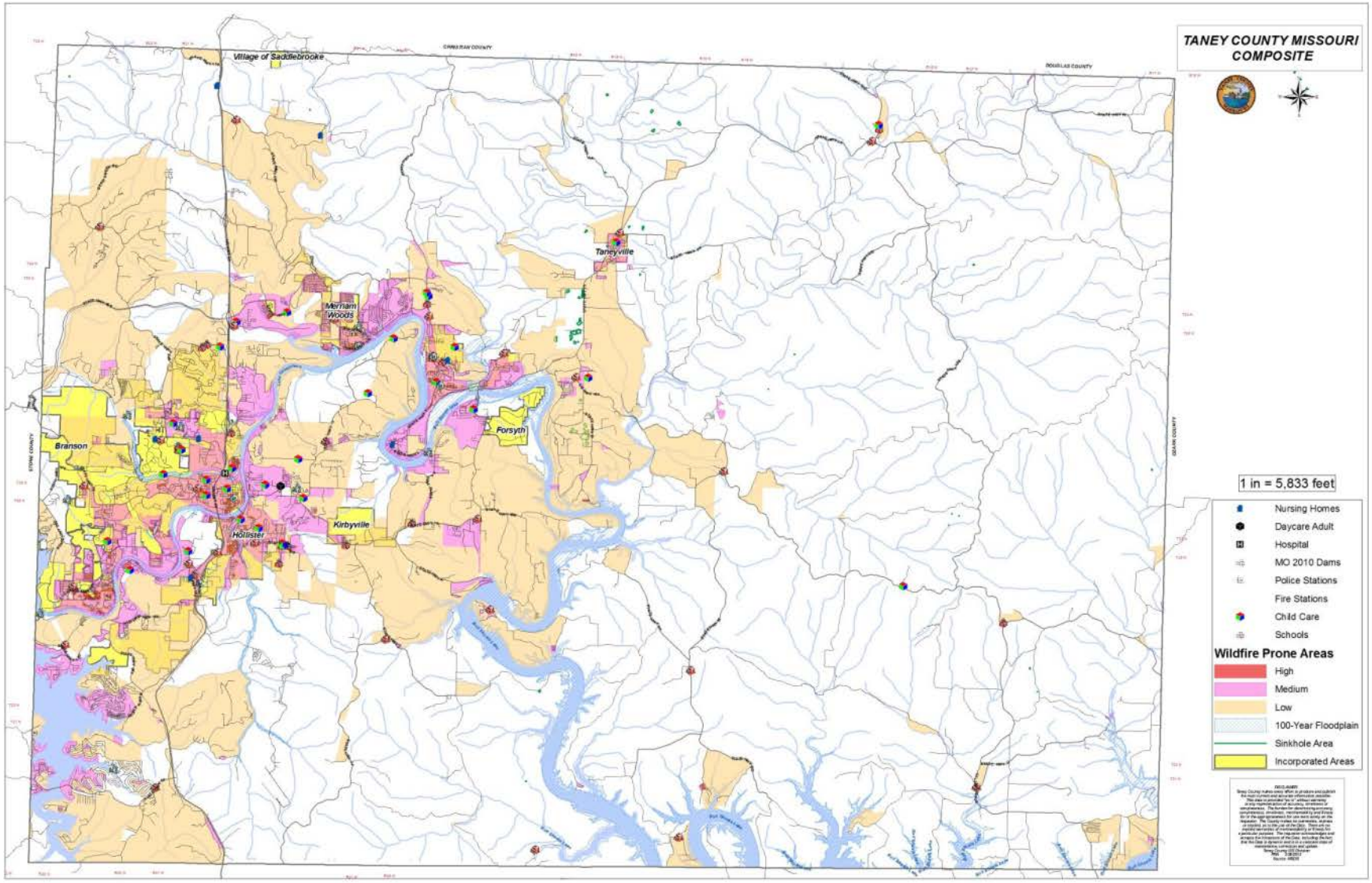


Figure 3-20: Branson Hazard Composite Map

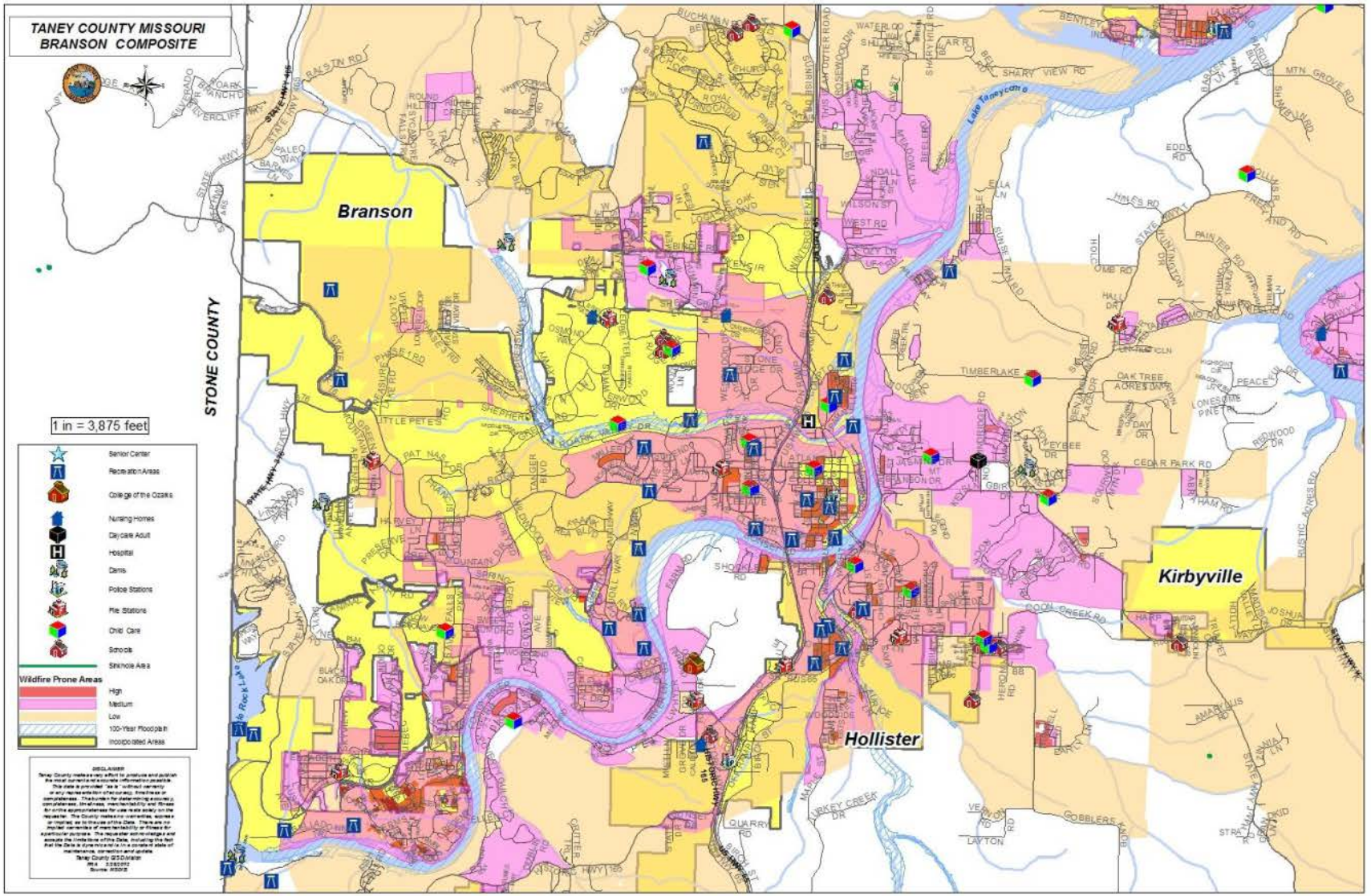


Figure 3-21: Forsyth Hazard Composite Map

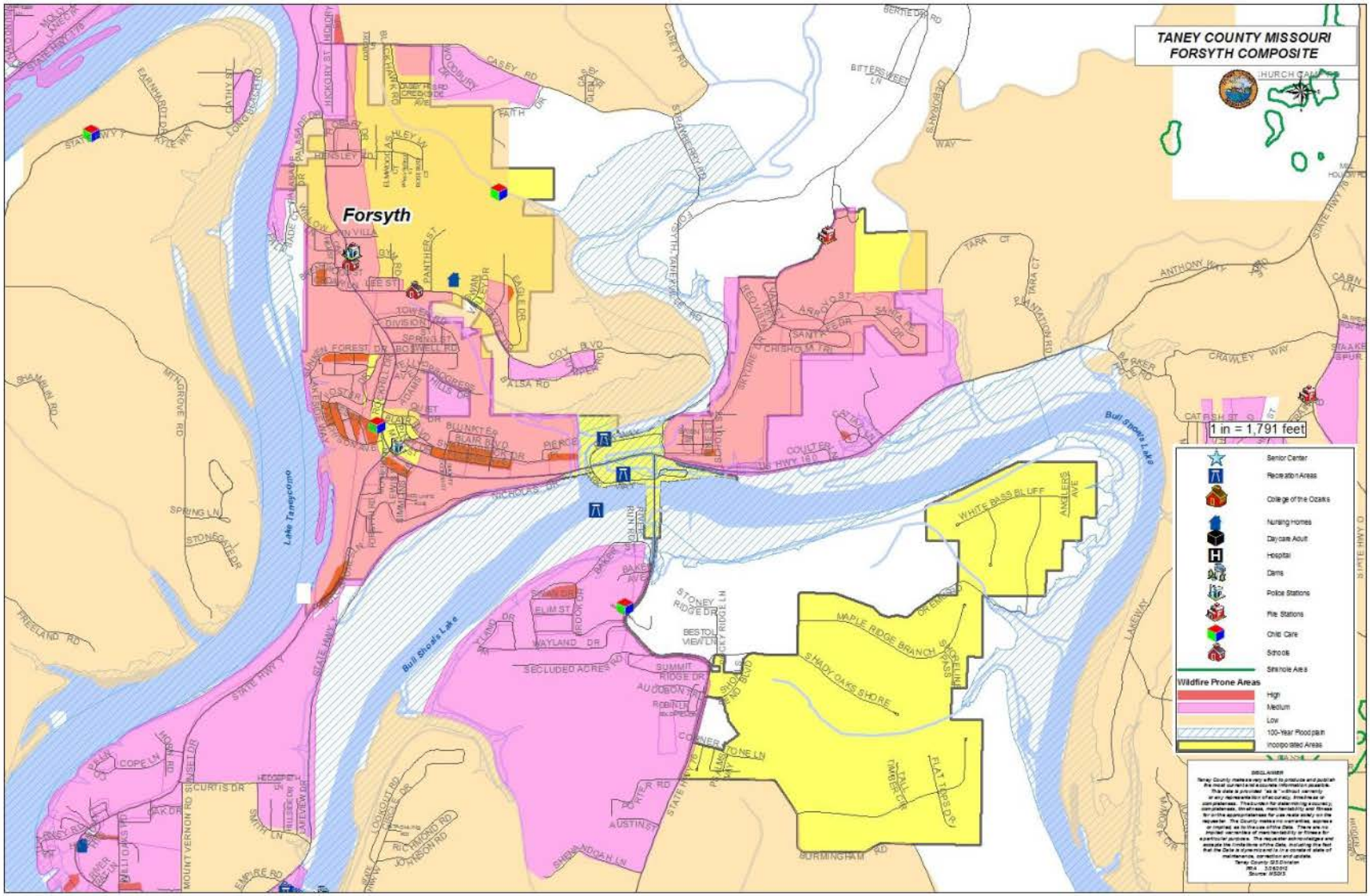


Figure 3-22: Hollister Hazard Composite Map

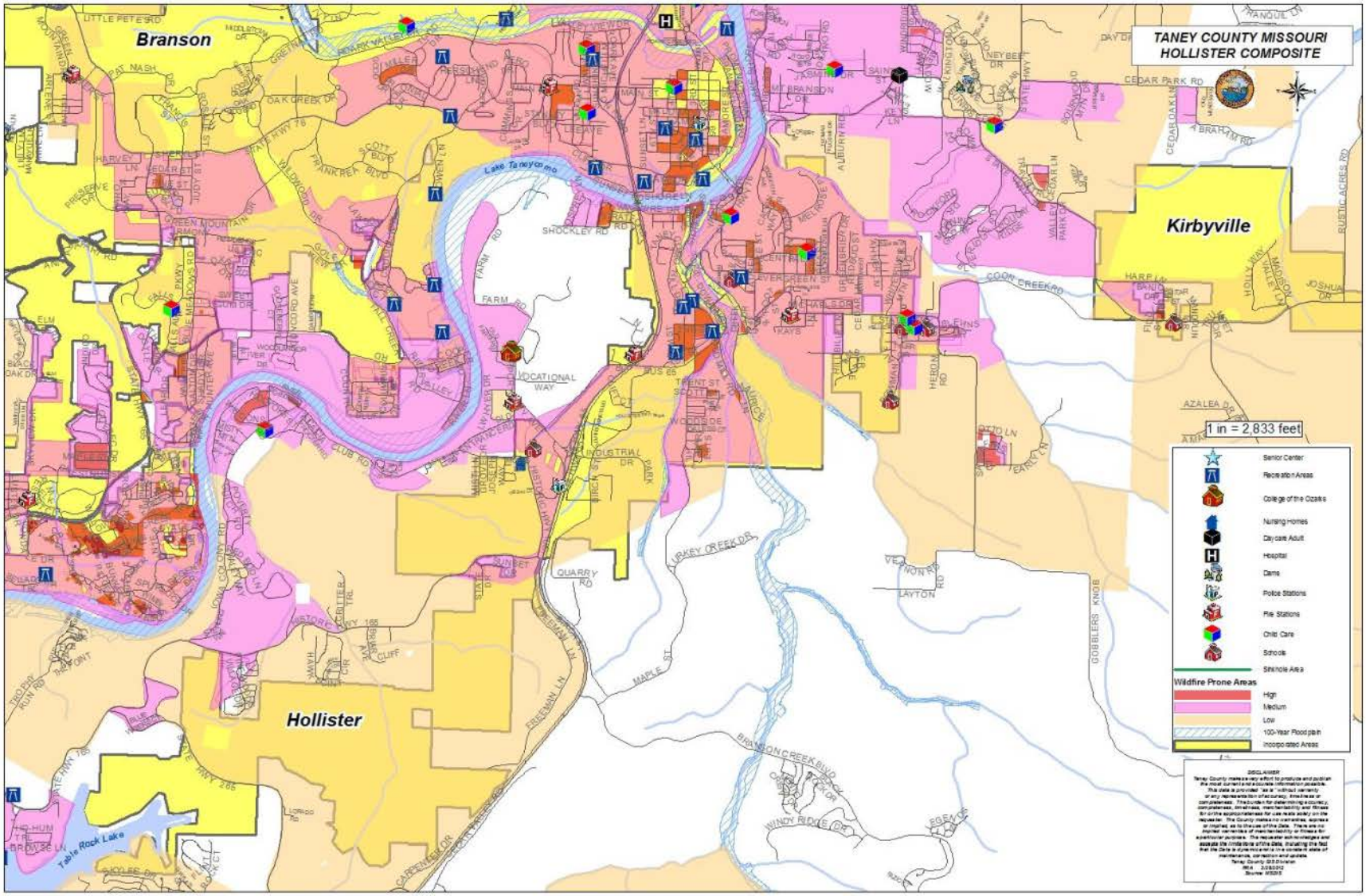


Figure 3-23: Kirbyville Hazard Composite Map

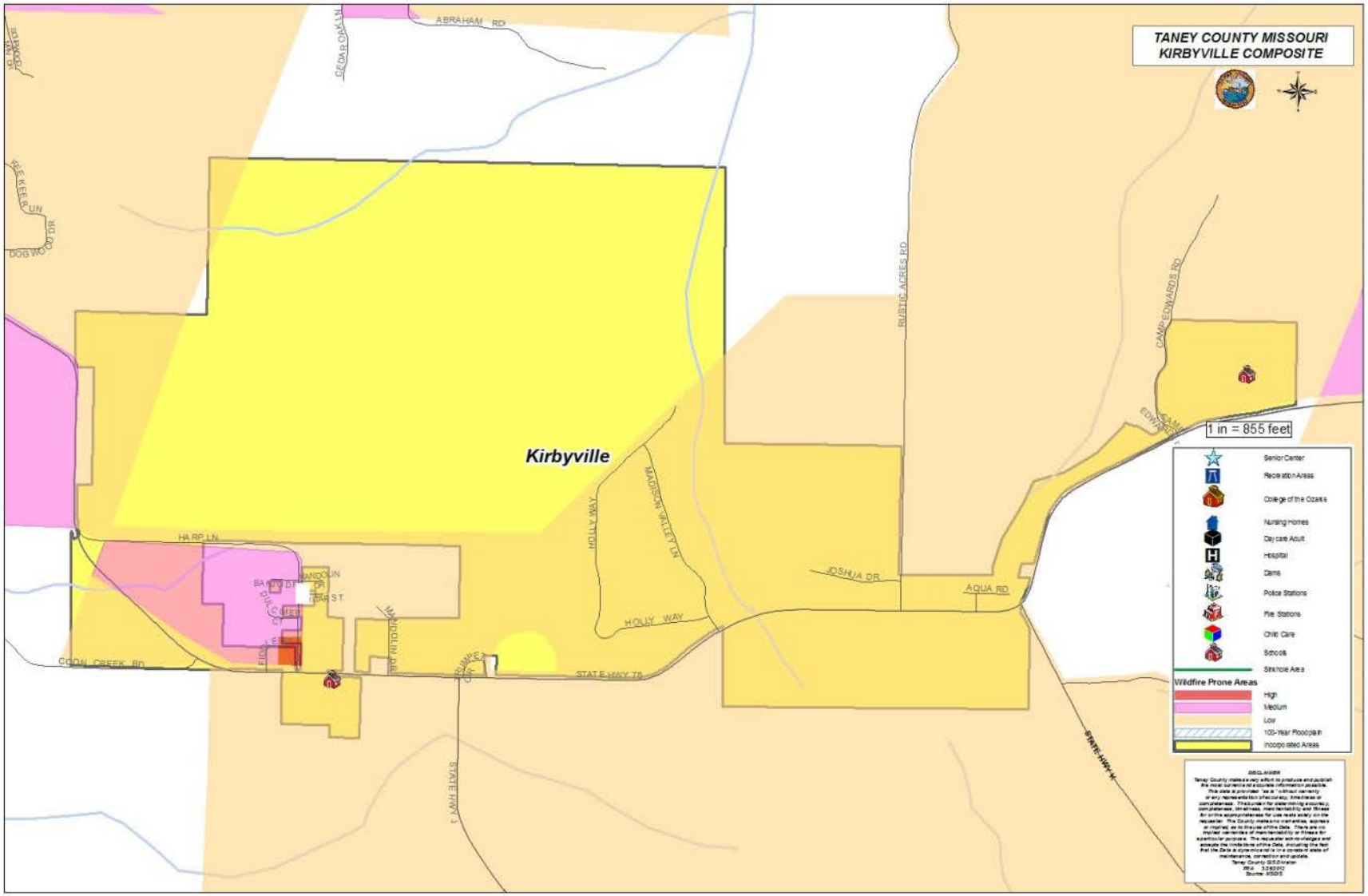


Figure 3-24: Merriam Woods Hazard Composite Map

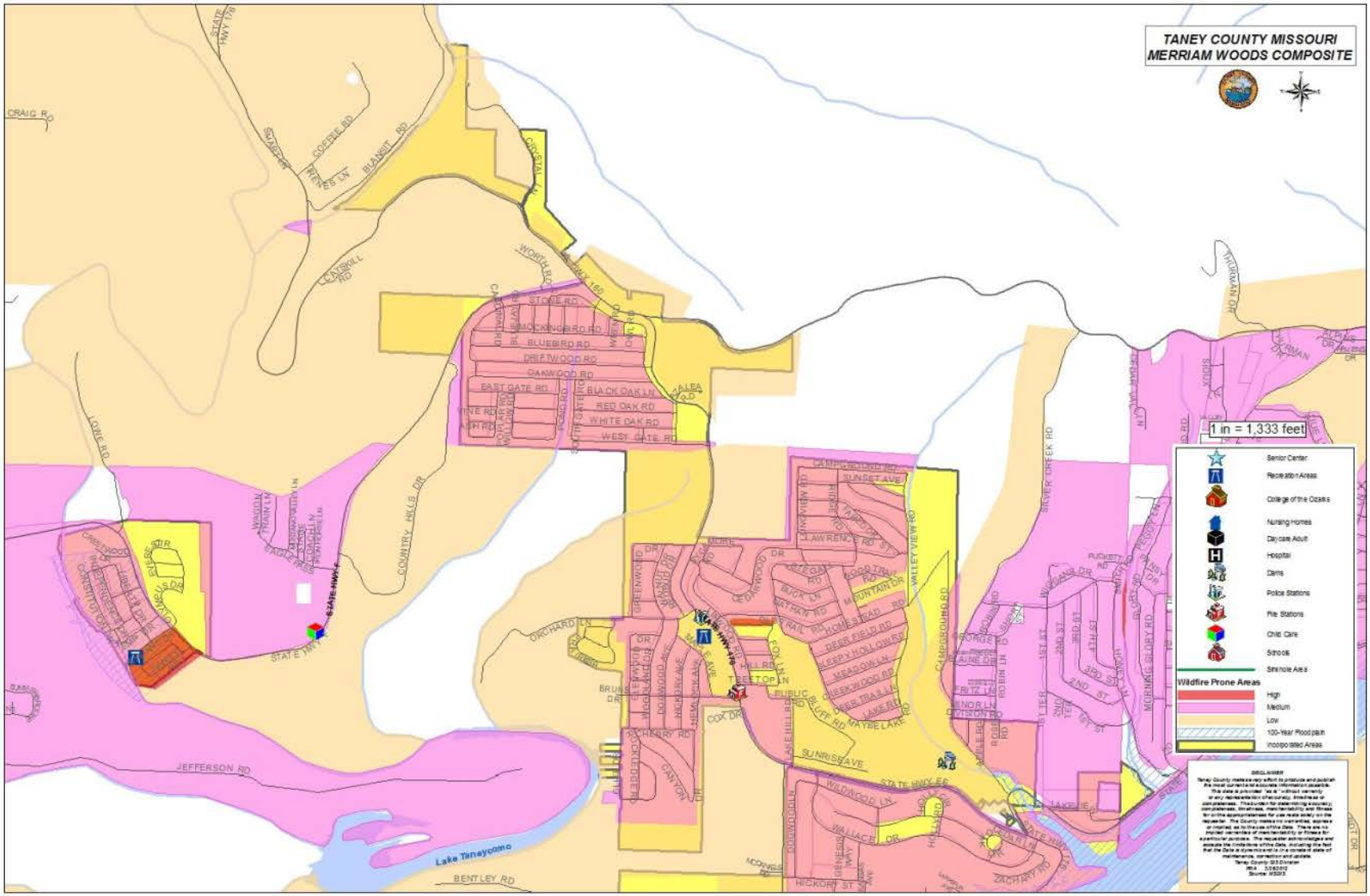


Figure 3-25: Rockaway Beach Hazard Composite Map

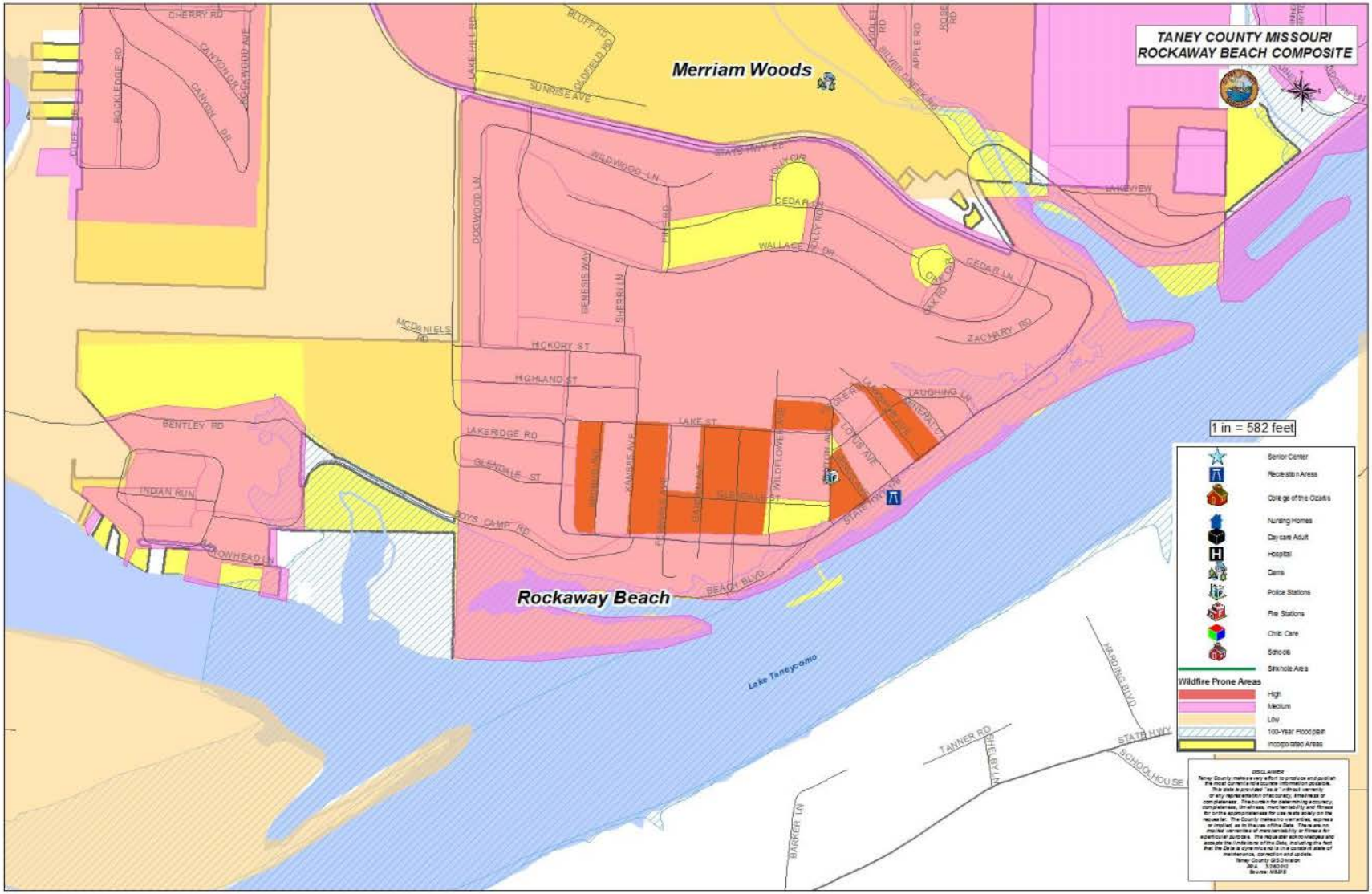
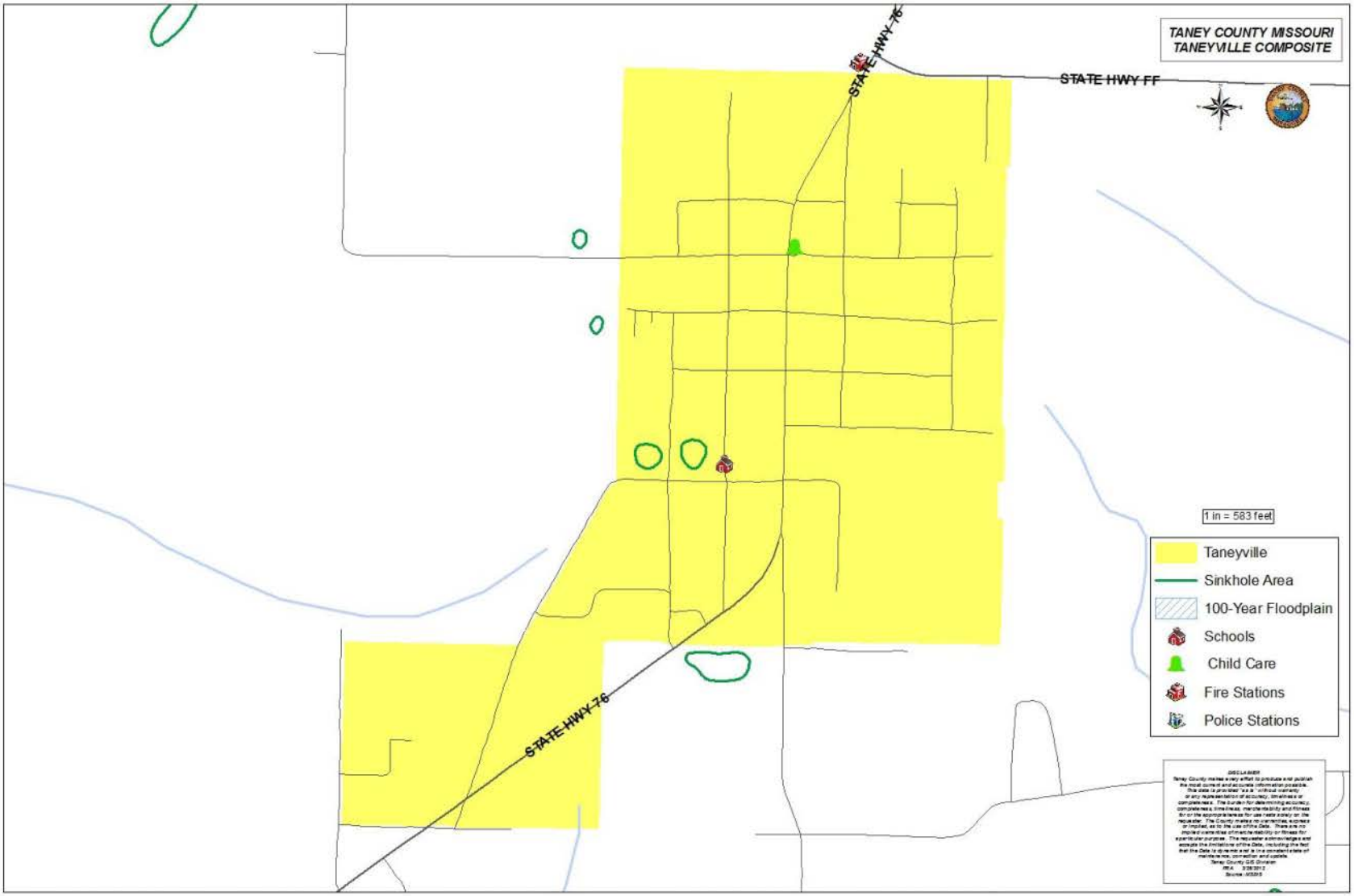


Figure 3-26: Taneyville Hazard Composite Map



Multi-jurisdictional Risk Assessment

The multi-jurisdictional risk assessment developed in this plan includes a hazard identification and analysis by jurisdiction. This analysis is an attempt to delineate the threat level of all natural hazards that can affect each participating jurisdiction in Taney County. Likely locations of some hazards can be identified in each of the lengthy hazard profiles previously presented in this section of the plan and in the composite hazard maps, as was their intent. Other regional hazards defy assigning variability to geographically dispersed communities. A method was developed, which capitalized on the data available from the NCDC regarding past events for each hazard. In many cases, a particular jurisdiction was identified as the location associated with individual events. A multi-criteria evaluation of the data was used to develop the hazard identification and analysis described in the plan. In the end, the analysis did not solely rely on these data but was subjected to a common sense review by representatives from each jurisdiction. School districts were surveyed and self-reported the threat of each of these hazards based on specialized knowledge of their own facilities and boundaries.

The second component of the risk assessment is a vulnerability assessment based on estimates of potential loss by jurisdiction. This assessment defines vulnerability in terms of the general type and number of existing buildings and critical facilities located within each jurisdiction. The estimates of potential loss are based on a percentage of damage relating to the threat level developed in the risk identification and analysis by jurisdiction and summarized in the Overall Summary of Hazard Vulnerability by Jurisdiction in Table 3-41.

Natural Hazards Risk Identification and Analysis by Jurisdiction

In order to identify and assess variability of the risk of natural hazards that can affect each jurisdiction in Taney County, data for each recorded hazard events on the National Oceanic and Atmospheric Administration (NOAA) website and ranking of what constitutes a low, moderate or high probability and severity of an event from the 2007 State Hazard Mitigation Plan were used in a multi-criteria assessment. Based on the NOAA records, data for past events were divided into categories of crop and other damage resulting from the event, number of causalities and injuries due to the event, and the probability of the event based on the number of occurrences divided by the number of years in the timeframe from the first documented event to the year of the last recorded event. The numeric values for these categories were collapsed in the three ordered classes of low, moderate and high based on the following definitions from the 2007 State Hazard Mitigation Plan:

Probability—The likelihood that the hazard will occur.

- **Low**—The hazard has little or no chance of happening (Less than 1 percent chance of occurrence in any given year.).
- **Moderate**—The hazard has a reasonable probability of occurring (Between 1 and 10 percent chance of occurrence in any given year).
- **High**—The probability is considered sufficiently high to assume that the event will occur (Between 10 and 100 percent chance of occurrence in any given year).

Severity—The deaths, injuries, or damage (property or environmental) that could result from the hazard.

- **Low**—Few or minor damage or injuries are likely.
- **Moderate**—Injuries to personnel and damage to property and the environment is expected.
- **High**—Deaths and major injuries and damage will likely occur

Functional Loss – The down-time that occurs

- **Low**—Less than 24 hours
- **Moderate**—1 to 4 days
- **High**— 5 days or longer

Damages per Event

The damages in dollar amounts reported for each type of hazard event for each jurisdiction associated with that event were added together and then divided by the number of events creating the value for damages per event. For the purposes of this analysis; low damage equaled $0 - $49,000, moderate equaled $50,000 - $99,000 and high equaled $100,000 or more.

Injuries and Deaths per Event

Similar to damages per event, a total of all injuries and deaths associated with all events identified with certain jurisdictions were divided by the number of those events. This number was reclassified into low; 0-1 person affected, moderate; 1.1-4 persons affected and high; 4.1 or more persons affected.

Probability of Future Events

This criterion was broken down according to the definitions used in the State Plan where; low equaled less than 1%, moderate equaled 1%-10% and high was a value greater than 10%.

In order to sum and divide the classes of low, moderate and high, these ordered levels were assigned a value of 1 for low, 2 for moderate and 3 for high. For each jurisdiction, the value of 1, 2, or 3 corresponding to each category were added together and divided by 3 creating a cumulative ranking of threat level for individual jurisdictions. These values were then converted back to ordered statements of low, moderate and high based on values of less than 1.6 (low), 1.6 – 2.0 (moderate) and greater than 2.0 (high). Finally, this information was presented to the Plan Review and Advisory Committee meeting for a common sense review in a format similar to Table 3-41. It was explained to the committee that the NOAA data may not be comprehensive, meaning that not all events may have been reported, and that there were some serious issues in the method used and the definitions of the classes. In addition, graphic displays of the geographic specific hazards by jurisdiction maps were presented on posters and highly visible during the meeting. Based on input from meeting attendees, many values were changed to where they made more sense. For instance, the final results from the analysis and review are presented in the Overall Summary of Hazard Vulnerability by Jurisdiction in Table 3-44.

Table 3-44: Overall Summary of Hazard Vulnerability by Jurisdiction											
Hazards / Jurisdiction	Tornado	Severe T-storm	Flood (Riverine and Flash)	Severe Winter Weather	Drought	Heat Wave	Earthquake	Dam Failure	Wildfire	Sinkhole	EID
Taney County	H	H	H	M	L	M	L	L/H	H	L	
Municipalities											
Branson	H	H	H	H	L	M	L	M	L	L	
Bull Creek	M	H	H	M	L	M	L	L	H	L	
Forsyth	H	H	H	M	L	M	L	L/H	M	L	
Hollister	H	H	H	M	L	M	L	L	L	L	
Merriam Woods	H	H	M	M	L	M	L	L	H	L	
Kirbyville	H	H	L	M	L	M	L	L	L	L	
Rockaway Beach	H	H	H	M	L	M	L	M	L	L	
Taneyville	H	H	L	M	L	M	L	L	L	L	
School Districts											
Bradleyville R-I											
Taneyville R-II	H	H	L	M	L	M	L	L	L	L	
Forsyth R-III	H	H	M	H	L	L	L	L	M	L	
Branson R-IV											
Hollister R-V	H/L	H	M	H	L	L	L	L	M	L	
Kirbyville R-VI	H	H	M	M	L	M	L	M	L	L	
Mark Twain R-VIII											
Colleges and Other Special District											
OTC	H	H	L	M	L	L	M	L	L	L	
Taney Co. Sewer District	M	M	H	M	L	L	L	M	M	L	
Taney Co. Ambulance District	M	M	L	M	L	M	L	L	L	L	

Vulnerability Assessment and Estimates of Potential Loss by Jurisdiction

Methodology

The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to natural hazards by jurisdiction. The vulnerability assessment for this plan is based on the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (2002). This section describes overall vulnerability and estimates potential losses for buildings, infrastructure and critical facilities located in identified hazard areas. The vulnerability assessment was conducted based on the best available data and the

significance of the hazard by jurisdiction in Table 3-44. Data to support the vulnerability assessment was collected from the following sources:

- County Assessor's GIS parcel data (appraised valuations)
- Missouri United School Insurance Council
- FEMA's HAZUS-MH loss estimation software
- Insured replacement cost of assets provided by participating jurisdictions
- Existing plans and reports

The methods used to calculate potential losses in dollar amounts vary according to the natural hazard addressed and type of entity or jurisdiction. The methods used to estimate losses for local governments are not the same for school districts. Local government loss estimates were first calculated for identified and profiled hazards that can affect the entire planning area. These hazards include drought, earthquake, extreme heat, tornado/thunderstorms and winter storms. The corresponding values of low, medium and high for each jurisdiction in the Overall Summary of Hazard Vulnerability in Table 3-44 were converted to a damage factor or vulnerability percentage of 1%, %5 and 10% respectively.

The damage factors for individual jurisdictions were applied to a community's inventory of assets by building type. A GIS parcel file with residential, commercial and agricultural appraised valuation was the primary source used to create the total replacement costs for these building types and contents. Critical facilities included in the local government loss estimations are the essential facilities listed in Table 3-41, main government buildings and water treatment facilities. Schools are not included in the local government loss estimates because they are included in the loss estimates for school districts. Day care centers and nursing homes are assumed to have been captured in the total commercial appraised value in the jurisdiction that it is located.

Replacement values for local government critical facilities were based on insured replacement values for buildings and contents provided by local jurisdictions. The corresponding damage factor for each jurisdiction from the Overall Summary of Hazard Vulnerability in Table 3-44 was applied to that jurisdiction's inventory of assets replacement values to create a dollar value of potential losses. Drought and extreme heat are not likely to result in damage to structures but are more likely to affect the contents housed in buildings. Therefore, the damage factors for these two hazards were only applied to the contents values.

After the tables depicting loss estimations for area wide hazards for local governments, local area hazard loss estimates for each participating local government are presented. Local area hazards include dam failure, flooding (riverine and flash), sinkholes and wildfire where certain hazard prone areas can be defined. The loss estimates for local area hazards depict losses to structures in the hazard prone areas only. A brief description of the method used for these hazards is provided here:

- Dam failure loss estimates were included for unincorporated Taney County only due to the only significant hazard dam is located in a rural east central portion of the county. To estimate the losses from the failure of this dam a ten meter buffer of the floodplain up to five miles downstream of the dam was used as a likely inundation area. HAZUS-MR4 census blocks that intersected with the likely inundation area were used to generate a building count within the hazard area.

An average replacement value for the type of structures based on appraised valuations in unincorporated Taney County was multiplied by the number of structures in the hazard area to generate the loss estimation for this hazard event.

- Flood loss estimates were developed using a method similar to the one used for dam failure. All HAZUS census blocks situated within 100 feet of the 100 year floodplain were selected to compile building counts by type for each participating municipality and the unincorporated balance of Taney County. It is important to note that this method created building counts for areas well outside the 100 year floodplain but in an effort to depict losses from flash flooding as well, the entire building count for all census blocks within 100 feet of the 100 year floodplain would be more prone to flash flooding due to the proximity to natural drainage features in the area. Average replacement values for each community were then applied to the HAZUS building counts before the damage factor for the community was applied to create a loss estimate for both types of flood events.

- Sinkhole loss estimates were established using GIS processes and appraised valuations. A sinkhole point shapefile acquired from MSDIS was used to run a point density function in GIS. The output from this function created values for individual pixels based on a count of sinkhole features within a specified radius from each pixel. The values of all pixels were grouped into 3 classes from low to high creating three zones. The zone with the highest pixel values was designated as the hazard prone area for sinkholes. The map layer of the hazard prone area was used as an overlay on the parcel data to generate the loss estimates from this hazard by jurisdiction.

- Wildfire loss estimates were created by overlaying the SILVIS lab Wildland Urban Interface census blocks over the HAZUS census blocks. If the census blocks were categorized as medium or high interface or intermix, its coincident HAZUS census block was used to generate building counts for each community. The average appraised valuation by building type in each community was applied to the number of structures before the appropriate damage factor was calculated.

Loss estimates for school districts were developed using Missouri United School Insurance Council (MUSIC) replacement values for school district structures and contents. This information was provided by all school districts that participated in the plan. The Hazard Vulnerability to each identified hazard was self reported by each participating school district through a survey instrument. Unlike potential loss estimations for local municipal and the county government, the loss estimations for school districts include a value for the number of building occupants and a projection of losses for future development of district facilities based on the growth percentage of the municipality or unincorporated area of the county which it serves. The growth percentage for communities is based the difference between the 2000 census and 2008 population estimates from Table 2-2 in Part II and accounts for growth over the next eight years.

Critical Facilities and Infrastructure

A critical facility may be defined as one that provides essential public safety or mitigation functions during response or recovery operations. Table 3-45 below gives examples of critical facilities, high potential loss facilities and transportation and lifelines as they are

defined for the purposes of this analysis. Table 3-46 describes the number and types of these facilities by jurisdiction. Immediately following Table 3-46 are the potential loss estimates by hazard and by jurisdiction.

The loss estimates are based on the summary of hazard vulnerability by jurisdiction from Table 3-44. Structural loss and the number of people affected is defined as a percentage of the replacement value of buildings and contents or a percentage of the number of people assumed to be present in certain building types. Standard percentages of 1, 5 or 10 were used as damage factors as they correspond to the jurisdictions hazard vulnerability in Table 3-44.

Table 3-45: Critical Facilities, Definitions and Examples

Essential Facilities	High Potential Loss Failure	Transportation and Lifelines
Hospital and other medical facilities	Power Plants	Railroad and facilities
Police Stations	Dams and Levees	Airports
Fire Stations	Hazardous material sites	Water Treatment facilities
	Schools	Natural gas facilities, Pipelines
	Day Care Centers	Communication facilities
	Nursing Homes	
	Main government buildings	

Source: FEMA HAZUS-MH MR

Table 3-46: Inventory of Critical Infrastructure in Taney County									
	Medical Clinics	Main Gov't. Buildings	Dams	Police Stations	Fire Stations	Schools	911 Station	Nursing Homes	Senior Centers
Bradleyville	1	2	--	--	1	2	--	--	--
Branson	12	8	1	1	7	6	--	2	1
Bull Creek	--	1	--	--	--	--	--	--	--
Forsyth	4	5	--	1	3	4	--	2	1
Hollister	6	5	--	1	2	4	--	1	--
Kirbyville	--	2	--	--	3	2	--	--	--
Merriam Woods	--	1	1	1	1	--	--	--	--
Rockaway Beach	--	2	--	1	--	--	--	--	--
Tayneyville	--	3	--	--	1	1	--	--	--
Taney County	--	13	6	1	10	1	--	2	--
Total	23	42	8	6	28	20	--	7	2

Area Wide Vulnerability Assessment Tables for Participating Jurisdictions

Table 3-47	Area Wide Hazard Vulnerability Percentages					
Unincorporated Taney County	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$1,098,738,145	$140,521,028	$8,337,429		
Contents	x	$549,369,073	$140,521,028	$8,337,429		
Building and Contents	x	$1,648,107,218	$281,042,056	$16,674,858		
Estimated Number of buildings		13,131	895	926		
Hazard						
Drought	1%	$16,481,072	$2,810,421	$166,749		
Earthquake	1%	$16,481,072	$2,810,421	$166,749		
Heatwave	5%	$82,405,361	$14,052,103	$833,743		
Tornado/T-Storms	10%	$164,810,722	$28,104,206	$1,667,486		
Winter Storms	10%	$164,810,722	$28,104,206	$1,667,486		

Table 3-48	Area Wide Hazard Vulnerability Percentages					
City of Branson	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$625,583,514	$786,578,248	$4,024		
Contents	x	$312,791,757	$786,578,248	$4,024		
Building and Contents	x	$938,375,271	$1,573,156,496	$8,048		
Estimated Number of buildings		5,493	1,787	4		
Hazard						
Drought	1%	$9,383,753	$15,731,565	$80		
Earthquake	1%	$9,383,753	$15,731,565	$80		
Heatwave	5%	$46,918,764	$78,657,825	$402		
Tornado/T-Storms	10%	$93,837,527	$157,315,650	$805		
Winter Storms	10%	$93,837,527	$157,315,650	$805		

Table 3-49	Area Wide Hazard Vulnerability Percentages					
Village of Bull Creek	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$5,382,537	$197,160	$0		
Contents	x	$2,691,269	$197,160	$0		
Building and Contents	x	$8,073,806	$394,320	$0		
Estimated Number of buildings		53	3	0		
Hazard						
Drought	1%	$80,738	$3,943	$0		
Earthquake	1%	$80,738	$3,943	$0		
Heatwave	5%	$403,690	$19,716	$0		
Tornado/T-Storms	10%	$807,381	$39,432	$0		
Winter Storms	10%	$807,381	$39,432	$0		

Table 3-50	Area Wide Hazard Vulnerability Percentages					
City of Forsyth	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$63,576,564	$15,227,807	$18,814		
Contents	x	$31,788,282	$15,227,807	$18,814		
Building and Contents	x	$95,364,846	$30,455,614	$37,628		
Estimated Number of buildings		891	119	1		
Hazard						
Drought	1%	$953,648	$304,556	$376		
Earthquake	1%	$953,648	$304,556	$376		
Heatwave	5%	$4,768,242	$1,522,781	$1,881		
Tornado/T-Storms	10%	$9,536,485	$3,045,561	$3,763		
Winter Storms	10%	$9,536,485	$3,045,561	$3,763		

Table 3-51	Area Wide Hazard Vulnerability Percentages					
City of Hollister	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$82,307,910	$43,318,550	$7,676		
Contents	x	$41,153,955	$43,318,550	$7,676		
Building and Contents	x	$123,461,865	$86,637,100	$15,352		
Estimated Number of buildings		1,249	157	1		
Hazard						
Drought	1%	$1,234,619	$866,371	$154		
Earthquake	1%	$1,234,619	$866,371	$154		
Heatwave	5%	$6,173,093	$4,331,855	$768		
Tornado/T-Storms	10%	$12,346,187	$8,663,710	$1,535		
Winter Storms	10%	$12,346,187	$8,663,710	$1,535		

Table 3-52	Area Wide Hazard Vulnerability Percentages					
City of Kirbyville	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$2,585,016	$1,015,639	$29,874		
Contents	x	$1,292,508	$1,015,639	$29,874		
Building and Contents	x	$3,877,524	$2,031,278	$59,748		
Estimated Number of buildings		58	20	4		
Hazard						
Drought	1%	$38,775	$20,313	$597		
Earthquake	1%	$38,775	$20,313	$597		
Heatwave	5%	$193,876	$101,564	$2,987		
Tornado/T-Storms	10%	$387,752	$203,128	$5,975		
Winter Storms	10%	$387,752	$203,128	$5,975		

Table 3-53	Area Wide Hazard Vulnerability Percentages					
Village of Merriam Woods	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$30,986,156	$4,005,625	$4,047		
Contents	x	$15,493,078	$4,005,625	$4,047		
Building and Contents	x	$46,479,234	$8,011,250	$8,094		
Estimated Number of buildings		827	11	1		
Hazard						
Drought	1%	$464,792	$80,113	$81		
Earthquake	1%	$464,792	$80,113	$81		
Heatwave	5%	$2,323,962	$400,563	$405		
Tornado/T-Storms	10%	$4,647,923	$801,125	$809		
Winter Storms	10%	$4,647,923	$801,125	$809		

Table 3-54	Area Wide Hazard Vulnerability Percentages					
City of Rockaway Beach	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$30,986,156	$4,005,625	$4,047		
Contents	x	$15,493,078	$4,005,625	$4,047		
Building and Contents	x	$46,479,234	$8,011,250	$8,094		
Estimated Number of buildings		424	40	1		
Hazard						
Drought	1%	$464,792	$80,113	$81		
Earthquake	1%	$464,792	$80,113	$81		
Heatwave	5%	$2,323,962	$400,563	$405		
Tornado/T-Storms	10%	$4,647,923	$801,125	$809		
Winter Storms	10%	$4,647,923	$801,125	$809		

Table 3-55	Area Wide Hazard Vulnerability Percentages					
City of Taneyville	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Building Only	x	$4,613,583	$863,372	$1,694		
Contents	x	$2,306,792	$863,372	$1,694		
Building and Contents	x	$6,920,375	$1,726,744	$3,388		
Estimated Number of buildings		157	13	1		
Hazard						
Drought	1%	$69,204	$17,267	$34		
Earthquake	1%	$69,204	$17,267	$34		
Heatwave	5%	$346,019	$86,337	$169		
Tornado/T-Storms	10%	$692,037	$172,674	$339		
Winter Storms	10%	$692,037	$172,674	$339		

Local Area Hazard Vulnerability Tables for Participating Jurisdictions

Table 3-56	**Local Area Hazard Vulnerability Percentages**					
Unincorporated Taney County	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$63,233,296.49	$6,782,690.74	$288,011.84		
Contents	x	$31,616,648.25	$6,782,690.74	$288,011.84		
Building and Contents	x	$94,849,944.74	$13,565,381.47	$576,023.68		
Estimated Number of buildings		7,557	432	32		
Sinkhole	**1%**					
Building Only	x	$570,613.86	$48,471.76	$14,086.47		
Contents	x	$285,306.93	$48,471.76	$14,086.47		
Building and Contents	x	$855,920.79	$96,943.52	$28,172.94		
Estimated Number of buildings		1,096	38	3		
Wildfire	**10%**					
Building Only	x	$46,715,825.63	$3,909,467.58	$9,003.70		
Contents	x	$23,357,912.82	$3,909,467.58	$9,003.70		
Building and Contents	x	$70,073,738.45	$7,818,935.15	$18,007.40		
Estimated Number of buildings		5,583	249	10		

Table 3-57	Local Area Hazard Vulnerability Percentages					
City of Branson	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**5%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$36,002,852.91	$37,966,681.58	$13.92		
Contents	x	$18,001,426.45	$37,966,681.58	$13.92		
Building and Contents	x	$54,004,279.36	$75,933,363.17	$27.84		
Estimated Number of buildings		1,773	189	7		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**1%**					
Building Only	x	$4,049,836.11	$1,452,550.77	$100.60		
Contents	x	$2,024,918.06	$1,452,550.77	$100.60		
Building and Contents	x	$6,074,754.17	$2,905,101.53	$201.20		
Estimated Number of buildings		3,556	330	10		

Table 3-58	Local Area Hazard Vulnerability Percentages					
Village of Bull Creek	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$1,330,400.65	$13,144.00	$0		
Contents	x	$665,200.33	$13,144.00	$0		
Building and Contents	x	$1,995,600.98	$26,288.00	$0		
Estimated Number of buildings		131	2	0		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**10%**					
Building Only	x	$1,330,400.65	$361,460.00	$0		
Contents	x	$665,200.33	$361,460.00	$0		
Building and Contents	x	$1,995,600.98	$722,920.00	$0		
Estimated Number of buildings		131	2	0		

Table 3-59	Local Area Hazard Vulnerability Percentages					
City of Forsyth	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**5%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$2,504,531.31	$153,557.72	$0		
Contents	x	$1,252,265.65	$153,557.72	$0		
Building and Contents	x	$3,756,796.96	$307,115.44	$0		
Estimated Number of buildings		351	12	0		
Sinkhole	**1%**					
Building Only	x	$119,464.95	$8,871.58	$188.14		
Contents	x	$59,732.48	$8,871.58	$188.14		
Building and Contents	x	$179,197.43	$17,743.16	$376.28		
Estimated Number of buildings		181	5	1		
Wildfire	**5%**					
Building Only	x	$37,746,355.06	$3,519,031.03	$9,407.00		
Contents	x	$18,873,177.53	$3,519,031.03	$9,407.00		
Building and Contents	x	$56,619,532.59	$7,038,062.06	$18,814.00		
Estimated Number of buildings		1,058	55	1		

Table 3-60	Local Area Hazard Vulnerability Percentages					
City of Hollister	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$7,683,828.91	$1,738,260.29	$2,302.80		
Contents	x	$3,841,914.45	$1,738,260.29	$2,302.80		
Building and Contents	x	$11,525,743.36	$3,476,520.57	$4,605.60		
Estimated Number of buildings		1,166	63	3		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**1%**					
Building Only	x	$1,144,666.45	$195,899.18	$230.28		
Contents	x	$572,333.23	$195,899.18	$230.28		
Building and Contents	x	$1,716,999.68	$391,798.35	$460.56		
Estimated Number of buildings		1,737	71	3		

Table 3-61	Local Area Hazard Vulnerability Percentages					
City of Kirbyville	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$62,396.94	$10,156.39	$0		
Contents	x	$31,198.47	$10,156.39	$0		
Building and Contents	x	$93,595.41	$20,312.78	$0		
Estimated Number of buildings		14	2	0		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**1%**					
Building Only	x	$4,902.62	$0	$0		
Contents	x	$2,451.31	$0	$0		
Building and Contents	x	$7,353.92	$0	$0		
Estimated Number of buildings		11	0	0		

Table 3-62	Local Area Hazard Vulnerability Percentages					
Village of Merriam Woods	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**5%**					
Building Only	x	$281,011.09	$0	$0		
Contents	x	$140,505.54	$0	$0		
Building and Contents	x	$421,516.63	$0	$0		
Estimated Number of buildings		15	0	0		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**10%**					
Building Only	x	$3,420,841.65	$86,329.32	$0		
Contents	x	$1,710,420.82	$86,329.32	$0		
Building and Contents	x	$5,131,262.47	$172,658.63	$0		
Estimated Number of buildings		913	17	0		

Table 3-63	Local Area Hazard Vulnerability Percentages					
City of Rockaway Beach	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**5%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**10%**					
Building Only	x	$1,446,995.02	$40,056.25	$404.70		
Contents	x	$723,497.51	$40,056.25	$404.70		
Building and Contents	x	$2,170,492.53	$80,112.50	$809.40		
Estimated Number of buildings		198	4	1		
Sinkhole	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Wildfire	**1%**					
Building Only	x	$370,518.42	$8,632.93	$40.47		
Contents	x	$185,259.21	$8,632.93	$40.47		
Building and Contents	x	$555,777.63	$17,265.86	$80.94		
Estimated Number of buildings		507	17	1		

Table 3-64	Local Area Hazard Vulnerability Percentages					
Village of Taneyville	Hazard Value	Building Types				
	%	**Residential** (Contents Valued at 50%)	**Commercial** (Contents Valued at 100%)	**Agriculture** (Contents Valued at 100%)	**Critical Facilities** (Contents Valued at 150%)	**Totals**
Hazard						
Dam Failure	**1%**					
Building Only	x					
Contents	x					
Building and Contents	x					
Estimated Number of buildings						
Flooding	**1%**					
Building Only	x	$0	$0	$0		
Contents	x	$0	$0	$0		
Building and Contents	x	$0	$0	$0		
Estimated Number of buildings		0	0	0		
Sinkhole	**1%**					
Building Only	x	$46,135.83	$8,633.72	$16.94		
Contents	x	$23,067.92	$8,633.72	$16.94		
Building and Contents	x	$69,203.75	$17,267.44	$33.88		
Estimated Number of buildings		187	5	0		
Wildfire	**1%**					
Building Only	x	$11,754.35	$0	$0		
Contents	x	$5,877.18	$0	$0		
Building and Contents	x	$17,631.53	$0	$0		
Estimated Number of buildings		40	0	0		

Vulnerability Assessment Tables for Taney County School Districts

Table 3-65 Vulnerability Assessment for Taney County School Districts

School District	# of Enrolled Students	# of Buildings	# of Employees	Approx Value
Bradleyville R-1	239	1	35	
Branson R-IV	4,545		343	
Forsyth R-III	1,213		108	
Hollister R-V	1,439	11	209	$50,800,367
Kirbyville R-IV	321	2	59	$10,966,453
Taneyville R-II	200	3	22	$5,532,494
Mark Twain R-VIII	59	1	8	
TOTAL	**8,016**		**629**	

Table 3-66
Tornado: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a tornado event)

Tornado					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	10%	27	1		High
Branson R-IV	10%	489			High
Forsyth R-III	10%	132			High
Hollister R-V	10%	165	11	$5,080,037	High
Kirbyville R-IV	10%	38	2	$1,096,645	High
Taneyville R-II	10%	22	3	$553,249	High
Mark Twain R-VIII	10%	7	1		High
TOTAL					

Note: Emergency shelters included in critical non-profits and schools.

Table 3-67
Flood: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a flood event)

Flood					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	1%	3	1		Low
Branson R-IV	1%	49			Low
Forsyth R-III	1%	13			Low
Hollister R-V	1%	16	11	$508,004	Low
Kirbyville R-IV	1%	4	2	$109,665	Low
Taneyville R-II	5%	11	3	$276,624	Moderate
Mark Twain R-VIII	1%	1	1		Low
TOTAL					

Table 3-68
Severe Winter Storm: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a severe winter storm)

Severe Winter Storm					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	10%	27	1		High
Branson R-IV	10%	489			High
Forsyth R-III	10%	132			High
Hollister R-V	10%	165	11	$5,080,037	High
Kirbyville R-IV	10%	38	2	$1,096,645	High
Taneyville R-II	10%	22	3	$553,249	High
Mark Twain R-VIII	10%	7	1		High
TOTAL					

Table 3-69
Drought: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a drought event)

Drought					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	1%	3	1		Low
Branson R-IV	1%	49			Low
Forsyth R-III	1%	13			Low
Hollister R-V	1%	16	11	$508,004	Low
Kirbyville R-IV	1%	4	2	$109,665	Low
Taneyville R-II	1%	2	3	$55,325	Low
Mark Twain R-VIII	1%	1	1		Low
TOTAL					

Table 3-70
Heat Wave: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a heat wave event)

Heat Wave					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	5%	14	1		Moderate
Branson R-IV	5%	244			Moderate
Forsyth R-III	5%	66			Moderate
Hollister R-V	5%	82	11	$2,540,018	Moderate
Kirbyville R-IV	5%	19	2	$548,322	Moderate
Taneyville R-II	5%	11	3	$276,624	Moderate
Mark Twain R-VIII	5%	3	1		Moderate
TOTAL					

Table 3-71
Earthquake: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to an earthquake event)

Earthquake					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	1%	3	1		Low
Branson R-IV	1%	49			Low
Forsyth R-III	1%	13			Low
Hollister R-V	1%	16	11	$508,004	Low
Kirbyville R-IV	1%	4	2	$109,665	Low
Taneyville R-II	1%	2	3	$55,325	Low
Mark Twain R-VIII	1%	1	1		Low
TOTAL					

Table 3-72
Dam Failure: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a dam failure event)

Dam Failure					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	1%	3	1		Low
Branson R-IV	1%	49			Low
Forsyth R-III	1%	13			Low
Hollister R-V	1%	16	11	$508,004	Low
Kirbyville R-IV	1%	4	2	$109,665	Low
Taneyville R-II	1%	2	3	$55,325	Low
Mark Twain R-VIII	1%	1	1		Low
TOTAL					

Table 3-73
Wild Fire: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to a wild fire event)

Wild Fire					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	5%	14	1		Moderate
Branson R-IV	1%	49			Low
Forsyth R-III	5%	66			Moderate
Hollister R-V	5%	82	11	$2,540,018	Moderate
Kirbyville R-IV	1%	4	2	$109,664	Low
Taneyville R-II	5%	11	3	$276,624	Moderate
Mark Twain R-VIII	5%	3	1		Moderate
TOTAL					

Note: Threat of wildfire exists in residential subdivisions and isolated developments scattered across the County.

Table 3-74
Sink Holes: Taney County School District's Vulnerability Assessment
(Estimates based on level of vulnerability from the table 3-42 "Overall Summary of Hazard Vulnerability by Jurisdiction" of each district to sink hole event)

Sink Hole					
School District	Hazard Value	# of People Affected	# of Buildings	Property Damage	Functional Loss
Bradleyville R-1	1%	3	1		Low
Branson R-IV	1%	48			Low
Forsyth R-III	1%	13			Low
Hollister R-V	1%	16	11	$508,003	Low
Kirbyville R-IV	1%	4	2	$109,664	Low
Taneyville R-II	1%	2	3	$55,324	Low
Mark Twain R-VIII	1%	1	1		Low
TOTAL					

Vulnerability Assessment Tables for Special Districts

Table 3-75
Ozarks Technical Community College – Table Rock Campus Opening 2013

Hazard	Hazard Value	Property Damage	Functional Loss
Tornado	10%	$800,000	High
Severe Thunder Storms	10%	$800,000	High
Flood	1%	$80,000	Low
Severe Winter Weather	5%	$400 ,000	Moderate
Drought	1%	$80,000	Low
Heat Wave	1%	$80,000	Low
Earthquake	5%	$400,000	Moderate
Dam Failure	1%	$80,000	Low
Wild Fire	1%	$80,000	Low
Sink Hole	1%	$80,000	Low

Part 4: City/County Capability Assessment

Mitigation Management Policies

The Taney County Emergency Management Agency is charged with preparing for disasters. This responsibility includes advising the Taney County Commission on mitigation measures and implementing those measures deemed appropriate by the commission. In general, the county's policies encourage cooperation between the various Taney County agencies and cooperation between county agencies and those of neighboring jurisdictions.

Existing Plans

Taney County Emergency Operations Plan

The *Taney County Emergency Operation Plan* (EOP) is approved by the County Commission and identifies facilities and resources that require special security during a disaster, promotes the development and maintenance of mutual aid agreements with nearby agencies, requires participation in drills and exercises, identifies vulnerabilities within the county, and includes an evacuation plan. The EOP includes all-hazard mitigation measures.

Taney County Master Plan

The *Taney County Master Plan*, developed and adopted by the county in 1999, sets forth goals, objectives and policies to better manage growth and development in the unincorporated areas of the county. One of the main goals is to encourage development in and around already-developed areas to provide more efficient access to adequate roadways, utilities, and emergency services.

Taney County Development Guidance Code

Adopted by the Taney County Commission in November 1984, the purpose of these codes is to manage the growth and development of the unincorporated areas of Taney County so as to achieve the objectives authorized by law according to RSMo 64.815, RSMo 64.825, and RSMo 64.850. The Development Guide Code is a performance-based zoning and subdivision regulation; the Code is reviewed on an annual basis and updated as determined necessary. The most recent update was in May 2012.

Community Health Assessment for Taney County

The purpose of the 2008 assessment process was to provide a report to the community regarding progress that has been made on previously identified priorities and to review current trends that may require action to protect the health of the public. The previous health assessment, in 2005, identified three priority areas that were presented to the community to increase awareness and stimulate public health efforts. The priority areas focused on tobacco use, obesity and family/domestic violence. From these priorities, community meetings and groups met and early progress toward addressing these issues was observed.

State Transportation Improvement Plan (STIP)

The STIP is the Missouri Department of Transportation's plan outline for transportation system improvements programmed for a five year period. Programmed improvements in the 2011-2015 relevant to Taney County include various pavement improvements on Rte. 76, at the Rte. 65/Rte. 160 interchange, and on the ramps at interchanges with Rtes. 106, F, Bee Creek Road, 248 and 76. There will be a replacement of interchange ramps at Rte. 248 (Shepherd of the Hills Expressway/ Branson Landing Blvd. as well as bridge improvements over Bull Shoals Lake.

Taney County Wastewater Master Plan

The *Taney County Wastewater Master Plan*, developed for the Taney County Regional Sewer District in 1999, addresses the current and projected wastewater treatment needs in sixteen of the twenty-one watersheds in Taney County, excluding the watershed areas within the cities of Branson, Hollister, and Forsyth. The Taney County Regional Sewer District is also working on relocation and raising a sewer lift station that flooded in 2008 and 2011.

City of Branson Comprehensive Plan

As of March 2012, they are in the final review stage for their 2030 Comprehensive Plan.

City of Forsyth Comprehensive Plan

Forsyth adopted their Comprehensive Plan in January 2003 and updated for 2010/2011. This plan is used as a guide and as a legal basis in making land use and zoning decisions

City of Rockaway Beach Comprehensive Plan

Rockaway Beach adopted a 2010 Comprehensive Plan in November. The purpose of the plan is to provide a policy guide for the growth and future development of the city.

City of Hollister Comprehensive Plan

Hollister adopted their most recent Comprehensive Plan in 2005.

School Districts

Emergency procedures are in place for many of the school districts located within Taney County. They conduct regular emergency drills for tornadoes, fires, earthquakes, and other severe weather events. In addition, many districts have evacuation plans in place. Kirbyville RVI, Taneyville RII, and Forsyth RIII have district-wide automated messaging systems that can notify employees, students, and parents of any emergencies.

Mitigation Programs

The mitigation programs outlined below are primarily outlined in the *Taney County Emergency Operations Plan* (EOP). The county does have a floodplain ordinance, as required by the National Flood Insurance Program (NIFP). It is the intent of these mitigation programs to deal with hazards that can be potentially catastrophic to life and property and to attempt to minimize those losses.

Tornado

The National Weather Service monitors atmospheric conditions and issues weather forecasts. When threatening conditions are detected, the Weather Service will issue either a tornado watch to indicate when conditions are favorable for tornadoes to develop, or a tornado warning when a tornado is sighted or indicated by radar. The burden of heeding warnings and taking proper action rests with individual communities and citizens. Local Emergency Management Agencies have developed effective community warning systems.

Riverine Flooding

Taney County Emergency Management Operations has established a plan for the onset of floods. It contains an extensive plan and management practices for any flood hazards that may affect the entire county or smaller secluded areas.

a. Protect human life and property.

b. National Weather Service will give advanced notice of flooding conditions to the public to minimize loss of life and property.

c. Establish and designate areas to be evacuated.

d. Local authorities will take immediate steps to warn and evacuate citizens.

e. Local authorities will commit available resources before requesting assistance from the next higher level of government.

f. Establish a secure perimeter to limit access to looters and sightseers.

g. Establish shelters and relief services for victims.

h. Establish a support system for those victims, whom are returned and require assistance with the reestablishment of their homes.

Severe Winter Weather

Utility companies in Taney County engage in right of way tree trimming and brush removal programs to mitigate problems of downed lines and poles that may be caused by high winds or severe winter weather (ice and snow).

Heat Wave/Extreme Cold

The National Oceanic and Atmospheric Administration (NOAA) outlines safety measures that can be taken and are broadcast during times of excessive heat/cold from local and regional radio and television stations.

Drought

The National Oceanic and Atmospheric Administration provides the first warning to the onset of drought. During times of drought, the NOAA monitors precipitation conditions throughout the United States. The NOAA also issues guidelines for water conservation, agriculture, and livestock preservation. It is the responsibility of local and regional governmental agencies to alert the public to the onset of drought and conservation practices to alleviate further water depletion.

Earthquake

The overall organization and emergency responsibilities for Taney County Emergency Management operations are provided in the Emergency Operations Plan and its annexes. In the event of an earthquake emergency such responses will be established:

a. Save lives and eliminate hazards which pose an immediate threat.

b. Establish reliable lines of communication between county and state emergency management agencies.

c. Mobilize emergency medical services.

d. Maintain access to and from damaged areas (i.e., debris removal).

e. Establish procedures for resources management.

f. Mobilize search and rescue operations.

g. Evacuate hazardous structures (after inspection).

h. Maintain public health (potable water and disease control).

i. Establish and maintain public works (restore utilities).

j. Open shelters and establish feeding centers for persons unable to return home.

Dam Failure

There are eight dams located in Taney County. The largest is Table Rock Dam, an earth and rock-fill embankment dam, which is maintained by the U.S. Army Corps of Engineers in Little Rock. A failure of the Table Rock Dam would cause a major flash flood along the White River basin west and south of the dam site. This could affect thousands of residents and visitors, depending on the season.

A second dam down river, Ozark Beach Dam (also known as Powersite Dam), owned and operated by the Empire District Electric Company, would also be affected if there is a failure from Table Rock Dam.

Because dam failure is seldom sudden, it is assumed that the residents in the inundation pathway along the river basin would receive adequate warning. The warning for Table Rock would come from the project office located above the dam or the 911 service at the Taney County Sheriff's Office in Forsyth. They, in turn, would notify the public in the danger area with the assistance of the rangers and local emergency responders. The Empire District Electric Company also has an Emergency Action Plan in place responsive to dam failure of the Ozark Beach or Table Rock dams.

There are also six earthen dams located in Taney County. The owners of the dams are responsible for providing early warnings of problems at their dams, for developing effective emergency action plans, and for coordinating these plans with local officials. The Water Resources Program within the MDNR provides technical assistance and informational resources for all dam owners.

Wildfire

The Missouri Department of Conservation works closely with each county by supplying support to prevent wildfires. This support is an outreach program mainly to private owners to carefully maintain their grounds. The program teaches safe practices for leaf and rubbish burning and the clearance of the ground around wooded areas. There are certain types of grasses and trees that are more resistant to fires and species diversity is encouraged.

Capabilities and Responsibilities

The *Taney County Emergency Operations Plan* has a specific outline of emergency functions for most of the departments within local government. This is in addition to their day-to-day duties. The emergency management organization has set up the following functional lines and definitions:

- Direction and Control: To direct and control emergency support personnel from a centralized facility in the event of an emergency.

- Communications and Warning: To provide information and guidance concerning available communications and warning capabilities.

- Emergency Public Information: To provide the timely release of accurate information in the event of a disaster or emergency.

- Damage Assessment: To organize existing personnel and communities so that repair, outside assistance, safety and mitigation efforts are carried out in a timely manner.

- Law Enforcement: To organize local law enforcement personnel and develop procedures that will enable Barry County and its municipalities to provide law enforcement services regardless of the situation.

- Fire and Rescue: To organize local firefighting resources and establish procedures that will enable these resources to meet demands of a disaster situation.

- Resource and Supply: To give local officials the ability to maintain a continuous inventory of resources and to allocate these resources in a prompt and orderly manner.

- Public Works: To organize public works resources so that they will be able to perform the many tasks essential to an effective emergency (disaster) response.

- Evacuation: To establish an organization and procedures for evacuation operations.

- In-place Shelter: To establish an option of sheltering residents in place to protect them from the effects of a disaster that threatens Barry County.

- Reception and Care: To provide for the temporary reception and care of people displaced or evacuated from their residence because of an emergency or disaster situation.

- Health and Medical: To establish an organization and procedure to provide needed health and medical services following a disaster of any type.

The EOP also has functions for Hazardous Materials Response and Terrorism that are not covered in this mitigation plan. The subsequent sections outline the responsibilities and capabilities of local governments and private and public organizations in Taney County.

County Commission/Mayor

The primary responsibility of the County Commission/Mayor is Direction and Control. Under Direction and Control, the Presiding Commissioner/Mayor implements the Emergency Operations Plan, activates response personnel, and directs emergency response operations. They are also responsible for Emergency Public Information. They either prepare and release public information themselves or designate a Public Information Officer to be responsible for public information.

Law Enforcement

The Sheriff's Department/Municipal Police have the primary responsibilities for Law Enforcement, Communications and Warning, and Evacuation. These include, but are not limited to, maintaining law and order, providing protection/security for critical facilities and resources (EOC) and at the disaster site (private and public property), limit access to the disaster scene and/or evacuated area, and provide law enforcement in reception centers, lodging and feeding facilities, and emergency shelters. Law enforcement must also provide communications and assist in the dissemination of warning to the public (mobile units), provide traffic and crowd control, and assist in the evacuation of disaster areas. Due to security reasons, the specific capabilities and staffing of law enforcement are detailed only in the Emergency Management Director's Manual.

Several organizations provide law enforcement in Taney County and share the burden of all of these tasks. These entities include:

- Taney County Sheriff's Department
- Missouri Highway Patrol
- Missouri Water Patrol
- Missouri Department of Conservation
- Branson Police Department
- Forsyth Police Department
- Rockaway Beach Police Department
- Merriam Woods Police Department
- Surrounding Law Enforcement Agencies: Stone County Sheriff's Office, Christian County Sheriff's Office, Ozark County Sheriff's Office, Douglas County Sheriff's Office

County Engineer

The County Engineer has the primary responsibility of Public Works. The responsibilities include, but are not limited to, overall administration of the Public Works service for Taney County, clearing roads and assisting in restoring utilities to facilitate emergency operations, participating in cleanup and recovery operations, and assisting in search and rescue operations. Due to security reasons, the specific capabilities of Public Works are detailed only in the Director's Manual.

Fire Departments/Districts

The Fire Departments/Districts have the primary responsibility for Fire and Rescue. This includes, but is not limited to, controlling fires during emergency operations, assisting as medical first responders, and directing search and rescue operations for victims. They should also participate in tests, exercises, and drills and develop fire safety programs, to include disaster situations, and present them to the public. The fire departments/districts are outlined with their specific capabilities and staffing in the Emergency Management Director's Manual.

Emergency Management Director

The Emergency Management Director (EMD) for Taney County has the primary responsibilities for Emergency Operations, In-place Shelter, and Reception and Care. The EMD is responsible for the coordination of all emergency management activities and EOC (emergency operations center) operations, ensuring proper functioning of the EOC during emergency operations, and acting as liaison with other local, state, and federal emergency management agencies.

In-place shelter responsibilities include, but are not limited to, conducting public awareness programs and working with local officials to develop in-place protective shelter plans. The EMD is responsible for seeing that necessary plans and procedures are developed to ensure a capability for Reception and Care operations, which will include coordinating Reception and Care operations with the American Red Cross.

County Health Department

The County Health Department has the primary responsibility of Health and Medical. This includes, but is not limited to, identifying clinics, nursing homes, and other facilities (i.e., school gyms) that could be expanded into emergency treatment centers for disaster victims, instituting public health measures in reception centers, public shelters, and at the disaster scene, and distributing antidotes, drugs, vaccines, etc., to shelters when opened to the public. They need to develop and conduct programs for the public on first-aid and public health practices and provide public health information to the PIO for dissemination to the public. They should also train health and medical personnel and volunteers in special procedures.

The Local Public Health Emergency Plan (LPHEP) outlines the actions to be taken by the Local Public Health Agency (LPHA) in conjunction with local government officials and cooperating private and volunteer organizations. A local public health emergency can best be described as an event, which threatens the safety and well being of a number of people in an area, i.e. bio-terrorism incident, anthrax, smallpox, pandemic influenza, etc. The plan has been developed to:

- Reduce the vulnerability of citizens to any disasters that creates a local public health emergency.
- Establish capabilities for protecting citizens from the effects of a local public health emergency.
- Respond effectively to the actual occurrence of disasters.
- Provide for recovery in the aftermath of any local public health emergency.

County/City Clerk

The County/City Clerk has the primary responsibility of Resource and Supply. This includes, but is not limited to, identifying potential resource needs, locating the required resources in the community or finding their nearest location, and maintaining these resource lists. They need to coordinate activities with other response agencies (i.e., Red Cross) to ensure a coordinated and efficient allocation and with the PIO (public information officer) in informing the public of the locations of available assistance. They

need to maintain records of services rendered, resources utilized and their costs, unused resources, etc. for the emergency.

County Assessor

The County Assessor has the primary responsibility of Damage Assessment. This includes, but is not limited to, maintaining a file of maps, pre-disaster photos, tax assessments, etc., conducting private and public damage assessments, accompanying/assisting state and federal damage assessment teams, and assisting in preparing damage repairs reports to receive federal aid.

County Coroner

The County Coroner has no primary responsibility but is to assist in the support of Health and Medical. The coroner must develop/maintain emergency mortuary plans and procedures, coordinate with the Missouri Funeral Directors Association, and provide a list of the deceased.

Ambulance Districts and Hospitals

The Taney County Ambulance District does not have a primary responsibility but is to aid in the support of Health and Medical by being responsible for first responder emergency medical care including initial triage, emergency medical treatment, and patient transport. Taney County is supported by one hospital, Skaggs Community Health Center located in Branson. This hospital has developed emergency plans in accordance with state and federal regulations. Such plans are tested and exercised regularly.

Utility Companies

The utility companies do not have a primary responsibility but help in the support of Public Works. The private utility companies are responsible for the direction and control of the services they provide to their customers. The utility companies serving Taney County do maintain their own emergency plans.

American Red Cross

The Red Cross responds and provides emergency assistance to evacuees, disaster victims and emergency workers involved in a disaster or threatened by a disaster. Assistance may be in the form of fixed or mobile feeding stations, clothing, mass or individual shelter, cleaning supplies, comfort kits, first aid, supplementary medical care or blood and blood products. As soon as families are able to resume living as families rather than in shelters, they are assisted with their verified urgent needs—rent, beds and bedding, necessary furniture, fuel, cooking and eating utensils, health needs, occupational supplies, transportation and minor home repairs. In doing so, the Red Cross uses all available resources from the federal, state and local governments and private agencies.

Additional recovery assistance may be provided when other resources are not available or are inadequate; such assistance may include repair or rebuilding of homes, replacement of essential household contents or other needs.

The local chapter of the American Red Cross can and will call upon the regional and/or national headquarters for assistance and additional trained staff and volunteers to aid in the operations of disaster relief when necessary. The American Red Cross Ozarks Chapter office is located at 1211 S. Glenstone, Springfield, Missouri (Greene County).

E-911 Emergency Communications Center/Mobile Command Center

E-911 communications for Taney County is located in Forsyth at the County Sheriff's Department. The primary EOC is located in the ground level courtroom in the Taney County Courthouse in Forsyth. The alternate EOC is the Fire Station #1 in Branson. Municipal EOCs are as follows:

• Branson:	Primary EOC	-	Fire Station #1
	Alternate EOC	-	Lower level of City Hall at Commercial & Maddux
• Hollister:	Primary EOC	-	Hollister City Hall on Esplanade Street
	Alternate EOC	-	Hollister City Police Department
		-	
• Forsyth:	Primary EOC	-	Forsyth City Hall
	Alternate EOC	-	Forsyth Police Department
• Rockaway Beach	Primary EOC	-	Rockaway Beach City Hall
	Alternate EOC	-	Rockaway Beach Police Department
• Merriam Woods	Primary EOC	-	Merriam Woods City Hall
	Alternate EOC	-	No alternate EOC

The Taney County Ambulance District mobile multi-agency command center located at the district office in Hollister could be used as a mobile EOC, if necessary.

Advanced Warning Systems

Outdoor Warning sirens

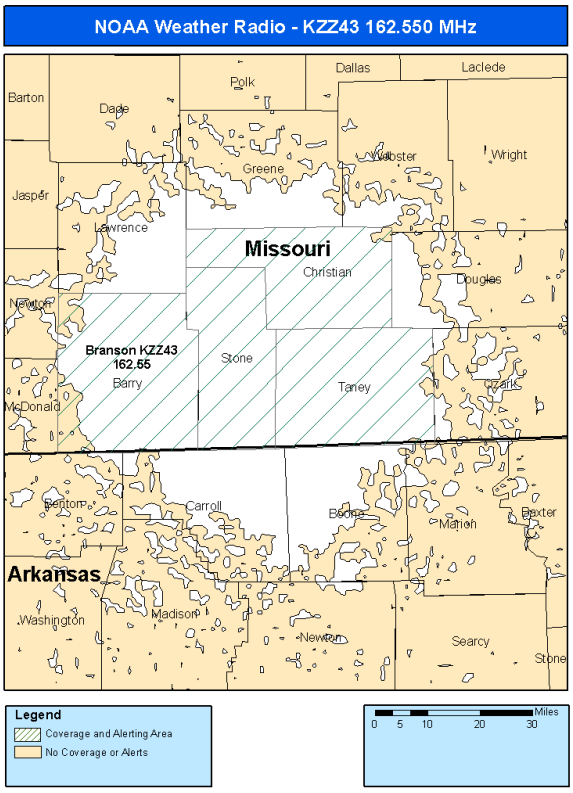
There are presently 31 outdoor warning sirens in Taney County. These sirens can be activated on the authority of the Fire or Police Chief of the community, the Taney County Sheriff, or the Emergency Management Director. Warning in these communities and the remaining areas of Taney County will be supplemented with mobile public address operations by the Sheriff's Office, municipal police and local fire departments. Radio and television stations will also broadcast warnings.

- The City of Branson has 23 sirens that are radio activated by the fire and police departments.
- The City of Forsyth has four (4) sirens that are radio activated by the fire and police departments.
- The City of Rockaway Beach has one siren that is manually activated.
- The Village of Taneyville has one siren that is manually activated.
- College of the Ozarks (Point Lookout) has one siren that is manually activated.
- Marriam Woods has one radio activated by Forsyth.

NOAA Weather Radios

Figure 4-1 shows the NOAA weather radio coverage and alerting areas for the NOAA transmission station in Branson. The coverage statistics and maps are calculated using a computer model that is sensitive to antenna performance in local conditions. The white area in the figure includes nearly all of Taney County. The cross hatching indicates alerting areas.

Figure 4-1: NOAA Radio Transmission Area



Source: http://www.nws.noaa.gov/nwr/Maps/PHP/site.php?State=MO&Site=KZZ43

Weather Spotters

Taney County has approximately 100 weather spotters, including firefighters from the various fire protection districts or departments, law enforcement, EMTs, ham radio

operators, and citizens within the county. The last training course was held in March, 2005. Information on weather spotters is included in the Director's Manual.

Assessment of Policies and Programs

Commitments to a Comprehensive Mitigation Program

Taney County and incorporated areas executed resolutions adopting the *2005 Plan* as a commitment to the mitigation. This commitment was demonstrated when the cities of Forsyth and Merriam Woods joined the NFIP. Participation in the NFIP requires adoption of flood plain management regulations. The only communities yet to join the NFIP are Kirbyville and Taneyville where there are no special flood hazard areas. All county and municipal floodplain management ordinances, and land development codes reduce some of the county's vulnerability to natural disasters. Branson, Hollister and Rockaway Beach have updated or adopted comprehensive plans since 2005. All communities that maintained building codes in the *2005 Plan* updated to more recently published standards. However, Taney County, Kirbyville and Bull Creek have not adopted buildings codes. Taney County is highly vulnerable to tornadoes, severe thunderstorms, flooding and severe winter weather. Participation in the NFIP and restrictions on flood plain development are certainly the greatest mitigation actions in protecting the lives of county residents. Taney County has made progress towards mitigation and is continuing efforts to decrease the impact of a natural hazard. School districts and other special districts have been added as participants in the *Plan* expanding the commitment to the mitigation program.

Laws, Regulations and Policies Relating to Development in Hazard–Prone Areas

The Taney County Commission has established a floodplain management program to maintain the community's eligibility for participation in the National Flood Insurance Program. The county contracts with the Planning and Zoning Administrator to administer the program. The county's floodplain management ordinance specifies the requirements for development in the identified special flood hazard areas. It states that anyone building in the flood hazard area must first obtain a floodplain permit. It also sets forth penalties for violation of the ordinance.

Taney County does require building permits. When a permit is requested the Planning and Zoning Department is contacted and asked to survey the land. While conducting the survey the administrator has the opportunity to review the building's location in, near, or around a floodplain. Once that has been established, the administrator can make recommendations as to whether the proposed building meets the requirements of the Floodplain Management ordinance.

Laws, Regulations and Policies Related to Hazard Mitigation in General

Taney County's Development Guidance Code, which are reviewed and amended as determined necessary on an annual basis, provide for general regulation of land development location and intensity of development in the unincorporated portions of the county, including requirements for stormwater drainage and other infrastructure. Several

of the incorporated communities have adopted zoning and subdivision regulations which contain general provisions related to hazard mitigation. Communities such as Merriam Woods are in the process of updating their land development codes to better manage the demands of growth.

How the County Determines Cost-Effectiveness and Manages/Implements Programs

Cost-effectiveness is considered on a case-by-case basis, dependent upon the scope of damages, estimated savings in future hazard events, the type of mitigation project, and the probable hazard to human life in future events. For example, FEMA-funded mitigation projects must meet the benefit/cost analysis criteria required by FEMA.

Current Criteria Used to Prioritize Mitigation Funding

Mitigation funding priority is primarily based upon a combination of anticipated damage and injury/death impacts. It is a county priority to enable access to infrastructures and emergency measures in areas of higher population concentration.

Integration of Hazard Mitigation with the City/County Department's Plans

The *Taney County Emergency Operations Plan* outlines the departments and entities responsible for implementing plans, actions and specific duties prescribed in the EOP. The Taney County Commission has overall responsibility for integration of hazard mitigation into county plans. The Taney County Emergency Management Director advises the Commission on hazard mitigation. Several communities have emergency management coordinators that are responsible for advising their governing boards on hazard mitigation. In addition, the Local Emergency Planning Committee (LEPC) meets bi-monthly. The Taney County EMA committee includes representatives from the fire district, law enforcement, emergency medical and health organizations. The cities rely on the county's EOP. .

Mitigation Funding Options Including Federal, State, Local, and Private Sources

Taney County and the municipalities have historically relied upon federal disaster declarations in cases of heavy widespread damages. Funding sources have included FEMA, SEMA, the Missouri Department of Natural Resources and Department of Economic Development (DED), and various other grant programs. In addition, investments in infrastructures that have mitigating effects have been funded from sources such as local tax revenues.

How County Government Meets Requirements for Hazard Mitigation Funding

Taney County primarily meets requirements for hazard mitigation funding through its participation in the National Flood Insurance Program. The county's *Emergency Operations Plan*, floodplain management ordinance, and Development Guidance Code (zoning and subdivision regulations) include various measures addressing floodplain

development, sewer and water installations, roadway construction, and stormwater management.

City/Town/Village Policies and Development Trends

Table 4-1 notes the plans and regulations related to hazard mitigation that have been adopted by the municipalities in Taney County. Of the nine communities in the county, all but two have adopted subdivision regulations. Branson, Forsyth, Hollister, Kirbyville, Merriam Woods, Rockaway Beach, and Taneyville have adopted other regulations as well, including building codes, zoning regulations, and stormwater regulations. The Village of Merriam Woods also has earthquake design regulations. The communities of Branson, Forsyth, Hollister, Merriam Woods, and Rockaway Beach have adopted comprehensive plans. Branson, Bull Creek, Hollister, Rockaway Beach, Forsyth and Merriam Woods are all members of the NFIP as of July 2012.

Substantial new development has occurred over the past decade along the major highway corridors in Taney County, including U.S. Highway 65 and Missouri Highways 76 and 160. Most major commercial developments are located in or near the cities. Much of the new development in the unincorporated areas is residential development, including both single family residential uses and multi-family. Condominium development is also included in the multi-family category. Scattered residential uses are also located along the major and secondary roads, with increasing levels of development occurring in the Merriam Woods and Bull Creek areas, north of Branson and in the Hollister area along Highway 65.

National recognition of the Branson area and the opening of many new music theatres in the early 1990s have made tourism the economic mainstay in Taney County. Today, Branson has over 40 theaters with more than 60,000 theater seats, 207 lodging facilities with over 18,000 rooms and 200 restaurants with over 38,000 seats. At any given night, there may by up to 20,000 visitors and employees located in the various hotels and theaters on Branson's main arterial road.

How Local Risk Assessments are Incorporated into Local Planning

The Taney County Emergency Operations Plan outlines the departments and entities responsible for implementing plans, actions and specific duties prescribed in the EOP. The governing bodies of each participating jurisdiction are responsible for integration of hazard mitigation into local plans.

The most notable local planning mechanism is a community's comprehensive or master plan. The purpose of the comprehensive plan is goal oriented document that serves as a policy guide for the future growth and physical development of the community. The plan itself is not law but serves as the foundation for further ordinances and regulations necessary to implement the plan. The mechanisms for implementing the comprehensive plan are zoning ordinances, subdivision regulations, building codes, storm water and floodplain management regulations and capital improvement programs.

The review, revision, update and adoption of local government land use controls, as listed above, serve as the process by which multi-jurisdictional risk assessments are integrated into local planning mechanisms that are ultimately administered through site plan review, evaluation of development and redevelopment proposals and resource allocation for local government. Table 4-1 and Table 4-2 list the plans and land development regulations adopted by the incorporated communities in Taney County.

The local government floodplain management ordinance and development code provide the primary means for incorporating risk assessment and mitigation into local planning. Storm water regulations and building codes are also in effect in the county and several of the incorporated communities. In terms of school districts, long-range strategic, facilities, storm sheltering and evacuation plans are the mechanisms through which jurisdictional risk assessments are incorporated.

Table 4-1: City Plans and Regulations

Jurisdiction	Master Plan	Zoning	Building Codes	Earthquake Design	Subdivision Regulations	Stormwater Regulations	Floodplain Regulations
Taney County	No	No	No	No	No	No	No
Branson	Yes	Yes	Yes	No	Yes	Yes	Yes
Bull Creek	No	No	No	No	Yes	No	Yes
Forsyth	Yes	Yes	Yes	No	Yes	Yes	Yes
Hollister	Yes	Yes	Yes	No	Yes	Yes	Yes
Kirbyville	No	Yes	No	No	Yes	No	No
Merriam Woods	Yes	Yes	Yes	Yes	No	No	Yes
Rockaway Beach	Yes	Yes	Yes	No	Yes	No	Yes
Taneyville	No	Yes	No	No	Yes	No	No

How Local Jurisdictions Have Incorporated Mitigation Strategies and Risk Assessment into Planning Mechanisms

Since the original *Taney County Natural Hazard Mitigation* Plan in 2005, several mitigation strategies and risk assessment have been incorporated into city planning mechanisms. Forsyth has implemented not only a Comprehensive Plan, but stormwater regulations and floodplain regulations. In addition, Rockaway Beach has gone from having no zoning, to having a Comprehensive Plan, Zoning Regulations, Subdivision Regulations, Stormwater Regulations, and Floodplain Regulations. Building Codes for Branson, Forsyth, Hollister, and Rockaway Beach have all been updated as well.

In addition to these new city plans and regulations, Merriam Woods and Forsyth have been added as members and participants in the NFIP, among the already participating Branson, Bull Creek, Hollister, and Rockaway Beach.

*In Table 4-2, it is important to note that although the County's capability assessment of effectiveness for stormwater regulations, building regulations, and zoning regulations may be low to medium, many of the cities within the county have taken positive

preventative measures by implementing their own stormwater, zoning, and building regulations.

Table 4-2: Taney County Capability Assessment

Policies and Programs (ex. Zoning Ordinance)	Document Reference (ex. Comprehensive Plan & page number)	Effectiveness for Mitigation (ex. low, medium, high)	Rationale for Effectiveness (ex. low because allows development in floodplain)
Floodplain Management	Taney County Floodplain Management Resolution/Ordinance No. 60.3b, 4/22/2002 No. 60.3b amended on 12/23/2002	High	New construction and improvements not allowed without requirements.
Flood Insurance	National Flood Insurance Program, #290435, joined 4/1/2002	High	The county administers and participates in the NFIP.
Stormwater Regulations	Some stormwater management regulation included in the Development Guidance Code.	Medium*	The county currently does not have separate stormwater regulations. The Development Guidance Code does provide some regulation for stormwater management in new developments.
Comprehensive Plan	Taney County Master Plan, adopted 12/27/1999	Medium	The Master Plan contains goals, objectives and strategies related to stormwater management.
Zoning and Subdivision Regulations	Taney County Development Guidance Code, adopted 11/1984	Medium*	Provides some regulation for stormwater management infrastructure in new development.
Building Regulations	N/A	Low*	The county does not have building regulations.
Right-of-way tree trimming/brush removal	Utility companies' programs	Medium	Removes tree limbs/brush near power lines to prevent power outages caused by heavy winds and winter storms

Part 6: Plan Maintenance

Taney County has developed a method to ensure regular review and update of the *Natural Hazard Mitigation Plan.* The County's Hazard Mitigation Planning Committee consists of the County Commissioners, municipal officials, members of the Taney County Emergency Management Committee (fire, law enforcement, emergency medical, and public health officers), officials responsible for various objectives in the Plan, and the County EMD. Hazard mitigation objectives will be an agenda item, as needed, at bi-monthly meetings of Local Emergency Planning Committee (LEPC).

The County EMD shall be responsible for contacting all Hazard Mitigation Planning Committee members and organizing the annual meeting. The County Commission, the EMD, and the participating municipalities will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan. They will review each goal and objective to determine their relevance to changing situations in the county, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions. They also will review the risk assessment portion of the Plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, including which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

Following the annual review, the County EMD will have three months to update and make changes to the Plan as determined necessary before submitting it to the Committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination.

The general public will be encouraged to attend Hazard Mitigation Planning Committee meetings through published notices, reminders or announcements at civic meetings, and possibly public speaking engagements. The Southwest Missouri Council of Governments will host announcements as well as a copy of the latest Plan on the SMCOG website at www.smcog.missouristate.edu.

Part 7: Appendices

Appendix A: Sample Adoption Resolutions

Appendix B: Repetitive Losses

Appendix C: Acronyms

Appendix D: Glossary

Appendix E: References

Appendix F: Neighboring Jurisdictions

Appendix A: Sample Adoption Resolutions

Sample Adoption Resolutions for County, Cities and Villages

RESOLUTION NO. _____

A RESOLUTION OF INTENT TO PARTICIPATE IN NATURAL HAZARD MITIGATION AND TO WORK TOWARD BECOMING A SAFER COMMUNITY.

WHEREAS, the (Jurisdiction) recognizes that no community is immune from natural hazards whether it be tornado/severe thunderstorm, flood, severe winter weather, drought, heat wave, earthquake, dam failure or wildfire and recognizes the importance enhancing its ability to withstand natural hazards as well as the importance of reducing the human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, the (Jurisdiction) may have previously pursued measures such as building codes, fire codes, floodplain management regulations, zoning ordinances, and stormwater management regulations to minimize the impact of natural hazards; and

WHEREAS, the Federal Emergency Management Agency and the State Emergency Management Agency have developed a natural hazard mitigation program that assists communities in their efforts to become Disaster-Resistant Communities which are sustainable communities after a natural disaster that focus, not just on disaster relief, but also on recovery and reconstruction that brings the community to at least pre-disaster conditions in an accelerated, orderly and preplanned manner; and

WHEREAS, by participating in the Natural Hazard Mitigation program, the (Jurisdiction) will be eligible to apply for post-disaster mitigation funds; and

WHEREAS, the (Jurisdiction) desires to commit to working with government partners and community partners to implement the Natural Hazard Mitigation Plan; and

WHEREAS, the (Jurisdiction) will implement pertinent precepts of the mitigation plan by incorporation into other community plans and mechanisms where appropriate; and

WHEREAS, the (Jurisdiction) will participate in the evaluation and review of the Plan after a disaster as well as complete a mandated five-year update submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval; and

NOW, THEREFORE BE IT RESOLVED BY THE (Jurisdiction) AS FOLLOWS:

The (Jurisdiction) hereby adopts the Barry County Multi-Jurisdictional Natural Hazard Mitigation Plan attached hereto for the purpose of building a safer community by reducing natural hazard vulnerability.

Certifying Official(s) Date

Sample Resolution for School Districts

RESOLUTION NO. _____

A RESOLUTION OF INTENT TO PARTICIPATE IN NATURAL HAZARD MITIGATION AND TO WORK TOWARD BECOMING A SAFER COMMUNITY.

WHEREAS, the (District Name) recognizes that no community is immune from natural hazards whether it be tornado/severe thunderstorm, flood, severe winter weather, drought, heat wave, earthquake, dam failure or wildfire and recognizes the importance enhancing its ability to withstand natural hazards as well as the importance of reducing the human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, the (District Name) may have previously pursued measures such as building modifications, storm water management, or educational instruction and safety drills to minimize the impact of natural hazards; and

WHEREAS, the Federal Emergency Management Agency and the State Emergency Management Agency have developed a natural hazard mitigation program that assists communities in their efforts to become Disaster-Resistant Communities which are sustainable communities after a natural disaster that focus, not just on disaster relief, but also on recovery and reconstruction that brings the community to at least pre-disaster conditions in an accelerated, orderly and preplanned manner; and

WHEREAS, by participating in the Natural Hazard Mitigation program, the (District Name) will be eligible to apply for post-disaster mitigation funds; and

WHEREAS, the (District Name) desires to commit to working with government partners and community partners to implement the Natural Hazard Mitigation Plan; and

WHEREAS, the (District Name) will implement pertinent precepts of the mitigation plan by incorporation into other plans and mechanisms where appropriate; and

WHEREAS, the (District Name) will participate in the evaluation and review of the Plan after a disaster as well as complete a mandated five-year update submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval; and

NOW, THEREFORE BE IT RESOLVED BY THE (District Organization Name), Missouri AS FOLLOWS:

The (District Organization Name) hereby adopts the Barry County Multi-Jurisdictional Natural Hazard Mitigation Plan attached hereto for the purpose of building a safer community by reducing natural hazard vulnerability.

District Chairman/President Date

Appendix B: Repetitive Losses

Table B-1 shows repetitive losses to the National Flood Insurance Program (NFIP) in Taney County as of 2009. Information is shown concerning whether mitigation actions were previously taken, whether the property was insured at the time of the flood, total payments made by the NFIP for building losses and contents losses, the number of times the property has been claimed to the NFIP, total claims paid on the property, and average claim payment.

Table B-1: Taney County Repetitive Losses as of 2009	
Community	City of Branson
State	Missouri
Zip Code	65616-3600
Type	Single Family
Mitigated?	No
Insured?	No
Total Building Payment	-
Total Contents Payment	-
Losses	2 (1984 and 1982)
Total Paid	-
Average Paid	-
Source: Federal Emergency Management Agency, Region VII.	

Appendix C: Acronyms

- ASM Archaeological Survey of Missouri
- BFE Base Flood Elevation
- BLM Bureau of Land Management
- CDBG Community Block Development Program
- CEDS Comprehensive Economic Development Strategy
- CERI Center for Earthquake Research and Information
- CPC Climate Prediction Center
- CRS Community Rating System
- CTCFPD Central Taney County Fire Protection District
- DMA 2000 Disaster Mitigation Act of 2000
- EDA Economic Development Administration
- EMD Emergency Management Director
- EOC Emergency Operations Center
- EOP Emergency Operations Plan
- EPA Environmental Protection Agency
- FEMA Federal Emergency Management Agency
- FIRM Flood Insurance Rate Map
- FMA Flood Management Assistance (FEMA Program)
- GIS Geographic Information System
- HMGP Hazard Mitigation Grant Program
- HMST Hazard Mitigation Survey Team
- HUD Housing and Urban Development (United States, Department of)
- ICC Increased Cost of Compliance
- LMI Labor Market Information
- MCC Midwestern Climate Center
- MDC Missouri Department of Conservation
- MDNR Missouri Department of Natural Resources
- MoDOT Missouri Department of Transportation
- NCDC National Climatic Data Center
- NEHRP National Earthquake Hazards Reduction Program
- NFIP National Flood Insurance Program
- NFPA National Fire Protection Association
- NHMP Natural Hazard Mitigation Plan
- NOAA National Oceanic and Atmospheric Administration
- NRHP National Register of Historic Places
- NRCS Natural Resources Conservation Service
- NWS National Weather Service
- OEDP Overall Economic Development Program (see CEDS)
- PDM Pre-Disaster Mitigation Program
- PDSI Palmer Drought Severity Index
- SBA Small Business Administration
- SEMA Missouri State Emergency Management Agency
- SHMO State Hazard Mitigation Officer
- SMCOG Southwest Missouri Council of Governments
- SPC Storm Prediction Center

- USACE United States Army Corps of Engineers
- USDA United States Department of Agriculture
- USFA United States Fire Administration
- USFS United States Forest Service
- USFWS United States Fish and Wildlife Service
- USGS United States Geological Survey
- WTCFPD Western Taney County Fire Protection District

Appendix E: Glossary

Acquisition: Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Acquisition of Hazard-prone structures: Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Asset: Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Benefit: Net project outcomes, usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of conducting a benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable risk reduction factors, including a reduction in expected property losses (building, contents, and function) and protection of human life.

Benefit-Cost Analysis (BCA): A systematic method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost-effectiveness.

Building: A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Capability Assessment: An assessment that provides a description and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards or specific threats.

Community Emergency Response Team (CERT): CERT is the mechanism to establish, train, and maintain a local cadre of residents to act as first responders in the event of an emergency. A CERT team is especially critical in the first three days following a disaster when conditions may prevent access by emergency response personnel.

Community Rating System (CRS): CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of the policyholders in those communities are reduced.

Comprehensive Plan: A document, also known as a "general plan," covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all to the physical elements that will determine the community's future development. This plan may discuss the community's desired physical development, desired rate and quantity of growth, community character, transportation service, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.

Cost–effectiveness: Cost-effectiveness is a key evaluation criterion for federal grant programs. Cost-effectiveness has several possible definitions, although for grant-making

purposes FEMA defines a cost-effective project as one whose long-term benefits exceed its cost. That is, a project should prevent more expected damages than it cost initially to fund the effort. This is done to ensure that limited public funds are used in the most efficient manner possible. Benefit-cost analysis is one way to illustrate that a project is cost-effective.

Critical facilities: Facilities vital to the health, safety, and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Debris: The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Disaster Mitigation Act of 2000 (DMA 2000): DMA 2000 (Public Law 106-390) is the latest legislation to improve the planning process. It was signed into law on October 10, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Earthquake: A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.

Elevation of Structures: Raising structures above the base flood elevation to protect structures located in areas prone to flooding.

Emergency Response Services: The actions of first responders such as firefighters, police, and other emergency service personnel at the scene of a hazard event. The first responders take appropriate actions to contain the hazard, protect property, conduct search and rescue operations, provide mass care, and ensure public safety.

Erosion: Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.

Extent: The size of an area affected by a hazard or hazard event.

Fault: A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.

Federal Emergency Management Agency (FEMA): Independent agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

Flood Depth: Height of the flood water surface above the ground surface.

Flood Hazard Area: The area shown to be inundated by a flood of a given magnitude on a map.

Flood Insurance Rate Map (FIRM): Map of a community, prepared by FEMA, shows both the special flood hazard areas and the risk premium zones applicable to the community under the National Flood Insurance Program.

Flood Mitigation Assistance (FMA) Program: A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties.

Floodplain: Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Flood-proofing: Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight or intentionally allowing flood-waters to enter the interior to equalize flood pressures are examples of flood-proofing.

Flood Zone: A geographical area shown on a FIRM that reflects the severity or type of flooding in the area.

Goals: General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term in nature, and represent global visions.

Hazard: A source of potential danger or adverse condition.

Hazard Event: A specific occurrence of a particular type of hazard.

Hazard Identification: The process of identifying hazards that threaten an area.

Hazard Mitigation: Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.

Hazard Mitigation Grant Program (HMGP): authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administrated by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as community recovers from a disaster.

Hazard Profile: A description of the physical characteristics of hazards and a determination of various descriptions, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

HAZUS (Hazards U.S.): A GIS-based, nationally standardized, loss estimation tool developed by FEMA.

Infrastructure: Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, and includes an area's transportation system such as airports, heliports, highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry docks, piers, and regional dams.

Landslide: Downward movement of a slope and materials under the force of gravity.

Loss Estimation: Forecast of and economic impacts and property damage from future hazard events, based on current scientific and engineering knowledge.

Local Emergency Planning Committee (LEPC): LEPCs consist of community representatives and are appointed by the State Emergency Response Commissions (SERCs), as required by Superfund Amendments and Reauthorization Act (SARA), Title III. They develop an emergency plan to prepare for and respond to chemical emergencies. They are also responsible for coordinating with local facilities to find out what they are doing to reduce hazards, prepare for accidents, and reduce hazardous inventories and releases. The LEPC serves as a focal point in the community for

information and discussions about hazardous substances, emergency planning, and health and environmental risks.

Magnitude: A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Memorandum of Agreement: A non-binding statement that defines the duties, responsibilities, and commitment of the different parties or individuals; provides a clear statement of values, principles, and goals; and establishes an organizational structure to assist in measuring and evaluating progress.

Mitigate: To cause something to become less harsh or hostile, to make less severe or painful.

Mitigation Actions: Activities or projects that help achieve the goals and objectives of a mitigation plan.

Mitigation Plan: Systematically evaluating community policies, actions, and tools, and setting goals for implementation over the long term that will result in a reduction in risk and minimize future losses community-wide.

National Flood Insurance Program (NFIP): Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations as indicated in 44 CFR §60.3.

National Weather Service (NWS): Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to federal and state entities in preparing weather and flood warning plans.

Objectives: Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.

Open Space Preservation: Preserving undeveloped areas from development through any number of methods, including low-density zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone areas, land failures on steep slopes or liquefaction-prone soils, and can enhance that nature and beneficial functions of floodplains.

Ordinance: A term for a law or regulation adopted by a local government.

Planning: The act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Policy: A course of action or specific rule of conduct to be followed in achieving goals and objectives.

Post-Disaster Mitigation: An ordinance authorizing certain governmental actions to be taken during the immediate aftermath of a hazard event to expedite implementation of recovery and reconstruction actions identified in a pre-event plan.

Post-Disaster Recovery Planning: The purpose of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post- disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.

Preparedness: Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Probability: A statistical measure of the likelihood that a hazard event will occur.

Public Education and Outreach Programs: A campaign to make the public more aware of hazard mitigation programs, including hazard information centers, mailings, public meetings, etc.

Recovery: The actions taken by an individual or community after a catastrophic event to restore order and lifelines in a community.

Regulatory Power: Local jurisdictions have the authority to regulate certain activities in their jurisdiction. With respect to mitigation planning, the focus is on such things as regulating land use development and construction through zoning, subdivision regulations, design standards, and floodplain regulations.

Relocation out of Hazard Areas: A mitigation technique that features the process of demolishing or moving a building to a new location outside the hazard area.

Resources: Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.

Response: The actions taken during an event to address immediate life and safety needs and to minimize further damage to properties.

Risk: The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Stakeholder: Individual or group that will be affected in any way by an action or policy. They include businesses, private organizations, and citizens.

State Hazard Mitigation Officer (SHMO): The representative of state government who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Structural Retrofitting: Modifying existing buildings and infrastructure to protect them from hazards.

Subdivision: The division of a tract of land into two or more lots for sale or development.

Subdivision Regulations: Regulations and standards governing the division of land for development or sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sediment during development. They can be used to minimize exposure of buildings and infrastructure to hazards.

Substantial Damage: Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition

would equal or exceed 50 percent of the market value of the structure before the damage.

Tectonic Plate: Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.

Topographic: Characterizes maps that show manmade features and indicate the physical shape of the land using contour lines.

Tornado: A violently rotating column of air extending from a thunderstorm to the ground.

Vulnerability: Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, since many businesses depend on uninterrupted electrical power, if an electric substation is flooded it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability Assessment: The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Water Systems: Information about drinking water systems in Missouri is maintained by the Missouri Department of Natural Resources. Water systems in Taney County listed in the Safe Drinking Water Information System are defined as:

> **Community Water Systems**. Water systems that serve the same people year around, such as homes and businesses.
>
> **Non-Transient Non-Community Water Systems**. Water systems that serve the same people, but not year around, such as schools or lodges that have their own systems.
>
> **Transient Non-Community Water Systems**. Water systems that do not consistently serve the same people, such as rest stops, gas stations and campgrounds.

Wildfire: An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Zoning: The division of land within a local jurisdiction by local legislative regulation into zones of allowable types and intensities of land uses.

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Appendix F: Neighboring Agency Invitation List

Contact	Agency	How Contacted	Added to List	Invited to Attend
Peggy Golden	OACAC	Mail/Email	4/10/ 2012	All meetings
	Forsyth Chamber of Commerce	Mail/Email	4/10/2012	All meetings
	Hollister Chamber of Commerce	Mail/Email	4/10/2012	All meetings
	Rockaway Beach Chamber of Commerce	Mail/Email	4/10/2012	All meetings
	Branson Lakes Area Chamber of Commerce and Convention Visitors' Bureau	Mail/Email	4/10/2012	All meetings
Wayne Dietrich	University of Missouri Extension	Mail/Email	4/10/2012	All meetings
Cy Murray	White River Valley Electric Co-Operative	Mail/Email	4/10/2012	All meetings
Debi Meeds	Ozarks Regional American Red Cross	Mail/Email	4/10/2012	All meetings
Tom Martin	Stone County Office of Emergency Management	Mail/Email	4/10/2012	All meetings
Phil Amtower	Christian County Office of Emergency Management	Mail/Email	4/10/2012	All meetings