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Purpose: Provide an operationally focused analysis of the public safety impacts, lifeline risks, and emergency management considerations associated with the 2024 drought impacting Clinton, Fayette, and Highland Counties in Southwest Ohio.

2024 Drought

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Executive Summary

The 2024 drought has created significant operational, agricultural, and water-resource stress across Southwest Ohio. Portions of Fayette and Highland Counties reached D4 (Exceptional Drought), while Clinton County reached D3 (Extreme Drought) with areas ranging from D2 to D3, and the potential for escalation if dry conditions persisted.

The most immediate impacts were observed in the Food, Hydration & Shelter, Water Systems, Safety & Security, and Hazardous Materials lifelines. Agricultural losses, livestock stress, and reduced pasture viability created economic strain and increased demand for supplemental feed. At the same time, declining streamflow and groundwater recharge increased risk to both household wells and municipal water systems.

Drought conditions also elevated wildfire potential and increased concerns related to agricultural chemical storage exposure during fires. Burn bans and water conservation measures were implemented or considered across the region to reduce preventable ignition sources and preserve limited water supply.

Overall, this drought represents a slow-onset but high-impact hazard. It does not generate a single "response day," but instead creates a sustained strain environment where small incidents (fires, well failures, livestock emergencies, water restrictions) accumulate into a prolonged operational burden for public safety agencies and local government.

Introduction and Context

The 2024 drought intensified in early June and worsened steadily through the summer, with the most severe conditions emerging by September. As of mid-September 2024, Clinton County had expanded into D3, while Fayette and Highland Counties reached D4, reflecting exceptional drought severity.

The drought severely reduced topsoil moisture, with over 90% of topsoil rated "very short to short" across the region, creating widespread agricultural stress, reduced pasture quality, and increased vulnerability of crops such as soybeans and corn.

The drought also contributed to abnormally low streamflow, reduced groundwater recharge, and increasing concerns about household wells, village systems, and agricultural water access.

From an emergency management standpoint, drought is a prolonged hazard that affects lifelines gradually but continuously. Unlike severe weather, it does not have a clean start/stop window, which complicates public messaging, operational tempo, and sustained coordination across multiple agencies.

Operational Environment and Hazard Overview

Drought conditions create a unique operational environment where risk accumulates over time and impacts multiple sectors simultaneously.

Near-Term Operational Threats (0–3 months)

- Reduced crop yields (corn, soybeans, pasture), increasing financial strain on farms.
- Livestock stress due to limited water availability and poor pasture, increasing feed costs and animal health issues.
- Increased wildfire risk due to dry vegetation, dust, and debris.
- Water shortages affecting agricultural and municipal use, including reservoirs and streams.

Mid-Term Operational Threats (3–6 months)

- Prolonged economic impacts on agriculture, including farm closures.
- Winter crop viability concerns due to depleted soil moisture.
- Public health impacts from dust, smoke, and air-quality degradation.
- Continued strain on emergency services from fire risk and drought-related incidents.

Long-Term Operational Threats (6+ months)

- Long-term soil degradation reducing productivity beyond 2024.
- Rural economic decline, reduced property values, and workforce impacts.
- Water supply sustainability risks affecting long-term security for households, agriculture, and industry.
- Ecosystem disruption and biodiversity loss due to prolonged dryness.

Key EMA Concerns: Threats and Hazards

Agricultural and Livestock Impacts

The drought created immediate and compounding stress on row crops, pasturelands, and livestock operations. Crop reductions and pasture failure forced increased reliance on purchased feed and supplemental watering strategies. This increased financial pressure on producers and contributed to wider downstream economic impacts in rural communities.

Water Shortages (Municipal and Private Wells)

Water systems were a major concern, particularly for rural households dependent on wells and small village systems vulnerable to groundwater decline. Reduced streamflow and limited recharge increased the risk of localized well failures, water hauling needs, and future restrictions.

Wildfire and Fire Service Strain

Dry conditions elevated fire risk across rural areas, especially around fields, brush, and woodland interfaces. Burn bans were implemented in response to increased ignition potential and limited water resources.

Public Health and Mental Health

Air quality degradation from dust, pollen, and wildfire smoke increased risk for respiratory issues. Additionally, long-duration financial stress created mental health impacts for agricultural families and rural communities.

Hazardous Materials "Secondary" Risks

While drought is not a hazmat event, it increases secondary hazmat risks through wildfire exposure to agricultural chemical storage sites. Fires involving pesticides, fertilizers, or farm chemical stores can produce toxic smoke, runoff contamination, and responder exposure hazards.

FEMA Lifeline Impacts

Overall, the drought produced the greatest stress on Food, Hydration & Shelter, Water Systems, Safety & Security, and Hazardous Materials lifelines. Energy, communications, and transportation impacts were secondary and primarily indirect.

The drought's lifeline impacts were not driven by a single catastrophic event, but by cumulative degradation across water availability, agriculture, and fire risk. This produced a sustained hazard environment that required long-duration monitoring, coordination, and public messaging.

> Note: Risk levels in this briefing reflect an operational estimate of how strongly the drought is affecting (or is likely to affect) each lifeline. **Low** indicates minimal disruption and limited operational concern. **Marginal** indicates noticeable impacts, but primarily minor or manageable disruptions. **Slight** indicates a measurable stressor that may cause intermittent issues or localized strain. **Moderate** indicates significant, sustained impacts that may require coordinated monitoring and response actions. **High** indicates major impacts with a strong likelihood of service disruption, significant community effects, or resource shortfalls. **Enhanced** indicates a heightened risk environment where secondary hazards (such as wildfire exposure, chemical release potential, or responder safety risks) create increased danger even if major lifeline failure is not occurring.

Safety and Security Lifeline

(Law enforcement, fire services, search & rescue, government services, EOC, public safety functions)

> Fire services experienced the most direct drought-related impacts due to increased wildfire risk, burn ban enforcement, and higher ignition vulnerability in rural areas. Local government and emergency management functions were also stressed by the need for sustained drought coordination and public messaging.
>
> Risk Level: **Moderate**

Food, Hydration, and Shelter Lifeline

(Grocers, food distribution, temporary hydration missions, shelters, hotels, agriculture, livestock)

> This lifeline experienced the highest impact due to agricultural losses, pasture degradation, and increased reliance on bottled water by rural households experiencing declining well reliability. Drought conditions increased feed costs and reduced agricultural productivity, creating both economic and household stability concerns.

Risk Level: **High**

Health and Medical Lifeline
(Hospitals, EMS, public health, pharmacies, dialysis, long-term care, VA, veterinary care, mortuary services, medical supply chain)

Health impacts were primarily indirect. Dust and smoke contributed to respiratory stress, and long-duration agricultural strain increased mental health concerns in rural communities. EMS demand was not expected to surge sharply, but ongoing stressors and fire-related events could create localized spikes.

Risk Level: **Moderate**

Energy Lifeline
(Power grid, generation, transmission, distribution, fuel storage, pipelines, gas stations)

Energy impacts were present but secondary. Drought can indirectly affect energy systems through increased demand during prolonged heat, and reduced water availability for cooling or generation in some systems. However, this was not assessed as a primary lifeline failure driver in the region.

Risk Level: **Slight**

Communications Lifeline
(Wireless, cable/wireline, broadcast, satellite, data centers, internet, CCEA alerts, IPAWS, NAWAS, PSAPs, dispatch, responder communications, finance/payment systems)

Communications impacts were minimal and primarily tied to secondary power disruption risk during heat or wildfire events. No significant communications disruptions were anticipated directly from drought conditions.

Risk Level: **Low**

Transportation Lifeline
(Roads, bridges, transit, freight rail, Wilmington Airpark operations)

Transportation impacts were limited but included economic/logistics effects due to low water levels affecting barge movement of agricultural goods and increased reliance on trucking. This was a supply-chain/logistics stressor rather than a public safety driver.

Risk Level: **Marginal**

Water Systems Lifeline
(Potable water intake, treatment, storage, distribution; wastewater collection, treatment, discharge)

This lifeline was one of the most stressed in the drought. Municipal and private well systems were increasingly vulnerable due to reduced groundwater recharge and declining streamflow. Rural households dependent on wells faced the highest risk of disruption.

Risk Level: **High**

Hazardous Materials Lifeline
(Hazmat facilities, industrial agents, pollutants, contaminants)

Drought increased hazmat relevance through wildfire exposure to farm chemical storage. While not a primary driver, this created an enhanced responder risk profile during any rural structure or brush fire involving agricultural supplies.

Risk Level: **Enhanced**

Countywide Infrastructure Implications

The drought placed significant strain on rural infrastructure, particularly private well systems, agricultural operations, and fire suppression capacity. It also created sustained economic pressure across farm-dependent communities, with potential long-term impacts including farm closures, out-migration, and reduced economic stability.

Public messaging challenges were also notable. Drought does not generate immediate dramatic incidents unless fires or well failures occur, which can reduce public urgency even while risk continues to worsen.

Preparedness and Mitigation Measures

- Promoting water conservation strategies and reducing non-essential water use.
- Encouraging agricultural producers to pursue USDA recovery and assistance programs.
- Implementing burn bans and increasing fire prevention measures to reduce wildfire ignition risk.
- Maintaining drought working group coordination for sustained monitoring, communications, and recovery planning.

Conclusion

The 2024 drought was a slow-onset hazard with significant and compounding impacts across Clinton, Fayette, and Highland Counties. The most critical risks involved water supply reliability, agricultural and livestock losses, and increased wildfire potential. Fayette and Highland Counties reached exceptional drought status (D4), while Clinton County reached extreme drought (D3), reinforcing the need for coordinated drought monitoring, public messaging, and long-duration mitigation planning.