

**4.11 Natural Hazard Indexing Methodology**

As discussed previously, Lake Cumberland faces a number of potential natural disasters and hazards. A Hazard Identification matrix was developed that rates natural hazards based on the following three items:

- Likelihood of Occurrence – the probability that a hazard will occur;
- Geographic Scale – location and/or size of the area affected; and
- Impacts – expected damage and disruptions to be expected.

Specific hazards were then assigned a point value for each of these items based on the expected severity of the hazard. This information was then used to establish a Hazard Index for each type of natural hazard and associated risk level based on the total score. Hazards associated with the highest index value were determined to have the greatest potential impact to Lake Cumberland Region.

**Tables 4.11(1a-d) – Show the Hazard Indexing Methodology Criteria - Natural Hazard Identification and Indexing Worksheet results.**

**Jurisdiction Lake Cumberland Regional Hazard Risk Levels**

Specific hazards are assigned a point value for each of these items based on the expected severity of the hazard. Point values and descriptions for each category are shown in **Hazard Identification Criteria Table**. This information was then used to establish a Hazard Index for each type of natural hazard and associated risk level based on the total score as shown in **Risk Level Table**. Hazards associated with the highest index value were determined to have the greatest potential impact to the LCR. The entire scoring matrix is provided as Natural **Hazard Index Table**.

**Tables 4.11(1a) - Hazard Identification Criteria**

Score	Category	Description
<b>Likelihood of Occurrence</b>		
3	Highly Likely	50% to 100% probability in the next year
2	Likely	Between 10% and 50% probability in the next year
1	Possible	Between 1% and 10% probability in the next year
0	Unlikely	Less than 1% probability in the next year
<b>Geographic Scale</b>		
3	Large	More than 50% of the town affected
2	Medium	10% to 50% of the town affected
1	Small	Less than 10% of the town affected
<b>Impacts</b>		
3	Catastrophic	Multiple deaths & injuries possible, >50% property severely damaged Complete shutdown of facilities for 30 days or more
2	Critical	Multiple injuries possible, <50% to >25% property severely damaged Complete shutdown of critical facilities for at least 1 week

1	Limited	Minor injuries only, <25% to >10% property severely damaged Complete shutdown of critical facilities for more than one day
0	Minor	Very few injuries, if any, only minor property damage Shutdown of critical facilities and services for 24 hours or less

**Tables 4.11(1b) – Risk Level**

Hazard Index Score	Risk Level
8-9	Extremely High
6-7	Very High
5	High
4	Moderate
3	Low
1-2	Very Low

**(Individual county/city risk levels arrived jointly and were scored numerically below in this order: Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Taylor, and Wayne counties. Dashes [-] indicate no information provided for the specific county in the above order.)**

Tables 4.11(1c) - Natural Hazard Index Scoring by County

Natural Hazard	Likelihood of Occurrence	Geographic Scale	Impacts	Hazard Index Regional Average Score	Risk Level
<b>Floods</b>					
Flash Flooding	3,-,2,2,3,2,1,3,3,3	2,-,2,1,3,1,1,2,2,2	1,-,1,0,1,0,0,1,1,0	<b>43/9=5</b>	<b>High</b>
Riverine Flooding	2,-,0,1,2,1,0,1,1,3	2,-,0,1,2,1,0,0,1,2	0,-,0,0,2,0,0,1,1,0	<b>24/9=3</b>	<b>Low</b>
Flooding from Storm Runoff	3,-,1,2,2,1,1,3,3,3	2,-,1,1,2,1,1,2,2,2	0,-,1,0,2,0,0,1,2,0	<b>39/9=4</b>	<b>Moderate</b>
Erosion	3,-,1,1,1,2,1,1,1,1	1,-,1,1,1,2,0,1,1,2	1,-,0,0,1,0,0,0,1,0	<b>25/9=3</b>	<b>Low</b>
<b>Winter Storm Events</b>					
Snowstorms and Blizzards	2,-,2,2,3,3,1,2,3,3	3,-,1,3,3,3,2,2,3,3	2,-,1,1,2,2,1,1,3,2	<b>59/9=7</b>	<b>Very High</b>
Ice Storm	2,-,1,2,2,3,1,1,2,2	3,-,1,3,3,3,2,1,1,3	2,-,1,1,2,1,1,1,3,2	<b>50/9=6</b>	<b>Very High</b>
<b>Tornadoes and Thunderstorms</b>					
Tornadoes	3,-,2,2,2,2,2,3,1,2	3,-,1,2,3,2,2,2,1,2	3,-,1,1,3,2,1,2,3,2	<b>55/9=6</b>	<b>Very High</b>
Thunderstorms/Lighting	3,-,2,2,3,3,3,3,3,3	3,-,1,2,3,2,1,2,3,2	1,-,0,1,2,0,0,2,1,1	<b>52/9=6</b>	<b>Very High</b>
Windstorm (Straight Line Winds)	3,-,1,2,3,3,3,3,3,3	3,-,1,2,3,1,2,2,3,2	2,-,0,1,2,0,1,2,1,1	<b>53/9=6</b>	<b>Very High</b>
Hailstorm	3,-,1,2,2,2,2,3,1,2	3,-,1,2,3,1,1,2,1,2	2,-,0,1,1,0,0,2,3,1	<b>44/9=5</b>	<b>High</b>

<b>Geologic Hazards</b>					
Earthquakes	1,-,1,1,1,1,1,0,0	3,-,1,2,3,1,2,2,2,1	3,-,0,2,3,1,1,2,1,0	<b>37/9=4</b>	<b>Moderate</b>
Land Subsidence (Landslides)	1,-,1,2,1,3,1,0,1,1	1,-,0,1,2,1,1,0,1,1	0,-,0,1,0,1,0,0,1,0	<b>22/9=2</b>	<b>Very Low</b>
Sinkholes	1,-,2,1,2,1,1,1,0,1	1,-,1,1,3,1,1,1,0,1	0,-,1,1,0,0,0,1,0,0	<b>23/9=3</b>	<b>Low</b>
<b>Other Hazards</b>					
Drought	1,-,1,1,2,2,1,1,1,1	2,-,2,2,3,2,0,3,3,1	0,-,1,1,1,2,0,1,0,1	<b>36/9=4</b>	<b>Moderate</b>
Forest Fires / Wildfires	2,-,1,1,1,2,1,1,1,3	1,-,1,2,2,2,0,2,2,1	0,-,0,1,1,2,1,1,1,1	<b>34/9=4</b>	<b>Moderate</b>
Dam/Levee Failures	0,-,1,1,0,1,0,1,1,0	1,-,1,2,3,1,0,1,0,1	0,-,1,1,3,1,1,1,0,1	<b>24/9=3</b>	<b>Low</b>
Expansive Soil	0,-,1,1,0,1,0,0,0,0	1,-,1,2,1,0,0,1,0,0	0,-,0,1,0,0,0,0,0,0	<b>10/9=1</b>	<b>Very Low</b>
Extreme Summer Weather	2,-,1,1,2,1,1,2,1,2	2,-,1,2,2,3,1,3,3,1	1,-,0,1,1,2,1,0,0,1	<b>38/9=4</b>	<b>Moderate</b>
<b>Manmade Hazard</b>	<b>Likelihood of Occurrence</b>	<b>Geographic</b>	<b>Impacts</b>	<b>Hazard Index</b>	<b>Risk Level</b>
<b>Technological and Other Hazards</b> (Although not required by the FEMA manmade hazards such as hazardous materials release, nuclear materials release, and terrorism were also Disaster Mitigation Act of 2000, manmade hazards such as hazardous materials release, nuclear materials release, and terrorism were also reviewed by the Lake Cumberland Regional Hazard Mitigation Committee.)					
Natural Biohazard	1,-,-,0,1,1,-,2,-,0	3,-,-,0,3,1,-,2,-,1	2,-,-,0,3,2,-,1,-,0	<b>23/6=4</b>	<b>Moderate</b>
Nuclear Facilities	0,-,-,0,0,1,-,0,-,0	0,-,-,0,0,2,-,0,-,0	0,-,-,0,0,2,-,0,-,0	<b>7/6=1</b>	<b>Very Low</b>
Hazardous Material Sites	1,-,-,1,1,1,-,1,-,0	3,-,-,1,1,1,-,1,-,1	2,-,-,1,1,1,-,0,-,0	<b>18/6=3</b>	<b>Low</b>
<b>Non-Regional Hazards</b> ( <i>Determined not to be a hazard threat and therefore is not profiled.</i> )					
Coastal Erosion					
Snow Avalanche					
Storm Surge					
Tsunami Event					
Volcano					
Hurricane (Tropical Cyclone)					