2022 POWELL COUNTY/
CITIES OF CLAY CITY AND STANTON
HAZARD MITIGATION PLAN

BLUEGRASS AREA DEVELOPMENT DISTRICT

CHAPTER 1: PLANNING PROCESS

***§201.6(b)*:** Planning process. An open public involvement process is essential to the development of an effective plan. To develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

***§201.6(c)(1)*:** [The plan shall include…] (1) Documentation of the planning process used to develop including how it was prepared, who was involved in the process, and how the public was involved.

This section includes a discussion and information about various DMA 2000 requirements, the regional and local subcommittees, their purpose and role in the process, as well as identifying the lead team members, committee members, other stakeholders, and activities within each county over the course of the update process.

Bluegrass Area Development District Composition and Governance

The Bluegrass Area Development District (BGADD), along with 14 other Area Development Districts, are nonprofit organizations established by the Commonwealth of Kentucky in 1971. The BGADD is comprised of sixteen (16) counties, one (1) urban county government, and thirty-one (31) municipalities. This Hazard Mitigation Plan Update document will focus on Powell County and the Cities of Clay City and Stanton. BGADD will be responsible for maintaining this Hazard Mitigation Plan.

As required by legislation, the Board of Directors of the BGADD is composed of 51 percent elected officials (County Judge/Executives and Mayors) with the remaining board members from aging, business, education, emergency, services, finance, industry, labor, low income, minorities, utilities, and women.

Update Process and Grants

The Bluegrass Area Development District applied for and received a Hazard Mitigation Grant Program (HMGP) grant to fund the 2021/2022 Bluegrass Area Development District Multi-Jurisdictional, Multi-Hazard Mitigation Plan Update.

After receiving the grant award, staff met with representatives of Kentucky Emergency Management (KYEM) to discuss the process and the "next steps". A kickoff meeting was scheduled for and held on May 6, 2021 and was well attended. This marked the first Regional Subcommittee Meeting held for the process.

The Planning Team

The main planning team for the hazard mitigation update is comprised primarily of BGADD staff. The staff members from the ADD will be responsible for organizing the data received, setting up, attending, and conducting all of the required meetings, managing the stakeholders and public participation, and drafting the plan that will be sent to the State and FEMA for approval.

Planning Team Members		
Name	**Title**	**Contact**
Shane New	Director of Community Planning	shanen@bgadd.org
Greyson Evans	Economic Development Specialist	gevans@bgadd.org
Logan Hart	Community Development Specialist	lhart@bgadd.org
Austin Bates	GIS Specialist	abates@bgadd.org
Natalie Flores-Esquivel	Transportation Planner/Regional Land-Use Planner	nfesquivel@bgadd.org
Mikaela Gerry	Regional Land-Use Planner	mgerry@bgadd.org
Alex Sergent	Community Planning Intern	asergent@bgadd.org
Zach Akers	Community Planning Intern	zakers@bgadd.org

Local Subcommittee

Each local subcommittee is comprised of a host of stakeholders that serve the community's needs. These stakeholders work for the Emergency Management, Fire and Police Departments, Sheriff's Office, Planning Departments, Judge/Executive and Mayors' Offices, Health Care (i.e., hospitals, health departments) and School Districts. The local subcommittee lists originated from each County's Local Emergency Planning Committee

Powell County and the Cities of Clay City and Stanton Local Subcommittee Team			
Name	**Agency/Firm**	**Position**	**Contact**
Kevin Babcock	Powell	FM Director	pcemcsepp@gmail.com
Dale Allen	Powell	Mayor	vslemp@bellsouth.net
Meredith Robinson	Powell Schools	School Rep/OPP	meredith.robinson@powell.kyschools.us
Connie Crabtree	Powell Co. Fiscal Ct.	Treasurer	Rcrabtree37@hotmail.com
James Anderson	Powell	County Judge	Judge099@yahoo.com
Kacey Davidson	Powell Co. Fiscal Ct.	Finance Officer	kaceye@hotmail.com
Stacey Patton	Clay City/Powell	City Clerk	Claycity04@yahoo.com
Bobby Carmichael	Clay City/Powell	Clay City Manager	b.carmichaelmayor@yahoo.com
Leach Napier	Powell	CSEPP Financial	inapier@powellcountyky.us
Nathan Hall	Powell	PCAS Director	Hallnathan373@gmail.com
Doug Brewer	Powell	Powell Schools Facilities	Doug.brewer@powell.kyschools.us
Stephanie Faulkner	Powell	City Clerk	Stephanie.faulkner@stantonky.gov
Ian Martin	Stanton/Powell Co.	Sgt/Stanton PD	Ian.martin@stantonky.gov
Brenda Campbell	Powell	Middle Fork Fire Dept.	lizieboc@gmail.com
David Traugett	Stanton Powell	Powell Co. Mawt.	David-traugett@yahoo.com
Justin Rice	Powell	Powell 911/EM	Justinrice2392@gmail.com
Rob Williams	CCPD	CCPD Chief	Robwilliams1313@gmail.com

Subcommittee Activities

Staff, between June 2021 and January 2022 held (3) meetings in Powell County[1] to discuss the hazards that both, the Cities of Clay City and Stanton, and Powell County encounter perennially. These meetings not only focused on each hazard, but also targeted the goals and objectives and actionable policies to prevent the deleterious effects from future disaster events. All meetings invited those agencies and departments that would need to partner with the counties and cities to meet mitigation goals and objectives and to complete any projects (i.e., state agencies, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, neighboring communities, and other interests). Government officials and members of the public were also presented with the opportunity to assist in the drafting process of the plan itself. Each project discussed would help to either mitigate future disaster effects, or would help lessen loss of life or property, or increase educational opportunities for residents.

Following is a table that outlines a general summary of what was discussed at each meeting.

Powell County Activities	
Meeting Dates	**Topics**
1st Meeting: 7/07/2021 @ 1:00	Introduction to hazard mitigation, review of 2016 Plan (county-specific portions), overview of relevant hazard types, risk assessment by hazard (extent, frequency, recent events, etc.). Gathering qualitative data from relevant stakeholders.
2nd Meeting: 8/23/2021 @ 1:00	Presentation and review of initial risk assessment. Identification of critical infrastructure and problem areas within the county.
3rd Meeting: 11/2/2021 @ 1:00	Disaster response discussion, mitigation project identification, discussion of funding mechanisms and available grant programs.
4th Meeting: March 2023	Final drafting meeting. Adoption of the 2022 Hazard Mitigation Plan

[1] Each meeting held at the Powell County Emergency Operations Center located at 33 Commerce Dr., Stanton, Ky 40380

Public Participation and Activities

Generally, all formal hazard mitigation plan meetings (where drafting of the plan for all of the counties and cities comprising the Bluegrass Area Development District (BGADD), public involvement was fostered by attempting to host at least four (4) meetings for each of the ADD's sixteen[2] (16) counties at well-known locations within each county (i.e., City Halls, Emergency Operations Centers, Libraries, and other similar buildings. The main goal of these meetings, aside from satisfying minimum FEMA requirements for public involvement, was to educate the public about the hazard mitigation planning process, set goals and objectives, assess each county's overall vulnerability, and set mitigation actions. Some of the meetings were well attended with many stakeholders that helped move the plan forward, while others lacked attendance and support.

In addition to holding four local subcommittee meetings in each county, in 2021 BGADD staff also held two regional subcommittee meetings via Zoom. These meetings were held to discuss the regional aspects of the update including grant and funding sources available to communities in the BGADD region. Staff repeatedly encouraged each county's Emergency Management Director to mention the meetings on social media.

In an effort to conduct outreach and improve public participation, BGADD staff and/or local EMA directors sent out mass email invites to all stakeholders, including local boards and public employees. Further, in an attempt to involve each local community and county residents in the process, the BGADD made all information for each meeting available on our website. In addition to the documents and agenda available for download on our website, anyone interested in being involved in the process could add their names and emails to the email lists. The ADD also prepared and distributed a public input survey via its website, which gave residents the opportunity to provide input throughout the planning process. Further, each adoption meeting will be opened to the public and the plan will remain on the Bluegrass ADD website for comment.

After the Plan is finished, Bluegrass ADD intends to continue to take comments from the public to add to the next update. Currently Bluegrass ADD is designing a web portal for EM directors to add hazards and disasters to a map in real-time. The goal of this added feature is to increase input from EM directors and allow the public to input additional data such as costs associated with damages sustained during marked events.

[2] Fayette County (or Lexington/Fayette Urban County Government) is the Bluegrass Area Development District's seventeenth (17th) county. However, it has a multi-hazard mitigation plan independent from the plan for which Powell County and the Cities of Clay City and Stanton and the remaining sixteen (16) counties and the respective incorporated cities comprising BGADD will adopt.

Attendees

Meeting #1

Name	Title	Organization
Kevin Babcock	FM Director	Powell
Doug Brewer	Powell Schools Facilities	Powell
Connie Crabtree	Treasurer	Powell Co. Fiscal Ct.
James Anderson	County Judge	Powell
Kacey Davidson	Finance Officer	Powell Co. Fiscal Ct.
Stacey Patton	City Clerk	Clay City/Powell
Bobby Carmichael	Mayor	Clay City/Powell
Leach Napier	CSEPP Financial	Powell
Nathan Hall	PCAS Director	Powell
Stephanie Faulkner	City Clerk	Powell
Ian Martin	Sgt/Stanton PD	Stanton/Powell Co.

Meeting #2

Name	Title	Organization
Nathan Hall	PCAS Director	Powell
Stephanie Faulkner	City Clerk	Powell
Stacey Patton	City Clerk	Clay City/Powell
Bobby Carmichael	Mayor	Clay City/Powell
Kevin Babcock	FM Director	Powell
James Anderson	County Judge	Powell
Brenda Campbell	Middle Fork Fire Dept.	Powell
David Traugett	Powell Co. Mawt.	Stanton Powell
Justin Rice	Powell 911/EM	Powell
Rob Williams	CCPD Chief	CCPD

Meeting #3

Name	Title	Organization
Kevin Babcock	FM Director	Powell
Dale Allen	Mayor	Powell
Meredith Robinson	School Rep/OPP	Powell Schools
Connie Crabtree	Treasurer	Powell Co. Fiscal Ct.
James Anderson	County Judge	Powell
Kacey Davidson	Finance Officer	Powell Co. Fiscal Ct.
Stacey Patton	City Clerk	Clay City/Powell
Bobby Carmichael	Mayor	Clay City/Powell
Leach Napier	CSEPP Financial	Powell
Nathan Hall	PCAS Director	Powell

Source Material Used for New Plan

Staff used source material from various documents to draft this plan. Referenced materials included the 2011 Hazard Mitigation Plan, the 2016 Hazard Mitigation Plan, and previous Hazard Mitigation Plans from other jurisdictions. In order to obtain technical information, staff cited NOAA, FEMA, United States Census Bureau, and the American Community Survey (ACS), Kentucky Geological Survey, Kentucky Division of Forestry, and the Kentucky Transportation Cabinet. The BGADD GIS Department provided mapping for the project referencing each local jurisdiction as well as local and state collected data for the local hazard maps while using mapping services provided by ESRI.

CHAPTER 2: HAZARD IDENTIFICATION AND RISK ASSESSMENT

The following section profiles each natural hazard identified as affecting the region. The identified hazards that pose a threat to Powell County include earthquakes, floods, karst, landslides, severe storms and tornadoes, severe winter storms, and wildfires. The profiles capture historical occurrences for each hazard. The process included updating occurrence data, reviewing hazard specific data information, and conversing with stakeholders.

Local and Regional Ranking System

The local ranking of each hazard shall be obtained through discussion with local officials and based on the number of reported occurrences in the past, number of injuries and fatalities, and reported damage. These local vulnerability rankings were then used as part of the overall regional ranking system. Possible rankings included the terms LOW (1), MODERATE (2), and HIGH (3). A LOW ranking refers to any hazard or impact that has a low historical occurrence or cost. A HIGH ranking refers to any hazard or impact that falls between LOW and HIGH. Once each county ranked future potential disasters, total impact ($), and each counties' historical occurrence (local ranking) of each hazard, an overall average was calculated for the region for each hazard. These values are subjective and are based on the opinions of local emergency management staff and members of the public.

HAZARD[3]	PROBABILITY OF FUTURE EVENTS	IMPACT ($)	AVERAGE
Earthquakes	1	1	1
Flooding	3	3	3
Karst	1	1	1
Landslides	3	3	3
Severe Storms and Tornadoes	2.5	2.5	2.5
Severe Winter Storms	2	3	2.5
Wildfires	3	2	2.5

[3] It is relevant to note that the "Drought" hazard will not be analyzed for this 2022 hazard mitigation plan risk assessment: Using the Palmers Drought Severity Index and the National Center for Environmental Information's Storm Events database, there have zero (0) instances of drought for the Powell County/Cities of Clay City and Stanton area. Generally, for all counties and cities comprising the Bluegrass Area Development District, drought is a non-existent hazard: Central Kentucky is too seasonal and has far too much water. Additionally, participants to the planning process expressed very little concern and, thusly, proposed no mitigation actions that dealt with drought.

Storm Events Database

In terms of identifying previous occurrences of each hazard type, this analysis utilized data from the National Centers for Environmental Information (NCEI) and its Storm Events database. The reliance on this database is considered best-available data and it collects storm event data systematically for all jurisdictions comprising the Bluegrass Area Development District. This database currently contains data from January 1950 to April 2022, as entered by NOAA's National Weather Service (NWS). Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event time[4]. These timelines are as follows:

- Severe Thunderstorm: 01/01/1950 – 04/30/2022
  - Tornadoes: 01/01/1950 – 04/30/2022
  - Thunderstorm Wind and Hail: 01/01/1955 – 04/30/2022
- Flooding: 01/01/1996 – 04/30/2022
- Severe Winter Weather: 01/01/1996 – 04/30/2022

For this analysis, the time of each period-of-record is as follows:

- Severe Thunderstorm: 72 years or 868 months (867 months + 29 days)
  - Tornadoes: 72 years or 868 months (867 months + 29 days)
  - Thunderstorm Wind and Hail: 67 years or 808 months (807 months + 29 days)
- Flooding: 26 years or 316 months (315 months + 29 days)
- Severe Winter Weather: 26 years or 316 months (315 months + 29 days)

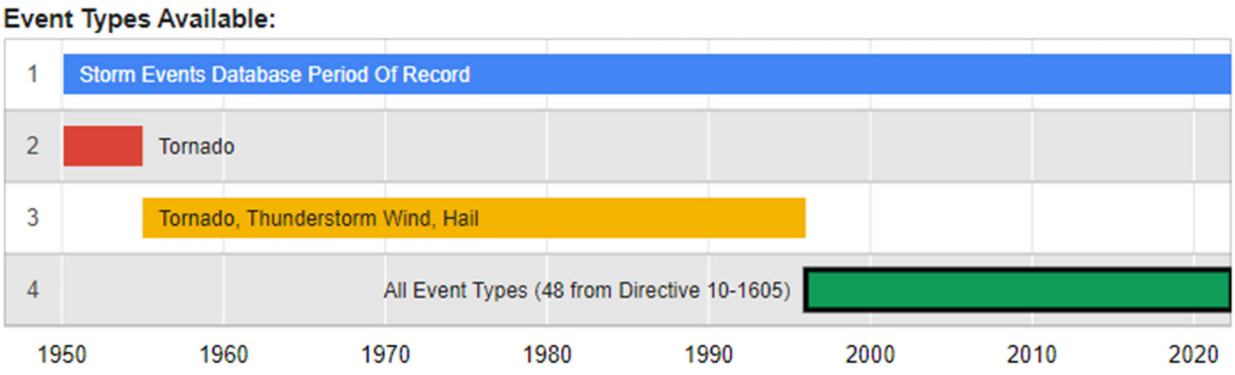


Figure 1: "All Event Types" includes Flooding and Severe Winter Weather Events

[4] SOURCE: https://www.ncdc.noaa.gov/stormevents/details.jsp

Earthquakes

An earthquake is a sudden, rapid shaking of the Earth caused by breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free releasing the stored energy and producing seismic waves generating an earthquake. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. However, some earthquakes occur in the middle of plates.

Ground motion, the movement of the Earth's surface during earthquakes or explosions is the catalyst for most of the damage done during an earthquake. Produced by waves generated by a sudden slip on a fault or sudden pressure at the explosive source, ground motion travels through the earth and along its surface. Ground motions are amplified by soft soils overlying hard bedrock, referred to as ground motion amplification. Ground motion amplification can cause an excess amount of damage during an earthquake, even to sites very from the epicenter.

Earthquakes strike suddenly and without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world.

Ground shaking from earthquakes can collapse buildings and bridges, disrupt gas, electric, and phone service, and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries and extensive property damage.

Earthquakes are measured in terms of their magnitude and intensity using the Richter Scale and Modified Mercalli Scale of Earthquake Intensity.

The Richter magnitude scale measures an earthquake's magnitude using an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude. The earthquake's magnitude is expressed in whole numbers and decimal fractions. Each whole number increase in magnitude represents a 10-fold increase in measured wave amplitude, or a release of 32 times more energy than the preceding whole number value.

Extent for Earthquakes

Modified Mercalli Intensity Scale

Intensity	Shaking	Description/Damage
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	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	Light	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	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	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	Severe	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	Violent	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	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Richter Scale to Modified Mercalli Intensity Scale (MMS) Comparison

Richter Scale Magnitude	Description	MMS
1.0-1.9	Not Felt/Micro	I
2.0-2.9	Minor	I to II
3.0-3.9	Minor	III to IV
4.0-4.9	Light	IV to VI
5.0-5.9	Moderate	VI to VII
6.0-6.9	Strong	VIII to X
7.0-7.9	Major	X or Greater
8.0-8.9	Great	X or Greater
9.0 and Greater	Great	X or Greater

Seismic Zones Affecting Kentucky

1. *New Madrid Seismic Zone*: Located in the central Mississippi Valley, the northern end of the New Madrid Seismic Zone (NMSZ) is marked approximately by the confluence of the Ohio and Mississippi Rivers. From this point in southern Illinois, the zone runs southwest, through western Kentucky (near Fulton), through eastern Missouri and western Tennessee to terminate in northeastern Arkansas. Along this course, the NMSZ crosses the Mississippi River three times.

2. *Wabash Seismic Zone*: The Wabash Seismic Zone that threatens southern Illinois, Indiana, and Kentucky shows evidence of large earthquakes in its geologic history. Additionally, there may be other unidentified faults that could produce strong earthquakes. Since 1895, the Wabash Valley Fault Zone has experienced more moderate quakes than the New Madrid Seismic Zone. Some prehistoric quakes that occurred in this zone between 4,000 and 10,000 years ago may have been larger than M 6.0. Earthquake ground shaking is amplified by lowlands soils, and modern earthquakes of M 5.5 – 6.0 in the Wabash Valley Fault Zone could cause substantial damage if they occur close to the populated river towns and cities along the Wabash River and its tributaries.

3. *Eastern Tennessee Seismic Zone*: The Eastern Tennessee Seismic Zone, which extends from southwest Virginia to northeast Alabama, is one of the most active seismic zones in the southeastern United States. Although this zone has not had a major earthquake in historic times, a few earthquakes have caused damage. The largest recorded earthquake in this seismic zone was a magnitude 4.6 quake that occurred in 1973 near Knoxville, Tennessee. Sensitive seismographs have recorded hundreds of earthquakes too small to be felt in this seismic zone. Small, non-damaging earthquakes that can still be felt occur about once a year. No evidence for larger prehistoric shocks has been discovered, yet the microearthquake data suggests coherent stress accumulation within a large volume. Physical processes for reactivation of basement faults in this region could involve a weak lower crust and/or increased fluid pressures within the upper to middle crust.

Earthquake Prediction

The goal of the earthquake prediction is to give warning of potentially damaging earthquakes early enough to allow appropriate response to the disaster, enabling people to minimize loss of life and property. The U.S. Geological Survey conducts and supports research on the likelihood of future earthquakes. This research includes field, laboratory, and theoretical investigations of earthquake mechanisms and fault zones. A primary goal of earthquake research is to increase the reliability of earthquake probability estimates. Ultimately, scientists would like to be able to specify a high probability for a specific earthquake, on a particular fault, within a particular year. Scientists estimate earthquake probabilities in two ways: by studying the history of the earthquakes in a specific area, and by the rate at which strain accumulates in the rock.

Evidence that earthquakes threaten the Mississippi, Ohio, and Wabash River valleys of the central United States abounds. In fact, one of the largest earthquakes to strike the continental United States occurred in the winter of 1811-1812 along the New Madrid Seismic Zone, which stretches from just west of Memphis, Tennessee, into southern Illinois. Several times in the past century, moderate earthquakes have been widely felt across southern Illinois and southwestern Indiana. Geologic evidence for prehistoric earthquakes throughout the region has been increasing since the late 1970s. The largest earthquake that had an epicenter *within* Kentucky's borders was the Sharpsburg earthquake on July 27, 1980 (USGS). Sharpsburg is located roughly 30 miles from Stanton, the county seat of Powell County.

As with many other natural phenomena, how an earthquake impacts people depend on multiple factors. Studying earthquakes is especially challenging because they are infrequent and take place without any advanced warning. Also, the forces that cause earthquakes build up over many thousands of years and take place deep below the Earth's surface.

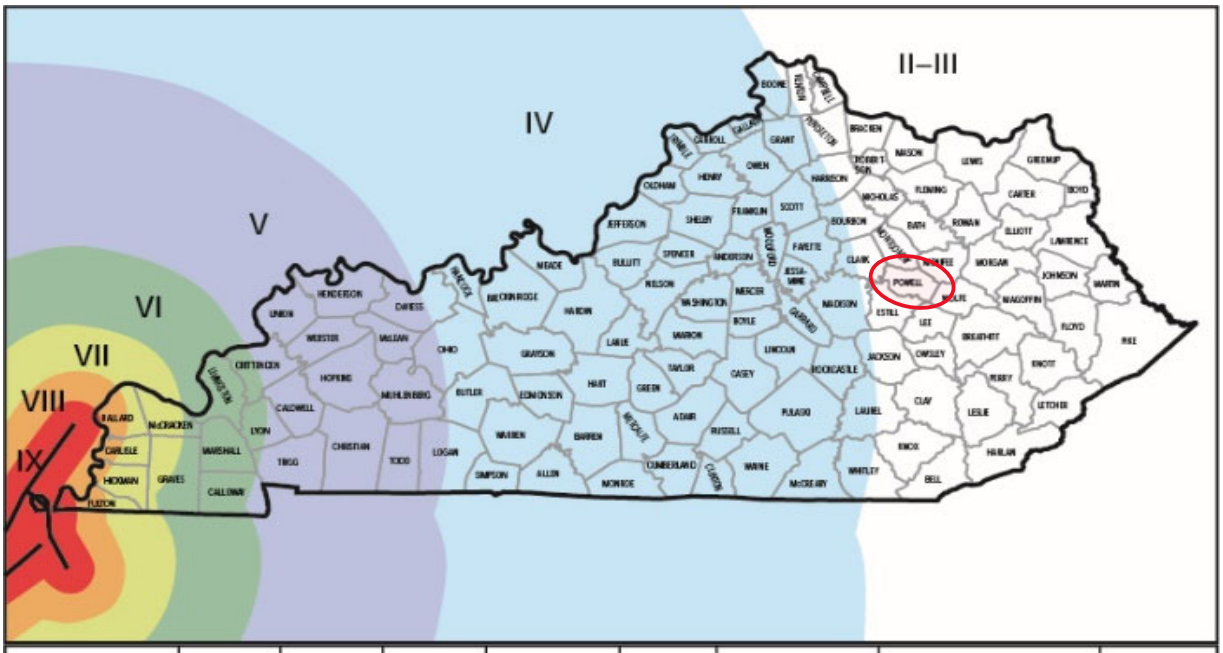
History

The largest earthquake in Kentucky history occurred in the Bath County town of Sharpsburg in July of 1980. The Sharpsburg earthquake was a 5.1 Richter scale earthquake with its epicenter located 50 miles northeast of Lexington. The entirety of the Bluegrass ADD region experienced a Modified Mercalli's Intensity (MMI) Scale Level of IV or V throughout the region. The out-of-state earthquakes that have had the greatest impact on central Kentucky were the 1811 and 1812 New Madrid, Missouri earthquakes which caused MMI level V effects in central Kentucky.

Higher intensity levels could occur in the region due to changing geographical circumstances in plate tectonics and the number of faults in the central Kentucky region. Earthquakes have the potential to damage critical infrastructure, such as the Clay's Ferry Bridge on Interstate 75 in nearby Madison County, which is located directly above a fault line. An earthquake could also lead to an influx of displaced residents from neighboring communities who are seeking refuge.

Probability of and Vulnerability to an Earthquake

The Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018 provides a way to illustrate the probability of and the vulnerability to an earthquake for Powell County and the Cities of Clay City and Stanton: "Ground motion is quantitatively measured as peak ground acceleration in terms of the percentage of the acceleration of gravity or peak ground velocity in terms of centimeters of shaking, potential damage level, or instrument intensity (i.e., modified Mercalli intensity). The table [below] lists the quantitative and qualitative measurements of ground motion. The level of ground motion at a site primarily depends on its distance from the fault that ruptured and the magnitude of the earthquake. Ground motion can be estimated from scientific information about earthquakes. The top part of [the figure below] shows the median peak ground acceleration on rock from a magnitude 7.5 scenario earthquake in the New Madrid Seismic Zone (Carpenter and others, 2014), which demonstrates that such an earthquake could have a significant impact on Kentucky, western Kentucky in particular[5]."



Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent
Potential Damage	None	None	None	Very Light	Light	Moderate	Moderately Heavy	Heavy
PGA (%g)	< 0.17	0.17–1.4	1.4–3.9	3.9–9.2	9.2–18	18–34	34–65	65–124
Instrumental Intensity	II	III	IV	V	VI	VII	VIII	IX

[5] See page KGS-6 in the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018.

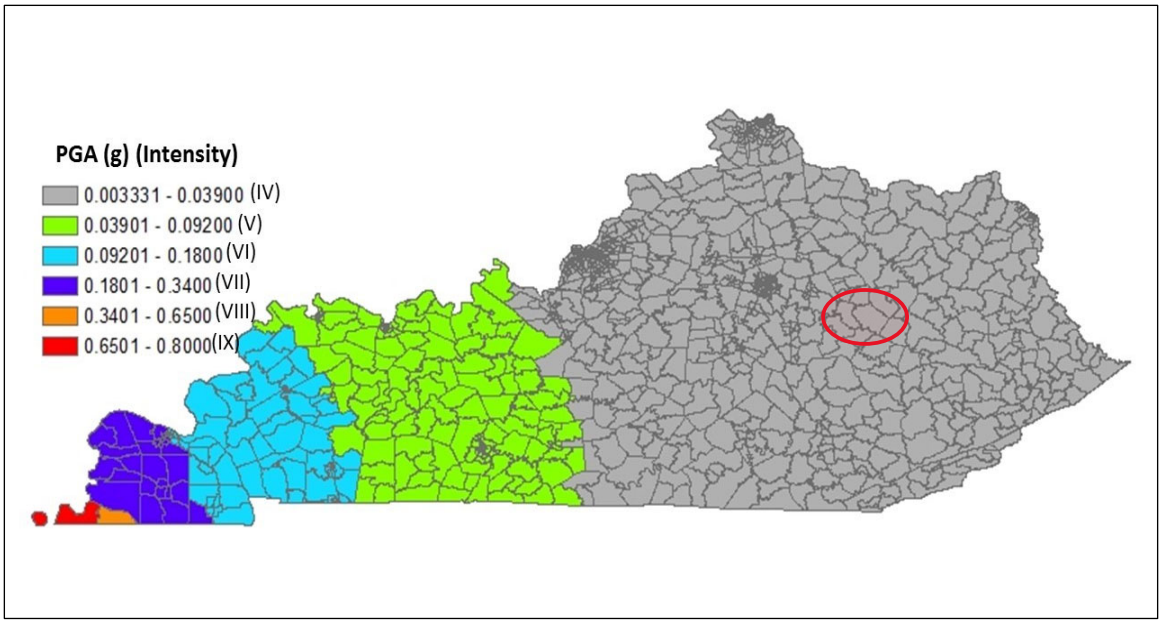
Again, using the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018, the Kentucky Geological Survey ran five (5) scenario earthquakes using FEMA's HAZUS software and its databases. It used three (3) scenarios where the epicenter was the New Madrid Seismic Zone, one (1) scenario where the epicenter was the Wabash Valley Seismic Zone, and one (1) scenario where the epicenter was the site of the Sharpsburg earthquake (i.e., the largest earthquake occurrence within Kentucky's borders and that measured 5.1 on the Richter scale). Before discussing the potential impacts resulting from the scenario analysis, Kentucky Geological Survey displays a de facto vulnerability and probability image that shows the Peak Ground Acceleration (PGA) (tied to the MMS) on rock should a magnitude 7.5 earthquake occur in the central New Madrid Seismic Zone:

"Five scenario earthquakes [table below] were selected to assess potential impacts using the HAZUS databases and default amplification, liquefaction, and triggered-landslide hazards. [The resulting figure below] shows peak ground acceleration on rock from the scenario earthquake of magnitude 7.5 along the central New Madrid Fault and indicates that ground-motion hazard is very high in the epicentral area, with peak ground acceleration greater than 0.65g[6]."

Source Parameters for Scenario Earthquakes

Seismic Zone	Epicenter Location	Magnitude	Focal Depth
New Madrid I	36.52°N/-89.53°W	7.0	15 km
New Madrid II	36.52°N/-89.53°W	7.5	15 km
New Madrid III	35.50°N/-89.99°W	7.0	10 km
Wabash Valley	38.17°N/-87.71°W	6.5	15 km
Sharpsburg	38.17°N/-83.91°W	5.0	12 km

[6] See pages KGS-9 – KGS-10 in the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018.

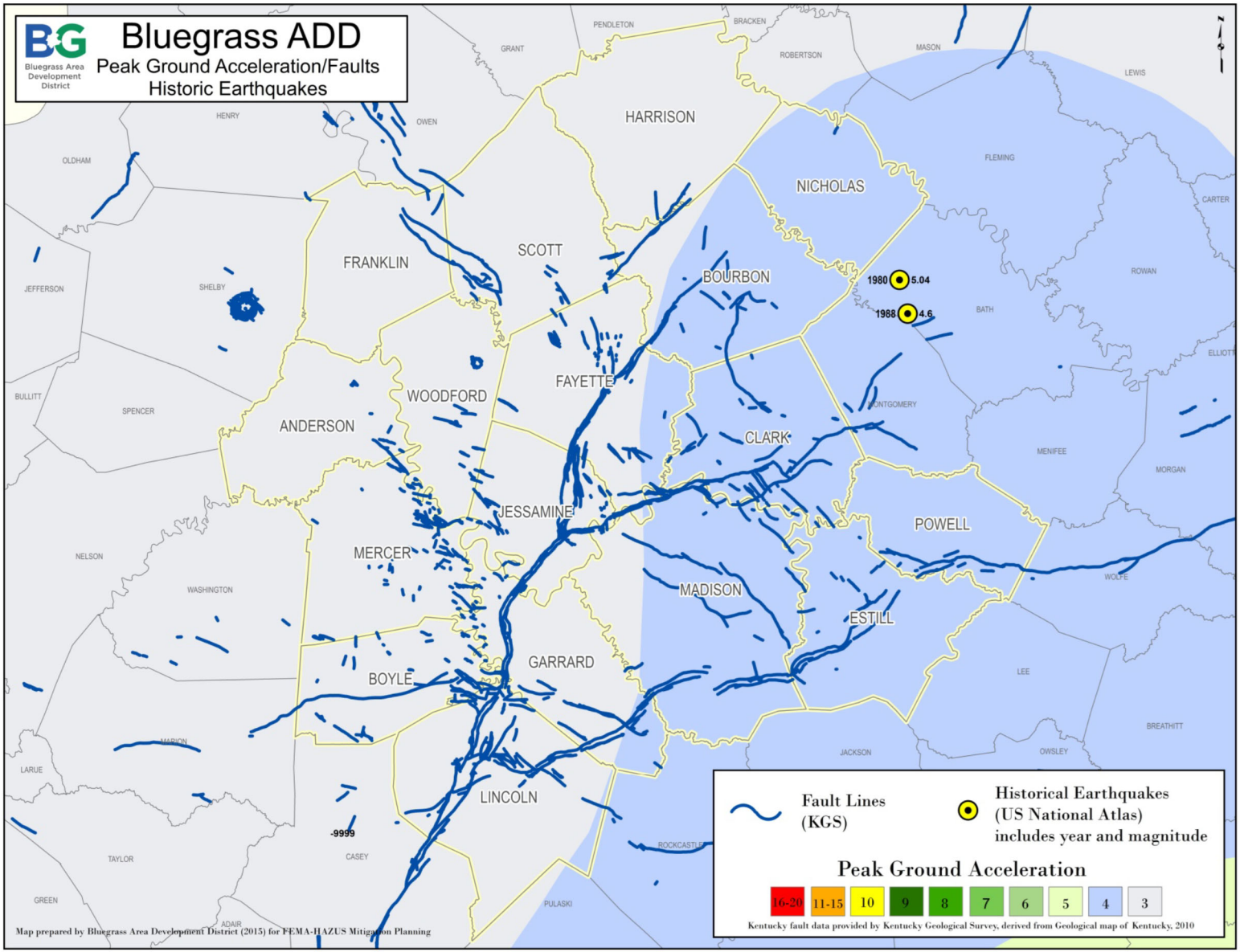


Peak Ground Acceleration on Rock from a Scenario Earthquake of Magnitude 7.5 in the Central New Madrid Seismic Zone (New Madrid Scenario II)

Powell County and the Cities of Clay City and Stanton lie within the gray-shaded area of the above figure, i.e., with an expected intensity from a magnitude 7.5 earthquake in the New Madrid Seismic Zone having the intensity of around IV on the Modified Mercalli Intensity Scale (MMS).

As a matter of clarification, this hazard mitigation plan document claims that the above two (2) images and citations from the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018 conveys probability, as well: This plan document assumes that Peak Ground Acceleration (PGA) is a way to think about probability for the earthquake hazard. While PGA says nothing about the probability of a future earthquake occurrence, it does provide an illustration of the probability of there being effects from an earthquake should one occur.

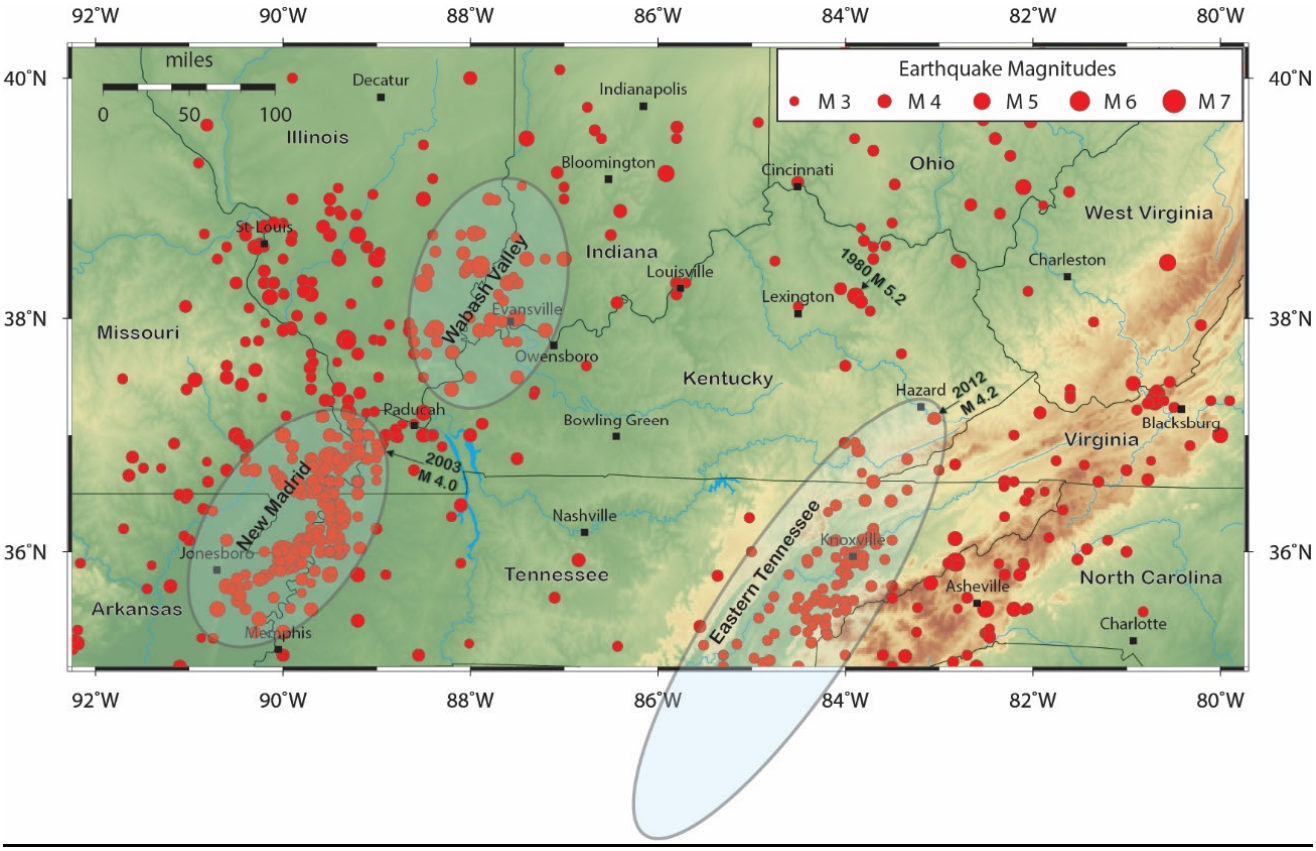
And should a considerable earthquake occur in the New Madrid Seismic Zone, Powell County and the Cities of Clay City and Stanton all are vulnerable to and can expect in the future to have effects identified as a IV on the MMS. To remind, a IV on the MMS refers to dishes, windows, and doors being disturbed; walls making cracking sounds; sensations like a heavy truck striking a building; the noticeable rocking of standing cars. An MMS IV earthquake can be felt indoors by many and outdoors by a few during the day. If at night, an MMS IV will awaken some from sleep.


Bluegrass ADD
Peak Ground Acceleration/Faults
Historic Earthquakes
Bluegrass Area Development District
HARRISON
NICHOLAS
BOURBON
SCOTT
FRANKLIN
FAYETTE
WOODFORD
ANDERSON
CLARK
JESSAMINE
MERCER
POWELL
MADISON
ESTILL
GARRARD
BOYLE
LINCOLN
1980 5.04
1988 4.6
-9999
Fault Lines (KGS)
Historical Earthquakes (US National Atlas) includes year and magnitude
Peak Ground Acceleration
16-20
11-15
10
9
8
7
6
5
4
3
Kentucky fault data provided by Kentucky Geological Survey, derived from Geological map of Kentucky, 2010
Map prepared by Bluegrass Area Development District (2015) for FEMA-HAZUS Mitigation Planning

Location and Previous Occurrences of Earthquakes

The Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018 provides a helpful graphic conveying locations of earthquakes of magnitude 3 or greater that have occurred in and around Kentucky, current to 2014[7]:

Powell County and the Cities of Clay City and Stanton lie southeast of Lexington identified in the below image.



[7] See page KGS-4 in the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018.

Flooding

A flood is a natural event for rivers and streams. It is defined by the National Flood Insurance Program as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties from:

A. Defined Flooding Events

1. Overflow of inland or tidal waters
2. Unusual and rapid accumulation or runoff of surface waters from any source
3. A mudflow; or,
4. A collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood.

B. Factors Determining the Severity of Floods

1. Rainfall intensity and duration
    - **a.** A large amount of rain over a short time can result in flash flooding
    - **b.** Small amounts may cause flooding where the soil is saturated
    - **c.** Small amounts may cause flooding if concentrated in an area of impermeable surfaces
2. Topography and ground cover
    - **a.** Water runoff is greater in areas with steep slope and little vegetation

C. Frequency of Inundation

Frequency of inundation depends on the climate, soil, and channel slope. In regions without extended periods of below-freezing temperatures, floods usually occur in the season of highest precipitation.

D. Types

Types of floods include regional floods, river or riverine floods, flash floods, urban floods, ice-jam floods, storm-surge floods, dam and levee failure floods, debris floods, landslide, and mudflow floods.

Regional flooding can occur seasonally when winter or spring rains coupled with melting snow fills river basins with significant amounts of water too rapidly. The ground may be frozen, reducing infiltration into the soil and thereby increasing runoff. Extended wet periods during any part of the year can create saturated soil conditions, after which any additional rain runs off into streams and rivers until river capacities are exceeded. Regional floods are many times associated with slow-moving, low-pressure, or frontal storm systems that include hurricanes or tropical storms.

River or riverine flooding is a high flow or overflow of water from a river or similar body of water, occurring over a period of time too long to be considered a flash flood. Flash floods are quick-rising floods that usually occur as a result of heavy rains over a short period of time, often only several hours or even less. Flash floods can occur within several seconds to several hours and with little warning. They can be deadly because they often lead to rapid rises in water levels and have devastating flow velocities.

Urban flooding is possible when land is converted from open fields or woodlands to roads and parking lots; thus, losing its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

Ice-Jam flooding occurs on rivers that are totally or partially frozen. A rise in stream stage will break up a totally frozen river and create ice flows that can pile up on channel obstructions such as shallow riffles, log jams, or bridge piers. Storm-surge flooding is water that is pushed up onto otherwise dry land by onshore winds. Friction between the water and the moving air creates drag that, depending upon the distance of water (fetch) and the velocity of the wind, can pile water up to depths greater than 20 feet. Intense, low-pressure systems and hurricanes can create storm-surge flooding. The storm surge is unquestionably the most dangerous part of a hurricane as pounding waves create very hazardous flood currents.

Dam and Levee Failure flooding are potentially the most catastrophic flood events. A dam failure is usually the result of neglect, poor design, or structural damage caused by a major event such as an earthquake. When a dam fails, an excess amount of water is suddenly released downstream, destroying anything in its path. Dams and levees are built for flood protection. They are generally engineered to withstand a flood with a computed risk of occurrence. Failed dams or levees can cause floods that are catastrophic to life and property because of the tremendous energy of the released water.

Debris, Landslide, and Mudflow flooding is created by the accumulation of debris, mud, rocks, and/or logs in a channel, forming a temporary dam and then becomes a flash flood when the dam is breached and rapidly washes away. Landslides can create large waves on lakes or embayment and can be deadly. Mudflow floods can occur when volcanic activity rapidly melts mountain snow and glaciers, and the water mixed with mud and debris moves rapidly down the slope.

Most lives are lost when people are swept away but flood currents, whereas property damage results from an inundation by sediment-water. Flood currents also possess tremendous amounts of destructive power as lateral forces can demolish buildings and erosion can undermine bridge foundations and footings leading to the collapse of structures.

E. Previous Occurrences and Impacts

See table on following page(s)

Powell County, Unincorporated Flooding and Flash-Flooding Types, Locations, Previous Occurrences, and Impacts

Powell County, Unincorporated Flooding and Flash-Flooding Events, 1996 - 2022[8]

Count	County	Location	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL CO.	COUNTYWIDE	5/5/1996	Flash Flood	0	0	$0	$0	0	0
2	POWELL CO.	COUNTYWIDE	5/28/1996	Flash Flood	0	0	$0	$0	0	0
3	POWELL (ZONE)		3/2/1997	Flood	0	0	$10,000	$0	0	0
4	POWELL (ZONE)		1/10/1999	Flood	0	0	$0	$0	0	0
5	POWELL CO.	COUNTYWIDE	2/18/2000	Flash Flood	0	0	$5,000	$0	0	0
6	POWELL (ZONE)		3/20/2002	Flood	0	0	$10,000	$0	0	0
7	POWELL (ZONE)		2/15/2003	Flood	0	0	$0	$0	0	0
8	POWELL (ZONE)		2/16/2003	Flood	0	0	$1,720,000	$0	0	0
9	POWELL (ZONE)		2/6/2004	Flood	0	0	$0	$0	0	0
10	POWELL CO.	COUNTYWIDE	5/27/2004	Flash Flood	0	0	$0	$0	0	0
11	POWELL CO.	COUNTYWIDE	5/30/2004	Flash Flood	0	0	$0	$0	0	0
12	POWELL (ZONE)		5/31/2004	Flood	0	0	$4,000,000	$0	0	0
13	POWELL (ZONE)		6/1/2004	Flood	0	0	$500	$0	0	0
	POWELL (ZONE)		6/1/2004	Flood	0	0	$3,000,000	$0	0	0
14	POWELL (ZONE)		9/8/2004	Flood	0	0	$0	$0	0	0
	POWELL (ZONE)		9/8/2004	Flood	0	0	$0	$0	0	0
15	POWELL (ZONE)		9/17/2004	Flood	0	0	$0	$0	0	0
	POWELL (ZONE)		9/17/2004	Flood	0	0	$0	$0	0	0
	POWELL (ZONE)		9/17/2004	Flood	0	0	$0	$0	0	0
16	POWELL (ZONE)		4/30/2005	Flood	0	0	$0	$0	0	0
17	POWELL (ZONE)		1/23/2006	Flood	0	0	$0	$0	0	0
18	POWELL (ZONE)		1/24/2006	Flood	0	0	$0	$0	0	0
19	POWELL CO.	BOWEN	9/23/2006	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	VAUGHNS MILL	9/23/2006	Flash Flood	0	0	$0	$0	0	0
20	POWELL CO.	WALTERSVILLE	2/7/2008	Flood	0	0	$0	$0	0	0
21	POWELL CO.	BOWEN	2/6/2010	Flood	0	0	$0	$0	0	0

[8] Source: National Centers for Environmental Information (NCEI) Storm Events database

Count	County	Location	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
22	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	VIRDEN	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	VIRDEN	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	VIRDEN	5/2/2010	Flood	0	0	$0	$0	0	0
	POWELL CO.	VAUGHNS MILL	5/2/2010	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	5/2/2010	Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	0	0	$0	$0	0	0
23	POWELL CO.	SLADE	7/19/2011	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	LOMBARD	7/19/2011	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	SLADE	7/19/2011	Flood	0	0	$0	$0	0	0
24	POWELL CO.	SLADE	8/13/2011	Flash Flood	0	0	$0	$0	0	0
25	POWELL CO.	ROSSLYN	3/15/2012	Flood	0	0	$0	$0	0	0
26	POWELL CO.	SLADE	5/21/2012	Flash Flood	0	0	$0	$0	0	0
27	POWELL CO.	VAUGHNS MILL	8/12/2013	Flash Flood	0	0	$0	$1,000	0	0
	POWELL CO.	VAUGHNS MILL	8/12/2013	Flash Flood	0	0	$0	$1,000	0	0
	POWELL CO.	STANTON ARPT	8/12/2013	Flash Flood	0	0	$2,000	$0	0	0
28	POWELL CO.	BOWEN	4/30/2014	Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	4/30/2014	Flood	0	0	$0	$0	0	0
29	POWELL CO.	BOWEN	8/31/2014	Flash Flood	0	0	$1,000	$0	0	0
30	POWELL CO.	BOWEN	9/1/2014	Flood	0	0	$1,000	$0	0	0
31	POWELL CO.	WALTERSVILLE	4/3/2015	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	NATURAL BRIDGE	4/3/2015	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	BOWEN	4/3/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	BOWEN	4/3/2015	Flood	0	0	$1,000	$0	0	0
32	POWELL CO.	BOWEN	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	NATURAL BRIDGE	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	WALTERSVILLE	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	BOWEN	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	SLADE	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	NADA	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	BOWEN	4/14/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	ROSSLYN	4/14/2015	Flood	0	0	$1,000	$0	0	0
33	POWELL CO.	WALTERSVILLE	7/3/2015	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	WALTERSVILLE	7/3/2015	Flash Flood	0	0	$1,000	$0	0	0
34	POWELL CO.	WALTERSVILLE	12/25/2015	Flood	0	0	$1,000	$0	0	0
35	POWELL CO.	WALTERSVILLE	9/18/2016	Flash Flood	0	0	$10	$0	0	0
36	POWELL CO.	WALTERSVILLE	6/23/2017	Flash Flood	0	0	$0	$0	0	0

Count	County	Location	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
37	POWELL CO.	WALTERSVILLE	8/1/2018	Flash Flood	0	0	$0	$0	0	0
38	POWELL CO.	BOWEN	9/9/2018	Flood	0	0	$500	$0	0	0
	POWELL CO.	BOWEN	9/9/2018	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	9/9/2018	Flash Flood	0	0	$0	$0	0	0
39	POWELL CO.	WALTERSVILLE	2/20/2019	Flood	0	0	$0	$0	0	0
40	POWELL CO.	BOWEN	2/23/2019	Flood	0	0	$0	$0	0	0
41	POWELL CO.	VAUGHNS MILL	2/24/2019	Flash Flood	0	0	$0	$0	0	0
42	POWELL CO.	NADA	6/6/2019	Flash Flood	0	0	$150,000	$0	0	0
43	POWELL CO.	BOWEN	5/19/2020	Flood	0	0	$200	$0	0	0
44	POWELL CO.	NATURAL BRIDGE	9/12/2020	Flash Flood	0	0	$25,000	$0	0	0
	POWELL CO.	NADA	9/12/2020	Flood	0	0	$3,000	$0	0	0
45	POWELL CO.	WALTERSVILLE	2/28/2021	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	VIRDEN	2/28/2021	Flood	0	0	$0	$0	0	0
46	POWELL CO.	WALTERSVILLE	7/1/2021	Flood	0	0	$0	$0	0	0
47	POWELL CO.	NADA	7/30/2021	Flash Flood	0	0	$0	$0	0	0
	TOTALS				***0***	***0***	***$8,943,210***	***$2,000***	***0***	***0***

F. Powell County, Unincorporated Probability (as a Function of Previous Occurrences)

This analysis counts as a discrete flooding or flash-flooding event for Powell County and its unincorporated areas only those events that occurred on different dates. Any event recorded that shares the same date of occurrence as other events are treated as one contiguous event.

The table above displays the entire record of flooding and flash-flooding events for Powell County and its unincorporated areas contained within the NCEI Storm Events database. This analysis counts 47 discrete events within the period-of-record.

To illustrate probability (as a function of previous occurrences) Powell County and its unincorporated areas are counted as having 47 flooding or flash-flooding events over 26 years. This translates to 1.8 flooding or flash-flooding events per year (i.e., [1/(26/47)] = 1.807). This statistic might be interpreted as assuming a 100% probability that one flooding or flash-flooding event will occur within Powell County and its unincorporated areas each year. So that the partial has meaning, in terms of months and assuming uniformity in likelihood, Powell County and its unincorporated areas can assume to have 1 flooding or flash-flooding event approximately every 7 months (i.e., [1/(47/316)] = 6.72).

Powell County, Unincorporated Flooding and Flash-Flooding Types, Locations, Previous Occurrences, Impacts, and Extent

Powell County, Unincorporated Flooding and Flash-Flooding Event with Narratives for Extent and Impacts, 1996 - 2022

Count	County	Location	Date	Type	Event Narrative
1	POWELL CO.	COUNTYWIDE	5/5/1996	Flash Flood	
2	POWELL CO.	COUNTYWIDE	5/28/1996	Flash Flood	
3	POWELL (ZONE)		3/2/1997	Flood	
4	POWELL (ZONE)		1/10/1999	Flood	Low lying river flooding occurred along the Red River near Clay City. The water had covered portions of Pompeii Road.
5	POWELL CO.	COUNTYWIDE	2/18/2000	Flash Flood	Several reports were received of water over roads and numerous rock slides occurred due to the heavy rains.
6	POWELL (ZONE)		3/20/2002	Flood	Prolonged rains caused streams and creeks to flood. This resulted in numerous road closures across Powell County.
7	POWELL (ZONE)		2/15/2003	Flood	Roads were closed throughout the county due to high water[9].
8	POWELL (ZONE)		2/16/2003	Flood	At 1000 EST, February, 17, the Red River crested at 23.16 feet. This is 4.16 feet above flood stage.
9	POWELL (ZONE)		2/6/2004	Flood	
10	POWELL CO.	COUNTYWIDE	5/27/2004	Flash Flood	Numerous roads were flooded across the county.
11	POWELL CO.	COUNTYWIDE	5/30/2004	Flash Flood	
12	POWELL (ZONE)		5/31/2004	Flood	
13	POWELL (ZONE)		6/1/2004	Flood	The Red River at Clay City crested at 24.08 feet, which was 5.08 feet above flood stage.
	POWELL (ZONE)		6/1/2004	Flood	
14	POWELL (ZONE)		9/8/2004	Flood	
	POWELL (ZONE)		9/8/2004	Flood	
15	POWELL (ZONE)		9/17/2004	Flood	The public reported that water was flowing across Highway 1057 near Clay City. Water was also reported over the road on Highway 2001 at the intersection of Highway 1057.
	POWELL (ZONE)		9/17/2004	Flood	Emergency Management officials reported numerous roads closed countywide due to flooding, including Highway 77 off Highway 15, Adams Ridge Road near Clay City, Highway 15 near Bowan and along Middle Fork, Cane Creek Road in northern Powell County, and Hardwick Creek Road in southwest Powell County.
	POWELL (ZONE)		9/17/2004	Flood	
16	POWELL (ZONE)		4/30/2005	Flood	
17	POWELL (ZONE)		1/23/2006	Flood	Portions of Highway 15 at Rosslyn covered by water.
18	POWELL (ZONE)		1/24/2006	Flood	
19	POWELL CO.	BOWEN	9/23/2006	Flash Flood	Highway 15 at the Bown North Fork cutover closed due to high water.
	POWELL CO.	VAUGHNS MILL	9/23/2006	Flash Flood	Hardwicks Creek Road closed due to high water.
20	POWELL CO.	WALTERSVILLE	2/7/2008	Flood	Pompeii road was closed due to flood waters.
21	POWELL CO.	BOWEN	2/6/2010	Flood	An NWS employee reported water over Highway 613 near the intersection with Highway 15 in Bowen.

[9] "High water" (or a variation of "water covering the roads" or "roads were impassable") is reported to the National Weather Service by local jurisdictions in the Bluegrass Area Development District region when water standing over the road is sufficiently deep to make driving unsafe. This is interpreted as two (2) feet or more of flooding depth.

Count	County	Location	Date	Type	Event Narrative
22	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	Main Street in Clay City was closed at the Dairy Queen due to flooding.
	POWELL CO.	VIRDEN	5/2/2010	Flash Flood	The Mountain Parkway was blocked at mile marker 16 in Clay City due to flash flooding. The water rose rapidly and was running across both the east and westbound lanes. The entrance to the Mountain Parkway in Winchester was also closed to keep hapless motorists from driving into the flooded road near in Clay City. The parkway was also closed at mile marker 18. Adams Ridge Road and Skinner Holler were also closed due to high water.
	POWELL CO.	VIRDEN	5/2/2010	Flash Flood	Main Street in Clay City was impassable at Diary Queen due to flooding. The Mountain Parkway was also closed at Exit 22 on the west side of Stanton.
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	Motorists had to be rescued from a vehicle along Adams Ridge Road in Clay City. Winchester Road at the Powell and Clark county line was closed due to flooding.
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	Three to four feet of water was flowing over Hardwicks Creek Road in Vaughns Mill.
	POWELL CO.	VIRDEN	5/2/2010	Flood	The Mountain Parkway was still closed in both directions.
	POWELL CO.	VAUGHNS MILL	5/2/2010	Flash Flood	A swift water rescue was performed on Frames Branch Road near Clay City. A motorist drove their car into flood waters and got stuck.
	POWELL CO.	WALTERSVILLE	5/2/2010	Flood	A 100 foot stretch of Main St in Clay City was covered by flood water from the Red River and was closed. Stretches of Pompeii Road, KY Hwy 11, 11th St, and Hardwood St in Clay City were also closed due to flooding.
	POWELL CO.	WALTERSVILLE	5/2/2010	Flash Flood	A swift water rescue was performed for a couple of motorists on Hardwicks Creek Road near Clay City.
23	POWELL CO.	SLADE	7/19/2011	Flash Flood	The Stanton dispatch office reported that major flooding was occurring in the Natural Bridge State Resort Park and that evacuations were taking place. A large mudslide had also occurred on Hwy 11 south of Natural Bridge and was in the process of being cleared. The flooding began around 7 pm and was ongoing at the time the report was called in at around 9 pm.
	POWELL CO.	LOMBARD	7/19/2011	Flash Flood	The Menifee county emergency manager witnessed flash flooding on Hwy 77 in extreme eastern Powell county near the Menifee county line. The flooding most likely occurred between 730 pm and 830 pm.
	POWELL CO.	SLADE	7/19/2011	Flood	After the initial flash flooding ended, much of the Natural Bridge State Park was under water. The flood waters slowly receded during the early overnight hours.
24	POWELL CO.	SLADE	8/13/2011	Flash Flood	Powell county rescue squads were dispatched to the Whittleton Branch camp grounds in Natural Bridge State Park for evacuation efforts due to flooding.
25	POWELL CO.	ROSSLYN	3/15/2012	Flood	Nuisance flooding reported on Cat Creek Road, Furnace Road and Railroad Streets in and around Stanton.
26	POWELL CO.	SLADE	5/21/2012	Flash Flood	Two roads in the Natural Bridge State Resort Park were closed due to high water.
27	POWELL CO.	VAUGHNS MILL	8/12/2013	Flash Flood	A foot of water was flowing across the intersection of Highways 1057 and 2001 at Vaughns Mill Rd.
	POWELL CO.	VAUGHNS MILL	8/12/2013	Flash Flood	A foot of water was flowing across 1017 Hardwicks Rd.
	POWELL CO.	STANTON ARPT	8/12/2013	Flash Flood	Water was reported flowing across East College Avenue in several places. At one point water entered the Pooh and Pals daycare center. The water receded from the building and off the road by 335 pm.
28	POWELL CO.	BOWEN	4/30/2014	Flood	Highway 599 Cane Creek Road closed due to high water.
	POWELL CO.	WALTERSVILLE	4/30/2014	Flood	Old Clay City Road is closed due to high water.

Count	County	Location	Date	Type	Event Narrative
29	POWELL CO.	BOWEN	8/31/2014	Flash Flood	Water was reported to be flowing over Upper Cane Creek and Lower Cane Creek Roads in a total of four locations with water still rising. As of 1225 am the county was working on closing the roads.
30	POWELL CO.	BOWEN	9/1/2014	Flood	Water was reported to be over Upper Cane Creek and Lower Cane Creek Roads in a total of four locations as a flash flood event transitioned to a flood event.
31	POWELL CO.	WALTERSVILLE	4/3/2015	Flash Flood	A vehicle became stranded due to flash flooding on Adams Ridge Road. The drive had to be rescued.
	POWELL CO.	NATURAL BRIDGE	4/3/2015	Flash Flood	The Middlefork Campground had to be evacuated due to flash flooding.
	POWELL CO.	BOWEN	4/3/2015	Flood	Three feet of water was covering Hwy 613 near Bowen.
	POWELL CO.	BOWEN	4/3/2015	Flood	Highway 15 had a foot of standing water over it and Hwy 613 had 5 feet of water over it.
32	POWELL CO.	BOWEN	4/14/2015	Flood	Highway 615 had a foot of water covering it.
	POWELL CO.	NATURAL BRIDGE	4/14/2015	Flood	Parking lots at the Natural Bridge State Park were flooded.
	POWELL CO.	WALTERSVILLE	4/14/2015	Flood	Adams Ridge Rd was under water.
	POWELL CO.	BOWEN	4/14/2015	Flood	North Fork Rd was under water.
	POWELL CO.	SLADE	4/14/2015	Flood	Highway 15 at the Middle Fork Fire Dept was covered by 2 feet of water.
	POWELL CO.	NADA	4/14/2015	Flood	Two feet of water was observed over Highway 15 at the Middlefork Fire Department.
	POWELL CO.	BOWEN	4/14/2015	Flood	Kentucky Hwy 613 was flooded and impassable.
	POWELL CO.	ROSSLYN	4/14/2015	Flood	Kentucky Hwy 1184 was flooded in a low lying area and was impassable.
33	POWELL CO.	WALTERSVILLE	7/3/2015	Flash Flood	Severe flash flooding occurred in Clay City and in the surrounding areas. The Mountain Parkway at exit 16 had to be closed due to flash flooding. A car was washed off the road at this location. A ten foot section of Poplar Bluff Road was washed out and an old church on Beech Fork Road was moved about 40 feet from its foundation by flood waters. A single wide house trailer was washed down Brushy Creek and wedged under a private bridge.
	POWELL CO.	WALTERSVILLE	7/3/2015	Flash Flood	Water entered homes on Black Creek Rd. A family was trapped on Brush Creek due to a tree blocking the road. A number of water rescues had to be performed including a swift water rescue on Brush Creek Road due to rapidly rising flood waters. One person was trapped on Pilot Knob due to flooding.
34	POWELL CO.	WALTERSVILLE	12/25/2015	Flood	Minor flooding occurred along Adams Ridge Road and Hardwicks Creek Road in Clay City.
35	POWELL CO.	WALTERSVILLE	9/18/2016	Flash Flood	Dispatch relayed a report from a citizen of flood waters across Adams Ridge Road just off of Highway 15 in Clay City, making the roadway impassable.
36	POWELL CO.	WALTERSVILLE	6/23/2017	Flash Flood	Dispatch reported water over Black Creek Road near and north of Clay City where over 2 inches of rain fell.
37	POWELL CO.	WALTERSVILLE	8/1/2018	Flash Flood	Dispatch reported that a portion of Adams Ridge Road west of Clay City was closed due to flowing water over the highway.

Count	County	Location	Date	Type	Event Narrative
38	POWELL CO.	BOWEN	9/9/2018	Flood	Kentucky Highway 15 was covered with water in a couple of places east of Stanton. Additionally, overflow drainages became covered with water as they overfilled their capacity, including those as far southeast as Halls Branch Road.
	POWELL CO.	BOWEN	9/9/2018	Flash Flood	Halls Branch southeast of Stanton spilled out of its banks, resulting in rapidly flowing flood waters threatening Halls Branch Road.
	POWELL CO.	WALTERSVILLE	9/9/2018	Flash Flood	Water was observed rushing across Adams Ridges Road from Brush Creek just west of Clay City.
39	POWELL CO.	WALTERSVILLE	2/20/2019	Flood	Dispatch reported water over Adams Ridge Road outside of Clay City, making the road impassable.
40	POWELL CO.	BOWEN	2/23/2019	Flood	A SKYWARN spotter reported water over Kentucky Highways 15 and 613 near Bowen.
41	POWELL CO.	VAUGHNS MILL	2/24/2019	Flash Flood	Dispatch reported that several roads experienced swiftly flowing water over them south of Stanton. This includes Campton Road, Pecks Creek Road, and Little Hardwicks Creek Road.
42	POWELL CO.	NADA	6/6/2019	Flash Flood	Fire Rescue, Dispatch, and an NWS Employee reported numerous roads and locations inundated by flowing flood waters. Multiple locations along Kentucky Highway 11 in Slade experienced half a foot or more of flowing water as vehicles became submerged in water near Little Abner's Motel, Miguel's Restaurant, and the Go Time convenience store off the Mountain Parkway exit in Slade. A swift water rescue was performed near See on High Rock Road as two people were trapped in a vehicle. Dispatch reported houses surrounded by water near Rogers Chapel, leading to numerous water rescues.
43	POWELL CO.	BOWEN	5/19/2020	Flood	A citizen observed low lying flooding along Little North Fork Road in Bowen.
44	POWELL CO.	NATURAL BRIDGE	9/12/2020	Flash Flood	High waters caused a truck to be swept off the road trying to leave the Middlefork Campground at Natural Bridge. All passengers were able to escape safely.
	POWELL CO.	NADA	9/12/2020	Flood	Heavy rains led to rising water levels on the Red River, flooding the Red River Gorge Campground located along its banks.
45	POWELL CO.	WALTERSVILLE	2/28/2021	Flash Flood	Adams Ridge Road was reported to have water flowing across the road making it impassable. An alternate route was being used for people traveling the road.
	POWELL CO.	VIRDEN	2/28/2021	Flood	Water was covering the road at mile marker 16 on the Mountain Parkway. The dispatch also reported that the road was not closed.
46	POWELL CO.	WALTERSVILLE	7/1/2021	Flood	Adams Ridge Road was closed due to high water from Brush Creek.
47	POWELL CO.	NADA	7/30/2021	Flash Flood	Powell County dispatch reported water up to a residence in the 5900 block of High Rock Road south of the community of Bowen. The fire department was performing a water rescue of the residents at the time of the report.

City of Clay City Flooding and Flash-Flooding Types, Locations, Previous Occurrences, Impacts, and Extent

City of Clay City Flooding and Flash Flooding Events, 1996 - 2022[10]

Count	County	Location	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL CO.	CLAY CITY	3/1/1997	Flash Flood	0	0	$200,000	$0	0	0
2	POWELL CO.	CLAY CITY	1/7/1998	Flash Flood	0	0	$0	$0	0	0
3	POWELL CO.	CLAY CITY	1/9/1999	Flash Flood	0	0	$0	$0	0	0
4	POWELL CO.	CLAY CITY	12/16/2000	Flash Flood	0	0	$0	$0	0	0
5	POWELL CO.	CLAY CITY	8/10/2001	Flash Flood	0	0	$0	$0	0	0
6	POWELL CO.	CLAY CITY	3/5/2004	Flash Flood	0	0	$0	$0	0	0
7	POWELL CO.	CLAY CITY	1/23/2006	Flash Flood	0	0	$0	$0	0	0
8	POWELL CO.	CLAY CITY	2/7/2008	Flood	0	0	$0	$0	0	0
9	POWELL CO.	CLAY CITY	4/4/2008	Flash Flood	0	0	$55,000	$0	0	0
10	POWELL CO.	CLAY CITY	1/28/2009	Flood	0	0	$0	$0	0	0
11	POWELL CO.	CLAY CITY	8/4/2009	Flash Flood	0	0	$0	$0	0	0
	POWELL CO.	CLAY CITY	8/4/2009	Flash Flood	0	0	$50,000	$0	0	0
12	POWELL CO.	CLAY CITY	5/2/2010	Flash Flood	0	0	$0	$0	0	0
13	POWELL CO.	CLAY CITY	3/4/2015	Flood	0	0	$1,000	$0	0	0
14	POWELL CO.	CLAY CITY	2/20/2019	Flood	0	0	$0	$0	0	0
15	POWELL CO.	CLAY CITY	12/17/2019	Flood	0	0	$11,000	$0	0	0
	TOTALS				***0***	***0***	***$317,000***	***$0***	***0***	***0***

[10] Source: National Centers for Environmental Information (NCEI) Storm Events database

G. City of Clay City Probability (as a Function of Previous Occurrences)

This analysis counts as a discrete flooding or flash-flooding event for the City of Clay City only those events that occurred on different dates. Any event recorded that shares the same date of occurrence as other events are treated as one contiguous event.

The table above displays the entire record of flooding and flash-flooding events for Clay City contained within the NCEI Storm Events database. This analysis counts 15 discrete events within the period-of-record.

To illustrate probability (as a function of previous occurrences) Clay City is counted as having 15 flooding or flash-flooding events over 26 years. This translates to 0.57 flooding or flash-flooding events per year (i.e., [1/(26/15)] = 0.57). So that the partial has meaning, in terms of months and assuming uniformity in likelihood, Clay City can assume to have 1 flooding or flash-flooding event approximately every 21 months (i.e., [1/(15/316)] = 21.06).

City of Clay City Flooding and Flash-Flooding Types, Locations, Previous Occurrences, Impacts, and Extent

City of Clay City Flooding and Flash-Flooding Event with Narratives for Extent and Impacts, 1996 - 2022

Count	County	Location	Date	Type	Event Narrative
1	POWELL CO.	CLAY CITY	3/1/1997	Flash Flood	
2	POWELL CO.	CLAY CITY	1/7/1998	Flash Flood	
3	POWELL CO.	CLAY CITY	1/9/1999	Flash Flood	Water blocked roads in and around the Clay City area.
4	POWELL CO.	CLAY CITY	12/16/2000	Flash Flood	Harwicks Creek and Frames Branch reported out of their banks at Adams Ridge near Clay City. Several homes cut off by floodwaters.
5	POWELL CO.	CLAY CITY	8/10/2001	Flash Flood	Two feet of flowing water between mile marker 12 and 16 on the Mountain Parkway. Portion of the Parkway was closed at Exit 16 due to high water. Kentucky Highways 15 and 11 were also closed due to flowing water. One house and 2 mobile homes were surrounded by water, no damage was reported.
6	POWELL CO.	CLAY CITY	3/5/2004	Flash Flood	
7	POWELL CO.	CLAY CITY	1/23/2006	Flash Flood	Twelve inches of water flowing across several areas of Highway 82, Hardwick Road, and Adams Ridge Road.
8	POWELL CO.	CLAY CITY	2/7/2008	Flood	Highway 2026 near beach fork was flooded. Flooding was also reported in the Bowen Community on Highway 15.
9	POWELL CO.	CLAY CITY	4/4/2008	Flash Flood	Adams Ridge Road was washed out by flood waters.
10	POWELL CO.	CLAY CITY	1/28/2009	Flood	Numerous roads were flooded due to the ice and debris in the Red River causing it to overflow its banks. Roads closures included Pompeii, Adams Ridge, Rosslyn, Bowen and Maple Street. These roads were all in the Clay City and Stanton areas.
11	POWELL CO.	CLAY CITY	8/4/2009	Flash Flood	Portions of Highway 15 has over 6 inches of water flowing across it. Debris was also flowing across the road.
	POWELL CO.	CLAY CITY	8/4/2009	Flash Flood	The Powell County emergency manager say that Stanton is experiencing severe flash flooding. A rescue was underway in the city limits on Stanton Road. A daycare center was evacuated due to flooding and many businesses were flooded. Debris was seen flowing across many roads within Stanton city limits.
12	POWELL CO.	CLAY CITY	5/2/2010	Flash Flood	The Beech Fork Reservoir between Clay City and Stanton was in danger of breach. Water was overflowing the dam according to the Beech Fork Water Commission.
13	POWELL CO.	CLAY CITY	3/4/2015	Flood	Adams Ridge on Brush Branch had to be closed due to flooding.
14	POWELL CO.	CLAY CITY	2/20/2019	Flood	Local media reported flooding between Stanton and Clay City along Kentucky Highway 2026.
15	POWELL CO.	CLAY CITY	12/17/2019	Flood	The Kentucky Transportation Cabinet reported standing water over Kentucky Highways 2026, 1184, and 613 between Bowen and Clay City.

City of Stanton Flooding and Flash-Flooding Types, Locations, Previous Occurrences, Impacts, and Extent

City of Stanton Flooding and Flash Flooding Events, 1996 - 2022[11]

Count	County	Location	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL CO.	STANTON	6/16/1997	Flash Flood	0	1	$3,300,000	$1,700,000	0	0
2	POWELL CO.	STANTON	7/29/2001	Flash Flood	0	0	$0	$0	0	0
3	POWELL CO.	STANTON	5/2/2002	Flash Flood	0	0	$0	$0	0	0
4	POWELL CO.	STANTON	5/15/2003	Flash Flood	0	0	$0	$0	0	0
5	POWELL CO.	STANTON	5/27/2004	Flash Flood	0	0	$0	$0	0	0
6	POWELL CO.	STANTON	5/3/2010	Flood	0	0	$0	$0	0	0
7	POWELL CO.	STANTON	7/4/2013	Flash Flood	0	0	$1,000	$1,000	0	0
8	POWELL CO.	STANTON	8/12/2013	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON	8/12/2013	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON	8/12/2013	Flash Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON ARPT	8/12/2013	Flash Flood	0	0	$2,000	$0	0	0
9	POWELL CO.	STANTON	8/21/2013	Flash Flood	0	0	$0	$1,000	0	0
10	POWELL CO.	STANTON	8/31/2014	Flash Flood	0	0	$1,000	$0	0	0
11	POWELL CO.	STANTON	3/4/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON	3/4/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON	3/4/2015	Flood	0	0	$1,000	$0	0	0
	POWELL CO.	STANTON	3/4/2015	Flood	0	0	$1,000	$0	0	0
12	POWELL CO.	STANTON ARPT	4/14/2015	Flood	0	0	$1,000	$0	0	0
13	POWELL CO.	STANTON	9/18/2016	Flash Flood	0	0	$50	$0	0	0
14	POWELL CO.	STANTON	12/1/2019	Flood	0	0	$0	$0	0	0
15	POWELL CO.	STANTON	7/30/2021	Flash Flood	0	0	$15,000	$0	0	0
	POWELL CO.	STANTON	7/30/2021	Flash Flood	0	0	$0	$0	0	0
16	POWELL CO.	STANTON	12/11/2021	Flood	0	0	$0	$0	0	0
	TOTALS				***0***	***1***	***$3,327,050***	***$1,702,000***	***0***	***0***

[11] Source: National Centers for Environmental Information (NCEI) Storm Events database

H. City of Stanton Probability (as a Function of Previous Occurrences)

This analysis counts as a discrete flooding or flash-flooding event for the City of Stanton only those events that occurred on different dates. Any event recorded that shares the same date of occurrence as other events are treated as one contiguous event.

The table above displays the entire record of flooding and flash-flooding events for Stanton contained within the NCEI Storm Events database. This analysis counts 16 discrete events within the period-of-record.

To illustrate probability (as a function of previous occurrences) Stanton is counted as having 16 flooding or flash-flooding events over 26 years. This translates to 0.62 flooding or flash-flooding events per year (i.e., [1/(26/16)] = 0.62). So that the partial has meaning, in terms of months and assuming uniformity in likelihood, Stanton can assume to have 1 flooding or flash-flooding event approximately every 20 months (i.e., [1/(16/316)] = 19.75).

City of Stanton Flooding and Flash-Flooding Types, Locations, Previous Occurrences, Impacts, and Extent

City of Stanton Flooding and Flash-Flooding Events with Narratives for Extent and Impacts, 1996 - 2022

Count	County	Location	Date	Type	Event Narrative
1	POWELL CO.	STANTON	6/16/1997	Flash Flood	
2	POWELL CO.	STANTON	7/29/2001	Flash Flood	Heavy rains brought 6 inches of water to flow over roads in town.
3	POWELL CO.	STANTON	5/2/2002	Flash Flood	Flash Flooding caused a reported one to one and a half feet of water to flow over Hardwick Creek Road.
4	POWELL CO.	STANTON	5/15/2003	Flash Flood	Water was flowing over Kentucky Highway 15.
5	POWELL CO.	STANTON	5/27/2004	Flash Flood	Three to four feet of water was flowing in the Kroger parking lot.
6	POWELL CO.	STANTON	5/3/2010	Flood	A large amount of flooding occurred along Boone Street in Stanton. Yards were flooded almost up to porches in some cases with up to a foot of water in lower lying areas. Many small tree limbs had been blown down. Six inches of storm total rainfall was measured.
7	POWELL CO.	STANTON	7/4/2013	Flash Flood	Water was reported to have been flowing over portions of both East and West College Avenue and Airport Rd in Stanton. The roads were temporarily impassable.
8	POWELL CO.	STANTON	8/12/2013	Flash Flood	A resident of Willowbend Way in the Brookside Cottages subdivision in Stanton reported that 18-24 inches of water was flowing across the backyard of her residence and that 3 inches of water entered her garage. The water swept away the large trash can in front of her home and carried the full bags of trash to the other end of the subdivision. One other resident of Willowbend Way had water enter her home and an office building in the neighborhood had 2 inches of water inside at one point.
	POWELL CO.	STANTON	8/12/2013	Flash Flood	Both Railroad St and Washington Ave were flooded.
	POWELL CO.	STANTON	8/12/2013	Flash Flood	Knee deep water was flowing across the intersection of Washington Ave and Railroad Street. The water receded off the road around 335 pm.
	POWELL CO.	STANTON ARPT	8/12/2013	Flash Flood	Water was reported flowing across East College Avenue in several places. At one point water entered the Pooh and Pals daycare center. The water receded from the building and off the road by 335 pm.
9	POWELL CO.	STANTON	8/21/2013	Flash Flood	Eighteen inches of water were flowing across Willow Bend Way in the Brookside Cottages subdivision.
10	POWELL CO.	STANTON	8/31/2014	Flash Flood	Two bridges were reported to have been washed out along Jerrica Leigh Lane just to the east of KY Hwy 213.
11	POWELL CO.	STANTON	3/4/2015	Flood	Maple Street was flooded.
	POWELL CO.	STANTON	3/4/2015	Flood	Paint Creek was out of its banks and causing flooding, but nearby Hwy 615 was not flooded.
	POWELL CO.	STANTON	3/4/2015	Flood	The Red River left its banks and flooded Hwy 613.
	POWELL CO.	STANTON	3/4/2015	Flood	Maple St at the Red River was closed due to flooding.

Count	County	Location	Date	Type	Event Narrative
12	POWELL CO.	STANTON ARPT	4/14/2015	Flood	One lane of Maple Street was under water.
13	POWELL CO.	STANTON	9/18/2016	Flash Flood	A Kroger employee reported the store parking lot was inundated with water. Nearby ditches and Judy Creek overspilled their banks. Water rose over semi truck wheel wells as approximately three to four feet of water flooded loading dock ramps.
14	POWELL CO.	STANTON	12/1/2019	Flood	A spotter observed water from the Red River spilling over onto Kentucky Highway 2026 northwest of Stanton, forcing the closure of the highway.
15	POWELL CO.	STANTON	7/30/2021	Flash Flood	Water was flowing over the road in the Brookside Cottages subdivision in Stanton and made it into the Leasing Office. The force of the water cased the pavement on the road to break apart.
	POWELL CO.	STANTON	7/30/2021	Flash Flood	Powell County dispatch reported that all the primary streets in Stanton now have water over them.
16	POWELL CO.	STANTON	12/11/2021	Flood	Maple Street (Pompeii Road) is closed and flooded by water of an unknown depth.

National Flood Insurance Program (NFIP) Participation

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
210194#	Powell County	Powell	11/29/74	09/27/85	02/17/10	09/27/85
210195#	City of Clay City	Powell	02/01/74	02/19/92	02/17/10	09/06/89
210196#	City of Stanton	Powell	05/24/74	01/16/87	02/17/10	01/16/87

Powell County, Unincorporated and the Cities of Clay City and Stanton are participants in good standing with the National Flood Insurance Program (NFIP).

Community Rating System (CRS) Participation

CID	Community Name	County	CRS Entry Date	Curr Eff Date	Curr Class
210194#	Powell County	Powell	-	-	-
210195#	City of Clay City	Powell	-	-	-
210196#	City of Stanton	Powell	-	-	-

Neither Powell County, Unincorporated, or its incorporated cities, Clay City and Stanton, are active participants of FEMA's Community Rating System (CRS).

Repetitive-Loss and Severe Repetitive-Loss Properties

Powell County, Uninc., RL and SRL Properties by Type and by RL/SRL Definition Category

Jurisdiction	Occupancy Type	Number of Type	NFIP RL	FMA RL	NFIP SRL	FMA SRL
Powell County, Uninc.	Single Family	0	0	0	0	0
Powell County, Uninc.	2-4 Family	0	0	0	0	0
Powell County, Uninc.	Non-Residential/Business	0	0	0	0	0
Powell County, Uninc.	Non-Residential/Other	0	0	0	0	0
	TOTALS:	***0***	***0***	***0***	***0***	***0***

City of Clay City RL and SRL Properties by Type and by RL/SRL Definition Category

Jurisdiction	Occupancy Type	Number of Type	NFIP RL	FMA RL	NFIP SRL	FMA SRL
Clay City	Single-Family	3	3	2	2	2
Clay City	2-4 Family	0	0	0	0	0
Clay City	Non-Residential/Business	0	0	0	0	0
Clay City	Non-Residential/Other	0	0	0	0	0
	TOTALS:	***3***	***3***	***2***	***2***	***2***

City of Stanton RL and SRL Properties by Type and by RL/SRL Definition Category

Jurisdiction	Occupancy Type	Number of Type	NFIP RL	FMA RL	NFIP SRL	FMA SRL
Stanton	Single-Family	0	0	0	0	0
Stanton	2-4 Family	0	0	0	0	0
Stanton	Non-Residential/Business	0	0	0	0	0
Stanton	Non-Residential/ Other	0	0	0	0	0
	TOTALS:	***0***	***0***	***0***	***0***	***0***

A Statement of Vulnerability to Flooding for Powell County and the Cities of Clay City and Stanton

From the Flood Factor website, the following relevant statement regarding vulnerability to flooding for Powell County and the Cities of Clay City and Stanton are made.[12]

Powell County, Unincorporated
"There are 1,274 properties in Powell County that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 27% of all properties in Powell County.

"In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, Powell County has a severe risk of flooding over the next 30 years, which means flooding is likely to impact day to day life within the community."

Additionally:

- 960 out of 3,614 homes are considered to have "some flood risk."
- 330 out of 737 miles of roads are considered "at risk of becoming impassable due to flooding."
- 56 out of 214 commercial properties in Powell County have "some flood risk."
- 10 out of 14 infrastructure facilities "are at risk of flooding in Powell County. This includes: hospitals, police stations, fire stations, airports, seaports, power stations, wastewater station plants, superfund/hazardous waste sites, and water treatment facilities."
- 8 out of 17 "social facilities" (e.g., schools, houses of worship, museums, government and/or historic buildings) in Powell County have "some flood risk."

[12] SOURCES:
- https://riskfactor.com/county/powell-county-kentucky/21197_fsid/flood
- https://riskfactor.com/city/clay-city-ky/2115238_fsid/flood
- https://riskfactor.com/city/stanton-ky/2173164_fsid/flood

City of Clay City

"There are 188 properties in Clay City that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 47% of all properties in Clay City…In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, Clay City has a major risk of flooding over the next 30 years, which means flooding is likely to impact day-to-day life within the community…"

Additionally:

- 142 out of 335 homes are considered to have "some flood risk."
- 12 out of 22 miles of roads are considered "at risk of becoming impassable due to flooding."
- 29 out of 46 commercial properties in the City of Clay City have "some flood risk."
- 2 out of 3 infrastructure facilities "are at risk of flooding in the City of Clay City. This includes: hospitals, police stations, fire stations, airports, seaports, power stations, wastewater station plants, superfund/hazardous waste sites, and water treatment facilities."
- 3 out of 4 "social facilities" (e.g., schools, houses of worship, museums, government and/or historic buildings) in the City of Clay City have "some flood risk."

City of Stanton

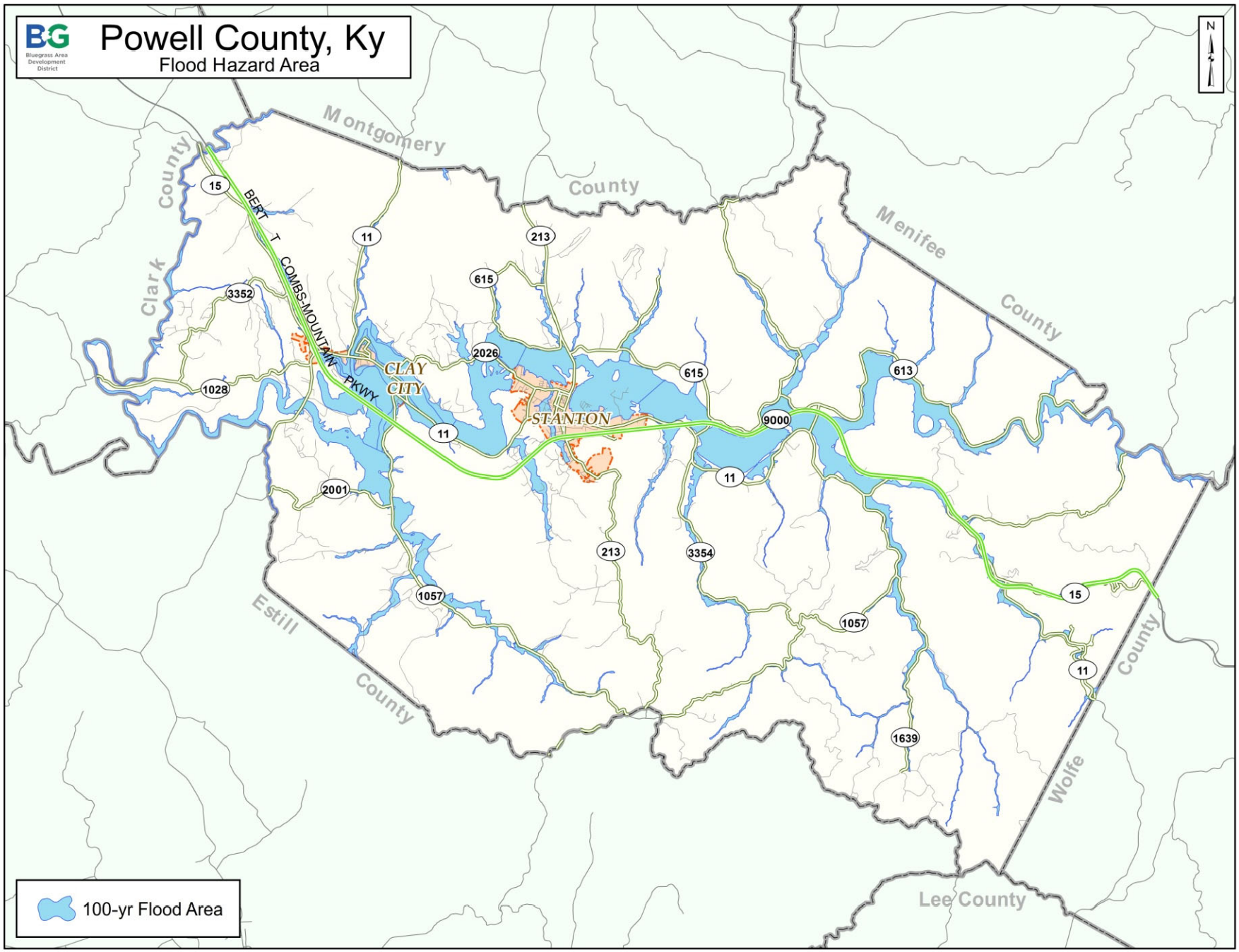
"There are 127 properties in Stanton that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 18% of all properties in Stanton…In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, Stanton has a moderate risk of flooding over the next 30 years, which means flooding is likely to impact day-to-day life within the community…"

Additionally:

- 162 out of 795 homes are considered to have "some flood risk."
- 8 out of 42 miles of roads are considered "at risk of becoming impassable due to flooding."
- 7 out of 115 commercial properties in the City of Stanton have "some flood risk."
- 3 out of 6 infrastructure facilities "are at risk of flooding in the City of Stanton. This includes: hospitals, police stations, fire stations, airports, seaports, power stations, wastewater station plants, superfund/hazardous waste sites, and water treatment facilities."
- 1 out of 6 "social facilities" (e.g., schools, houses of worship, museums, government and/or historic buildings) in the City of Stanton have "some flood risk."

On the next page is a map of Powell County and the City of Clay City and Stanton's flood zones[13].

[13] SOURCE: BGADD GIS, Community Planning Department


Powell County, Ky
Flood Hazard Area
Bluegrass Area Development District
N
Montgomery County
Clark County
Menifee County
Estill County
Wolfe County
Lee County
BERT T COMBS-MOUNTAIN PKWY
CLAY CITY
STANTON
15
11
213
615
3352
2026
1028
613
9000
2001
3354
1057
1639
100-yr Flood Area

Dams

A. New and Existing Dams

Depending on the type of dam, periodic inspections are performed during the construction of a new dam. A final inspection is performed when the construction is complete and as-built drawings are submitted. If the dam is constructed according to the plans and specifications, a letter is issued approving the impounding of water. The dam is then added to the inventory database.

B. Signs of Potential Dam Failure

Seepage: The appearance of seepage on the downstream slope, abutments, or downstream area is cause for concern. If the water is muddy and is coming from a well-defined hole, material is probably being eroded from inside the embankment and a potentially dangerous situation can develop.

Erosion: Erosion on the dam and spillway is one of the evident signs of danger. The size of erosion channels and gullies can increase greatly with slight amounts of rainfall.

Cracks: Cracks are one of two types: traverse or longitudinal. Traverse cracks appear perpendicular to the axis of the dam and indicate settlement of the dam. Longitudinal cracks run parallel to the axis of the dam and may be the signal for a slide, or slump on either face of the dam.

Subsidence: Subsidence is the vertical movement of the foundation materials due to failure of consolidation. The rate of subsidence may be so slow that it can go unnoticed without proper inspection. Foundation settlement is the result of placing the dam and reservoir on an area not having suitable strength or over collapsed caves or mines.

Structural: Conduit separations or ruptures can result in water leaking into the embankment and subsequent weakening of the dam. Pipe collapse can result in hydraulic failures due to diminished capacity.

Vegetation: A prominent danger signal is the appearance of “wet environment” types of vegetation such as cattails, reeds, mosses, and other wet area vegetation. Appearance of these types of vegetation can be a sign of seepage.
Boils: Boils indicate seepage water exiting under some pressure and typically occur in areas downstream of the dam.

*Animal Burrows**:*** Animal Burrows are a potential danger since such activity can undermine the structural integrity of the dam.

C. Types of Dam Failures

Dam failures generally result from a complex interrelationship of several failure modes. Uncontrolled seepage may weaken the soils and lead to a structural failure. Structural failure may shorten the seepage path and lead to piping failure. Surface erosion may lead to structural piping failures.

Hydraulic Failure. Hydraulic failures result from the uncontrolled flow of water over, around the dam and/or adjacent to the dam, and the erosive action of water on the dam and its foundation. Earth dams are particularly vulnerable to hydraulic failure since earth erodes at relatively small velocities.

Seepage Failure. All dams exhibit some seepage that must be controlled in velocity and amount. Seepage can occur through the dam and its foundation. If uncontrolled, it can erode material from the foundation of an earth dam to form a conduit through which water can pass. This passing of water often leads to a complete failure of the structure known as piping.

Structural Failure. Structural failures involve the rupture of the dam and/or its foundation. This is particularly hazard for large dams and for dams built of low strength materials such as silts, slag, fly ash, etc.

D. Dam Impacts

Dam failures cause flooding that is significantly different from natural flooding. A flood from a dam failure may arrive before any warning or evacuation based on limited environmental cues occur making it very problematic. The failure of large dams results in flooding with enough energy to damage or destroy residences and other structures.

Karst

An area of irregular limestone in which erosion has produced fissures, sinkholes, underground streams, and caverns. Karst refers to a type of topography formed in limestone, dolomite, or gypsum by dissolution of these rocks by rain and underground water, and is characterized by closed depressions or sinkholes, and underground drainage. During the formation of karst terrain, water percolating underground enlarges subsurface flow paths by dissolving the rock. As some subsurface flow paths are enlarged over time, water movement in the aquifer changes character from one where ground water flow was initially through small, scattered openings in the rock to one where most flow is concentrated in a few, well developed conduits. As the flow paths continue to enlarge, caves may be formed, and the ground water table may drop below the level of surface streams. Surface streams may then begin to lose water to the subsurface. As more of the surface water is diverted underground, surface streams and valleys become a less conspicuous feature of the land surface and are replaced by closed basins. Funnels or circular depressions called sinkholes often develop at some places in the low points of these closed.

Sinkholes

A sinkhole is a natural depression in a land surface communicating with a subterranean passage, generally occurring in limestone regions, and formed by solution or by the collapse of a cavern roof.

A karst landscape has sinkholes, sinking streams, caves, and springs. Precipitation infiltrates into the soil and flows into the subsurface from higher elevations and generally toward a stream at a lower elevation. Weak acids found naturally in rain and soil water slowly dissolve the tiny fractures in the soluble bedrock, enlarging the joints and bedding planes.

Sinkhole Types

1. Collapse Sinkholes: Occur when the bridging material over a subsurface cavern cannot support the overlying material. The cover collapses into the cavern and a large, funnel-shaped depression forms.

2. Solution Sinkholes: Results from increased groundwater flow into higher porosity zones within the rock, typically through fractures or joints within the rock. An increase of slightly acidic surface water into the subsurface continues to slow dissolution of the rock matrix, resulting in slow subsidence as surface materials fill the voids.

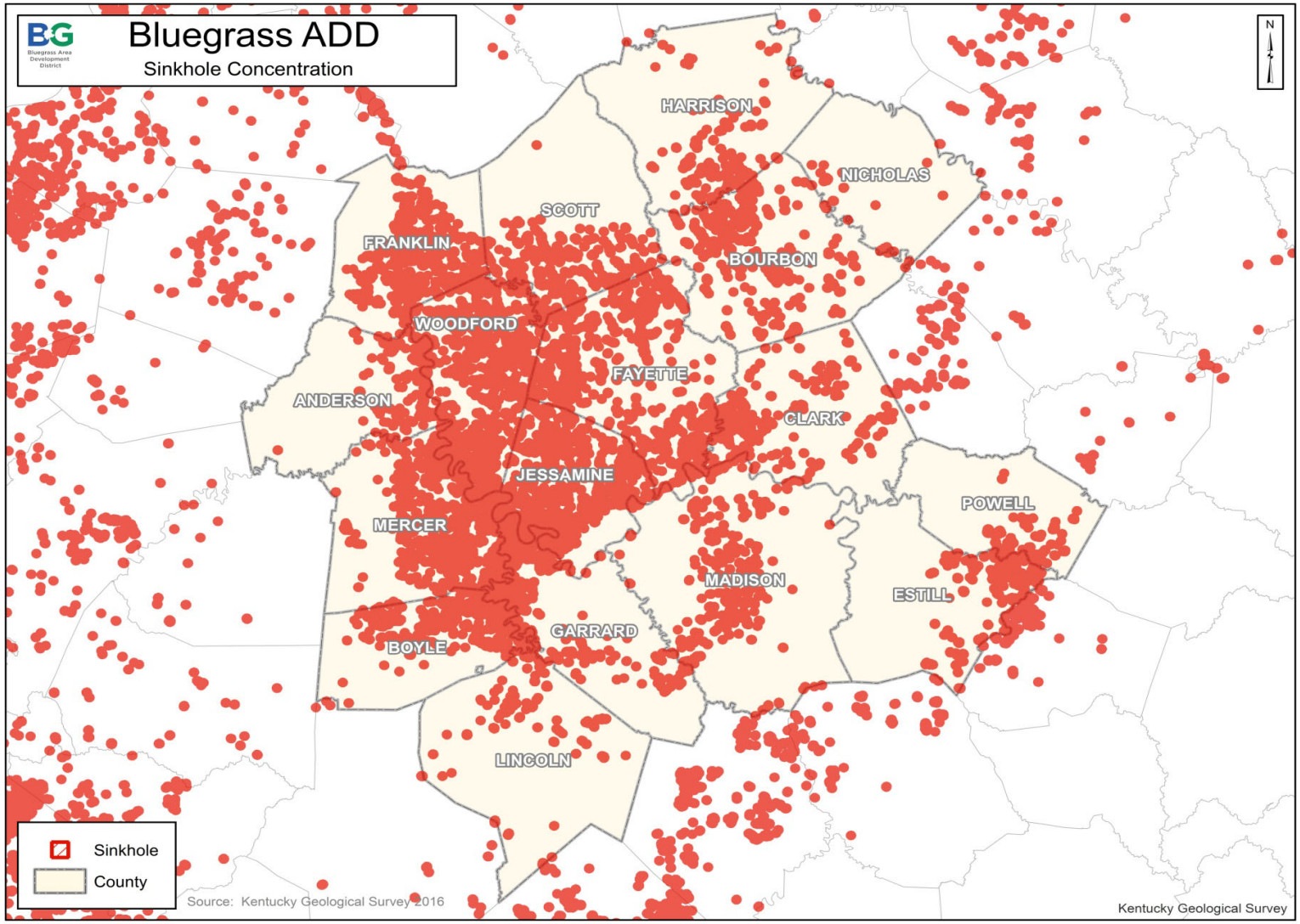
3. Alluvial Sinkholes: Older sinkholes that have been partially filled with marine, wetland or soil sediments. These features are common in low lying coastal areas, where the water table is shallow, and typically appear as shallow lakes and wetlands.

4. Raveling Sinkholes: Form when a thick overburden of sediment over a deep cavern cave into the void and pipes upward toward the surface. As the overlying material or "plug" erodes into the cavern, the void migrates upward until the cover can no longer be supported then subsidence begins.

Sinkhole Potential Loss and Probability

The lack of proper data prohibits accurate loss estimation modeling, on jurisdictions, for the karst hazard. There is not enough data available to adequately detail what potential losses may occur from karst. That said, it is assumed given Powell County and the Cities of Clay City and Stanton's location near the inner Bluegrass Karst Area (see below) that there is near a 100% chance of a sinkhole event occurring somewhere within the county and/or cities. That there are no systematic damages is a function of ubiquity of events.

Sinkhole Locations/Previous Occurrences/Extent/Impact



In the meeting that was held with the public and the local emergency management stakeholders, karst was rated as posing a low risk to Powell County. Because Powell County is located near one of the most severe karst regions in the state, the Bluegrass ADD planning staff would argue that it likely poses a moderate rather than a low risk.

Given the characteristics of the County's topography, it can be assumed that there are a significant number of sinkholes throughout the County on private property that have not been identified and recorded. Although Powell County, Clay City, and Stanton have been fortunate in that no sinkholes have caused any significant damage to property or infrastructure, it must be noted that the risk does exist, and it is significant. One can look to events in neighboring counties as events that could potentially take place in Powell County given their similar topography. For example, in 2019 a major sinkhole opened in a residential neighborhood in nearby Fayette County[14]. This sinkhole was over 30-feet deep. A sinkhole of this size has the potential to cause significant damage to homes, businesses, and infrastructure.

[14] Source: https://foxlexington.com/news/local/lexington-sinkhole-crews-to-further-examine-30-foot-holes-impact/

Sinkhole Vulnerability (Karst Terrain)

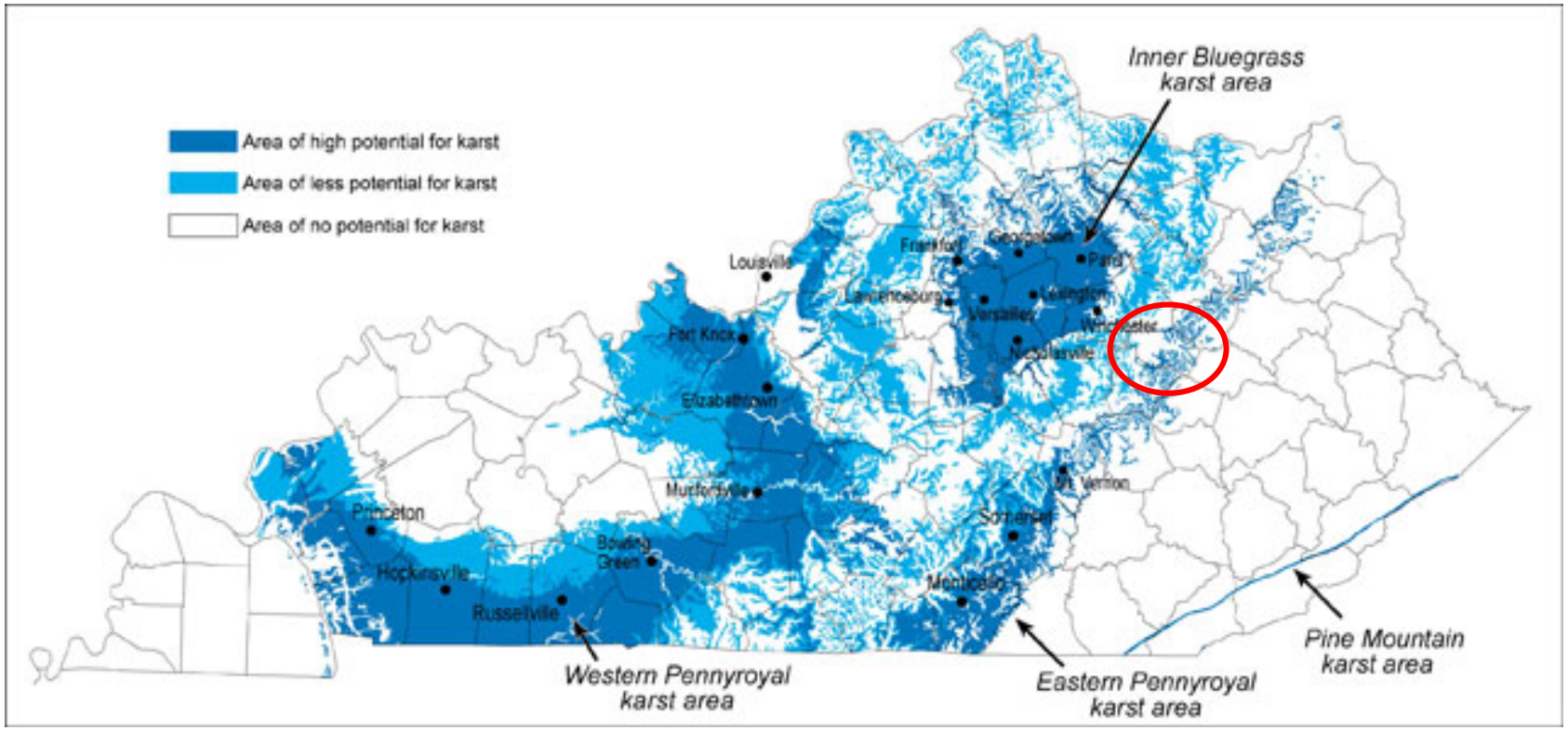


Figure 2: Kentucky Karst Topography, Source: Kentucky Geological Survey

Landslides

According to the Kentucky Geological Survey, landslides are the downslope movement of rock, soil, or both under the influence of gravity. They can occur in landscapes ranging from gentle slopes to steep cliffs. Velocity of landslide movement can also vary from slow to very rapid.

Landslides occur in each of the 50 states. In Kentucky, they are not isolated to a particular region within the state, as all that is required is gravity to exceed the strength of the materials that compose a slope.

Landslides can be triggered or facilitated by intense rainfall, earthquakes, water level change, human activities, and geology. Areas that are generally prone to landslide hazards include existing old landslides; the bases of steep slopes; the bases of drainage channels; and developed hillsides where leach-field septic systems are used.

Areas that are typically considered safe from landslides include areas that have not moved in the past; relatively flat-lying areas away from sudden changes in slope; and areas at the top or along ridges, set back from the tops of slopes. Federal, state, and local agencies responsible for disaster assistance, flood insurance, and highway maintenance and repair incur much of the economic loss. Private costs involve mainly damage to land and structures. A severe landslide can result in financial ruin for the property owners because landslide insurance (except for disease flow coverage) or other means of spreading the costs of damage are unavailable. Since the early 1970s, the Kentucky Transportation Cabinet and the Kentucky Transportation Center has received reports of approximately 3,000 landslides. The cost for landslide damage repair has exceeded $2 million annually. Thousands of slides are unrelated to transportation, however, and remain unreported. Landslides are also significant hazards to people and infrastructure.

Population increases, rapid urbanization, and development will lead to an increase in landslide activity. The direct costs of a landslide can include repair and maintenance of roads and property. The indirect costs result in a loss of tax revenue on property devalued because of landslides, loss of real estate value in landslide-prone areas, and environmental effects such as water quality. In addition, indirect cost can result in lost productivity, disruption of utility and transportation systems, and costs for any litigation. Some indirect costs are difficult to evaluate, thus estimates are usually conservative or simply ignored. If indirect costs were realistically determined, they likely would exceed direct costs.

A. Historical Landslide Data for the Region

See table on following page(s)

Powell County and the Cities of Clay City and Stanton Landslide Previous Occurrences, Types, Locations, Extent, Impacts from Kentucky Geological Survey Landslide Inventory, 2011[15] - January 2022

Count	County	City	Latitude	Longitude	Location: Site	Location: Failure Location	Date	Type	Extent: Track Length	Extent: Width	Extent: Head Scarp Height	Extent: Slip Surface Depth	Type: Lithology	Impacts: Damage Narrative	Impacts: Costs	Extent: Movement Rate
1	Powell	Slade	37.783577	-83.685075	KY 11	Above Road	6/22/2011	Rockfall					Siltstone; Shale; Dolomite	Yes		
2	Powell	Slade	37.78339	-83.686028	KY 11	Above Road	7/19/2011	Composite Slide	350'				Siltstone; Shale	Yes		
3	Powell	Stanton	37.792055	-83.790318	CR 3354		2010						Limestone; Shale; Dolomite			
4	Powell	Slade	37.783809	-83.685599	KY 11		2011						Siltstone; Shale; Dolomite			
5	Powell	Slade	37.790132	-83.708272		Above Road		Landslide					Siltstone; Shale			
6	Powell	Slade	37.7884	-83.709527		Natural Slope	5/8/2013	Landslide					Siltstone; Shale			
7	Powell	Slade	37.8476	-83.69032	KY 613	General Road Embankment; Stream at Bottom	2015	Landslide					Siltstone; Shale	Road Damage		
8	Powell	Slade	37.815734	-83.780323		Quarry Highwall		Landslide					Limestone; Shale			
9	Powell	Slade	37.848475	-83.727526	KY 613	Above and Below Road; Stream at Bottom	2015	Landslide					Shale; Siltstone	Break in Pavement		
10	Powell	Stanton	37.831078	-83.839764	KY 213					50'			Limestone; Shale			
11	Powell	Stanton	37.843573	-83.826954	KY 9000 Mountain Pkwy	Below Road							Shale; Siltstone			
12	Powell	Clay City	37.871295	-83.948302	KY 9000 Mountain Pkwy	Below Road; Stream at Bottom				60'			Shale; Dolomite			
13	Powell	Clay City	37.830776	-83.889883	KY 9000 Mountain Pkwy	Below Road				100'			Shale; Siltstone			
14	Powell	Slade	37.752976	-83.739884	KY 1639								Siltstone; Shale; Dolomite			
15	Powell	Stanton	37.831504	-83.84233	KY 213								Siltstone; Shale			
16	Powell	Stanton	37.831085	-83.844905	KY 213								Siltstone; Shale			
17	Powell	Stanton	37.842808	-83.791029	KY 615		1/19/2019	Landslide					Siltstone; Shale			
18	Powell	Clay City	37.836785	-83.888423	1700 Block Stanton Highway		1/4/2019						Siltstone; Shale			
19	Powell	Stanton	37.861861	-83.819705	KY 615		6/17/2019	Debris Flow		125'			Shale; Siltstone	Destroyed Home; Resident Rescued Alive		

[15] The events that are not dated (i.e., have nothing in the "Failure Date" column) may have failed prior to 2011.

Probability for Landslides as a Function of Previous Occurrences and a Note on Extent and Impacts

First, it is relevant to note that the landslide events recorded above for which there is no value in the "Failure Date" column may have failed prior to 2011. Frankly, they may have failed years or decades prior to 2011. Still, Kentucky suffers from dramatic underreporting of landslides. So, a way to correct this underreporting and to illustrate the risk from landslides for Powell County and for the Cities of Clay City and Stanton, when discussing probability of future landslide occurrence in terms of frequency of occurrence (i.e., as a function of recorded previous occurrences) this analysis assumes it more accurate to compact the date range for previous occurrences (thus making the denominator smaller and the per annum landslide frequency larger) than elongate the date range. Over the entire span of time for which landslides could be or should have been recorded in a fantastical world where recording a landslide event is as quotidian as picking up one's mail, there are far more than 19 total previous occurrences. Represented above is the best available data.

All jurisdictions adopting the Bluegrass Area Development District multi-jurisdictional, multi-hazard mitigation plan from Powell County have "extent" and "impact" statistics.

Regarding probability, note the following:

There are 19 of events recorded for the entirety of Powell County, i.e., unincorporated Powell County, and the Cities of Clay City and Stanton.

There are nine (9) events recorded for Powell County, unincorporated only.

There are three (3) events recorded specifically for Clay City.

There are seven (7) events recorded specifically for the City of Stanton.

The period-of-record is considered 2011 – 2022, or 11 years.

Probability of Landslide Occurrence as a Function of Past Events, 2011-2022

Jurisdiction	# Events	# Years	Events Per Year	1 Event Every [Unit of Time]
Powell County	19	11	1.72	1 Event Every 7 Months
Powell County, Unincorporated	9	11	0.81	1 Event Every 1 Year and 3 Months
Clay City	3	11	0.27	1 Event Every 3 Years and 8 Months
Stanton	7	11	0.64	1 Event Every 1 Year and 7 Months

Vulnerability to Landslides

The following statement of methodology describing what will be an illustration of the vulnerability to landslides for Nicholas County and the City of Carlisle derives from the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018:

Regarding susceptibility, "[a] statewide landslide susceptibility model was developed in ArcGIS using two map layers: geology and slope. The geology and slope maps (raster images) were reclassified based on a matrix of weighted scores that were assigned to particular geologic formations and ranges of slope values (Table 2-5). The weighted score for slope doubled with each increasing slope range. The weighted score for the geology ranged from 10 to 40 depending on the rock type. Using the ArcGIS Weighted Sum tool, the newly reclassified values of both raster map layers were multiplied by an assigned weight and then values for both layers were added together (Eq. 2-1). In order to have slope be a greater influence on the susceptibility model, a 70 percent weight was assigned for slope and a 30 percent weight was assigned for geology.

"**Eq. 2-1**
(geology reclass value × 0.30) + (slope reclass value × 0.70) = landslide susceptibility value

"Using the summed cell values from the two layers, landslide susceptibility was manually classified into low, moderate, and high categories.... Classification was made by visually inspecting the map and by determining the distribution of existing landslides cataloged in the Kentucky Geological Survey inventory."

Regarding vulnerability, "[a] landslide vulnerability map was created to identify specific areas where impact from landslide activity may be significant because of exposure... U.S. Census Bureau census tract population data and the landslide susceptibility values were used to create the map. Using the ArcGIS Raster Calculator, the vulnerability values were calculated by multiplying population by the weighted landslide susceptibility score. Vulnerability was classified as low, moderate, high, or very high based on population, topography, and the distribution of landslides listed in the inventory[16]."

[16] See pages KGS-27 – KGS-28 in the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018.

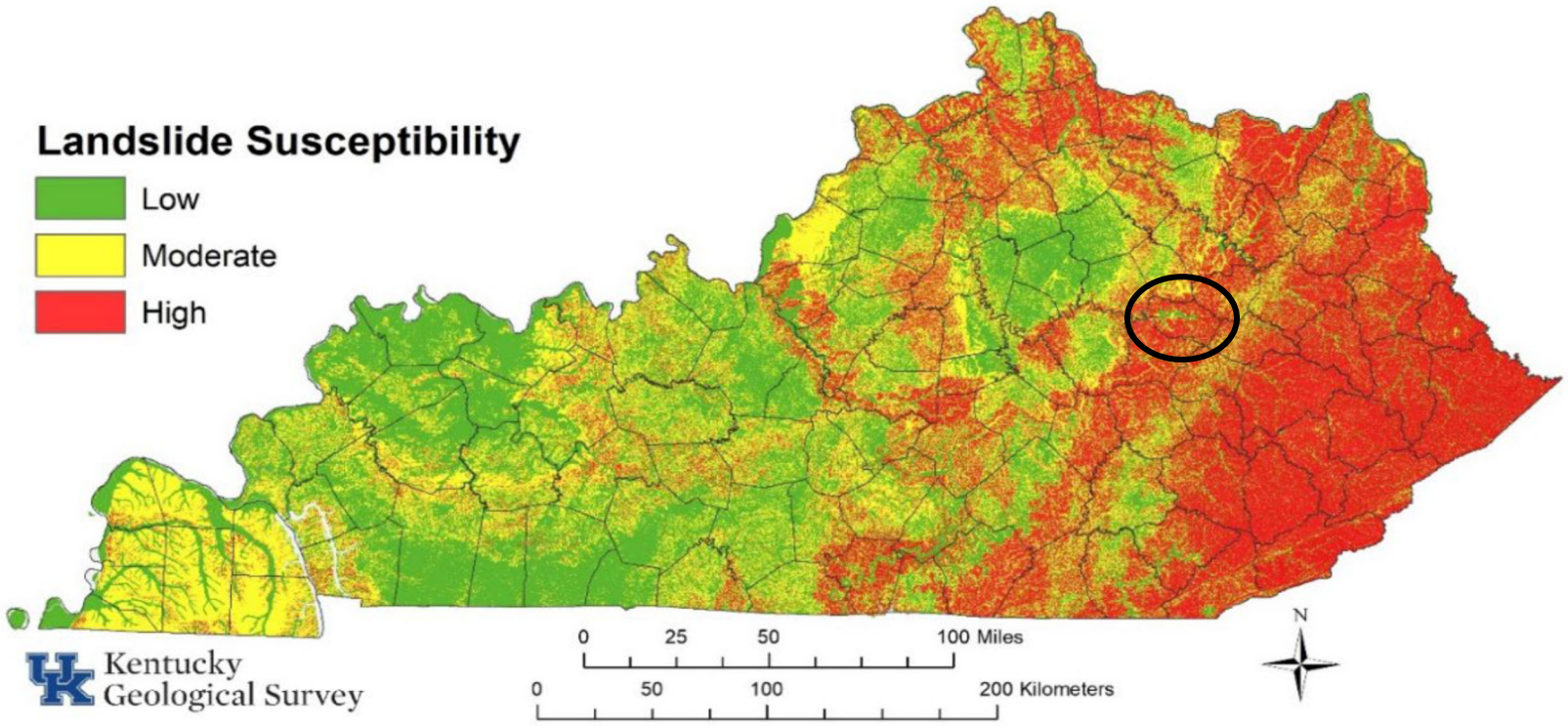


Figure 3: Landslide susceptibility of Kentucky. Powell County is located within circle.

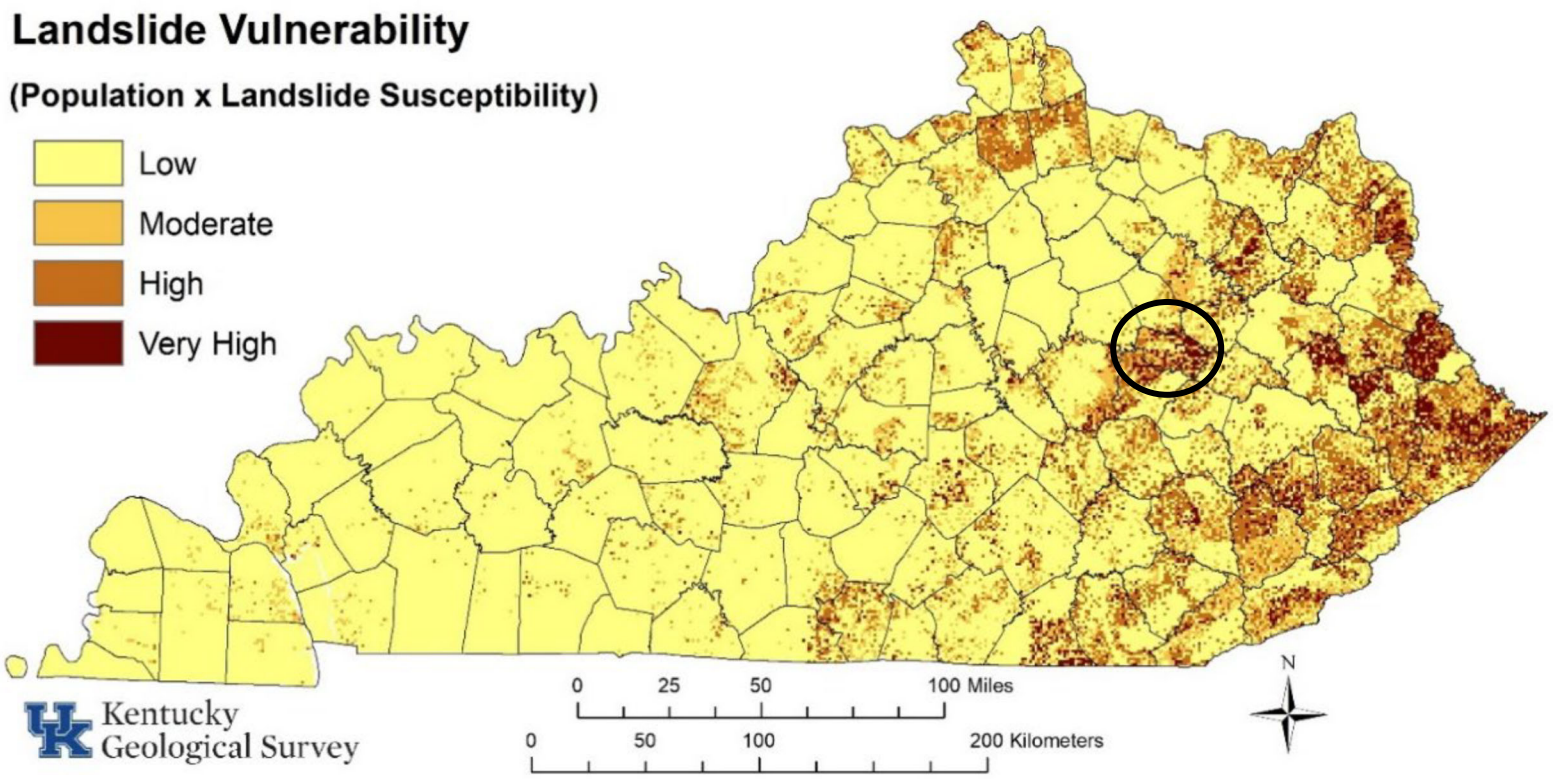


Figure 4: Landslide vulnerability in Kentucky. Darker colors indicate areas of high population and high susceptibility, lighter colors indicate low population and low to moderate susceptibility. Powell County is located within circle.

Severe Thunderstorms (and Tornadoes)

Thunder is a shock wave that results in a sound wave of thunder, which is caused by the rapid heating and cooling of the air near lightning channels.

A. Types of Thunderstorms

All thunderstorms require instability and lift. Fronts, low pressure troughs or an air rising upslope produce lifts, which release the instability. Instability occurs when cooler air rises to a warmer environment. Cooler air tends to sink. The upward moving air is the updraft, and the downdraft winds produce one of the four storms below: single cell, multicell cluster, multicell line, or supercell.

1. **Single Cell (pulse storms)**
   Typically, these storms last 20-30 minutes. Pulse storms can produce severe weather elements such as downbursts, hail, some heavy rainfall and occasionally weak tornadoes. This storm is light to moderately dangerous to the public and moderately to highly dangerous to aviation.

2. **Multicell Cluster**
   These storms consist of a cluster of storms in varying stages of development. Multicell storms can produce moderate sized hail, flash floods, and weak tornadoes. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.

3. **Multicell Line**
   Multicell line storms consist of a line of storms with a continuous, well developed gust front at the leading edge of the line. Also known as squall lines, these storms can produce small to moderate sized hail, occasional flash floods and weak tornadoes. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.

4. **Supercell**
   Even though it is the rarest of storm types, the supercell is the most dangerous because of the extreme weather generated. Defined as a thunderstorm with a rotating updraft, these storms can produce strong downbursts, large hail, occasional flash floods and weak to violent tornadoes. This storm is extremely dangerous to the public and aviation.

5. Tornadoes

A tornado is a highly unpredictable, violently rotating column of air in contact with the ground and extending from the base of a thunderstorm characterized by a twisting, funnel shaped cloud. It is spawned when cool air overrides a layer of warm air, forcing the warm air to rise rapidly.

The most destructive and deadly tornadoes occur from supercells, which are rotating thunderstorms with a well-defined radar circulation called a mesocyclone. Tornado season is generally March through August, although tornadoes can occur at any time of year. They tend to occur in the afternoons and evenings (over 80 percent of all tornado strikes occur between noon and midnight).

The damage from a tornado is a result of the high wind velocity (up to 250mph) and wind-blown debris with paths that can be more than one mile wide and fifty miles long. Tornadoes gain their destructive power by increasing wind speed and picking up all debris in its path. They have been known to blow off roofs of houses, move cars and tractor trailers, and demolish homes.

B. Definition of "Severe Thunderstorms"

This hazard mitigation plan document analyzes the "severe thunderstorm" hazard using the definition articulated by the National Weather Service (NWS) for its forecasts: A "severe thunderstorm" produces a tornado, winds of at least 58 miles per hour (i.e., 50 knots), and/or hail at least one (1) inch in diameter.

In terms of variable labels used by the National Weather Service (and reflected in the National Center for Environmental Information Storm Events Database), this document will isolate records to "Hail" events one (1) inch in diameter or above, "Thunderstorm Wind[17]" events, "High Wind" events, and "Tornado" events.

C. Historical Severe Thunderstorm Data

See table on following pages

[17] A note on the "Thunderstorm Wind" variable: Early records label past events as "Thunderstorm Wind," but cite that wind speeds were zero (0) knots. This plan is interpreting this relationship as the result of bad records in the past. That NWS labeled the past event (likely retroactively) a "Thunderstorm Wind" event signifies for this plan that wind speeds were assumed or estimated at 50 knots or above. The record shows zero (0) knots because the exact wind speed was not recorded. But, the plan wants the frequency of events cited.

Powell County/Cities of Clay City and Stanton Severe Thunderstorm Events, Extent, and Impacts, 1950-2022

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	Powell Co.		11/13/1955	Hail	2		0	0	$0	$0	0	0
2	Powell Co.		8/30/1978	Tornado	0	F2	0	0	$25,000	$0	0	0
3	Powell Co.		7/2/1980	Tornado	0	F1	0	0	$25,000	$0	0	0
4	Powell Co.		3/16/1982	Tornado	0	F2	0	1	$250,000	$0	0	0
5	Powell Co.		8/11/1983	Thunderstorm Wind	0		0	0	$0	$0	0	0
6	Powell Co.		5/9/1988	Thunderstorm Wind	50		0	0	$0	$0	0	0
7	Powell Co.		5/21/1990	Tornado	0	F0	0	0	$25,000	$0	0	0
8	Powell Co.		4/9/1991	Thunderstorm Wind	0		0	0	$0	$0	0	0
9	Powell Co.		7/8/1991	Thunderstorm Wind	0		0	0	$0	$0	0	0
10	Powell Co.	Clay City	6/6/1995	Hail	1.75		0	0	$0	$0	0	0
11	Powell Co.	Countywide	5/27/1996	Thunderstorm Wind	50		0	0	$0	$0	0	0
12	Powell Co.	Countywide	5/28/1996	Thunderstorm Wind	50		0	0	$0	$0	0	0
13	Powell Co.	Stanton	3/1/1997	Tornado		F1	0	0	$500,000	$0	0	0
	Powell Co.	Stanton	3/1/1997	Thunderstorm Wind			0	0	$50,000	$0	0	0
14	Powell Co.	Clay City	3/2/1997	Thunderstorm Wind			0	0	$3,000	$0	0	0
	Powell Co.	Stanton	3/2/1997	Tornado		F0	0	0	$1,250,000	$0	0	0
15	Powell Co.	Clay City	7/27/1997	Thunderstorm Wind			0	0	$0	$0	0	0
16	Powell Co.	Clay City	5/20/1998	Thunderstorm Wind			0	0	$3,000	$0	0	0
17	Powell Co.	Stanton	5/31/1998	Thunderstorm Wind			0	0	$2,000	$0	0	0
	Powell Co.	Slade	5/31/1998	Thunderstorm Wind			0	0	$2,000	$0	0	0
18	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			0	0	$5,000	$0	0	0
	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			0	0	$0	$0	0	0
19	Powell Co.	Slade	1/4/2000	Thunderstorm Wind	58		0	0	$0	$0	0	0
20	Powell Co.	Stanton	2/18/2000	Thunderstorm Wind			0	0	$0	$0	0	0
21	Powell Co.	Clay City	7/10/2000	Thunderstorm Wind			0	0	$0	$0	0	0
22	Powell Co.	Clay City	8/7/2000	Hail	0.75		0	0	$0	$0	0	0
23	Powell Co.	Natural Bridge	8/8/2000	Thunderstorm Wind			0	0	$0	$0	0	0
24	Powell Co.	Slade	8/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Countywide	8/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
25	Powell Co.	Clay City	8/17/2000	Hail	0.75		0	0	$0	$0	0	0
26	Powell Co.	Stanton	9/20/2000	Thunderstorm Wind			0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
27	Powell Co.	Countywide	11/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
28	Powell Co.	Countywide	12/16/2000	Thunderstorm Wind			0	0	$0	$0	0	0
29	Powell Co.	Stanton	7/3/2001	Thunderstorm Wind			0	0	$0	$0	0	0
30	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Clay City	7/8/2001	Hail	1.75		0	0	$0	$0	0	0
	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			0	0	$0	$0	0	0
31	Powell Co.	Clay City	10/24/2001	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Stanton	10/24/2001	Thunderstorm Wind			0	0	$0	$0	0	0
32	Powell Co.	Slade	3/29/2002	Hail	0.75		0	0	$0	$0	0	0
33	Powell Co.	Slade	4/28/2002	Hail	1.75		0	0	$0	$0	0	0
	Powell Co.	Countywide	4/28/2002	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Stanton	4/28/2002	Hail	0.75		0	0	$0	$0	0	0
34	Powell Co.	Stanton	3/19/2003	Hail	0.75		0	0	$0	$0	0	0
35	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	60		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	65		0	0	$0	$0	0	0
36	Powell Co.	Clay City	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/15/2003	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/15/2003	Hail	1.25		0	0	$0	$0	0	0
37	Powell Co.	Clay City	7/12/2003	Hail	0.88		0	0	$0	$0	0	0
38	Powell Co.	Countywide	11/12/2003	Thunderstorm Wind	55		0	0	$0	$0	0	0
39	Powell Co.	Stanton	5/10/2004	Hail	0.75		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/10/2004	Hail	0.75		0	0	$0	$0	0	0
40	Powell Co.	Countywide	5/27/2004	Thunderstorm Wind	55		0	0	$10,000	$0	0	0
41	Powell Co.	Clay City	5/30/2004	Tornado		F0	0	0	$0	$0	0	0
	Powell Co.	Slade	5/30/2004	Thunderstorm Wind	75		0	0	$50,000	$0	0	0
	Powell Co.	Slade	5/30/2004	Hail	0.75		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/30/2004	Hail	1.75		0	0	$0	$0	0	0
42	Powell Co.	Stanton	6/1/2004	Thunderstorm Wind	50		0	0	$0	$0	0	0
43	Powell Co.	Stanton	7/6/2004	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Slade	7/6/2004	Hail	0.75		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
44	Powell Co.	Clay City	4/22/2005	Thunderstorm Wind	56		0	0	$0	$0	0	0
45	Powell Co.	Clay City	5/19/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
46	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
47	Powell Co.	Clay City	6/30/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	6/30/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
48	Powell Co.	Stanton	7/4/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
49	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
50	Powell Co.	Stanton	1/2/2006	Thunderstorm Wind	60		0	0	$0	$0	0	0
51	Powell Co.	Stanton	4/2/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
52	Powell Co.	Clay City	5/18/2006	Thunderstorm Wind	53		0	0	$1,000	$0	0	0
	Powell Co.	Stanton	5/18/2006	Thunderstorm Wind	53		0	0	$0	$0	0	0
53	Powell Co.	Stanton	5/26/2006	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/26/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/26/2006	Hail	1		0	0	$0	$0	0	0
54	Powell Co.	Bowen	5/31/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
55	Powell Co.	Stanton	7/20/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
56	Powell Co.	Stanton	9/23/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
57	Powell Co.	Stanton	4/3/2007	Thunderstorm Wind	55		0	0	$7,000	$0	0	0
58	Powell Co.	Vaughns Mill	6/24/2007	Thunderstorm Wind	55		0	0	$5,000	$0	0	0
	Powell Co.	Clay City	6/24/2007	Thunderstorm Wind	55		0	0	$10,000	$0	0	0
59	Powell Co.	Clay City	7/18/2007	Thunderstorm Wind	53		0	0	$2,000	$0	0	0
	Powell Co.	Clay City	7/18/2007	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Clay City	7/18/2007	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/18/2007	Hail	1		0	0	$0	$0	0	0
60	Powell Co.	Clay City	1/29/2008	Thunderstorm Wind	53		0	0	$2,500	$0	0	0
61	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	56		0	0	$0	$0	0	0
	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	58		0	0	$35,000	$0	0	0
	Powell Co.	Slade	2/6/2008	Thunderstorm Wind	50		0	0	$1,000	$0	0	0
62	Powell Co.	Clay City	3/4/2008	Thunderstorm Wind	53		0	0	$2,000	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
63	Powell Co.	Stanton	4/11/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
	Powell Co.	Stanton	4/11/2008	Hail	0.75		0	0	$0	$0	0	0
64	Powell Co.	Clay City	5/11/2008	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	53		0	0	$10,000	$0	0	0
65	Powell Co.	Clay City	6/16/2008	Hail	1		0	0	$0	$0	0	0
66	Powell Co.	Stanton	6/28/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
67	Powell Co.	Clay City	7/20/2008	Thunderstorm Wind	54		0	0	$1,000	$0	0	0
68	Powell Co.	Clay City	7/30/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
69	Powell Co.	Stanton	2/11/2009	Thunderstorm Wind	51		0	0	$1,000	$0	0	0
70	Powell Co.	Stanton	2/18/2009	Hail	0.75		0	0	$0	$0	0	0
71	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	2		0	0	$2,000	$0	0	0
	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	52		0	0	$3,000	$0	0	0
72	Powell Co.	Westbend	4/10/2009	Thunderstorm Wind	56		0	0	$0	$0	0	0
	Powell Co.	Slade	4/10/2009	Hail	1.75		0	0	$0	$0	0	0
73	Powell Co.	Vaughns Mill	6/2/2009	Hail	1		0	0	$0	$0	0	0
74	Powell Co.	Stanton	8/4/2009	Thunderstorm Wind	52		0	0	$3,000	$0	0	0
75	Powell Co.	Stanton	9/8/2009	Thunderstorm Wind	51		0	0	$1,000	$0	0	0
76	Powell Co.	Knowlton	6/3/2010	Thunderstorm Wind	53		0	0	$5,000	$0	0	0
77	Powell Co.	Stanton	6/15/2010	Thunderstorm Wind	55		0	0	$50,000	$0	0	0
78	Powell Co.	Westbend	7/19/2010	Thunderstorm Wind	55		0	0	$15,000	$0	0	0
79	Powell Co.	Clay City	8/13/2010	Thunderstorm Wind	50		0	0	$7,000	$0	0	0
80	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	60		0	0	$50,000	$0	0	0
	Powell Co.	Knowlton	2/28/2011	Thunderstorm Wind	55		0	0	$2,000	$0	0	0
	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	55		0	0	$3,000	$0	0	0
81	Powell Co.	Bowen	3/23/2011	Hail	1.75		0	0	$0	$0	0	0
82	Powell Co.	Clay City	4/8/2011	Hail	1.25		0	0	$0	$0	0	0
	Powell Co.	Waltersville	4/8/2011	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Stanton	4/8/2011	Hail	1.25		0	0	$0	$0	0	0
	Powell Co.	Stanton Arpt	4/8/2011	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Vaughns Mill	4/8/2011	Hail	1.75		0	0	$0	$0	0	0
	Powell Co.	Stanton	4/8/2011	Hail	1.75		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
83	Powell Co.	Stanton	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$2,500	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
84	Powell Co.	Virden	8/3/2011	Thunderstorm Wind	50		0	0	$4,000	$0	0	0
85	Powell Co.	Stanton	1/17/2012	Thunderstorm Wind	50		0	0	$6,000	$0	0	0
86	Powell Co.	Clay City	2/29/2012	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Clay City	2/29/2012	Thunderstorm Wind	50		0	0	$2,000	$0	0	0
	Powell Co.	Stanton	2/29/2012	Thunderstorm Wind	50		0	0	$2,000	$0	0	0
	Powell Co.	Stanton	2/29/2012	Hail	1		0	0	$0	$0	0	0
87	Powell Co.	Clay City	3/2/2012	Hail	1.25		0	0	$0	$0	0	0
	Powell Co.	Clay City	3/2/2012	Hail	1.25		0	0	$0	$0	0	0
88	Powell Co.	Natural Bridge	5/21/2012	Hail	1		0	0	$0	$0	0	0
89	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		0	0	$80,000	$0	0	0
	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		0	0	$20,000	$0	0	0
90	Powell Co.	Natural Bridge	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Natural Bridge	7/1/2012	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/1/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Rosslyn	7/1/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
91	Powell Co.	Stanton	7/5/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
92	Powell Co.	Waltersville	1/30/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
93	Powell Co.	Waltersville	6/10/2013	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
94	Powell Co.	Stanton	6/13/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
95	Powell Co.	Natural Bridge	7/10/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
96	Powell Co.	Vaughns Mill	11/1/2013	Thunderstorm Wind	50		0	0	$1,000	$0	0	0
	Powell Co.	Bowen	11/1/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
97	Powell Co.	Stanton	12/22/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
98	Powell Co.	Vaughns Mill	2/20/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Westbend	2/20/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
99	Powell Co.	Vaughns Mill	7/27/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Xena	7/27/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
100	Powell Co.	Vaughns Mill	9/2/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
101	Powell Co.	Knowlton	10/6/2014	Thunderstorm Wind	55		0	0	$0	$0	0	0
102	Powell Co.	Natural Bridge	4/3/2015	Thunderstorm Wind	35		1	1	$0	$0	0	0
103	Powell Co.	Stanton	6/8/2015	Thunderstorm Wind	43		0	0	$1,000	$0	0	0
104	Powell Co.	Stanton	6/29/2015	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Stanton	6/29/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
105	Powell Co.	Bowen	6/30/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
106	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Indian Fields	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Bowen	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Rosslyn	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
107	Powell Co.	Stanton	6/15/2016	Thunderstorm Wind	52		0	0	$0	$0	0	0
108	Powell Co.	Waltersville	7/8/2016	Thunderstorm Wind	55		0	0	$0	$0	0	0
109	Powell Co.	Stanton Arpt	7/14/2016	Thunderstorm Wind	56		0	0	$0	$0	0	0
110	Powell Co.	Slade	2/24/2017	Hail	0.88		0	0	$0	$0	0	0
111	Powell Co.	Clay City	3/1/2017	Thunderstorm Wind	60		0	0	$0	$0	0	0
112	Powell Co.	Waltersville	4/5/2017	Thunderstorm Wind	56		0	0	$0	$0	0	0
113	Powell Co.	Waltersville	5/27/2017	Hail	0.88		0	0	$0	$0	0	0
	Powell Co.	Waltersville	5/27/2017	Hail	1		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/27/2017	Hail	1.75		0	0	$0	$0	0	0
114	Powell Co.	Stanton	4/3/2018	Thunderstorm Wind	50		0	0	$0	$0	0	0
115	Powell Co.	Stanton	5/31/2018	Thunderstorm Wind	50		0	0	$0	$0	0	0
116	Powell Co.	Stanton Arpt	7/5/2018	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/5/2018	Thunderstorm Wind	52		0	0	$0	$0	0	0
117	Powell Co.	Bowen	7/20/2018	Thunderstorm Wind	53		0	0	$0	$0	0	0
118	Powell Co.	Virden	7/30/2018	Thunderstorm Wind	53		0	0	$7,000	$0	0	0
119	Powell Co.	Virden	6/16/2019	Thunderstorm Wind	51		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
120	Powell Co.	Westbend	8/20/2019	Thunderstorm Wind	52		0	0	$0	$0	0	0
121	Powell Co.	Virden	1/11/2020	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Waltersville	1/11/2020	Thunderstorm Wind	55		0	0	$2,000	$0	0	0
122	Powell Co.	Rosslyn	4/8/2020	Hail	0.75		0	0	$0	$0	0	0
123	Powell Co.	Waltersville	5/3/2020	Thunderstorm Wind	50		0	0	$5,000	$100	0	0
124	Powell Co.	Bowen	6/4/2020	Thunderstorm Wind	50		0	0	$5,000	$200	0	0
125	Powell Co.	Slade	6/10/2020	Thunderstorm Wind	50		0	0	$0	$100	0	0
126	Powell Co.	Nada	7/6/2020	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Virden	7/6/2020	Thunderstorm Wind	50		0	0	$0	$0	0	0
127	Powell Co.	Stanton Arpt	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Knowlton	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Vaughns Mill	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
128	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		0	0	$100	$100	0	0
	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		0	0	$0	$50	0	0
129	Powell Co.	Westbend	12/11/2021	Thunderstorm Wind	50		0	0	$1,000	$1,000	0	0
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Vaughns Mill	12/11/2021	Thunderstorm Wind	50		0	0	$5,000	$2,000	0	0
	Powell Co.	Clay City	12/11/2021	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		0	0	$1,000	$1,000	0	0
130	Powell Co.	Vaughns Mill	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Natural Bridge	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Rosslyn	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
131	Powell Co.	Virden	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Vaughns Mill	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton Arpt	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Knowlton	4/13/2022	Thunderstorm Wind	50		0	0	$22,000	$0	0	0
132	Powell Co.	Nada	5/3/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
133	Powell Co.	Xena	5/19/2022	Hail	2		0	0	$0	$0	0	0
134	Powell Co.	Xena	5/26/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
135	Powell Co.	Clay City	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Rosslyn	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton	6/17/2022	Thunderstorm Wind	50		0	0	$10,000	$0	0	0
	Powell Co.	Westbend	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
136	Powell Co.	Xena	6/22/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton Arpt	6/22/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
137	Powell Co.	Vaughns Mill	7/6/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	TOTALS						***1***	***2***	***$2,600,100***	***$20,550***	***0***	***0***

Powell County/Cities of Clay City and Stanton Severe Thunderstorm Events, Extent, and Impacts via Event Narratives, 1950-2022

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
1	Powell Co.		11/13/1955	Hail	2		
2	Powell Co.		8/30/1978	Tornado	0	F2	
3	Powell Co.		7/2/1980	Tornado	0	F1	
4	Powell Co.		3/16/1982	Tornado	0	F2	
5	Powell Co.		8/11/1983	Thunderstorm Wind	0		
6	Powell Co.		5/9/1988	Thunderstorm Wind	50		
7	Powell Co.		5/21/1990	Tornado	0	F0	
8	Powell Co.		4/9/1991	Thunderstorm Wind	0		
9	Powell Co.		7/8/1991	Thunderstorm Wind	0		
10	Powell Co.	Clay City	6/6/1995	Hail	1.75		Public reports golf ball-size hail.
11	Powell Co.	Countywide	5/27/1996	Thunderstorm Wind	50		
12	Powell Co.	Countywide	5/28/1996	Thunderstorm Wind	50		
13	Powell Co.	Stanton	3/1/1997	Tornado		F1	
	Powell Co.	Stanton	3/1/1997	Thunderstorm Wind			
14	Powell Co.	Clay City	3/2/1997	Thunderstorm Wind			
	Powell Co.	Stanton	3/2/1997	Tornado		F0	
15	Powell Co.	Clay City	7/27/1997	Thunderstorm Wind			Trees were downed.
16	Powell Co.	Clay City	5/20/1998	Thunderstorm Wind			Power lines were downed.
17	Powell Co.	Stanton	5/31/1998	Thunderstorm Wind			Power lines were downed.
	Powell Co.	Slade	5/31/1998	Thunderstorm Wind			Power lines were downed.
18	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			Trees downed. One tree fell onto house.
	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			Trees downed.
19	Powell Co.	Slade	1/4/2000	Thunderstorm Wind	58		Trees were blown down by strong winds blocking state and county roads across the eastern side of the county.
20	Powell Co.	Stanton	2/18/2000	Thunderstorm Wind			Several reports of trees downed by strong winds in the city of Stanton.
21	Powell Co.	Clay City	7/10/2000	Thunderstorm Wind			One tree and several large limbs down.
22	Powell Co.	Clay City	8/7/2000	Hail	0.75		
23	Powell Co.	Natural Bridge	8/8/2000	Thunderstorm Wind			Trees were down near Natural Bridge State Park.
24	Powell Co.	Slade	8/9/2000	Thunderstorm Wind			Several trees down across HWY 11.
	Powell Co.	Countywide	8/9/2000	Thunderstorm Wind			Numerous trees reported down.
25	Powell Co.	Clay City	8/17/2000	Hail	0.75		

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
26	Powell Co.	Stanton	9/20/2000	Thunderstorm Wind			Trees were blown down by strong winds on Highway 213 and on Highway 615.
27	Powell Co.	Countywide	11/9/2000	Thunderstorm Wind			Trees down in Cat Creek, Hardis Creek, and Happy Top. Numerous power lines down countywide.
28	Powell Co.	Countywide	12/16/2000	Thunderstorm Wind			Trees were reported down across several locations in the county.
29	Powell Co.	Stanton	7/3/2001	Thunderstorm Wind			Strong winds blew numerous trees down in the Hardwick Creek area. Trees also were reported blown down in the city of Stanton.
30	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			Trees were blown down.
	Powell Co.	Clay City	7/8/2001	Hail	1.75		
	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			Thunderstorm winds brought several trees down in the area.
31	Powell Co.	Clay City	10/24/2001	Thunderstorm Wind			Trees were blown down.
	Powell Co.	Stanton	10/24/2001	Thunderstorm Wind			Trees were blown down.
32	Powell Co.	Slade	3/29/2002	Hail	0.75		
33	Powell Co.	Slade	4/28/2002	Hail	1.75		
	Powell Co.	Countywide	4/28/2002	Thunderstorm Wind			
	Powell Co.	Stanton	4/28/2002	Hail	0.75		
34	Powell Co.	Stanton	3/19/2003	Hail	0.75		
35	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	60		Trees were down.
	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	65		Trees and power lines were down.
36	Powell Co.	Clay City	5/15/2003	Hail	0.88		
	Powell Co.	Stanton	5/15/2003	Hail	0.88		
	Powell Co.	Stanton	5/15/2003	Hail	0.88		
	Powell Co.	Stanton	5/15/2003	Hail	1		
	Powell Co.	Stanton	5/15/2003	Hail	1.25		
37	Powell Co.	Clay City	7/12/2003	Hail	0.88		
38	Powell Co.	Countywide	11/12/2003	Thunderstorm Wind	55		Trees were down.
39	Powell Co.	Stanton	5/10/2004	Hail	0.75		
	Powell Co.	Stanton	5/10/2004	Hail	0.75		
40	Powell Co.	Countywide	5/27/2004	Thunderstorm Wind	55		Trees and power lines were down in many areas, including Hard Wicks Creek, Skyview Drive, Natural Bridge State Park, and Nada Tunnel Road.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
41	Powell Co.	Clay City	5/30/2004	Tornado		F0	A storm survey confirmed that an F0 tornado, with a wind of 60 to 70 miles per hour, touched down in Clay City near Highway 15. The tornado had a width of about 50 feet and touched down very briefly. The tornado was embedded in a large area of straight-line, downburst wind.
	Powell Co.	Slade	5/30/2004	Thunderstorm Wind	75		Straight-line wind broke off trees and power poles through the area and blew the roofs off two dugouts in Clay City.
	Powell Co.	Slade	5/30/2004	Hail	0.75		
	Powell Co.	Stanton	5/30/2004	Hail	1.75		
42	Powell Co.	Stanton	6/1/2004	Thunderstorm Wind	50		
43	Powell Co.	Stanton	7/6/2004	Thunderstorm Wind	50		Numerous large tree limbs were down.
	Powell Co.	Slade	7/6/2004	Hail	0.75		
44	Powell Co.	Clay City	4/22/2005	Thunderstorm Wind	56		Trees down on Happy Top Road near Clay City.
45	Powell Co.	Clay City	5/19/2005	Thunderstorm Wind	55		Large tree limbs down in Clay City.
46	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	55		
	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	50		Two foot diameter tree limb blown down.
47	Powell Co.	Clay City	6/30/2005	Thunderstorm Wind	50		Trees down in Clay City.
	Powell Co.	Stanton	6/30/2005	Thunderstorm Wind	55		Trees down in front of high school.
48	Powell Co.	Stanton	7/4/2005	Thunderstorm Wind	55		Several trees down.
49	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		One tree down at Snow Creek.
	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		One tree down on Highway 82.
50	Powell Co.	Stanton	1/2/2006	Thunderstorm Wind	60		Trees down countywide blocking roads. Highways affected includ Kentucky Highways 1057 and 1639 in Stanton as well as Kentucky Highways 11 and 77 near Natural Bridge State Park.
51	Powell Co.	Stanton	4/2/2006	Thunderstorm Wind	55		Two pine trees down across Skidmore Lane in Stanton.
52	Powell Co.	Clay City	5/18/2006	Thunderstorm Wind	53		Tree blown down on a power line.
	Powell Co.	Stanton	5/18/2006	Thunderstorm Wind	53		Three trees down in town and one out in the county. Lots of limbs down as well.
53	Powell Co.	Stanton	5/26/2006	Hail	0.88		Dime to nickel size hail reported.
	Powell Co.	Stanton	5/26/2006	Thunderstorm Wind	55		Trees down.
	Powell Co.	Stanton	5/26/2006	Hail	1		
54	Powell Co.	Bowen	5/31/2006	Thunderstorm Wind	55		Numerous trees down.
55	Powell Co.	Stanton	7/20/2006	Thunderstorm Wind	55		Two trees down on Alley Lane. Numerous tree branches torn off throughout town.
56	Powell Co.	Stanton	9/23/2006	Thunderstorm Wind	55		County dispatch office reported numerous trees down across the county.
57	Powell Co.	Stanton	4/3/2007	Thunderstorm Wind	55		Seven trees blown down.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
58	Powell Co.	Vaughns Mill	6/24/2007	Thunderstorm Wind	55		Trees down along Hardwick Creek Rd.
	Powell Co.	Clay City	6/24/2007	Thunderstorm Wind	55		Several trees down.
59	Powell Co.	Clay City	7/18/2007	Thunderstorm Wind	53		Two trees down on old Winchester Road. One tree down on Pecks Creek Road and another on Oak Ridge Drive.
	Powell Co.	Clay City	7/18/2007	Hail	1		
	Powell Co.	Clay City	7/18/2007	Hail	1		
	Powell Co.	Stanton	7/18/2007	Hail	1		Quarter size hail and estimated 50 mph winds. Quarter size hail started falling at 707 pm and ended at 712 pm.
60	Powell Co.	Clay City	1/29/2008	Thunderstorm Wind	53		A thunderstorm wind gust estimated at 60 mph occurred near Stanton in Powell county. One small tree and two large limbs blown down in Stanton.
61	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	56		Thunderstorm winds were estimated at 65 mph by a National Weather Service employee.
	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	58		Numerous trees and power lines were blown down county wide.
	Powell Co.	Slade	2/6/2008	Thunderstorm Wind	50		Minor damage occurred to a smoke house as a result of thunderstorm wind gusts.
62	Powell Co.	Clay City	3/4/2008	Thunderstorm Wind	53		Two trees were blown down on Highway 11.
63	Powell Co.	Stanton	4/11/2008	Thunderstorm Wind	52		A tree was blown down on Highway 1057.
	Powell Co.	Stanton	4/11/2008	Hail	0.75		
64	Powell Co.	Clay City	5/11/2008	Hail	0.88		
	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	52		A 5 inch diameter tree limb was blown down by thunderstorm wind gusts.
	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	53		Numerous tree branches were torn off along Spout Springs Road. Branches were 2 to 5 inches in diameter. One tree was also blown down on Highway 2001.
65	Powell Co.	Clay City	6/16/2008	Hail	1		
66	Powell Co.	Stanton	6/28/2008	Thunderstorm Wind	52		One tree was blown down by thunderstorm wind gusts on Upper Cane Creek Road.
67	Powell Co.	Clay City	7/20/2008	Thunderstorm Wind	54		Three trees were blown down on Little Hardwicks Creek Road.
68	Powell Co.	Clay City	7/30/2008	Thunderstorm Wind	52		A tree was blown down on Route 1057 near Big Hardwicks Creek Road.
69	Powell Co.	Stanton	2/11/2009	Thunderstorm Wind	51		A couple of large tree limbs were blown down.
70	Powell Co.	Stanton	2/18/2009	Hail	0.75		One half to three quarter inch hail was observed and fell for 8 minutes.
71	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	2		A county official observed large limbs down along Cane Creek Road.
	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	52		Large limbs were blown down by thunderstorm wind gusts.
72	Powell Co.	Westbend	4/10/2009	Thunderstorm Wind	56		The public and media reported that a vehicle was blown off of the Mountain Parkway by a thunderstorm wind gust. Nickel sized hail was also reported.
	Powell Co.	Slade	4/10/2009	Hail	1.75		Golf ball sized hail was reported at Natural Bridge State Resort Park.
73	Powell Co.	Vaughns Mill	6/2/2009	Hail	1		
74	Powell Co.	Stanton	8/4/2009	Thunderstorm Wind	52		A few trees were blown down at various locations around the county.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
75	Powell Co.	Stanton	9/8/2009	Thunderstorm Wind	51		Large tree limbs were blown down east of Stanton.
76	Powell Co.	Knowlton	6/3/2010	Thunderstorm Wind	53		Trees were blown down onto power lines in the Cat Creek area.
77	Powell Co.	Stanton	6/15/2010	Thunderstorm Wind	55		A roof was blown off of a house. Multiple trees were blown down. Power lines were blown down.
78	Powell Co.	Westbend	7/19/2010	Thunderstorm Wind	55		Trees and large limbs were blown down on Winchester Road and in the Black Creek area.
79	Powell Co.	Clay City	8/13/2010	Thunderstorm Wind	50		Dispatch reported that a tree fell on a vehicle on Main St, injuring two of the passengers.
80	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	60		Numerous large trees had been blown down. Several out buildings were also damaged or had their roofs blown off in the Hardwick Creek area.
	Powell Co.	Knowlton	2/28/2011	Thunderstorm Wind	55		Large tree limbs were partially blocking the road at the intersection of James Crowe Hollow and Cat Creek Roads.
	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	55		Downed power lines blocked the road at the intersection of Hardwicks Creek and Frames Branch Roads southwest of Stanton.
81	Powell Co.	Bowen	3/23/2011	Hail	1.75		The hail was the size of golfballs.
82	Powell Co.	Clay City	4/8/2011	Hail	1.25		The hail was the size of half dollars.
	Powell Co.	Waltersville	4/8/2011	Hail	1		The hail was the size of quarters.
	Powell Co.	Stanton	4/8/2011	Hail	1.25		The hail was the size of half dollars.
	Powell Co.	Stanton Arpt	4/8/2011	Hail	1		The hail was the size of quarters.
	Powell Co.	Vaughns Mill	4/8/2011	Hail	1.75		The hail was the size of golf balls and was falling on Happy Top road.
	Powell Co.	Stanton	4/8/2011	Hail	1.75		The hail was the size of golf balls.
83	Powell Co.	Stanton	4/9/2011	Thunderstorm Wind	52		Utility poles were snapped off near the middle school.
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		There were power lines blown down.
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		Several large tree branches were blocking the east bound left lane of the Mountain Parkway near mile marker 28.
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		There were several trees down and structures damaged. Many roads were blocked by trees.
84	Powell Co.	Virden	8/3/2011	Thunderstorm Wind	50		A tree was blown down and onto some power lines.
85	Powell Co.	Stanton	1/17/2012	Thunderstorm Wind	50		Trees were blown down and onto power lines in Stanton.
86	Powell Co.	Clay City	2/29/2012	Hail	1		Quarter size hail was reported in Clay City.
	Powell Co.	Clay City	2/29/2012	Thunderstorm Wind	50		Large tree limbs were blown down on Snow Creek.
	Powell Co.	Stanton	2/29/2012	Thunderstorm Wind	50		Large tree limbs were blown down on Mill Knob.
	Powell Co.	Stanton	2/29/2012	Hail	1		Quarter size hail was reported in Stanton.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
87	Powell Co.	Clay City	3/2/2012	Hail	1.25		
	Powell Co.	Clay City	3/2/2012	Hail	1.25		Hail, ranging from dime to half dollar size, covered the ground approximately 2.5 miles north on Route 11 heading towards Mount Sterling.
88	Powell Co.	Natural Bridge	5/21/2012	Hail	1		
89	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		There was roof damage on a house in Stanton and trees and power lines down county wide.
	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		Trees were blown down countywide.
90	Powell Co.	Natural Bridge	7/1/2012	Thunderstorm Wind	55		A large walnut tree was split in half while another large tree had the top taken out of it.
	Powell Co.	Natural Bridge	7/1/2012	Hail	1		
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		Trees were blown down between the 8000 and 9000 blocks of Winchester Rd.
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		Trees were blown down on Woody Ware Rd in Clay City.
	Powell Co.	Stanton	7/1/2012	Thunderstorm Wind	50		A tree was blown down on East Pendleton St.
	Powell Co.	Rosslyn	7/1/2012	Thunderstorm Wind	50		A tree was blown down on Campton Rd.
91	Powell Co.	Stanton	7/5/2012	Thunderstorm Wind	50		Power lines were blown down on George Drake Rd..
92	Powell Co.	Waltersville	1/30/2013	Thunderstorm Wind	50		Trees down on Winchester Road.
93	Powell Co.	Waltersville	6/10/2013	Thunderstorm Wind	52		Several trees were downed, including one 8-inch diameter tree that fell across the roof of a porch onto a nearby house. Several roads were also blocked due to downed trees.
94	Powell Co.	Stanton	6/13/2013	Thunderstorm Wind	50		A tree was blown down on East College Ave.
95	Powell Co.	Natural Bridge	7/10/2013	Thunderstorm Wind	50		Several large tree limbs were blown down near the Natural Bridge sky lift.
96	Powell Co.	Vaughns Mill	11/1/2013	Thunderstorm Wind	50		A mobile home had a roof partially torn off the porch, antenna snapped off the top of the trailer and portable basketball goal blown over.
	Powell Co.	Bowen	11/1/2013	Thunderstorm Wind	50		Trees were downed resulting in power outages near Stanton.
97	Powell Co.	Stanton	12/22/2013	Thunderstorm Wind	50		Trees were blown down on Furnace and Halls Roads.
98	Powell Co.	Vaughns Mill	2/20/2014	Thunderstorm Wind	50		Two trees were blown down on Frames Branch Road.
	Powell Co.	Westbend	2/20/2014	Thunderstorm Wind	50		A technician reported that large limbs had snapped off along tops of trees at the NWR transmitter site.
99	Powell Co.	Vaughns Mill	7/27/2014	Thunderstorm Wind	50		A tree was blown down near Route 1057.
	Powell Co.	Xena	7/27/2014	Thunderstorm Wind	50		A tree was blown down at Little Hardwicks Creek and Furnace Jct.
100	Powell Co.	Vaughns Mill	9/2/2014	Thunderstorm Wind	50		A tree was blown down and across KY Hwy 2001.
101	Powell Co.	Knowlton	10/6/2014	Thunderstorm Wind	55		Multiple trees were blown down on Highway's 1057 and 213 with hail up to the size of dimes also observed in the area.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
102	Powell Co.	Natural Bridge	4/3/2015	Thunderstorm Wind	35		A dead tree fell onto a tent at a campsite at the Middlefork campground, killing one person inside the tent and critically injuring a second person. No other tree damage was noted by first responders except for the dead tree.
103	Powell Co.	Stanton	6/8/2015	Thunderstorm Wind	43		A wind gust estimated at 50 mph was reported near Stanton. Small tree limbs were also blown down in the same area.
104	Powell Co.	Stanton	6/29/2015	Hail	1		Quarter size hail occurred near the UPS hub on Hwy 213 in Stanton.
	Powell Co.	Stanton	6/29/2015	Thunderstorm Wind	50		A large tree limb 3 to 4 inches in diameter fell onto Hwy 15 just east of Stanton.
105	Powell Co.	Bowen	6/30/2015	Thunderstorm Wind	50		A small tree was blown down and onto Hwy 15 at the Cow Creek Road intersection.
106	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	55		The eastbound lanes of the Mountain Parkway between mile markers 11 and 12 were closed due to fallen trees.
	Powell Co.	Indian Fields	7/10/2015	Thunderstorm Wind	50		Power lines were blown down and across Hwy 15 at the Clark and Powell county line. The road was closed for several hours.
	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	50		A tree was blown down and across the intersection of Old Winchester Road and Winchester Road.
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		A tree was blown down and onto Lower Hatcher Creek Road.
	Powell Co.	Bowen	7/10/2015	Thunderstorm Wind	50		A tree was blown down and onto Upper Cane Creek Road.
	Powell Co.	Rosslyn	7/10/2015	Thunderstorm Wind	50		A small tree was blown down.
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		A small tree was blown down.
107	Powell Co.	Stanton	6/15/2016	Thunderstorm Wind	52		A trained spotter observed a 30 to 40 foot tree blown down southeast of Stanton.
108	Powell Co.	Waltersville	7/8/2016	Thunderstorm Wind	55		Dispatch reported a tree down on Adams Ridge Road in Clay City.
109	Powell Co.	Stanton Arpt	7/14/2016	Thunderstorm Wind	56		A trained spotter observed damage to the concession stand and projection room roof of the Mountain View Drive-In movie theater in Stanton.
110	Powell Co.	Slade	2/24/2017	Hail	0.88		
111	Powell Co.	Clay City	3/1/2017	Thunderstorm Wind	60		A tree was blown down in the Heartbreak Ridge area.
112	Powell Co.	Waltersville	4/5/2017	Thunderstorm Wind	56		Emergency Management reported multiple trees down on Highway 82 southwest of Clay City to near Furnace.
113	Powell Co.	Waltersville	5/27/2017	Hail	0.88		
	Powell Co.	Waltersville	5/27/2017	Hail	1		
	Powell Co.	Stanton	5/27/2017	Hail	1.75		
114	Powell Co.	Stanton	4/3/2018	Thunderstorm Wind	50		Dispatch reported that two trees were knocked down within the city limits of Stanton.
115	Powell Co.	Stanton	5/31/2018	Thunderstorm Wind	50		Dispatch reported a large tree limb blown down in Stanton.
116	Powell Co.	Stanton Arpt	7/5/2018	Thunderstorm Wind	51		A trained spotter and a local media outlet reported trees down from Maple Street in Stanton south to Mountain Parkway.
	Powell Co.	Stanton	7/5/2018	Thunderstorm Wind	52		A Skywarn Spotter observed a large tree blown down off of Railroad Street in the Brookside Cottages Subdivision of Stanton.
117	Powell Co.	Bowen	7/20/2018	Thunderstorm Wind	53		A Skywarn storm spotter reported a tree and large limb were blown down near Stanton.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
118	Powell Co.	Virden	7/30/2018	Thunderstorm Wind	53		Numerous reports of wind damage were received from a National Weather Service employee, trained storm spotter, local fire rescue, and dispatch in between Clay City and Stanton. This consisted of a plethora of trees blown down, resulting in several power outages. The roofs of a barn and mobile home were also damaged as this storm moved east along Mountain Parkway.
119	Powell Co.	Virden	6/16/2019	Thunderstorm Wind	51		An NWS employee relayed a report of a tree down on Mountain Parkway northwest of Clay City. This forced the closure of both lanes of the road in the westbound direction.
120	Powell Co.	Westbend	8/20/2019	Thunderstorm Wind	52		Local media reported numerous trees blown down on the Mountain Parkway northwest of Westbend.
121	Powell Co.	Virden	1/11/2020	Thunderstorm Wind	51		Dispatch reported multiple trees were blown down along the Mountain Parkway near mile marker 12 west of Clay City.
	Powell Co.	Waltersville	1/11/2020	Thunderstorm Wind	55		Dispatch and Emergency Management relayed reports of the roof blown off of a home on Stokley Loop in Clay City, while another home on Ashley Hollow Road sustained roof damage. The latter home also had multiple trees blown down around it while having a meter pulled off of it.
122	Powell Co.	Rosslyn	4/8/2020	Hail	0.75		Social media report of penny sized hail west of Bowen.
123	Powell Co.	Waltersville	5/3/2020	Thunderstorm Wind	50		Dispatch relayed a report of a tree downed on Irvine Road near the intersection with Snow Creek Road west of Clay City. A vehicle struck this tree, but no injuries were sustained.
124	Powell Co.	Bowen	6/4/2020	Thunderstorm Wind	50		A citizen and local media outlet relayed a report of a few trees downed at Callies Lake and Campground near Bowen. A structure was damaged by one of these trees.
125	Powell Co.	Slade	6/10/2020	Thunderstorm Wind	50		The local Department of Highways relayed a report of a tree blown down along Kentucky Highway 1639 southwest of Slade.
126	Powell Co.	Nada	7/6/2020	Thunderstorm Wind	51		The Kentucky Transportation Cabinet reported numerous trees blown down near the Nada Tunnel and Red River Gorge on Kentucky Highway 77. This resulted in access to the tunnel being blocked for a few hours.
	Powell Co.	Virden	7/6/2020	Thunderstorm Wind	50		Dispatch relayed reports of trees downed on Red Bird Drive near Clay City.
127	Powell Co.	Stanton Arpt	6/12/2021	Thunderstorm Wind	50		A tree was reported down along Furnace Road just southeast of Stanton.
	Powell Co.	Knowlton	6/12/2021	Thunderstorm Wind	50		A tree was reported down along Cat Creek road in the Cat Creek community.
	Powell Co.	Vaughns Mill	6/12/2021	Thunderstorm Wind	50		A tree was reported down near the intersection of Happy Top and Eddie Ridge Roads, just southwest of Clay City.
128	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		An NWS employee reported a large tree snapped due to strong thunderstorm wind gusts along Pompeii Road, near the intersection with Thorpe Ridge Road.
	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		An NWS employee reported that strong thunderstorm wind gusts knocked down a small tree along KY-615, near the intersection with Thorpe Ridge Road.

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Event Narrative
129	Powell Co.	Westbend	12/11/2021	Thunderstorm Wind	50		A tree was down on a powerline along Brush Creek Road north of Clay City.
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		A tree was downed along the 7200 block of Hardwicks Creek Road south of Stanton.
	Powell Co.	Vaughns Mill	12/11/2021	Thunderstorm Wind	50		A tree is on a 3-phase powerline along Spout Springs Road. The road is closed and repairs are ongoing.
	Powell Co.	Clay City	12/11/2021	Thunderstorm Wind	50		A tree was downed and over Paint Creek Road in the 2500 block north of Stanton.
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		A tree is down on a power line and blocking Furnace Junction Road.
130	Powell Co.	Vaughns Mill	2/17/2022	Thunderstorm Wind	50		Dispatch reported that a tree was down on Hardwicks Creek Road near the community of Vaughns Mill.
	Powell Co.	Natural Bridge	2/17/2022	Thunderstorm Wind	50		A tree was reported down on Natural Bridge Road near Natural Bridge State Park.
	Powell Co.	Rosslyn	2/17/2022	Thunderstorm Wind	50		A tree was reported down on Cane Creek Road, near the community of Rosslyn.
131	Powell Co.	Virden	4/13/2022	Thunderstorm Wind	50		The highway department reported a tree down across KY-1028 between mile marker 3 and 4.
	Powell Co.	Vaughns Mill	4/13/2022	Thunderstorm Wind	50		The highway department reported a tree down across KY-1057 around mile marker 2.
	Powell Co.	Stanton Arpt	4/13/2022	Thunderstorm Wind	50		The highway department reported a tree down across KY-213 around mile marker 6 near Stanton, KY.
	Powell Co.	Knowlton	4/13/2022	Thunderstorm Wind	50		Powell County dispatch reported that a house off of Darrell Randall Rd in Stanton, Kentucky had its roof blown off, as well as a vehicle damaged from the roof. ||WKYT in Lexington also reported on this story. The information can be found at: https://www.wymt.com/2022/04/18/it-sounded-like-house-was-going-blow-apart-eastern-kentucky-family-cleaning-up-after-strong-storms-dealt-severe-damage/ .
132	Powell Co.	Nada	5/3/2022	Thunderstorm Wind	50		A tree was reported to have blown down along Campton Road, or KY-11, near the intersection with KY-77 close to the Nada Tunnel.
133	Powell Co.	Xena	5/19/2022	Hail	2		A picture on social media showed approximately golf ball to egg-sized (1.75 to 2.00 inch) hail along Hall Hill Rd.
134	Powell Co.	Xena	5/26/2022	Thunderstorm Wind	50		A tree was blown down near the intersection of State Routes 213 and 1057.
135	Powell Co.	Clay City	6/17/2022	Thunderstorm Wind	50		A tree was blown down on Beech Fork Road near Clay City.
	Powell Co.	Rosslyn	6/17/2022	Thunderstorm Wind	50		A tree was blown down near 500 Hatchers Creek Road.
	Powell Co.	Stanton	6/17/2022	Thunderstorm Wind	50		The roof was blown off of an apartment complex in Stanton.
	Powell Co.	Westbend	6/17/2022	Thunderstorm Wind	50		A tree was blown down near 9000 Winchester Road in Clay City.
136	Powell Co.	Xena	6/22/2022	Thunderstorm Wind	50		A tree was reported down near the 1900 block of Pilot Road in Stanton.
	Powell Co.	Stanton Arpt	6/22/2022	Thunderstorm Wind	50		A tree was reported down at the 2000 block of Furnace Road near Stanton.
137	Powell Co.	Vaughns Mill	7/6/2022	Thunderstorm Wind	50		A tree reported down at the corner of Spout Springs Rd and Hardwicks Creek Rd.

Probability for Severe Thunderstorms as a Function of Previous Occurrences

This analysis counts as a discrete "severe thunderstorm" event for Powell County (unincorporated) and the Cities of Clay City and Stanton only those events that occurred on different dates. Any event recorded that shares the same date of occurrence as other events are treated as one contiguous event.

Powell County and the Cities of Clay City and Stanton then, experienced 137 discrete "severe thunderstorm" events over the period of record.

Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future approximately 1.9 "severe thunderstorm" events every year (i.e., [1/(72/137)] = 1.9). This statistic might be interpreted as assuming a 100% probability that one "severe thunderstorm" event would occur within Powell County and the Cities of Clay City and Stanton each year. So the partial has meaning, in terms of months and assuming uniformity in likelihood, Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future 1 "severe thunderstorm" event approximately every 6 months (i.e., [1/(137/868)] = 6.34).

In terms of isolating the three (3) components comprising a "severe thunderstorm," Powell County and the Cities of Clay City and Stanton have had 114 high straight-line wind (50 knots or above) events, 31 hail events, and 7 tornado events during the period of record[18].

Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future approximately 1.7 high straight line wind (50 knot or above) events every year (i.e., [1/(67/114)] = 1.701). This statistic might be interpreted as assuming a 100% probability that one high straight line wind event would occur within Powell County and the Cities of Clay City and Stanton each year. So the partial has meaning, in terms of months and assuming uniformity in likelihood, Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future one 1 high straight line wind (50 knots or above) event approximately every seven (7) months (i.e., [1/(114/808)] = 7.088).

Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future approximately 0.46 hail events every year (i.e., [1/(67/31)] = 0.4627.) So the partial has meaning, in terms of months and assuming uniformity in likelihood, Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future one (1) hail event approximately every 26 months (i.e., [1/(31/808)] = 26.0645), or one (1) hail event every two (2) years and two (2) months.

[18] Note that disaggregated, the number of events for high straight line winds, hail, and tornadoes does not add up to 137 events. This is due to double counting: As one of three components of "severe thunderstorm," an event on a day that produced both hail and high wind will be counted once where, disaggregated, this event is counted twice.

Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future approximately 0.09 tornado events every year (i.e., [1/(72/7)] = 0.0972). So the partial has meaning, in terms of months and assuming uniformity in likelihood, Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future one tornado event approximately every 124 months (i.e., [1/(7/868)] = 124), or one (1) tornado event every 10 years and four (4) months.

See below for tables disaggregating high straightline wind, hail, and tornado events from overview list of "severe thunderstorm" events.

Powell County/Cities of Clay City and Stanton High Straightline Wind Events, Extent, and Impacts, 1955-2022

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	Powell Co.		8/11/1983	Thunderstorm Wind	0		0	0	$0	$0	0	0
2	Powell Co.		5/9/1988	Thunderstorm Wind	50		0	0	$0	$0	0	0
3	Powell Co.		4/9/1991	Thunderstorm Wind	0		0	0	$0	$0	0	0
4	Powell Co.		7/8/1991	Thunderstorm Wind	0		0	0	$0	$0	0	0
5	Powell Co.	Countywide	5/27/1996	Thunderstorm Wind	50		0	0	$0	$0	0	0
6	Powell Co.	Countywide	5/28/1996	Thunderstorm Wind	50		0	0	$0	$0	0	0
7	Powell Co.	Stanton	3/1/1997	Thunderstorm Wind			0	0	$50,000	$0	0	0
8	Powell Co.	Clay City	3/2/1997	Thunderstorm Wind			0	0	$3,000	$0	0	0
9	Powell Co.	Clay City	7/27/1997	Thunderstorm Wind			0	0	$0	$0	0	0
10	Powell Co.	Clay City	5/20/1998	Thunderstorm Wind			0	0	$3,000	$0	0	0
11	Powell Co.	Stanton	5/31/1998	Thunderstorm Wind			0	0	$2,000	$0	0	0
	Powell Co.	Slade	5/31/1998	Thunderstorm Wind			0	0	$2,000	$0	0	0
12	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			0	0	$5,000	$0	0	0
	Powell Co.	Clay City	6/22/1998	Thunderstorm Wind			0	0	$0	$0	0	0
13	Powell Co.	Slade	1/4/2000	Thunderstorm Wind	58		0	0	$0	$0	0	0
14	Powell Co.	Stanton	2/18/2000	Thunderstorm Wind			0	0	$0	$0	0	0
15	Powell Co.	Clay City	7/10/2000	Thunderstorm Wind			0	0	$0	$0	0	0
16	Powell Co.	Natural Bridge	8/8/2000	Thunderstorm Wind			0	0	$0	$0	0	0
17	Powell Co.	Slade	8/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Countywide	8/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
18	Powell Co.	Stanton	9/20/2000	Thunderstorm Wind			0	0	$0	$0	0	0
19	Powell Co.	Countywide	11/9/2000	Thunderstorm Wind			0	0	$0	$0	0	0
20	Powell Co.	Countywide	12/16/2000	Thunderstorm Wind			0	0	$0	$0	0	0
21	Powell Co.	Stanton	7/3/2001	Thunderstorm Wind			0	0	$0	$0	0	0
22	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Clay City	7/8/2001	Thunderstorm Wind			0	0	$0	$0	0	0
23	Powell Co.	Clay City	10/24/2001	Thunderstorm Wind			0	0	$0	$0	0	0
	Powell Co.	Stanton	10/24/2001	Thunderstorm Wind			0	0	$0	$0	0	0
24	Powell Co.	Countywide	4/28/2002	Thunderstorm Wind			0	0	$0	$0	0	0
25	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	60		0	0	$0	$0	0	0
	Powell Co.	Stanton	5/5/2003	Thunderstorm Wind	65		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
26	Powell Co.	Countywide	11/12/2003	Thunderstorm Wind	55		0	0	$0	$0	0	0
27	Powell Co.	Countywide	5/27/2004	Thunderstorm Wind	55		0	0	$10,000	$0	0	0
28	Powell Co.	Slade	5/30/2004	Thunderstorm Wind	75		0	0	$50,000	$0	0	0
29	Powell Co.	Stanton	6/1/2004	Thunderstorm Wind	50		0	0	$0	$0	0	0
30	Powell Co.	Stanton	7/6/2004	Thunderstorm Wind	50		0	0	$0	$0	0	0
31	Powell Co.	Clay City	4/22/2005	Thunderstorm Wind	56		0	0	$0	$0	0	0
32	Powell Co.	Clay City	5/19/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
33	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
34	Powell Co.	Stanton	6/14/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
35	Powell Co.	Clay City	6/30/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	6/30/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
36	Powell Co.	Stanton	7/4/2005	Thunderstorm Wind	55		0	0	$0	$0	0	0
37	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Clay City	8/13/2005	Thunderstorm Wind	50		0	0	$0	$0	0	0
38	Powell Co.	Stanton	1/2/2006	Thunderstorm Wind	60		0	0	$0	$0	0	0
39	Powell Co.	Stanton	4/2/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
40	Powell Co.	Clay City	5/18/2006	Thunderstorm Wind	53		0	0	$1,000	$0	0	0
	Powell Co.	Stanton	5/18/2006	Thunderstorm Wind	53		0	0	$0	$0	0	0
41	Powell Co.	Stanton	5/26/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
42	Powell Co.	Bowen	5/31/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
43	Powell Co.	Stanton	7/20/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
44	Powell Co.	Stanton	9/23/2006	Thunderstorm Wind	55		0	0	$0	$0	0	0
45	Powell Co.	Stanton	4/3/2007	Thunderstorm Wind	55		0	0	$7,000	$0	0	0
46	Powell Co.	Vaughns Mill	6/24/2007	Thunderstorm Wind	55		0	0	$5,000	$0	0	0
	Powell Co.	Clay City	6/24/2007	Thunderstorm Wind	55		0	0	$10,000	$0	0	0
47	Powell Co.	Clay City	7/18/2007	Thunderstorm Wind	53		0	0	$2,000	$0	0	0
48	Powell Co.	Clay City	1/29/2008	Thunderstorm Wind	53		0	0	$2,500	$0	0	0
49	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	56		0	0	$0	$0	0	0
	Powell Co.	Clay City	2/6/2008	Thunderstorm Wind	58		0	0	$35,000	$0	0	0
	Powell Co.	Slade	2/6/2008	Thunderstorm Wind	50		0	0	$1,000	$0	0	0
50	Powell Co.	Clay City	3/4/2008	Thunderstorm Wind	53		0	0	$2,000	$0	0	0
51	Powell Co.	Stanton	4/11/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
52	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
	Powell Co.	Clay City	5/11/2008	Thunderstorm Wind	53		0	0	$10,000	$0	0	0
53	Powell Co.	Stanton	6/28/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
54	Powell Co.	Clay City	7/20/2008	Thunderstorm Wind	54		0	0	$1,000	$0	0	0
55	Powell Co.	Clay City	7/30/2008	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
56	Powell Co.	Stanton	2/11/2009	Thunderstorm Wind	51		0	0	$1,000	$0	0	0
57	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	2		0	0	$2,000	$0	0	0
	Powell Co.	Stanton	2/27/2009	Thunderstorm Wind	52		0	0	$3,000	$0	0	0
58	Powell Co.	Westbend	4/10/2009	Thunderstorm Wind	56		0	0	$0	$0	0	0
59	Powell Co.	Stanton	8/4/2009	Thunderstorm Wind	52		0	0	$3,000	$0	0	0
60	Powell Co.	Stanton	9/8/2009	Thunderstorm Wind	51		0	0	$1,000	$0	0	0
61	Powell Co.	Knowlton	6/3/2010	Thunderstorm Wind	53		0	0	$5,000	$0	0	0
62	Powell Co.	Stanton	6/15/2010	Thunderstorm Wind	55		0	0	$50,000	$0	0	0
63	Powell Co.	Westbend	7/19/2010	Thunderstorm Wind	55		0	0	$15,000	$0	0	0
64	Powell Co.	Clay City	8/13/2010	Thunderstorm Wind	50		0	0	$7,000	$0	0	0
65	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	60		0	0	$50,000	$0	0	0
	Powell Co.	Knowlton	2/28/2011	Thunderstorm Wind	55		0	0	$2,000	$0	0	0
	Powell Co.	Vaughns Mill	2/28/2011	Thunderstorm Wind	55		0	0	$3,000	$0	0	0
66	Powell Co.	Stanton	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$2,500	$0	0	0
	Powell Co.	Bowen	4/9/2011	Thunderstorm Wind	52		0	0	$0	$0	0	0
67	Powell Co.	Virden	8/3/2011	Thunderstorm Wind	50		0	0	$4,000	$0	0	0
68	Powell Co.	Stanton	1/17/2012	Thunderstorm Wind	50		0	0	$6,000	$0	0	0
69	Powell Co.	Clay City	2/29/2012	Thunderstorm Wind	50		0	0	$2,000	$0	0	0
	Powell Co.	Stanton	2/29/2012	Thunderstorm Wind	50		0	0	$2,000	$0	0	0
70	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		0	0	$80,000	$0	0	0
	Powell Co.	Stanton	6/29/2012	Thunderstorm Wind	52		0	0	$20,000	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
71	Powell Co.	Natural Bridge	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Waltersville	7/1/2012	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/1/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Rosslyn	7/1/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
72	Powell Co.	Stanton	7/5/2012	Thunderstorm Wind	50		0	0	$0	$0	0	0
73	Powell Co.	Waltersville	1/30/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
74	Powell Co.	Waltersville	6/10/2013	Thunderstorm Wind	52		0	0	$1,000	$0	0	0
75	Powell Co.	Stanton	6/13/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
76	Powell Co.	Natural Bridge	7/10/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
77	Powell Co.	Vaughns Mill	11/1/2013	Thunderstorm Wind	50		0	0	$1,000	$0	0	0
	Powell Co.	Bowen	11/1/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
78	Powell Co.	Stanton	12/22/2013	Thunderstorm Wind	50		0	0	$0	$0	0	0
79	Powell Co.	Vaughns Mill	2/20/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Westbend	2/20/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
80	Powell Co.	Vaughns Mill	7/27/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Xena	7/27/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
81	Powell Co.	Vaughns Mill	9/2/2014	Thunderstorm Wind	50		0	0	$0	$0	0	0
82	Powell Co.	Knowlton	10/6/2014	Thunderstorm Wind	55		0	0	$0	$0	0	0
83	Powell Co.	Natural Bridge	4/3/2015	Thunderstorm Wind	35		1	1	$0	$0	0	0
84	Powell Co.	Stanton	6/8/2015	Thunderstorm Wind	43		0	0	$1,000	$0	0	0
85	Powell Co.	Stanton	6/29/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
86	Powell Co.	Bowen	6/30/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
87	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	55		0	0	$0	$0	0	0
	Powell Co.	Indian Fields	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Westbend	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Bowen	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Rosslyn	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/10/2015	Thunderstorm Wind	50		0	0	$0	$0	0	0
88	Powell Co.	Stanton	6/15/2016	Thunderstorm Wind	52		0	0	$0	$0	0	0
89	Powell Co.	Waltersville	7/8/2016	Thunderstorm Wind	55		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
90	Powell Co.	Stanton Arpt	7/14/2016	Thunderstorm Wind	56		0	0	$0	$0	0	0
91	Powell Co.	Clay City	3/1/2017	Thunderstorm Wind	60		0	0	$0	$0	0	0
92	Powell Co.	Waltersville	4/5/2017	Thunderstorm Wind	56		0	0	$0	$0	0	0
93	Powell Co.	Stanton	4/3/2018	Thunderstorm Wind	50		0	0	$0	$0	0	0
94	Powell Co.	Stanton	5/31/2018	Thunderstorm Wind	50		0	0	$0	$0	0	0
95	Powell Co.	Stanton Arpt	7/5/2018	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Stanton	7/5/2018	Thunderstorm Wind	52		0	0	$0	$0	0	0
96	Powell Co.	Bowen	7/20/2018	Thunderstorm Wind	53		0	0	$0	$0	0	0
97	Powell Co.	Virden	7/30/2018	Thunderstorm Wind	53		0	0	$7,000	$0	0	0
98	Powell Co.	Virden	6/16/2019	Thunderstorm Wind	51		0	0	$0	$0	0	0
99	Powell Co.	Westbend	8/20/2019	Thunderstorm Wind	52		0	0	$0	$0	0	0
100	Powell Co.	Virden	1/11/2020	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Waltersville	1/11/2020	Thunderstorm Wind	55		0	0	$2,000	$0	0	0
101	Powell Co.	Waltersville	5/3/2020	Thunderstorm Wind	50		0	0	$5,000	$100	0	0
102	Powell Co.	Bowen	6/4/2020	Thunderstorm Wind	50		0	0	$5,000	$200	0	0
103	Powell Co.	Slade	6/10/2020	Thunderstorm Wind	50		0	0	$0	$100	0	0
104	Powell Co.	Nada	7/6/2020	Thunderstorm Wind	51		0	0	$0	$0	0	0
	Powell Co.	Virden	7/6/2020	Thunderstorm Wind	50		0	0	$0	$0	0	0
105	Powell Co.	Stanton Arpt	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Knowlton	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
	Powell Co.	Vaughns Mill	6/12/2021	Thunderstorm Wind	50		0	0	$0	$0	0	0
106	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		0	0	$100	$100	0	0
	Powell Co.	Stanton	6/21/2021	Thunderstorm Wind	50		0	0	$0	$50	0	0
107	Powell Co.	Westbend	12/11/2021	Thunderstorm Wind	50		0	0	$1,000	$1,000	0	0
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Vaughns Mill	12/11/2021	Thunderstorm Wind	50		0	0	$5,000	$2,000	0	0
	Powell Co.	Clay City	12/11/2021	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Xena	12/11/2021	Thunderstorm Wind	50		0	0	$1,000	$1,000	0	0
108	Powell Co.	Vaughns Mill	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Natural Bridge	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Rosslyn	2/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
109	Powell Co.	Virden	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Vaughns Mill	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton Arpt	4/13/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Knowlton	4/13/2022	Thunderstorm Wind	50		0	0	$22,000	$0	0	0
110	Powell Co.	Nada	5/3/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
111	Powell Co.	Xena	5/26/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
112	Powell Co.	Clay City	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Rosslyn	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton	6/17/2022	Thunderstorm Wind	50		0	0	$10,000	$0	0	0
	Powell Co.	Westbend	6/17/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
113	Powell Co.	Xena	6/22/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	Powell Co.	Stanton Arpt	6/22/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
114	Powell Co.	Vaughns Mill	7/6/2022	Thunderstorm Wind	50		0	0	$0	$1,000	0	0
	TOTALS						***1***	***1***	***$525,100***	***$20,550***	***0***	***0***

Powell County/Cities of Clay City and Stanton Hail Events, Extent, and Impacts, 1950-2022

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL CO.		11/13/1955	Hail	2		0	0	$0	$0	0	0
2	POWELL CO.	CLAY CITY	6/6/1995	Hail	1.75		0	0	$0	$0	0	0
3	POWELL CO.	CLAY CITY	8/7/2000	Hail	0.75		0	0	$0	$0	0	0
4	POWELL CO.	CLAY CITY	8/17/2000	Hail	0.75		0	0	$0	$0	0	0
5	POWELL CO.	CLAY CITY	7/8/2001	Hail	1.75		0	0	$0	$0	0	0
6	POWELL CO.	SLADE	3/29/2002	Hail	0.75		0	0	$0	$0	0	0
7	POWELL CO.	SLADE	4/28/2002	Hail	1.75		0	0	$0	$0	0	0
	POWELL CO.	STANTON	4/28/2002	Hail	0.75		0	0	$0	$0	0	0
8	POWELL CO.	STANTON	3/19/2003	Hail	0.75		0	0	$0	$0	0	0
9	POWELL CO.	CLAY CITY	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/15/2003	Hail	0.88		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/15/2003	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/15/2003	Hail	1.25		0	0	$0	$0	0	0
10	POWELL CO.	CLAY CITY	7/12/2003	Hail	0.88		0	0	$0	$0	0	0
11	POWELL CO.	STANTON	5/10/2004	Hail	0.75		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/10/2004	Hail	0.75		0	0	$0	$0	0	0
12	POWELL CO.	SLADE	5/30/2004	Hail	0.75		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/30/2004	Hail	1.75		0	0	$0	$0	0	0
13	POWELL CO.	SLADE	7/6/2004	Hail	0.75		0	0	$0	$0	0	0
14	POWELL CO.	STANTON	5/26/2006	Hail	0.88		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/26/2006	Hail	1		0	0	$0	$0	0	0
15	POWELL CO.	CLAY CITY	7/18/2007	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	CLAY CITY	7/18/2007	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	STANTON	7/18/2007	Hail	1		0	0	$0	$0	0	0
16	POWELL CO.	STANTON	4/11/2008	Hail	0.75		0	0	$0	$0	0	0
	POWELL CO.	CLAY CITY	5/11/2008	Hail	0.88		0	0	$0	$0	0	0
17	POWELL CO.	CLAY CITY	6/16/2008	Hail	1		0	0	$0	$0	0	0
18	POWELL CO.	STANTON	2/18/2009	Hail	0.75		0	0	$0	$0	0	0
19	POWELL CO.	SLADE	4/10/2009	Hail	1.75		0	0	$0	$0	0	0
20	POWELL CO.	VAUGHNS MILL	6/2/2009	Hail	1		0	0	$0	$0	0	0

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
21	POWELL CO.	BOWEN	3/23/2011	Hail	1.75		0	0	$0	$0	0	0
22	POWELL CO.	CLAY CITY	4/8/2011	Hail	1.25		0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	4/8/2011	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	STANTON	4/8/2011	Hail	1.25		0	0	$0	$0	0	0
	POWELL CO.	STANTON ARPT	4/8/2011	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	VAUGHNS MILL	4/8/2011	Hail	1.75		0	0	$0	$0	0	0
	POWELL CO.	STANTON	4/8/2011	Hail	1.75		0	0	$0	$0	0	0
23	POWELL CO.	CLAY CITY	2/29/2012	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	STANTON	2/29/2012	Hail	1		0	0	$0	$0	0	0
24	POWELL CO.	CLAY CITY	3/2/2012	Hail	1.25		0	0	$0	$0	0	0
	POWELL CO.	CLAY CITY	3/2/2012	Hail	1.25		0	0	$0	$0	0	0
25	POWELL CO.	NATURAL BRIDGE	5/21/2012	Hail	1		0	0	$0	$0	0	0
26	POWELL CO.	NATURAL BRIDGE	7/1/2012	Hail	1		0	0	$0	$0	0	0
27	POWELL CO.	STANTON	6/29/2015	Hail	1		0	0	$0	$0	0	0
28	POWELL CO.	SLADE	2/24/2017	Hail	0.88		0	0	$0	$0	0	0
29	POWELL CO.	WALTERSVILLE	5/27/2017	Hail	0.88		0	0	$0	$0	0	0
	POWELL CO.	WALTERSVILLE	5/27/2017	Hail	1		0	0	$0	$0	0	0
	POWELL CO.	STANTON	5/27/2017	Hail	1.75		0	0	$0	$0	0	0
30	POWELL CO.	ROSSLYN	4/8/2020	Hail	0.75		0	0	$0	$0	0	0
31	POWELL CO.	XENA	5/19/2022	Hail	2		0	0	$0	$0	0	0
	TOTALS						***0***	***0***	***$0***	***$0***	***0***	***0***

Powell County/Cities of Clay City and Stanton Tornado Events, Extent, and Impacts, 1950-2022

Count	County	Location	Date	Type	Extent: Wind Speed or Hail Size	Extent: F/EF-Scale	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL CO.		8/30/1978	Tornado		F2	0	0	$25,000	$0	0	0
2	POWELL CO.		7/2/1980	Tornado		F1	0	0	$25,000	$0	0	0
3	POWELL CO.		3/16/1982	Tornado		F2	0	1	$250,000	$0	0	0
4	POWELL CO.		5/21/1990	Tornado		F0	0	0	$25,000	$0	0	0
5	POWELL CO.	STANTON	3/1/1997	Tornado		F1	0	0	$500,000	$0	0	0
6	POWELL CO.	STANTON	3/2/1997	Tornado		F0	0	0	$1,250,000	$0	0	0
7	POWELL CO.	CLAY CITY	5/30/2004	Tornado		F0	0	0	$0	$0	0	0
	TOTALS						***0***	***1***	***$2,075,000***	***$0***	***0***	***0***

Powell County/Cities of Clay City and Stanton Tornado Events, Extent, Impacts, and Vulnerability (Length), 1950-2022

Date	Event Type	Tornado Scale	Deaths (Direct)	Injuries (Direct)	Tornado Length (Miles)
8/30/1978	Tornado	F2	0	0	5.2
7/2/1980	Tornado	F1	0	0	2.7
3/16/1982	Tornado	F2	0	1	4
5/21/1990	Tornado	F0	0	0	0.5
3/1/1997	Tornado	F1	0	0	6
3/2/1997	Tornado	F0	0	0	1
5/30/2004	Tornado	F0	0	0	0.1

Extent for Tornadoes

This risk assessment will include both the Fujita-Pearson and the Enhanced Fujita Scale. The Fujita-Pearson Scale is included only for reference: Since 2007, the Enhanced Fujita Scale has been the standard by which to measure the extent of wind activity. However, Kentucky does contain dramatically different geographies within its boundaries. In discussing tornadic activity specifically, the mountainous eastern and southeastern Kentucky will have significantly less tornadic activity than central or western Kentucky. Resultingly, illustrating past events requires going back before 2007. Tornado path maps, for example, will reference the Fujita-Pearson Scale always in order to compare pre-2007 and post-2007 events.

The Enhanced Fujita Scale is a set of wind estimates (not measurements) based on damage. Its uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators listed below. These estimates vary with height and exposure. **Important**: The 3-second gust is not the same wind as in standard surface observations. Standard measurements are taken by weather stations in open exposures, using a directly measured, "one-minute mile" speed[19].

The Enhanced Fujita Scale is summarized by National Weather Service (NWS) thusly:

Enhanced Fujita Scale		
Weak	EF-0	65-85 mph winds
	EF-1	86-110 mph winds
Strong	EF-2	111-135 mph winds
	EF-3	136-165 mph winds
Violent	EF-4	166-200 mph winds
	EF-5	>200 mph winds

[19] This paragraph derives from NOAA: https://www.spc.noaa.gov/faq/tornado/ef-scale.html.

Fujita-Pearson Scale

Fujita Scale	Estimated Wind Speed (mph) (Fastest ¼-Mile)	3-Second Gust (mph)	Typical Damage
F0	< 73	45-78	*Light Damage*: Some damage to chimneys; branches broken off of trees; shallow-rooted trees pushed over; signboards damaged
F1	73-112	79-117	*Moderate Damage*: Peels surface off of roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
F2	113-157	118-161	*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
F3	158-207	162-209	*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
F4	208-260	210-261	*Devastating Damage*: Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated
F5	261-318	262-317	*Incredible Damage*: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur

Enhanced Fujita Scale

EF Number	3-Second Gust (mph)	Typical Damage
EF0	65-85	*Minor Damage*: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0
EF1	86-110	*Moderate Damage:* Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken
EF2	111-135	*Considerable Damage*: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
EF3	136-165	*Severe Damage*: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged
EF4	166-200	*Devastating Damage*: Well-constructed and whole frame houses completely leveled; cars and other large objects thrown and small missiles generated
EF5	> 200	*Incredible Damage:* Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately one (1) mile (1.6 kilometers)

Extent for Straightline Wind

This risk analysis uses the Beaufort Wind Scale to discuss extent. The Beaufort Wind Scale is the scale upon which the National Weather Service (NWS) bases its categorization of "Thunderstorm Wind" and "High Wind" variables recorded in the National Center for Environmental Information (NCEI) Storm Events database.

Quoted from the National Weather Service: "One of the first scales to estimate wind speeds and the effects was created by Britain's Admiral Sir Francis Beaufort (1774-1857). He developed the scale in 1805 to help sailors estimate the winds via visual observations. The scale starts with 0 and goes to a force of 12. The Beaufort scale is still used today to estimate wind strengths[20]."

Beaufort Wind Scale

Force	Speed (mph)	Speed (knots)	Description	Specifications
0	0-1	0-1	Calm	Calm; smoke rises vertically
1	1-3	1-3	Light Air	Direction of wind shown by smoke drift, but not by wind vanes
2	4-7	4-6	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind
3	8-12	7-10	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag
4	13-18	11-16	Moderate Breeze	Raises dust and loose paper; small branches are moved
5	19-24	17-21	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters
6	25-31	22-27	Strong Breeze	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty
7	32-38	28-33	Near Gale	Whole trees in motion; inconvenience felt when walking against the wind
8	39-46	34-40	Gale	Breaks twigs off trees; generally impedes progress
9	47-54	41-47	Severe Gale	Slight structural damage occurs (chimney-pots and slates removed)
10	55-63	48-55	Storm	Seldom experienced inland; trees uprooted; considerable structural damage occurs
11	64-72	56-63	Violent Storm	Very rarely experienced; accompanied by wide-spread damage
12	72-83	64-71	Hurricane	See Saffir-Simpson Hurricane Scale

[20] See https://www.weather.gov/mfl/beaufort.

Extent for Hail

In defining its "Severe Thunderstorm" category for forecasting and recording events, the National Weather Service (NWS) cites an unnamed scale for conceptualizing the magnitude of hail:

National Weather Service (NWS) Guide for Determining Hail Sizes[21]

Diameter	Conceptual Example
> 0.50 Inches	Pea
0.50 Inches	Marble/Mothball
0.75 Inches	Dime/Penny
0.88 Inches	Nickel
1.00 Inches	Quarter
1.25 Inches	Half Dollar
1.50 Inches	Walnut/Ping-Pong Ball
1.75 Inches	Golf Ball
2.00 Inches	Hen Egg
2.50 Inches	Tennis Ball
2.75 Inches	Baseball
3.00 Inches	Tea Cup
4.00 Inches	Grapefruit
4.50 Inches	Softball

[21] See https://www.weather.gov/bgm/severedefinitions.

The TORRO Hail Storm Intensity Scale (or the H-Scale) provides some additional illustration of the extent from hail. "The scale extends from H0 to H10 with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, numbers, fall speed, speed of storm translation, and strength of the accompanying wind. The characteristic damage associated with each increment in Britain is listed in the table but may need to be modified for other countries to reflect differences in building materials and types; e.g. whether roofing tiles are predominantly slate, shingle or concrete."

TORRO Hail Storm Intensity Scale (H-Scale)[22]

Scale	Intensity Category	Typical Hail Diameter (mm)	Probable Kinetic Energy J m^{-2}	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-15	> 20	Slight general damage to plants, crops
H2	Significant	10-20	> 100	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	> 300	Severe damage to fruit and crops; damage to glass and plastic structures; paint and wood scored
H4	Severe	25-40	> 500	Widespread glass damage; vehicle bodywork damage
H5	Destructive	30-50	> 800	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

As the TORRO H-Scale is British, its diameter measurements for hail are millimeters rather than in inches. So, by way of comparison to the NWS scale above, TORRO provides the following:

[22] See https://www.torro.org.uk/research/hail/hscale.

TORRO H-Scale Size Code Translation to Hail Descriptors

Size code	Maximum diameter (mm)	Description
0	5-9	Pea
1	10-15	Mothball
2	16-20	Marble, Grape
3	21-30	Walnut
4	31-40	Pigeon's Egg > Squash ball
5	41-50	Golf Ball > Pullet's Egg
6	51-60	Hen's egg
7	61-75	Tennis Ball > Cricket ball
8	76-90	Large Orange > Soft ball
9	91-100	Grapefruit
10	> 100	Melon

A Statement of Vulnerability to Severe Thunderstorms

It is assumed for Powell County and for the Cities of Clay City and Stanton that all of the critical facilities identified toward the end of the plan are under threat equally from a severe thunderstorm event.

Severe Winter Storms

A winter storm can range from moderate snow over a few hours to blizzard conditions with blinding wind-driven snow, sleet and/or ice that lasts several days. Some winter storms may be large enough to affect several states, while others may affect a single community. All winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by low temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is defined as an event that drops four or more inches of snow during a 12-hour period or 6 or more inches during a 24-hour span. The aftermath of a winter storm can impact a community or region for days, weeks, and months.

Types of Winter Storms: "Winter Storms" themselves are a category: "A winter storm is a combination of heavy snow, blowing snow and/or dangerous wind chills. A winter storm is life-threatening[23]."

1. Blizzards

Blizzards are by far the most dangerous of all winter storms. They are characterized by temperatures below twenty degrees Fahrenheit and winds of at least 35 miles per hour. In addition to the temperatures and winds, a blizzard must have a sufficient amount of falling or blowing snow. The snow must reduce visibility to one quarter of a mile or less for at least three hours. With high winds and heavy snow, these severe storms can punish residents throughout much of the United States during the winter months each year. In mid-March of 1993, a major blizzard struck the Eastern U.S., including parts of Kentucky.

2. Heavy Snowstorm

Heavy snows have the capacity to immobilize a region and paralyze a city, slowing the flow of supplies, and disrupting emergency and medical services. Accumulations of snow may collapse buildings and knock down trees and power lines. Homes and farms in rural areas may be isolated for days and unprotected livestock may be lost. The cost of snow removal, repairing damages, and loss of business can have enormous economic impacts on cities and towns.

3. Ice Storm

An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. Ice storms occur when cold air at the surface is overridden by warm, moist air at higher altitudes. As the warm air advances and is lifted over the cold, precipitation begins falling as rain at high altitudes, then, as it is super cooled, freezes upon contact with chilled surfaces at temperatures of 32 degrees Fahrenheit or below. In extreme cases, ice may accumulate inches thick, though just a thin coating is often enough to do severe damage.

[23] See https://www.nssl.noaa.gov/education/svrwx101/winter/types/.

Impact of Winter Storms

Storm effects such as power outages, extreme cold, flooding, and snow accumulation can cause hazardous conditions and hidden problems for people in affected areas.

1. Power Outages
   Snow and ice accumulation on trees can cause branches and trunk to break and fall on to vulnerable power lines causing blackouts varying in size from one street to an entire city. In turn, a population may be even more vulnerable to other effects such as extreme cold.

2. Extreme Cold
   With the occurrence of extremely cold temperatures comes the risk of frozen water mains and pipes, potentially damaged car engines, and, in extreme cases, prolonged exposure to cold resulting in frostbite.

3. Flooding
   After precipitation has mounted and temperatures rise once again, snow and ice melts and, depending on the amount of total precipitation, flooding can occur. In turn, as more snow and ice accumulate the threat of flooding increases.

4. Snow and Ice Accumulation on Roadways
   This can cause severe transportation problems in the form of extremely hazardous roadway conditions that encourage loss of controls of vehicles, collisions, and roadways and interstate closures.

Historical Winter Storm Data

See table on following page

Powell County/Cities of Clay City and Stanton Winter Storm Events, Type, and Impacts, 1996-2022

Count	Location: County	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
1	POWELL (ZONE)	1/6/1996	Heavy Snow	0	0	$0	$0	0	0
2	POWELL (ZONE)	2/3/1998	Heavy Snow	0	0	$0	$0	0	0
3	POWELL (ZONE)	1/7/1999	Ice Storm	0	0	$0	$0	0	0
4	POWELL (ZONE)	1/17/2000	Winter Storm	0	0	$0	$0	0	0
5	POWELL (ZONE)	12/2/2000	Heavy Snow	0	0	$0	$0	0	0
6	POWELL (ZONE)	1/20/2001	Heavy Snow	0	0	$0	$0	0	0
7	POWELL (ZONE)	2/22/2001	Winter Storm	0	0	$0	$0	0	0
8	POWELL (ZONE)	1/17/2002	Heavy Snow	0	0	$0	$0	0	0
9	POWELL (ZONE)	1/19/2002	Heavy Snow	0	0	$0	$0	0	0
10	POWELL (ZONE)	12/5/2002	Ice Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	12/5/2002	Ice Storm	0	0	$0	$0	0	0
11	POWELL (ZONE)	1/9/2004	Heavy Snow	0	0	$0	$0	0	0
12	POWELL (ZONE)	1/25/2004	Ice Storm	0	0	$0	$0	0	0
13	POWELL (ZONE)	12/15/2008	Winter Storm	0	0	$0	$0	0	0
14	POWELL (ZONE)	1/27/2009	Ice Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	1/27/2009	Ice Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	1/27/2009	Ice Storm	0	0	$0	$0	0	0
15	POWELL (ZONE)	1/29/2010	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	1/29/2010	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	1/29/2010	Heavy Snow	0	0	$0	$0	0	0
16	POWELL (ZONE)	2/9/2010	Heavy Snow	0	0	$0	$0	0	0
17	POWELL (ZONE)	12/12/2010	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	12/12/2010	Heavy Snow	0	0	$0	$0	0	0
18	POWELL (ZONE)	12/15/2010	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	12/15/2010	Ice Storm	0	0	$0	$0	0	0
19	POWELL (ZONE)	1/21/2014	Heavy Snow	0	0	$0	$0	0	0
20	POWELL (ZONE)	2/4/2014	Ice Storm	0	0	$0	$0	0	0
21	POWELL (ZONE)	3/2/2014	Winter Storm	0	0	$0	$0	0	0
22	POWELL (ZONE)	2/16/2015	Winter Storm	0	0	$0	$0	0	0
23	POWELL (ZONE)	2/21/2015	Winter Storm	0	0	$0	$0	0	0
24	POWELL (ZONE)	3/4/2015	Winter Storm	0	0	$0	$0	0	0
25	POWELL (ZONE)	1/22/2016	Heavy Snow	0	0	$0	$0	0	0

Count	Location: County	Date	Type	Deaths (Direct)	Injuries (Direct)	Property Damage	Crop Damage	Injuries (Indirect)	Deaths (Indirect)
26	POWELL (ZONE)	2/14/2016	Heavy Snow	0	0	$0	$0	0	0
27	POWELL (ZONE)	1/16/2018	Heavy Snow	0	0	$0	$0	0	0
28	POWELL (ZONE)	3/11/2018	Heavy Snow	0	0	$0	$0	0	0
29	POWELL (ZONE)	2/10/2021	Ice Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	2/10/2021	Ice Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	2/10/2021	Ice Storm	0	0	$0	$0	0	0
30	POWELL (ZONE)	2/14/2021	Winter Storm	0	0	$0	$0	0	0
	POWELL (ZONE)	2/14/2021	Ice Storm	0	0	$0	$0	0	0
31	POWELL (ZONE)	2/17/2021	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	2/17/2021	Heavy Snow	0	0	$0	$0	0	0
	POWELL (ZONE)	2/17/2021	Heavy Snow	0	0	$0	$0	0	0
32	POWELL (ZONE)	1/6/2022	Heavy Snow	0	0	$0	$0	0	0
33	POWELL (ZONE)	1/16/2022	Heavy Snow	0	0	$0	$0	0	0
34	POWELL (ZONE)	2/3/2022	Ice Storm	0	0	$0	$0	0	0
35	POWELL (ZONE)	3/11/2022	Heavy Snow	0	0	$0	$0	0	0
	TOTALS			***0***	***0***	***$0***	***$0***	***0***	***0***

Powell County/Cities of Clay City and Stanton Winter Storm Extent and Impacts via Narratives, 1996-2022

Count	Location: County	Date	Type	Event Narratives
1	POWELL (ZONE)	1/6/1996	Heavy Snow	
2	POWELL (ZONE)	2/3/1998	Heavy Snow	
3	POWELL (ZONE)	1/7/1999	Ice Storm	
4	POWELL (ZONE)	1/17/2000	Winter Storm	
5	POWELL (ZONE)	12/2/2000	Heavy Snow	
6	POWELL (ZONE)	1/20/2001	Heavy Snow	
7	POWELL (ZONE)	2/22/2001	Winter Storm	
8	POWELL (ZONE)	1/17/2002	Heavy Snow	
9	POWELL (ZONE)	1/19/2002	Heavy Snow	
10	POWELL (ZONE)	12/5/2002	Ice Storm	1/4 inch of ice was reported.
	POWELL (ZONE)	12/5/2002	Ice Storm	1/4 inch of ice was reported.
11	POWELL (ZONE)	1/9/2004	Heavy Snow	Seven inches of snow were reported in Stanton on higher ridges.
12	POWELL (ZONE)	1/25/2004	Ice Storm	
13	POWELL (ZONE)	12/15/2008	Winter Storm	Around half an inch of sleet fell in Clay City and Stanton.
14	POWELL (ZONE)	1/27/2009	Ice Storm	A volunteer weather observer reported a half an inch of snow and three tenths of an inch of ice accumulation in Stanton.
	POWELL (ZONE)	1/27/2009	Ice Storm	Dispatch estimated one quarter of an inch of ice due to freezing rain accumulated in Clay City.
	POWELL (ZONE)	1/27/2009	Ice Storm	Dispatch estimated one quarter of an inch of ice accumulation, with only a trace of sleet, in Clay City.
15	POWELL (ZONE)	1/29/2010	Heavy Snow	Four inches of storm total snowfall since 930 pm last night.
	POWELL (ZONE)	1/29/2010	Heavy Snow	A trained weather spotter measured 3.5 inches of snow 6 miles west southwest of Stanton.
	POWELL (ZONE)	1/29/2010	Heavy Snow	The Highway Dept reported about 5 inches of snow in valleys and up to 7 inches along the ridge tops around the county.
16	POWELL (ZONE)	2/9/2010	Heavy Snow	A weather service employee measured an overall snow depth of 4 inches at the top of Slade grade in Powell county.
17	POWELL (ZONE)	12/12/2010	Heavy Snow	Six inches of snow fell in Clay City.
	POWELL (ZONE)	12/12/2010	Heavy Snow	The storm total was 6 inches with a snow depth of 5 inches at 8 am on the 14th.
18	POWELL (ZONE)	12/15/2010	Heavy Snow	The total 12 hr snowfall amount was 4 inches in Stanton.
	POWELL (ZONE)	12/15/2010	Ice Storm	An ice accumulation of 0.33 inches was reported 2 miles west of Stanton.
19	POWELL (ZONE)	1/21/2014	Heavy Snow	Snowfall amounts ranged from 4.5 inches in Clay City to 6.1 inches near Stanton.
20	POWELL (ZONE)	2/4/2014	Ice Storm	Up to one quarter of an inch of ice accumulation occurred on ridges around the county. Numerous trees were brought down due to the weight of the ice on them on Furnace Mountain and on Cane Creek.
21	POWELL (ZONE)	3/2/2014	Winter Storm	Snow and sleet accumulations of around six inches were observed across the county.
22	POWELL (ZONE)	2/16/2015	Winter Storm	The first official snow measurement from Powell county was received at 7:00 am from a COOP weather observer who measured 2.5 inches of snow near Clay City a few hours into the storm. Storm total snow fall amounts from around the county ranged from 10 to 14 inches in and around Clay City and Stanton. Most other locations across the county received around 10 inches of snow by the time the storm ended.

Count	Location: County	Date	Type	Event Narratives
23	POWELL (ZONE)	2/21/2015	Winter Storm	Quarter inch ice accumulations occurred around the county.
24	POWELL (ZONE)	3/4/2015	Winter Storm	Powell county picked up a county wide average storm total snowfall of 6 to 7 inches.
25	POWELL (ZONE)	1/22/2016	Heavy Snow	Snowfall amounts ranged from 10 to 12 inches across the county.
26	POWELL (ZONE)	2/14/2016	Heavy Snow	Snowfall ranged from 3 to 5 inches across the county.
27	POWELL (ZONE)	1/16/2018	Heavy Snow	
28	POWELL (ZONE)	3/11/2018	Heavy Snow	
29	POWELL (ZONE)	2/10/2021	Ice Storm	Heavy accumulations of ice from freezing rain brought down trees along Highway 11 in Powell county, at the 25 MM. The trees fell onto and brought down phone and power lines in that same area. Freezing rain was ongoing at time of report.
	POWELL (ZONE)	2/10/2021	Ice Storm	Heavy ice accumulation due to freezing rain brought down a large tree onto Highway 615 around mile marker 1. The tree knocked down some power lines.
	POWELL (ZONE)	2/10/2021	Ice Storm	Three tenths of an inch of ice accumulation due to freezing rain had occurred near Stanton.
30	POWELL (ZONE)	2/14/2021	Winter Storm	A half an inch of ice accumulation due to freezing rain, and two inches of sleet accumulation, occurred in and around Stanton.
	POWELL (ZONE)	2/14/2021	Ice Storm	A tree was brought down due to the weight of ice on it on Hwy 213 on the Powell county side, causing the road to be blocked and closed.
31	POWELL (ZONE)	2/17/2021	Heavy Snow	A storm total snowfall of 3.6 inches was reported near Clay City.
	POWELL (ZONE)	2/17/2021	Heavy Snow	An estimated 5 inches of snow fell in Stanton.
	POWELL (ZONE)	2/17/2021	Heavy Snow	An estimated 5 inches of snow fell near the Koomer Ridge Campground.
32	POWELL (ZONE)	1/6/2022	Heavy Snow	As of 2:10 PM EST, an NWS Employee measured 4.6 inches 1 mile WSW of Stanton, with snow still falling. An hour later, totals were ranging between 4.3 inches (community of Nada) and 6.0 inches (1 mile S of Stanton). By the end of the event, 7.3 inches of storm total snowfall was reported 1 mile WSW of Stanton.
33	POWELL (ZONE)	1/16/2022	Heavy Snow	Snow fell heavily across the county during the afternoon and evening hours of the 16th. A storm total of 7.0 inches on Furnace Mountain was received at 10:50 PM. Another report of 6.3 inches was received from Slade via social social media at 11:55 PM. On the 17th, the co-op observers a Clay City and 2W Stanton reported 4.6 and 4.3 inch storm totals, respectively.
34	POWELL (ZONE)	2/3/2022	Ice Storm	A NWS Employee located 3 miles north of Stanton (near the Montgomery County line) estimated 0.25 inches of ice accumulations on the trees at 7:00 AM EST. A couple hours later, at 9:15 AM EST, the Department of Highways reported over 0.25 inches of ice on elevated surfaces 1 mile SW of Stanton.
35	POWELL (ZONE)	3/11/2022	Heavy Snow	One report was given overnight from a trained spotter that measured 2.8 inches near 3 am EST on the 12th. Storm totals were reported by COOP observers, with 3.3 inches near Stanton at 8am EST, and 5.0 inches further into the western third of the county near Clay City as of 7:00am EST.

Probability for Winter Storms as a Function of Previous Occurrences

This analysis counts as a discrete "winter storm" event for Powell County and the Cities of Clay City and Stanton only those events that occurred on different dates. Any event recorded that shares the same date of occurrence as other events are treated as one contiguous event.

Powell County and the Cities of Clay City and Stanton, then, experienced 35 discrete "winter storm" events over the period of record.

Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future 1.34 "winter storm" events every year (i.e., [1/(26/35)] = 1.34). This statistic might be interpreted as assuming an 100% probability that one winter storm event would occur within Powell County and the Cities of Clay City and Stanton each year. So the partial has meaning, Powell County and the Cities of Clay City and Stanton experienced and, thus, can be expected to experience in the future 1 "winter storm" event every 9 months (i.e., [1/(35/316)] = 9.02).

A Statement of Vulnerability to Winter Storms

It is assumed for Powell County and for the Cities of Clay City and Stanton that all of the critical facilities identified toward the end of this plan document are under threat equally from a winter storm as defined through the National Weather Service's use of the term "winter storm," and/or through heavy snow, a blizzard, or an ice storm.

Wildfires

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires.

A Wildland Fire[24] is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. Wildland fires have been occurring in Kentucky for thousands of years. Unfortunately, these fires began to threaten homes and communities prompting the need to suppress wildfires and establish forest protection laws. The first forest protection laws were enacted in 1831 in a few specific counties with heavily wooded areas. The fine and penalty for setting a fire was $20. Today, Kentucky's forest protection laws include much stiffer penalties for intentionally setting a fire on land owned by another (Kentucky Revised Statute, Chapter 149, Section 380). Penalties for violating KRS 149.380 include a fine of not less than $1,000 or more than $10,000, imprisonment for not more than five years, or both fine and imprisonment.

An Urban Wildland Interface Fire is a wildfire in a geographic area where structures and other human development meet or intermingle with wildland or vegetative fuels. Areas that have experienced prolonged droughts, or are excessively dry, are at risk of wildfires. People start more than four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires. Wildfire behavior is based on three primary factors: fuel, topography, and weather. The type, and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential and behavior. The continuity of fuels, expressed in both horizontal and vertical components is also a factor, in that it expresses the pattern of vegetative growth and open areas. Topography is important because it affects the movement of air (and thus the fire) over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity, and wind (both short and long term) affect the severity and duration of wildfires.

According to Kentucky Division of Forestry (KDF), wildfires are categorized into “Classes.” These “Classes,” then, represent types of wildfires and also represent an illustration of “extent,” i.e., a measurement of how bad a wildfire can get, preferably in terms of a scale. Below are “Class” distinctions between types of wildfires and the definition-cum-extent that determine each Class.

[24] The following description derives from the Kentucky Division of Forestry (KDF). See: https://eec.ky.gov/Natural-Resources/Forestry/wildland-fire-management/Pages/default.aspx [Last Accessed 3/1/2022].

According to Kentucky Division of Forestry (KDF), wildfires are categorized into "Classes." These "Classes," then, represent types of wildfires and also represent an illustration of "extent," i.e., a measurement of how bad a wildfire can get, preferably in terms of a scale. Below are "Class" distinctions between types of wildfires and the definition-cum-extent that determine each Class.

Classes of Wildfire as Distinguished by Acres Burned

Class A	Less than 0.25 Acres Burned
Class B	0.26 to 9 Acres Burned
Class C	10 to 99 Acres Burned
Class D	100 to 299 Acres Burned
Class E	300 to 999 Acres Burned
Class F	1,000 to 4,999 Acres Burned
Class G	5,000 or More Acres Burned

From January 1, 2013 until December 31, 2021, there have been the following number of wildfires in each Class for Powell County and the Cities of Clay City and Stanton. The number of wildfires is accompanied by the acreage burned and the percent of the total each Class comprised:

Summary of Fire Occurrences, Extent, January 1, 2013 – December 31, 2021

Fire Class	Class Descriptor	# Fires	Acreage Burned	% of Total Fire Type
Class A	>0.25 Acres	1	0.2	2.28%
Class B	0.25 to 9 Acres	38	90.55	86.36%
Class C	10 to 99 Acres	5	172	11.36%
Class D	100 to 299 Acres	0	0	0.0%
Class E	300 to 999 Acres	0	0	0.0%
Class F	1,000 to 4,999 Acres	0	0	0.0%
Class G	5,000 or More Acres	0	0	0.0%

Location and Previous Occurrences

Below is a map of the locations of all wildfire events to be recorded by Kentucky Division of Forestry (KDF) from January 1, 2013 – August 2018. This map derives from the Commonwealth of Kentucky Enhanced Hazard Mitigation Plan 2018. There were 29 wildfire events recorded for Powell County (and the Cities of Clay City and Stanton) from 2013 – 2018.

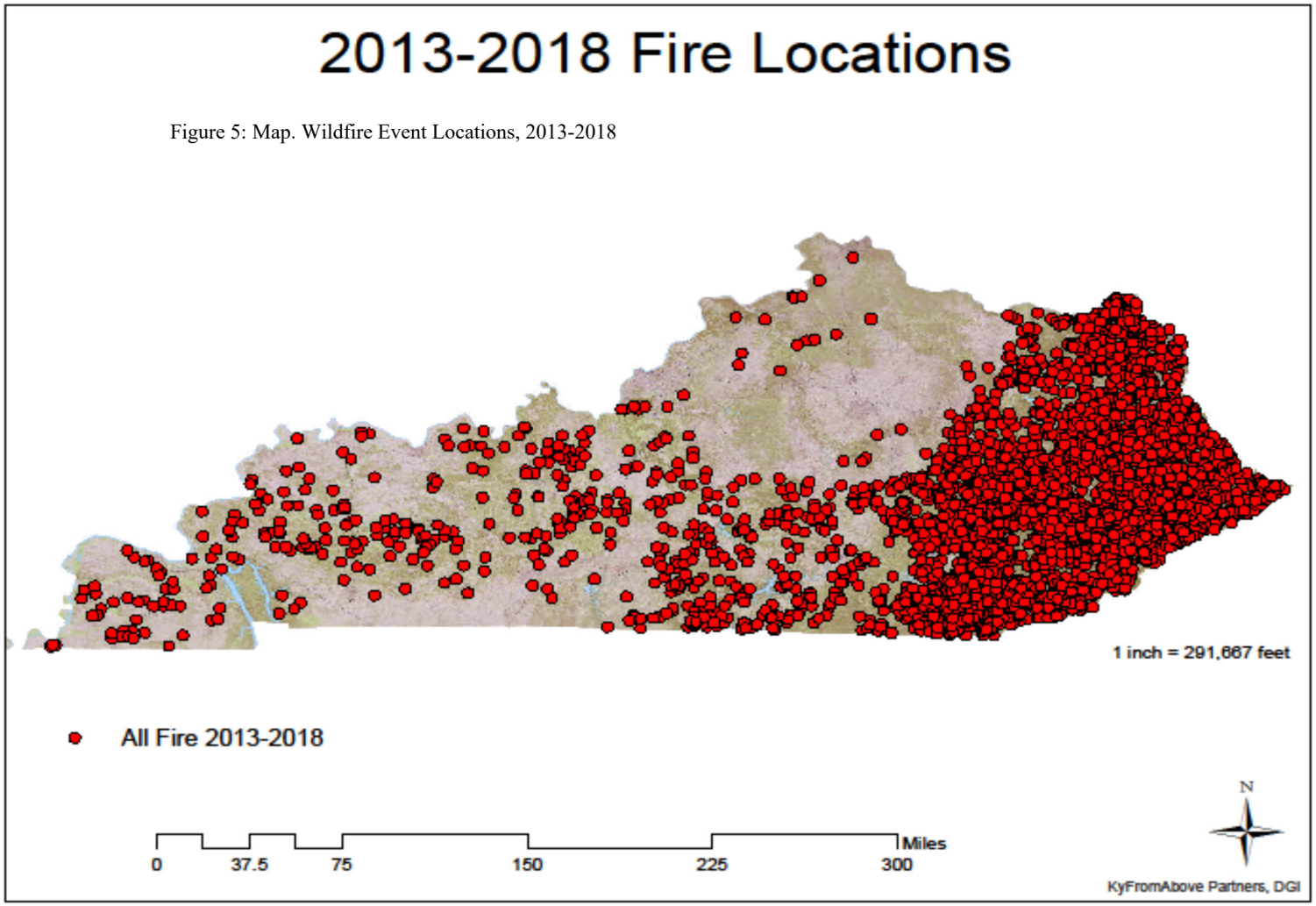


Figure 5: Map. Wildfire Event Locations, 2013-2018

Location, Previous Occurrences, Extent, Vulnerability

The following tables summarizing locations, previous occurrences, extent, and vulnerability are organized by "Region." "Regions" refer to Kentucky Division of Forestry (KDF) Regional Office locations. Below is a map for reference.

The purpose of this map in terms of illustrating risk for local governments is that it is evidence that Kentucky Division of Forestry data (i.e., the best available data) is collected at the county level in accordance with organization of the division by regions defined by counties. In this case, Powell County data is synonymous with Powell County and Cities of Clay City's and Stanton's data.

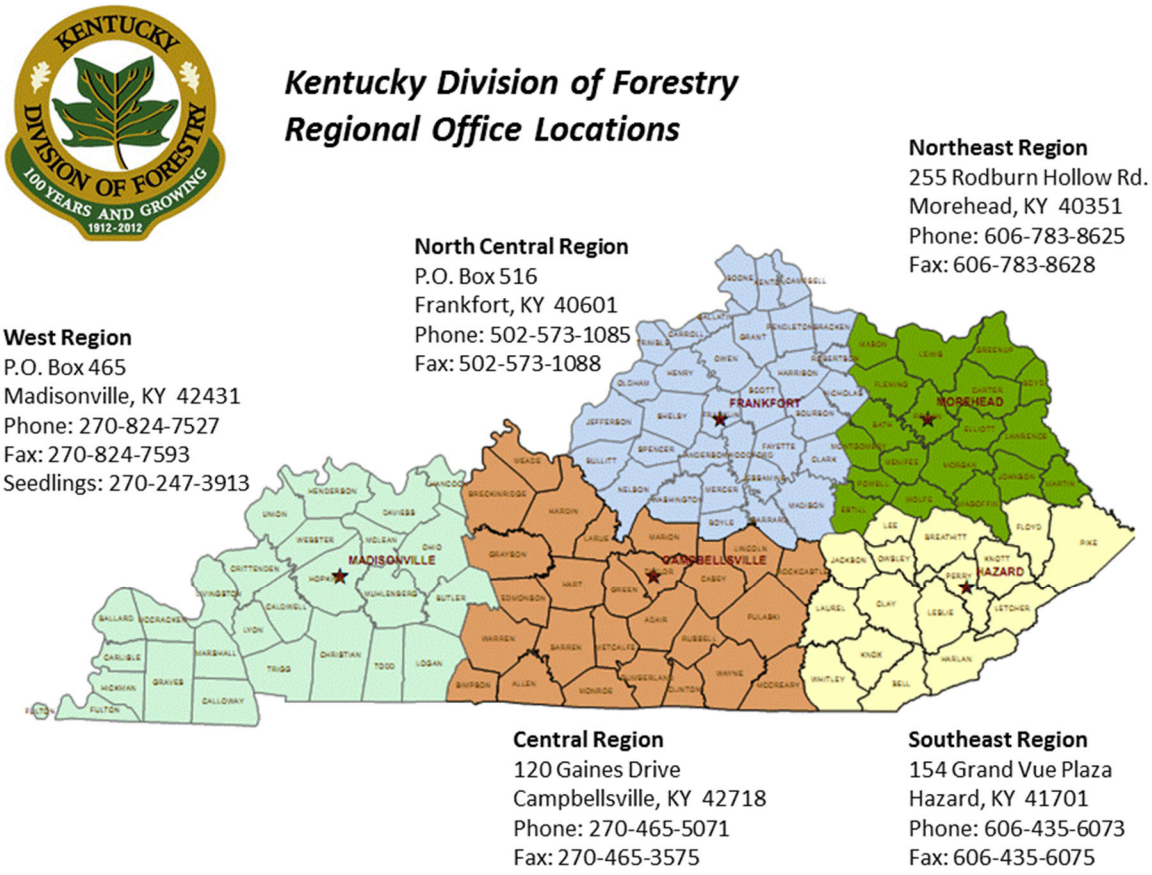


Figure 6: Map. KDF Regions for Reference

Powell County (inc. the Cities of Clay City and Stanton) Wildfire Previous Occurrences, Type, Location, Extent, Impacts, 2013-2017

Count	County	Date	Location	District	Area Type	Fire Size	Cause	Total Acres Burned	Suppression Costs	# Houses Saved	Saved Houses Value	# Houses Lost	Lost Houses Value	# Saved Structures	Saved Structures Value	# Lost Structures	Lost Structures Value	Injuries	Fatality
1	Powell	4/13/2013	Apple Drive	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 195.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
2	Powell	11/20/2013	Hardwicks Creek Rd.	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	3	$ 521.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
3	Powell	3/14/2014	Nelson Branch Rd.	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 200.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
4	Powell	3/15/2014	Hardwicks Creek	Northeast	Non-Commercial	0.25 to 9 Acres	Debris	5	$ 318.00	0	$ -	0	$ -	2	$ 8,000.00	0	$ -	0	0
5	Powell	4/5/2014	North Fork Road	Northeast	Commercial Forest Land	10 - 99 Acres	Debris	19	$ 1,088.00	2	$ 80,000.00	0	$ -	0	$ -	0	$ -	0	0
6	Powell	4/20/2014	Barker Branch	Northeast	Commercial Forest Land	10 - 99 Acres	Campfires	97	$ 3,904.00	0	$ -	0	$ -	3	$ 35,000.00	0	$ -	0	0
7	Powell	4/21/2014	Knowlton	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 461.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
8	Powell	4/27/2014	Estes Road	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	3.1	$ 328.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
9	Powell	3/23/2015	Hardwicks Creek	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	1	$ 253.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
10	Powell	3/31/2015	Furnace Rd	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	7	$ 930.00	1	$ 30,000.00	0	$ -	3	$ 60,000.00	2	$8,000.00	0	0
11	Powell	6/15/2015	Fife Lick	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 303.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
12	Powell	11/5/2015	Hatton School Rd	Northeast	Commercial Forest Land	0.25 to 9 Acres	Equipment	4	$ 397.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
13	Powell	3/21/2016	Beechfork Rd	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 353.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
14	Powell	4/3/2016	Pilot Rd Fire	Northeast	Non-Commercial	0.25 to 9 Acres	Misc.	2	$ 203.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
15	Powell	4/5/2016	Red Bird Lane	Northeast	Commercial Forest Land	Under 0.25 Acres	Debris	0.2	$ 109.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
16	Powell	4/18/2016	Albert Ridge Road	Northeast	Non-Commercial	0.25 to 9 Acres	Debris	1	$ 199.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
17	Powell	4/19/2016	Stokley Branch	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	4	$ 489.00	2	$160,000.00	0	$ -	0	$ -	0	$ -	0	0
18	Powell	11/15/2016	Little Abners Hotel/ Sr 822	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1.2	$ 178.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
19	Powell	2/21/2017	Highway 1639	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	1	$ 239.00	0	$ -	0	$ -	1	$ 500.00	0	$ -	0	0
20	Powell	3/15/2017	Dunaway Rd	Northeast	Commercial Forest Land	0.25 to 9 Acres	Misc.	2	$ 366.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
21	Powell	3/22/2017	Skinner Branch Fire	Northeast	Commercial Forest Land	0.25 to 9 Acres	Misc.	1.5	$ 250.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
22	Powell	3/23/2017	Z Ridge Fire	Northeast	Commercial Forest Land	0.25 to 9 Acres	Debris	0.5	$ 135.00	1	$140,000.00	0	$ -	0	$ 6,000.00	1	$ -	0	0
23	Powell	4/5/2017	Pompeii Rd	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	5	$ 216.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
24	Powell	4/9/2017	Paint Creek Rd	Northeast	Commercial Forest Land	10 - 99 Acres	Debris	11	$ 1,331.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
25	Powell	4/15/2017	Furnace Road	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	2	$ 373.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
26	Powell	11/12/2017	Fife Lick Rd.	Northeast	Commercial Forest Land	0.25 to 9 Acres	Incendiary	1	$ 724.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
			TOTALS:					**176.5**	**$ 14,063.00**	**6**	**$410,000.00**	**0**	**$ -**	**9**	**$109,500.00**	**3**	**$8,000.00**	**0**	**0**

Powell County (inc. the Clay City and Stanton) Wildfire Previous Occurrences, Type, Location, Extent, Impacts, 2018.

Count	County	Date	Location	Latitude	Longitude	District	Residences Threatened	Residences Destroyed	Other Structures Threatened	Other Structures Destroyed	Injuries	Fatalities	Total Acres Burned
1	Powell	4/13/2018	Rose Lane	37.81451	-83.899643	Morehead Branch	0	0	0	0	0	0	35
2	Powell	4/13/2018	Barker Ridge	37.73872	-83.736938	Morehead Branch	0	0	0	0	0	0	9
3	Powell	4/18/2018	Black Creek	37.909538	-83.917137	Morehead Branch	0	0	0	0	0	0	1
			TOTALS:				**0**	**0**	**0**	**0**	**0**	**0**	**45**

Powell County (inc. the Cities of Clay City and Stanton) Wildfire Previous Occurrences, Type, Location, Extent, Impacts, 2019-2020

Count	County	Date	Location	District	Area Type	Fire Size	Cause	Total Acres Burned	Suppression Costs	# Houses Saved	Saved House Value	# Houses Lost	Lost House Value	# Saved Structures	Saved Structure Value	# Lost Structure	Lost Structure Value	Injuries	Fatality
1	Powell	2/4/2019	Morris Creek	Morehead Branch	Other	0.25 to 9 Acres	Debris Burning	1	$ 79.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
2	Powell	3/16/2019	Hidden Valley Rd.	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Miscellaneous	3	$ 391.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
3	Powell	3/29/2019	Lloyd Lane	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Miscellaneous	1	$ 126.00	1	$200,000.00	0	$ -	0	$ -	0	$ -	0	0
4	Powell	4/3/2019	Lower Cane Creek	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Debris Burning	4	$ 383.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
5	Powell	4/10/2019	Natural Bridge Rd.	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Debris Burning	3	$ 307.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
6	Powell	9/22/2019	Slade-Campton Rd	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Debris Burning	1	$ 838.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
7	Powell	9/25/2019	Charlie Lane	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Incendiary	1	$ 126.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
8	Powell	3/9/2020	Skinner Branch	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Miscellaneous	3	$ 520.00	0	$ -	0	$ -	1	$1,500.00	0	$ -	0	0
9	Powell	4/4/2020	Childers Rd	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Debris Burning	3	$ 236.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
10	Powell	11/12/2020	Knowlton Ridge Rd.	Morehead Branch	Commercial Forest Land	0.25 to 9 Acres	Debris Burning	4	$ 162.00	0	$ -	0	$ -	0	$ -	0	$ -	0	0
			TOTALS:					**24**	**$ 3,168.00**	**1**	**$200,000.00**	**0**	**$ -**	**1**	**$1,500.00**	**0**	**$ -**	**0**	**0**

Powell County (inc. the Cities of Clay City and Stanton) Wildfire Previous Occurrences, Type, Location, Extent, Impacts, 2021[25].

Count	County	Date	Location	Latitude	Longitude	District	Residences Threatened	Residences Destroyed	Other Structures Threatened	Other Structures Destroyed	Injuries	Fatalities	Total Acres Burned
1	Powell County	3/8/2021	Tammy Lane	37.87281	-83.9879	Morehead Branch	0	0	0	0	0	0	1
2	Powell County	4/4/2021	Elk Track Trail	37.90287	-83.7965	Morehead Branch	0	0	1	0	0	0	5
3	Powell County	5/21/2021	Watson Road Fire	37.85932	-83.9498	Morehead Branch	0	0	0	0	0	0	1
4	Powell County	10/17/2021	5796 Main St	37.8676	-83.943	Morehead Branch	0	0	0	0	0	0	0.25
5	Powell County	11/16/2021	230 Upper Cane Creek Rd	37.8669	-83.7706	Morehead Branch	0	0	0	0	0	0	10
			TOTALS:				**0**	**0**	**1**	**0**	**0**	**0**	**17.25**

There have been 44 previous occurrences in Powell County (including its incorporated cities of Clay City and Stanton) recorded by the Kentucky Division of Forestry from 2013 until the end of 2021. Regarding "extent," there were, in total, 262.75 acres burned (primarily of commercial forest land) between 2013 and 2021.

[25] The Kentucky Division of Forestry is not able to release 2022 data until 2023.

Probability as a Function of Previous Occurrences

A cursory glance at the tables that have already been produced gives a clear picture of probability.

The number of discrete wildfire events for Powell County and the Cities of Clay City and Stanton since 2013 (i.e., over a nine-year period) have been broken down as such:

Number of Wildfire Events per Year, Powell County and the Cities of Clay City and Stanton, 2013-2021

Year	Number of Wildfire Events Recorded by KDF
2013	2 Events
2014	6 Events
2015	4 Events
2016	6 Events
2017	8 Events
2018	3 Events
2019	7 Events
2020	3 Events
2021	5 Events
TOTAL	***44 Events***

Because there have been 44 wildfire events recorded in Powell County (including its incorporated cities of Clay City and Stanton) by the Kentucky Division of Forestry between 2013 and 2021, it can be assumed that in the future, Powell County and the Cities of Clay City and Stanton will experience approximately 4.88 wildfire events each year (i.e., [1/(9/44)] = 4.8889). This conversationally translates to a 100% probability of a wildfire occurring in Powell County (and the Cities of Clay City and Stanton) during any given year.

Vulnerability

Firstly, according to the Kentucky Division of Forestry, there are 76,180 acres vulnerable to wildfire in Powell County and the Cities of Clay City and Stanton.

To address the vulnerability to wildfires for Powell County and for the Cities of Clay City and Stanton, the Bluegrass Area Development District multi-jurisdictional, multi-hazard mitigation plan will rely on the Kentucky Division of Forestry's "Kentucky Forest Action Plan 2020."[26]

As a matter of context or to anchor the vulnerability to wildfire specifically for Powell County and for the Cities of Clay City and Stanton consider that one of the most obvious proxies for said vulnerability would be to identify the locations of Kentucky's state parks. Arguably, in and around Kentucky state parks will be areas of vulnerability to the wildfire hazard with assets that create significant impacts if confronted with a wildfire.

Below is a graphic illustrating the location of Kentucky's state parks. Note that the tree icon represents the park, and the hiking person icon represents trail heads.

[26] The Kentucky Division of Forestry "Kentucky Forest Action Plan 2020" can be found here: https://eec.ky.gov/Natural-Resources/Forestry/Pages/Kentucky%27s-Forest-Action-Plan.aspx [Last accessed 3/2/2022]

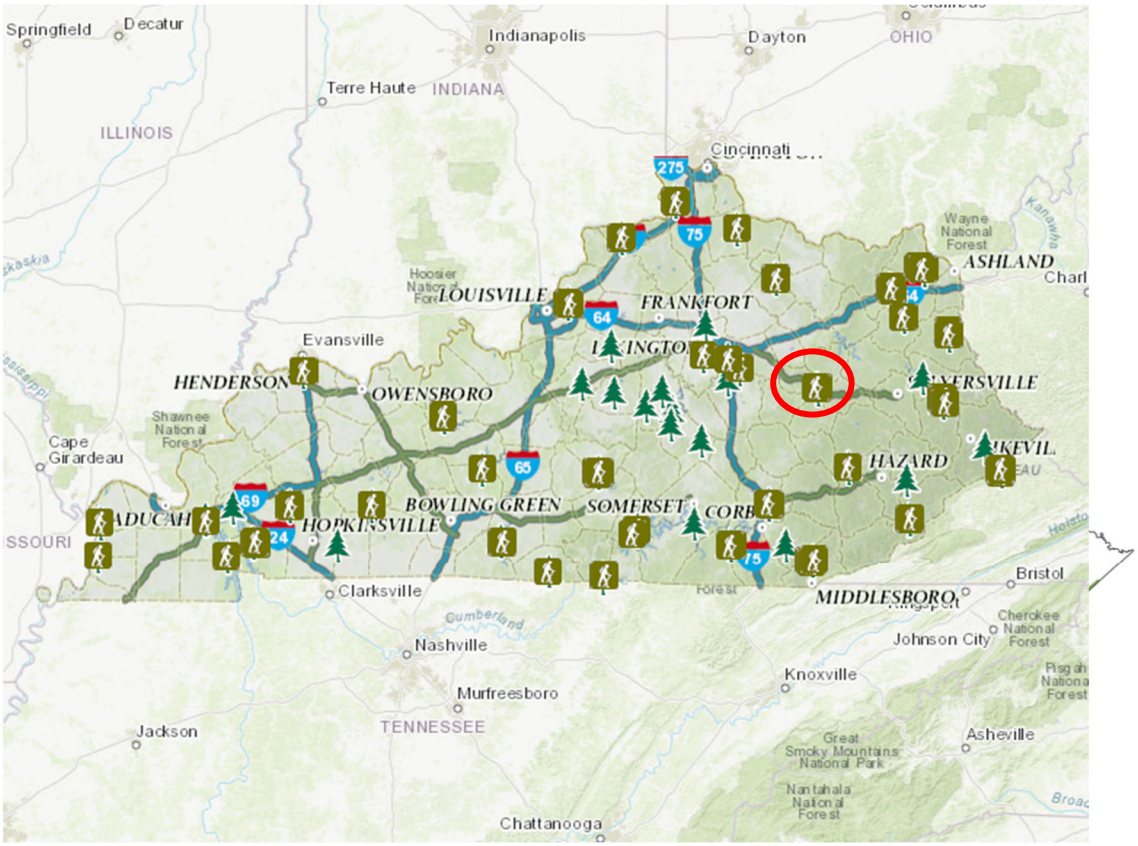


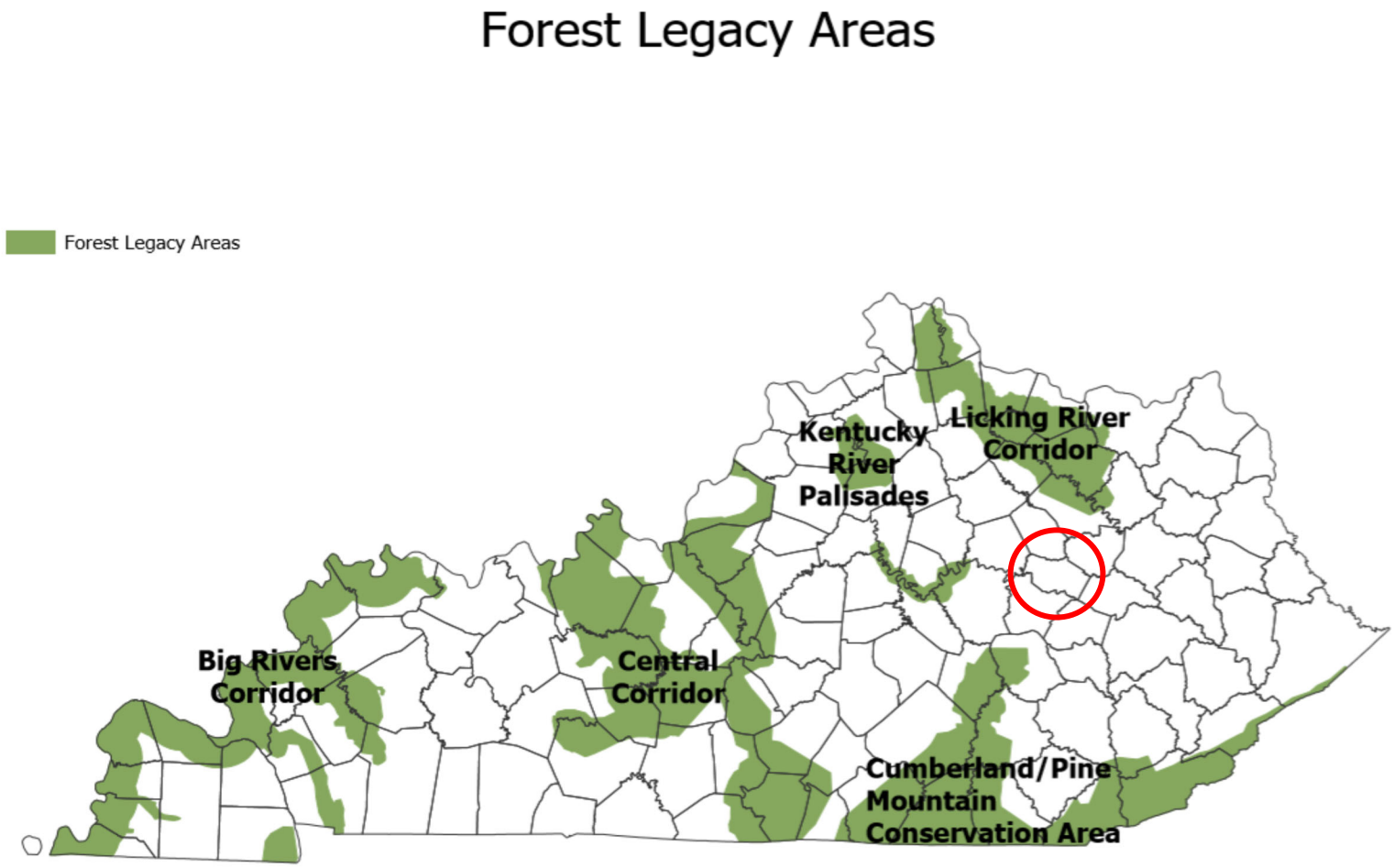
Figure 7: Illustration of Location of State Parks

Note that the Powell County (and the Cities of Clay City and Stanton) are within the immediate proximity of a Kentucky state park or trailhead.

Still, Powell County's and the Cities of Clay City's and Stanton's vulnerability to wildfire derives primarily from the danger to privately-owned "commercial forest land," i.e., rural farmland and assets.

Addressing the Cities of Clay City and Stanton specifically, the Kentucky Division of Forestry "Kentucky Forest Action Plan 2020" identified "Urban Forest Priority Areas".

Forest Legacy Areas (from the "Kentucky Forest Action Plan 2020")



Related to the Forest Legacy Area (FLA) designation is the requirement by Kentucky's Division of Forestry to identify priority areas for the distribution of forestry resources (that include mitigation needs). Hence, the development of the "Kentucky Forest Action Plan 2020." Specifically, "[t]he Cooperative Forestry Assistance Act (CFAA) provides the authorities for a broad range of state and private forestry programs. As amended by the 2008 Farm Bill, the CFAA requires each state forestry agency to develop a 'Statewide Assessment and Strategies for Forest Resources,' collectively referred to as State Forest Action Plan (SFAP), to be eligible to receive funds under the authorities of the Act… (p. 85)."

Thus, the "Kentucky Forest Action Plan 2020" identified a prioritization methodology ("based upon the framework developed by the Southern Forest Land Assessment"). Prioritization was based on 13 variables, ten (10) defining resource "richness" and three (3) representing threats to the forest resource.

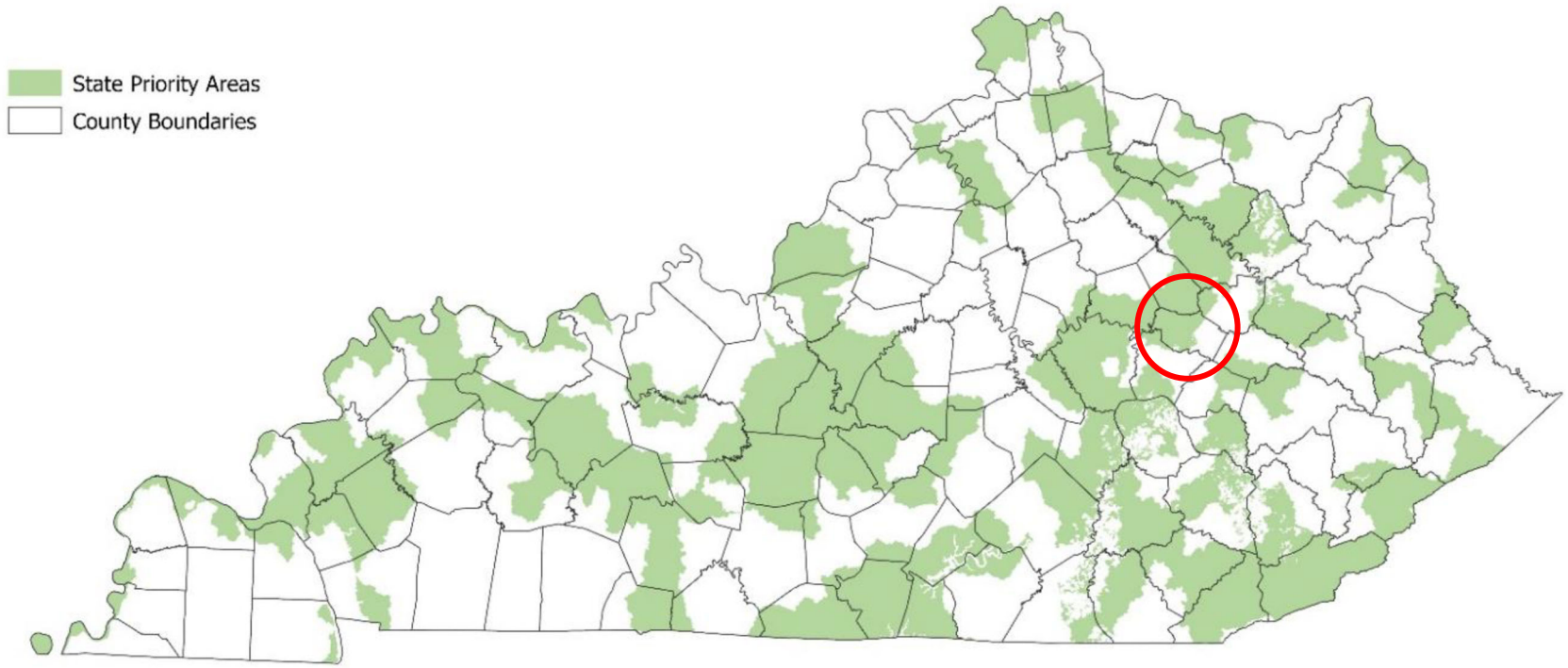
"Richness" was defined through "forestland," "riparian areas," "public drinking water," "priority watersheds," "forest patches," "site productivity," "forested wetlands," "threatened and endangered species," "proximity to public land," and "slope" variables from spatial datasets.

"Threat" (to the Forest Resource) was defined through "development level," "forest health," and, most relevantly here, "wildfire risk" variables, again, as captured via spatial datasets.

The 13 variables were then weighted using the "Analytic Hierarchy Process" (AHP) methodology.

From that methodology (and after designating watersheds as a separate automatic priority and removing federal lands from the spatial datasets), the following map of "Kentucky Forest Priority Areas" was produced:

Kentucky Forest Priority Area (from the "Kentucky Forest Action Plan 2020")



Finally, and addressing the Cities of Clay City and Stanton specifically, the Kentucky Division of Forestry "Kentucky Forest Action Plan 2020" identifies "Urban Forest Priority Areas":

"To address urban forestry issues, an analysis of population and canopy cover was conducted. This analysis resulted in the identification of three priority areas: Urban Priority Area, Developing Interface Priority Area, and Rural Interface Priority Area (p. 91)."

"Urban Priority Area," "Developing Interface Priority Area," and "Rural Interface Priority Area" are defined as follows:

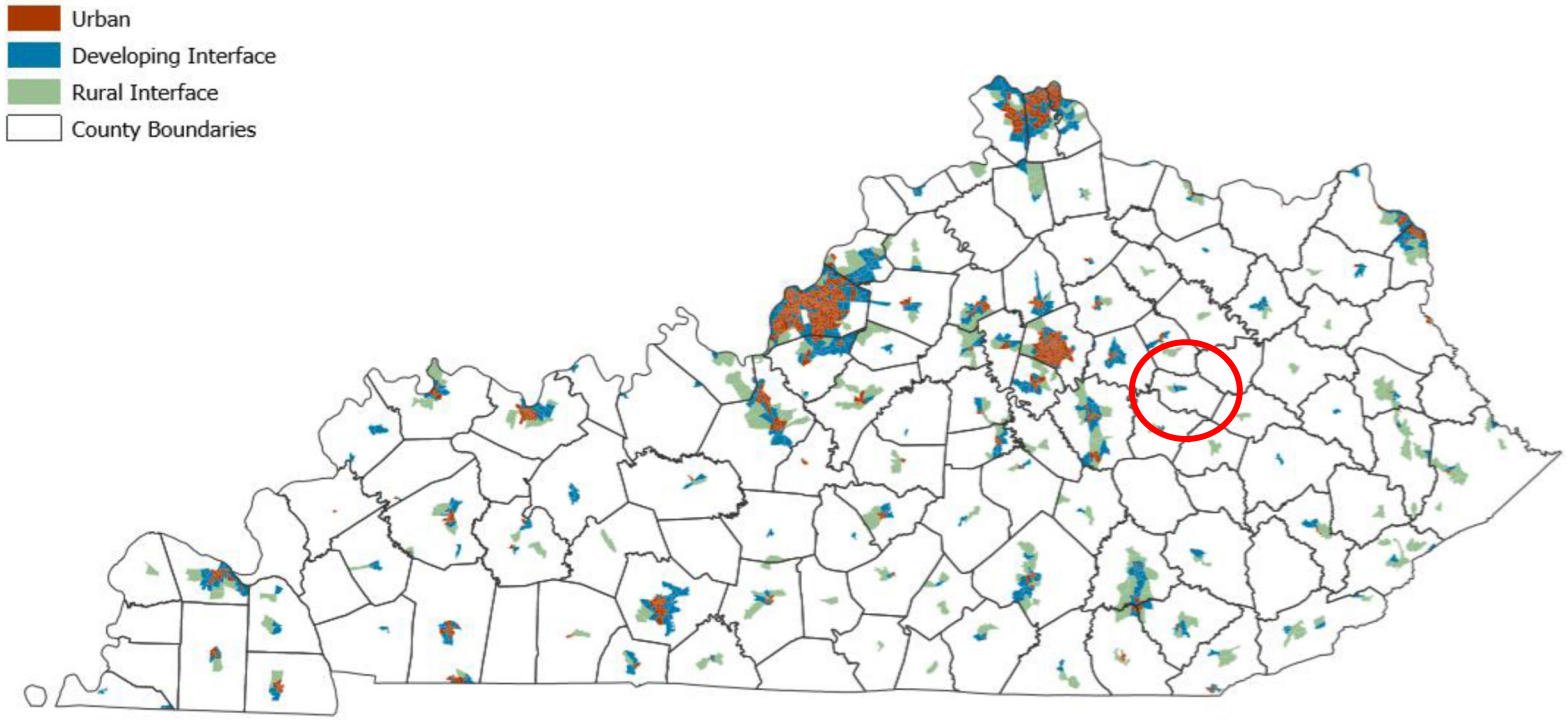
"The 'Urban Priority Area' is characterized by population greater than 1,000 residents per square mile. Average tree canopy is 18% in urban areas of Kentucky.

"The 'Developing Interface Priority Area' is characterized by population of 300 to 999 residents per square mile. These areas are typically located next to the Urban Priority Areas and are impacted by development pressures. Average tree canopy cover is 32% in these areas of Kentucky.

"The 'Rural Interface Priority Area' is characterized by population of 150 to 299 residents per square mile. These areas are typically located between the Developing Interface Priority Area and surrounding rural areas… (p. 91)."

Following is a map of the Urban Forestry Priority Areas of Kentucky and their three abovementioned distinctions color-coded. Powell County is noted.

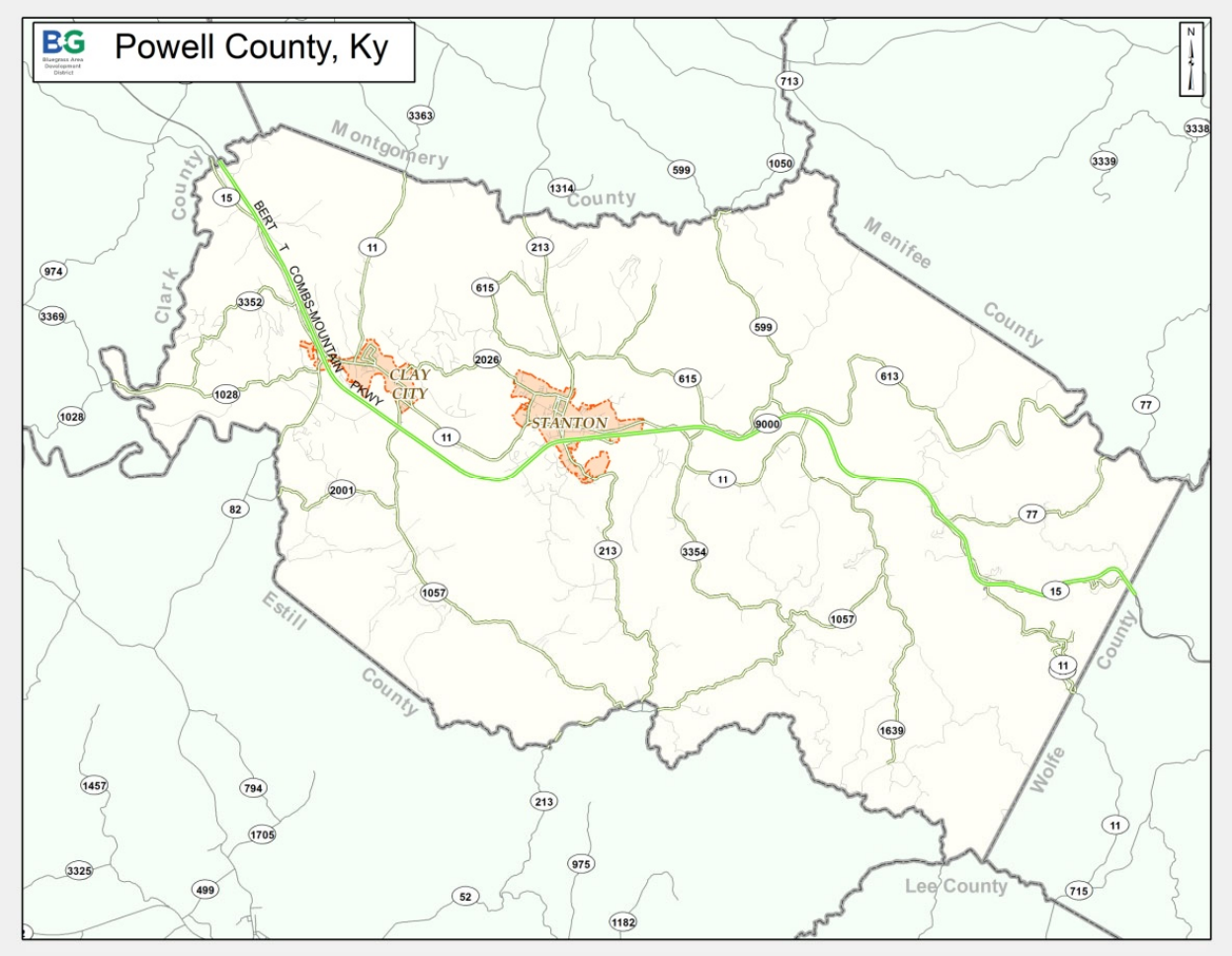
Urban Forestry Priority Areas



Note that the “Urban Priority Area” and the “Developing Interface Priority Area” within Powell County concentrates around the Cities of Clay City and Stanton.

CHAPTER 3

Geography



Development Data – Powell County

Population Data (Census, 2020)

Subject	Estimate	Percent (%)
Total Population	12,552	100
Male	6,205	49.4
Female	6,347	50.6
Median age (years)	39.1	-
Race	-	-
White	12,224	97.4
Black or African American	25	0.2
American Indian and Alaska Native	28	0.2
Asian	13	0.1
Native Hawaiian and Other Pacific Islander	0	0
Some other race	44	0.4

Powell Co. Population Change: 2014 – 2021 (ACS 2014, Census 2020)

Subject	2014	2021	Change (%)
Total Population	12,552	13,133	4.6
Male	6,205	6,580	6.0
Female	6,347	6,553	3.3
Median age (years)	39.1	39.3	0.5
Race	-	-	-
White	12,224	12,752	4.3
Black or African American	25	144	477.9
American Indian and Alaska Native	28	39	40.7
Asian	13	39	203.1
Native Hawaiian and Other Pacific Islander	0	0	-
Some other race	44	158	258.2

Housing Data (Census, 2020)

HOUSING OCCUPANCY	Estimate	Percent (%)
Total housing units	5,608	100
Occupied housing units	3,931	70.1
Vacant housing units	1,677	29.9

Jurisdictional Overviews (Census, 2020)

Powell County		13,133
	Clay City	1,200
	Stanton	3,154

Economy and Employment (Census, 2020)

EMPLOYMENT STATUS	Estimate	Percent (%)
In labor force	5,589	54.7
Civilian labor force	5,589	54.7
Employed	5,275	51.6
Unemployed	314	3.1
Armed Forces	0	0.0
Not in labor force	4,637	45.3
Median household income (dollars)	$41,071	-
Per capita income (dollars)	$21,484	-

Resources and Capabilities

A. State Primary Road System

- • KY 11 - from the Wolfe County Line via Natural Bridge State Park to the intersection with KY 15 at Slade, a distance of 3.598 miles. (MP 0.000 to MP 3.598)

- KY 9000 - from the Clark County Line via the Bert T. Combs Mountain Parkway to the Wolfe County Line, a distance of 24.087 miles. (MP 11.913 to MP 36.000)

B. State Secondary Road System

- KY 11 - from the intersection with KY 15 at Slade, via Nada, Rosslyn, Stanton, and Clay City to the Montgomery County Line, a distance of 21.441 miles. (MP 3.598 to MP 25.039)

- KY 15 - from the Wolfe County Line to a junction with KY 11 at Slade. Also, from a junction with KY 11 at Clay City via West Bend to the Clark County Line, a distance of 8.871 miles. (MP 0.000 to MP 3.493)(MP 3.493 to MP 8.871)

- KY 77 - from the junction with KY 11 at Nada to the Menifee County Line, a distance of 4.309 miles. (MP 0.000 to MP 4.309)

- KY 82 - from the Estill County Line to the junction with KY 15 in Powell Valley, a distance of 2.058 miles. (MP 0.000 to MP 2.058)

- KY 213 - from the Estill County Line, via Knowlton and Stanton to the Montgomery County Line, a distance of 12.076 miles. (MP 0.000 to MP 12.076)

- KY 1057 - from the junction with KY 11 in Clay City, via Eleventh Street in Clay City to the junction with KY 213 near the Estill County Line, a distance of 9.566. (MP 0.000 to 9.566)

Capabilities to Administer Mitigation Actions

Relevant to administering individual mitigation actions, Powell County houses the county's and the Cities of Clay City and Stanton's emergency manager (i.e., The Powell County Emergency Management Director). The Powell County Emergency Management office also combines homeland security functions.

In terms of relevant budgetary and financial capabilities, Powell County and the Cities of Clay City and Stanton maintain and provide funding for the Powell County Industrial Development Authority. The jurisdictions also have a planning and community development budget. This implies that the County and Cities have the political will and means to maintain and foster its potential mitigation investments.

In terms of its ability to expand on and improve the abovementioned existing policies and programs, the resources and staffing available to Powell County and the Cities of Clay City and Stanton are sufficiently adequate to address changes or additions to the mitigation and/or regulatory environment, to cost-share mitigation grants, and to expand and improve administration.

Critical Facilities and Infrastructure

See table on following page(s)

Critical Facilities and Infrastructure

NAME	ADDRESS	CITY	TYPE
POWELL COUNTY HIGH SCHOOL	700 WEST COLLEGE AVENUE	STANTON	SCHOOLS AND DAYCARES
POWELL COUNTY MIDDLE SCHOOL	770 WEST COLLEGE AVENUE	STANTON	SCHOOLS AND DAYCARES
CLAY CITY ELEMENTARY SCHOOL	4901 MAIN STREET	CLAY CITY	SCHOOLS AND DAYCARES
BOWEN ELEMENTARY SCHOOL	5099 CAMPTON ROAD	STANTON	SCHOOLS AND DAYCARES
STANTON ELEMENTARY SCHOOL	651 BRECKINRIDGE STREET	STANTON	SCHOOLS AND DAYCARES
POWELL COUNTY ALTERNATIVE SCHOOL	691 BRECKINRIDGE STREET	STANTON	SCHOOLS AND DAYCARES
POWELL COUNTY HEAD START	40 CR-1226A	CLAY CITY	SCHOOLS AND DAYCARES
POOH AND PALS LEARNING CENTER	1278 EAST COLLEGE AVENUE	STANTON	SCHOOLS AND DAYCARES
HAPPY HEARTS CHRISTIAN DAYCARE	3949 MAIN STREET	CLAY CITY	SCHOOLS AND DAYCARES
E'S BUSY BEE'S DAY CARE	24 ALLEN DRIVE	STANTON	SCHOOLS AND DAYCARES
TRAININGS TREASURES	100 W CHURCH STREET	STANTON	SCHOOLS AND DAYCARES
POWELL COUNTY EOC/911 DISPATCH	33 COMMERCE DRIVE	STANTON	PUBLIC SAFETY
POWELL COUNTY EMS	56 ADKINSON STREET	STANTON	PUBLIC SAFETY
STANTON FIRE DEPARTMENT	140 COURT STREET	STANTON	PUBLIC SAFETY
CLAY CITY FIRE & RESCUE	215 12TH ST	CLAY CITY	PUBLIC SAFETY
STANTON POLICE DEPARTMENT	98 COURT STREET	STANTON	PUBLIC SAFETY
CLAY CITY POLICE DEPARTMENT	4651 MAIN STREET	CLAY CITY	PUBLIC SAFETY
POWELL COUNTY SHERIFF'S DEPARTMENT	524 WASHINGTON STREET	STANTON	PUBLIC SAFETY
MIDDLEFORK FIRE DEPARTMENT	9219 CAMPTON ROAD	STANTON	PUBLIC SAFETY
CLAY CITY HALL	4651 MAIN STREET, CLAY CITY, KY	CLAY CITY	GOVERNMENT FACILITIES
STANTON CITY HALL	98 COURT STREET, STANTON, KY	STANTON	GOVERNMENT FACILITIES
POWELL COUNTY COURTHOUSE	525 WASHINGTON STREET, STANTON, KY	STANTON	GOVERNMENT FACILITIES
POWELL COUNTY EMERGENCY MANAGEMENT	33 COMMERCE DRIVE, STANTON, KY	STANTON	GOVERNMENT FACILITIES
POWELL COUNTY AMBULANCE SERVICE	56 ATKINSON STREET	STANTON	MEDICAL FACILITIES
STANTON NURSONG CENTER	31 DERICKSON LANE	STANTON	MEDICAL FACILITIES
KENTUCKY RIVER FOOTHILLS ADULT DAYCARE	176 12TH STREET	CLAY CITY	MEDICAL FACILITIES
POWELL COUNTY SENIOR CITIZENS CENTER	624 FURNACE ROAD	STANTON	MEDICAL FACILITIES
POWELL COUNTY HEALTH DEPARTMENT	376 N MAIN STREET	STANTON	MEDICAL FACILITIES
STANTON-POWELL COUNTY AIRPORT AUTHORITY	310 AIRPORT ROAD, STANTON, KY	STANTON	TRANSPORTATION

NAME	ADDRESS	CITY	TYPE
POWELL COUNTY ROAD DEPARTMENT	503 STEAM SHOVEL ROAD, STANTON, KY	STANTON	TRANSPORTATION
STATE HIGHWAY GARAGE	966 E PENDLETON STREET, STANTON, KY	STANTON	TRANSPORTATION
STANTON PUBLIC WORKS	98 COURT STREET, STANTON, KY	STANTON	TRANSPORTATION
CLAY CITY PUBLIC WORKS	4651 MAIN STREET, CLAY CITY, KY	CLAY CITY	TRANSPORTATION
HEARNE MOBILE HOME PARK	455 MAPLE STREET	STANTON	HOUSING
HEARNE MOBILE HOME PARK	565 MAPLE STREET	STANTON	HOUSING
VAN VILLAGE	DEERVIEW	STANTON	HOUSING
VAN VILLAGE	HILL CREST	STANTON	HOUSING
VAN VILLAGE	BUENA VISTA	STANTON	HOUSING
POTTS TRAILER PARK	526 11TH STREET	CLAY CITY	HOUSING
J&J TRAILER PARK	9750 WINCHESTER ROAD	CLAY CITY	HOUSING
PINE CREEK APARTMENTS	125 PINECREEK DRIVE	STANTON	HOUSING
STANTON FIRE DEPARTMENT	140 COURT STREET	STANTON	EMERGENCY SHELTERS
SANTON ELEMENTARY SCHOOL	651 BRECKINRIDGE STREET	STANTON	EMERGENCY SHELTERS
POWELL COUNT HIGH SCHOOL	700 W COLLEGE AVENUE	STANTON	EMERGENCY SHELTERS
POWELL COUNTY MIDDLE SCHOOL	770 W COLLEGE AVENUE	STANTON	EMERGENCY SHELTERS
POWELL COUNTY EMERGENCY OPERATIONS CENTER	33 COMMERCE DRIVE	STANTON	EMERGENCY SHELTERS
STANTON FIRST CHURCH OF GOD	980 E COLLEGE AVE	STANTON	EMERGENCY SHELTERS
BOWEN FIRST CHURCH OF GOD	5555 CAMPTON RD	STANTON	EMERGENCY SHELTERS
CITY OF STANTON	98 COURT STREET	STANTON	UTILITY HOME OFFICES
CITY OF CLAY CITY	4651 MAIN STREET	CLAY CITY	UTILITY HOME OFFICES
POWELL'S VALLEY WATER DISTRICT	31 ADAMS RIDGE ROAD	STANTON	UTILITY HOME OFFICES
CLARK ENERGY	170 HALLS LANE	STANTON	UTILITY HOME OFFICES

Goals and Prioritization and Changes to Goals and Prioritization

Below are listed goals guiding mitigation activities for Powell County and for the Cities of Clay City and Stanton. The cities and Powell County, unincorporated, share most of the administrative tasks relevant to implementing mitigation actions. Thus, the goals below reflect both the goals of Powell County unincorporated, and the goals of the Cities of Clay City and Stanton.

The goals for Powell County, unincorporated and the Cities of Clay City and Stanton did not change from their articulation in the previous iteration of the Bluegrass Area Development District multi-jurisdictional, multi-hazard mitigation plan.

Flooding

- Reduce the amount of property damage due to flooding in the Cities of Clay City and Stanton as well as throughout unincorporated Powell County.
- Reduce the amount of flood related fatalities and injuries due to flooding.
- Minimize the financial costs due to damage caused by flooding.

Severe Storms and Tornadoes

- Reduce the number of deaths and injuries in a tornado or other significant severe storm event.
- Ensure that emergency responders have the resources at their disposal to properly respond and assist the public in the event of a tornado or severe thunderstorm.
- Reduce the amount of property damage and the impact upon critical infrastructure such as roads, electricity, water supply, telecommunications, and sewer service in the event of a tornado or other destructive weather event.

Winter Storms

- Reduce the number of injuries and deaths in the event of a severe winter storm event.
- Ensure that electrical utility companies are capable of maintaining service in the event of a severe winter storm.
- Educate the general public about the dangers of severe winter storms.
- Reduce the future fiscal costs upon units of government as well as reduce the amount of property damage in the event Powell County experiences a severe winter storm.

Earthquakes

- Reduce the number of injuries and deaths in the event Powell County experiences an earthquake.
- Educate the general public about earthquakes.
- Reduce the future fiscal costs upon units of government as well as reduce the amount of property damage in the event Powell County experiences an earthquake.

Landslides

- Protect life and property within the County and Cities in the event of a landslide.

Karst

- Protect life and property within the County and the Cities in the event of the formation of a sinkhole.

Wildfires

- Ensure that the city and county fire departments have the necessary personnel, training, and equipment to respond to wildfires or forest fires throughout the county.
- Continue to educate the public about the dangers of forest fires and the proper maintenance of forested lands where residential structures are constructed.

Project Prioritization

In 2017, projects were prioritized on the cost of the project, feasibility of the project, and overall vulnerability. The plan also focused on the project's relationship to the community's priorities. Prioritization methodology has not significantly changed in 2022. Projects are prioritized by hazard and then by their assumed cost-benefit logic. Projects will be ranked as having a HIGH, MEDIUM, or LOW priority. Projects that have a high priority are those projects that address hazards from which there is a HIGH vulnerability and are feasible from a cost and capability standpoint. Projects that ranked as MEDIUM address hazards with a HIGH vulnerability but are not currently feasible from a cost and capability standpoint or address hazards with a MODERATE vulnerability but are feasible from a cost and capability standpoint. Projects ranked as LOW are those projects that address hazards with a LOW vulnerability.

Mitigation Actions for Powell County

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Seek funding to improve and implement	Habitually Pursued	Not Applicable: No New Action	Flooding	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping, Utilities	1-5 Years	County Budget	**High**
Monitor conditions in order to ensure that culverts throughout the county are free of debris or other restrictions to flow	Seek funding to improve: Brush Creek, Judy Creek, and Highway 11/15	Habitually Pursued	Not Applicable: No New Action	Flooding	County, State Road Department	Perpetual	County Budget	**High**
Establish a vegetative management program in non-vegetative areas along waterways	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Division of Water, County, Residents	1-5 Years	County Budget	**High**
Educate county residents to seek higher ground in the case of flash flooding	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	EMA, Fire, Police, Local Media	Perpetual	County Budget	**High**
Seek funding to acquire homes in identified flood-prone areas in the county	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	FEMA, County, KYEM, Local EMA, Floodplain Administrator	1-5 Years	County Budget	**High**
Identify the county's most at-risk critical facilities and evaluate the potential mitigation techniques for protecting each facility to the maximum extent feasible	Middlefork Fire Department, and Clay City, City Hall	Habitually Pursued	Not Applicable: No New Action	Flooding	County, Floodplain Administrator, EMA	1-5 Years	County Budget	**High**
Storm Water and storm drain survey to determine future needs and upgrades. Then upgrade storm drainage system	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Public Health, EMA, Division of Water, Public works, County	1-5 Years	County Budget	**High**

[27] Hazard Vulnerability: Earthquakes (Low), Flooding (High), Karst (Low), Landslides (High), Severe Storms and Tornadoes (High), Severe Winter Storms (High), Wildfires (High)

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Educate the public about the flood-prone areas in the County informing them of the regulations in place related to flooding and the importance of not constructing homes and other facilities in the floodplain	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Flood Administrator, County	1-5 Years	County Budget	**High**
Placement of alert radios in schools, nursing homes, hospitals	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	School District, Nursing Homes, EMA, Clinic	1-5 Years	County Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	County Budget	**High**
Continue information campaign to inform the public about what to do in the event of a tornado	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	National Weather Service, EMA, County, Schools	Perpetual	County Budget	**High**
Evaluate the number of designated recovery shelters throughout the county in order to serve the public in the aftermath of a tornado or severe storm	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	County, EMA, Local Public Health, State Public Health, Churches, EMS	1-5 Years	County Budget	**High**
Evaluate the comprehensive storm siren plan for the County and ensure all are in proper working order. Seek funds for the installation of new storm sirens in the County	Seek funding for installation and acquisition in areas not currently served	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	KOHS, FEMA, Emergency Management, County	1-5 Years	County Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Continue the progress of early warning notification systems, such as Code Red and other telecommunication systems, in order to give residents an even earlier warning of approaching dangerous storms	Continue to fund and implement Code Red	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	County, EMA, 911 Center, Code Red	Perpetual	County Budget	**High**
Acquire funding to construct Safe Rooms in the community	N/A	N/A	Seek funding to construct Safe Rooms	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**
Acquire funding to purchase emergency generators	N/A	N/A	Seek funding to purchase emergency generators	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	County Budget	**High**
Continue and/or develop a public information campaign in the County, informing them of the dangers and risks associated with severe winter storms	PSAs, and Fire Prevention, Alternative Heating Sources	Habitually Pursued	Not Applicable: No New Action	Winter Storms	County, EMA, Fire	Perpetual	County Budget	**High**
Refine plans to assist special needs populations during winter storm events	Continue to pre-qualify special needs shelters	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Churches, County, Bluegrass ADD, Emergency Management, Fire, Police, Hospice, Medco, EMS, Heath Department, Aide Agencies	Perpetual	County Budget	**High**
Seek funding to equip emergency response personnel to render aid during severe winter storms	Mini pumpers, and Chainsaw	Habitually Pursued	Not Applicable: No New Action	Winter Storms	County, Multiple Funding Sources, Bluegrass ADD, EMA	1-5 Years	County Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Acquire equipment to be used for road clearing and maintenance during winter storms to mitigate number of accidents and injuries in roadways	Salt, Multiple Trucks, GPS equipment tracking on salt trucks and general efficiency	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, Emergency Management, County, Road Crew	1-5 Years	County Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	County Budget	**High**
Continue/Develop a public information campaign to educate the public about earthquakes in the county, informing them of the dangers and risks associated with earthquakes	Utilize School District	Habitually Pursued	Not Applicable: No New Action	Earthquakes	School District, EMA, County	Perpetual	County Budget	**High**
Identify critical infrastructure that would be vulnerable in the event of an earthquake	Identify and locate all existing utilities, and reservoir/free-standing towers	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Engineering Services, State Building Inspector, County	1-5 Years	County Budget	**High**
Continue inspection of safety standards in all schools and other public buildings	N/A	Habitually Pursued	Not Applicable: No New Action	Earthquakes	State Fire Marshal, County, School District, Public Health, Plumbing	Perpetual	County Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	County Budget	**Low**
Educate the public about the dangers of sinkholes and the problems associated with constructing homes and businesses on unstable land and sinkhole-prone areas	Use GIS Data to educate the public, and look at developing County zoning and land use ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Extension Office, Property Owners, Bluegrass ADD, County, EMA	1-5 Years	County Budget	**Low**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Continue the cooperative effort between the Bluegrass ADD GIS Department, Kentucky Geological Society, and the County in order to adequately map all the sinkhole-prone areas in the County	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, County, Kentucky Geological Society	Perpetual	County Budget	**Low**
Establish a sinkhole ordinance in the County to restrict construction in sinkhole-prone areas	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, County, Kentucky Geological Society	1-5 Years	County Budget	**Low**
Educate the public through an information campaign about the dangers of unstable land and constructing homes and businesses on landslide-prone areas	Look at developing County Zoning and Land Use Ordinance	Habitually Pursued	Not Applicable: No New Action	Landslides	County, Extension Office, Property Owners	1-5 Years	County Budget	**High**
Ensure areas susceptible to landslides/rock slides in the County are properly maintained in order to prevent loss of life and property in the event of landslides	Hardwicks Creek, Cat Creek, and South Fork	Habitually Pursued	Not Applicable: No New Action	Landslides	County, Department of Transportation, Road Crews	Perpetual	County Budget	**High**
Seek funding and develop strategies to address landslides that affect roads within the county	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, County, EDA, KYTC	1-5 Years	County Budget	**High**
Seek funding to repair, replace or relocate structures affected by landslides	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, County, EDA	1-5 Years	County Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[27]
Make an effort to ensure that more rural parts of the county have adequate water supplies in order to fight grass and other wildfires	Dry hydrants	Habitually Pursued	Not Applicable: No New Action	Wildfires	Division of Water, Local Water Utility, County Fire Departments	Perpetual	County Budget	**High**
Continue the education about controlled burns and encourage county residents to notify officials in the event of controlled burns	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	County, Fire, EPA, EMA, Division of Forestry	Perpetual	County Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, EMA, County, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	County Budget	**High**
Establish better lines of communication between and among state officials with respect to wildfires. Encourage more cooperation from the state as well as a quicker and more adequate response in the event of a wildfire in the county	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, County, Fire, Division of Forestry, US Forest Service	1-5 Years	County Budget	**High**

Mitigation Actions for Clay City

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Seek funding to improve and implement	Habitually Pursued	Not Applicable: No New Action	Flooding	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping, Utilities	1-5 Years	City Budget	**High**
Monitor conditions in order to ensure that culverts throughout the city are free of debris or other restrictions to flow	Seek funding to improve: Brush Creek, Judy Creek, and Highway 11/15	Habitually Pursued	Not Applicable: No New Action	Flooding	City, State Road Department	Perpetual	City Budget	**High**
Establish a vegetative management program in non-vegetative areas along waterways	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Division of Water, City, Residents	1-5 Years	City Budget	**High**
Educate city residents to seek higher ground in the case of flash flooding	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	EMA, Fire, Police, Local Media	1-5 Years	City Budget	**High**
Seek funding to acquire homes in identified flood-prone areas in the city	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	FEMA, City, KYEM, Local EMA, Floodplain Administrator	1-5 Years	City Budget	**High**
Identify the city's most at-risk critical facilities and evaluate the potential mitigation techniques for protecting each facility to the maximum extent feasible	Middlefork Fire Department, and Clay City, City Hall	Habitually Pursued	Not Applicable: No New Action	Flooding	City, Floodplain Administrator, EMA	Perpetual	City Budget	**High**
Storm Water and storm drain survey to determine future needs and upgrades. Then upgrade storm drainage system	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Public Health, EMA, Division of Water, Public works, City	Perpetual	City Budget	**High**

[28] Hazard Vulnerability: Earthquakes (Low), Flooding (High), Karst (Low), Landslides (High), Severe Storms and Tornadoes (High), Severe Winter Storms (High), Wildfires (High)

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Educate the public about the flood-prone areas in the City informing them of the regulations in place related to flooding and the importance of not constructing homes and other facilities in the floodplain	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Flood Administrator, City	1-5 Years	City Budget	**High**
Placement of alert radios in schools, nursing homes, hospitals	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	School District, Nursing Homes, EMA, Clinic	1-5 Years	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Continue information campaign to inform the public about what to do in the event of a tornado	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	National Weather Service, EMA, City, Schools	Perpetual	City Budget	**High**
Evaluate the number of designated recovery shelters throughout the city in order to serve the public in the aftermath of a tornado or severe storm	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	City, EMA, Local Public Health, State Public Health, Churches, EMS	1-5 Years	City Budget	**High**
Evaluate the comprehensive storm siren plan for the City and ensure all are in proper working order. Seek funds for the installation of new storm sirens in the City	Seek funding for installation and acquisition in areas not currently served	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	KOHS, FEMA, Emergency Management, City	1-5 Years	City Budget	**High**
Continue the progress of early warning notification systems, such as Code Red and other telecommunication systems, in order to give residents an even earlier warning of approaching dangerous storms	Continue to fund and implement Code Red	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	City, EMA, 911 Center, Code Red	Perpetual	City Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Acquire funding to construct Safe Rooms in the community	N/A	N/A	Seek funding to construct Safe Rooms	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**
Acquire funding to purchase emergency generators	N/A	N/A	Seek funding to purchase emergency generators	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Continue and/or develop a public information campaign in the City, informing them of the dangers and risks associated with severe winter storms	PSAs, and Fire Prevention, Alternative Heating Sources	Habitually Pursued	Not Applicable: No New Action	Winter Storms	City, EMA, Fire	Perpetual	City Budget	**High**
Refine plans to assist special needs populations during winter storm events	Continue to pre-qualify special needs shelters	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Churches, City, Bluegrass ADD, Emergency Management, Fire, Police, Hospice, MebCo, EMS, Heath Department, Aide Agencies	1-5 Years	City Budget	**High**
Seek funding to equip emergency response personnel to render aid during severe winter storms	Mini pumpers, and Chainsaw	Habitually Pursued	Not Applicable: No New Action	Winter Storms	City, Multiple Funding Sources, Bluegrass ADD, EMA	1-5 Years	City Budget	**High**
Acquire equipment to be used for road clearing and maintenance during winter storms to mitigate number of accidents and injuries in roadways	Salt, Multiple Trucks, GPS equipment tracking on salt trucks and general efficiency	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, Emergency Management, City, Road Crew	1-5 Years	City Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Continue/Develop a public information campaign to educate the public about earthquakes in the city, informing them of the dangers and risks associated with earthquakes	Utilize School District	Habitually Pursued	Not Applicable: No New Action	Earthquakes	School District, EMA, City	Perpetual	City Budget	**High**
Identify critical infrastructure that would be vulnerable in the event of an earthquake	Identify and locate all existing utilities, and reservoir/free-standing towers	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Engineering Services, State Building Inspector, City	1-5 Years	City Budget	**High**
Continue inspection of safety standards in all schools and other public buildings	N/A	Habitually Pursued	Not Applicable: No New Action	Earthquakes	State Fire Marshal, City, School District, Public Health, Plumbing	Perpetual	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**Low**
Educate the public about the dangers of sinkholes and the problems associated with constructing homes and businesses on unstable land and sinkhole-prone areas	Use GIS Data to educate the public, and look at developing County zoning and land use ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Extension Office, Property Owners, Bluegrass ADD, City, EMA	Perpetual	City Budget	**Low**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Continue the cooperative effort between the Bluegrass ADD GIS Department, Kentucky Geological Society, and the City in order to adequately map all the sinkhole-prone areas in the City	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, City, Kentucky Geological Society	Perpetual	City Budget	**Low**
Establish a sinkhole ordinance in the City to restrict construction in sinkhole-prone areas	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, City, Kentucky Geological Society	1-5 Years	City Budget	**Low**
Educate the public through an information campaign about the dangers of unstable land and constructing homes and businesses on landslide-prone areas	Look at developing County Zoning and Land Use Ordinance	Habitually Pursued	Not Applicable: No New Action	Landslides	City, Extension Office, Property Owners	Perpetual	City Budget	**High**
Ensure areas susceptible to landslides/rock slides in the City are properly maintained in order to prevent loss of life and property in the event of landslides	Hardwicks Creek, Cat Creek, and South Fork	Habitually Pursued	Not Applicable: No New Action	Landslides	City, Department of Transportation, Road Crews	1-5 Years	City Budget	**High**
Seek funding and develop strategies to address landslides that affect roads within the city	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, City, EDA, KYTC	1-5 Years	City Budget	**High**
Seek funding to repair, replace or relocate structures affected by landslides	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, City, EDA	1-5 Years	City Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[28]
Continue the education about controlled burns and encourage city residents to notify officials in the event of controlled burns	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	City, Fire, EPA, EMA, Division of Forestry	Perpetual	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Establish better lines of communication between and among state officials with respect to wildfires. Encourage more cooperation from the state as well as a quicker and more adequate response in the event of a wildfire in the city	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, City, Fire, Division of Forestry, US Forest Service	1-5 Years	City Budget	**High**

Mitigation Actions for the City of Stanton

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Seek funding to improve and implement	Habitually Pursued	Not Applicable: No New Action	Flooding	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping, Utilities	1-5 Years	City Budget	**High**
Monitor conditions in order to ensure that culverts throughout the city are free of debris or other restrictions to flow	Seek funding to improve: Brush Creek, Judy Creek, and Highway 11/15	Habitually Pursued	Not Applicable: No New Action	Flooding	City, State Road Department	1-5 Years	City Budget	**High**
Establish a vegetative management program in non-vegetative areas along waterways	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Division of Water, City, Residents	1-5 Years	City Budget	**High**
Educate city residents to seek higher ground in the case of flash flooding	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	EMA, Fire, Police, Local Media	1-5 Years	City Budget	**High**
Seek funding to acquire homes in identified flood-prone areas in the city	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	FEMA, City, KYEM, Local EMA, Floodplain Administrator	1-5 Years	City Budget	**High**
Storm Water and storm drain survey to determine future needs and upgrades. Then upgrade storm drainage system	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Public Health, EMA, Division of Water, Public works, City	Perpetual	City Budget	**High**
Educate the public about the flood-prone areas in the City informing them of the regulations in place related to flooding and the importance of not constructing homes and other facilities in the floodplain	N/A	Habitually Pursued	Not Applicable: No New Action	Flooding	Flood Administrator, City	Perpetual	City Budget	**High**

[29] Hazard Vulnerability: Earthquakes (Low), Flooding (High), Karst (Low), Landslides (High), Severe Storms and Tornadoes (High), Severe Winter Storms (High), Wildfires (High)

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Placement of alert radios in schools, nursing homes, hospitals	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	School District, Nursing Homes, EMA, Clinic	1-5 Years	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Continue information campaign to inform the public about what to do in the event of a tornado	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	National Weather Service, EMA, City, Schools	Perpetual	City Budget	**High**
Evaluate the number of designated recovery shelters throughout the city in order to serve the public in the aftermath of a tornado or severe storm	N/A	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	City, EMA, Local Public Health, State Public Health, Churches, EMS	1-5 Years	City Budget	**High**
Evaluate the comprehensive storm siren plan for the City and ensure all are in proper working order. Seek funds for the installation of new storm sirens in the City	Seek funding for installation and acquisition in areas not currently served	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	KOHS, FEMA, Emergency Management, City	1-5 Years	City Budget	**High**
Continue the progress of early warning notification systems, such as Code Red and other telecommunication systems, in order to give residents an even earlier warning of approaching dangerous storms	Continue to fund and implement Code Red	Habitually Pursued	Not Applicable: No New Action	Severe Storms and Tornadoes	City, EMA, 911 Center, Code Red	Perpetual	City Budget	**High**
Acquire funding to construct Safe Rooms in the community	N/A	N/A	Seek funding to construct Safe Rooms	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**
Acquire funding to purchase emergency generators	N/A	N/A	Seek funding to purchase emergency generators	Severe Storms and Tornadoes	BGADD, City, Emergency Management, HMGP	1-5 Years	HMGP	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Continue and/or develop a public information campaign in the City, informing them of the dangers and risks associated with severe winter storms	PSAs, and Fire Prevention, Alternative Heating Sources	Habitually Pursued	Not Applicable: No New Action	Winter Storms	City, EMA, Fire	Perpetual	City Budget	**High**
Refine plans to assist special needs populations during winter storm events	Continue to pre-qualify special needs shelters	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Churches, City, Bluegrass ADD, Emergency Management, Fire, Police, Hospice, MebCo, EMS, Heath Department, Aide Agencies	1-5 Years	City Budget	**High**
Seek funding to equip emergency response personnel to render aid during severe winter storms	Mini pumpers, and Chainsaw	Habitually Pursued	Not Applicable: No New Action	Winter Storms	City, Multiple Funding Sources, Bluegrass ADD, EMA	1-5 Years	City Budget	**High**
Acquire equipment to be used for road clearing and maintenance during winter storms to mitigate number of accidents and injuries in roadways	Salt, Multiple Trucks, GPS equipment tracking on salt trucks and general efficiency	Habitually Pursued	Not Applicable: No New Action	Winter Storms	Bluegrass ADD, Emergency Management, City, Road Crew	1-5 Years	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Continue/Develop a public information campaign to educate the public about earthquakes in the city, informing them of the dangers and risks associated with earthquakes	Utilize School District	Habitually Pursued	Not Applicable: No New Action	Earthquakes	School District, EMA, City	Perpetual	City Budget	**High**
Identify critical infrastructure that would be vulnerable in the event of an earthquake	Identify and locate all existing utilities, and reservoir/free-standing towers	Habitually Pursued	Not Applicable: No New Action	Earthquakes	Engineering Services, State Building Inspector, City	1-5 Years	City Budget	**High**
Continue inspection of safety standards in all schools and other public buildings	N/A	Habitually Pursued	Not Applicable: No New Action	Earthquakes	State Fire Marshal, City, School District, Public Health, Plumbing	Perpetual	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**Low**
Educate the public about the dangers of sinkholes and the problems associated with constructing homes and businesses on unstable land and sinkhole-prone areas	Use GIS Data to educate the public, and look at developing County zoning and land use ordinance	Habitually Pursued	Not Applicable: No New Action	Karst	Extension Office, Property Owners, Bluegrass ADD, City, EMA	1-5 Years	City Budget	**Low**
Continue the cooperative effort between the Bluegrass ADD GIS Department, Kentucky Geological Society, and the City in order to adequately map all the sinkhole-prone areas in the City	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, City, Kentucky Geological Society	Perpetual	City Budget	**Low**
Establish a sinkhole ordinance in the City to restrict construction in sinkhole-prone areas	N/A	Habitually Pursued	Not Applicable: No New Action	Karst	Bluegrass ADD, City, Kentucky Geological Society	1-5 Years	City Budget	**Low**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Educate the public through an information campaign about the dangers of unstable land and constructing homes and businesses on landslide-prone areas	Look at developing County Zoning and Land Use Ordinance	Habitually Pursued	Not Applicable: No New Action	Landslides	City, Extension Office, Property Owners	1-5 Years	City Budget	**High**
Ensure areas susceptible to landslides/rock slides in the City are properly maintained in order to prevent loss of life and property in the event of landslides	Hardwicks Creek, Cat Creek, and South Fork	Habitually Pursued	Not Applicable: No New Action	Landslides	City, Department of Transportation, Road Crews	1-5 Years	City Budget	**High**
Seek funding and develop strategies to address landslides that affect roads within the city	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, City, EDA, KYTC	1-5 Years	City Budget	**High**
Seek funding to repair, replace or relocate structures affected by landslides	N/A	Habitually Pursued	Not Applicable: No New Action	Landslides	Bluegrass ADD, City, EDA	1-5 Years	City Budget	**High**

Action	Project Examples Cited from 2017	Status of 2017 Actions/Projects	Non-Exhaustive Examples of New Project Meeting Actions	Hazards Addressed	Partners for Implementation	Timeline	Funding Source	Priority[29]
Continue the education about controlled burns and encourage city residents to notify officials in the event of controlled burns	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	City, Fire, EPA, EMA, Division of Forestry	Perpetual	City Budget	**High**
Implement and improve a house identification system to expedite the arrival of emergency personnel in times of hazard	Cost feasibility to create and enforce address ordinance	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, EMA, City, Fire, Police, Sheriff, EMS, Mapping	1-5 Years	City Budget	**High**
Establish better lines of communication between and among state officials with respect to wildfires. Encourage more cooperation from the state as well as a quicker and more adequate response in the event of a wildfire in the city	N/A	Habitually Pursued	Not Applicable: No New Action	Wildfires	Bluegrass ADD, City, Fire, Division of Forestry, US Forest Service	1-5 Years	City Budget	**High**

Hazard Mitigation Plan Integration into Other Planning Mechanisms

Powell County and the Cities of Clay City and Stanton are responsible for a comprehensive plan that both jurisdictions contribute to maintaining. Bluegrass Area Development District, Powell County and the Cities of Clay City and Stanton will ensure that the mitigation actions and relevant risk assessment data is integrated into the comprehensive plan, where applicable.

The Bluegrass Area Development District is, by Kentucky Revised Statute and, subsequently, by Kentucky Administrative Regulation, responsible for regional planning and economic development activities for the counties and cities that it serves. In any plan or planning mechanism over which the Bluegrass Area Development District has control (e.g., the Comprehensive Economic Development Strategy, or CEDS), its staff will ensure that the hazard mitigation plan's actions are integrated into such plans and that actions do not conflict (e.g., that transportation plan actions do not conflict with hazard mitigation plan actions).

The Bluegrass Area Development District also ensures centrally that the hazard mitigation plan components are integrated into county or city plans or into regional plans and planning mechanisms by virtue of the ADD's role in external grant funding administration and application development: A quotidian role for Bluegrass ADD staff is to provide technical assistance and aid in application development for externally funded projects undertaken by the counties and cities it serves. Performing this function means that if there is plan or planning mechanism requirement, expectation, regulation, or consideration required in order to access the external funds, the Bluegrass ADD must coordinate with said requirements, expectations, regulations, and/or considerations. If applicable, Bluegrass ADD staff will have to integrate hazard mitigation plan components into other plans and planning mechanisms in order to coordinate the external funding necessary to achieve a mitigation goal for the community it is serving.

CHAPTER 4: PLAN MAINTENANCE AND ENSURING PUBLIC PARTICIPATION IN PLAN MAINTENANCE

For the 2017 multi-jurisdictional, multi-hazard mitigation plan, the Bluegrass ADD evaluated its plan maintenance procedures from the then-previous plan (i.e., 2011) and proposed a then-updated method for plan maintenance:

- Once per year, the Bluegrass ADD will send out e-mails to each Emergency Manager for the sixteen (16) counties over which it serves requesting a review of the goals and objectives for each jurisdiction and requesting an evaluation regarding whether goals and objectives were met through mitigation actions and projects pursued by respective jurisdictions and whether goals, objective, and action still reflect the mitigation needs of those jurisdictions.
- Once every two (2) years, the Homeland Security Council will meet with Bluegrass ADD staff and with the Emergency Management Agency Directors for the counties for which Bluegrass ADD serves to discuss the hazard mitigation plan and to prepare for the next update cycle.

Generally, the Bluegrass Area Development District will continue this plan maintenance methodology and, thusly, has rearticulated it for the 2022 hazard mitigation plan update.

In order to ensure public participation in the plan maintenance process, the Bluegrass Area Development District adds the following task to its plan maintenance methodology:

- Any evaluation/maintenance request submitted to Emergency Managers and/or to the Homeland Security Council also will be made available online, posted to the ADD's public website. The evaluation/maintenance request will be advertised on all of Bluegrass ADD's and the counties' and cities' social media sites.

The Bluegrass ADD would like to add the following expectation or clarification for plan maintenance, however, as it was not articulated directly in 2017: In its quotidian activities, Bluegrass ADD staff provides technical assistance and aids in the development of applications for external funding for the counties and cities it serves. Oftentimes, Bluegrass ADD staff manages the external grants of the counties and cities it serves after an external grant has been awarded. These activities, de facto, require maintenance of the hazard mitigation plan: If a jurisdiction wants to pursue X mitigation action using FEMA Hazard Mitigation Assistance (HMA) and seeks the ADD's assistance in its pursuit, that jurisdiction and the Area Development District must coordinate with the hazard mitigation plan first. The hazard mitigation plan receives ad hoc maintenance.

CHAPTER 5: PLAN APPROVAL AND PLAN ADOPTION