

## **DAM FAILURE – Hazard Description**

### **What is dam failure?**

(from: Federal Emergency Management Agency)

A "dam" is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water. Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage.
- Structural failure of materials used in dam construction.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete or embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

### **How are dam failures categorized?**

(from: the Illinois Natural Hazard Mitigation Plan)

There are two categories to describe dam failure.

Rainy day failure involves periods of excessive precipitation leading to an unusually high runoff. This high runoff increases the reservoir of the dam and if not controlled, the overtopping of the dam or excessive water pressure can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable.

Sunny day failures occur due to poor dam maintenance, damage/obstruction of outlet systems, or vandalism. This is the worst type of failure and can be catastrophic because the breach is unexpected and there may be insufficient time to properly warn downstream residents.

### **What dams could pose a risk in Sangamon County?**

There are three large dams that could impact Sangamon County if they failed. These are the two dams on Lake Springfield (owned by City Water, Light and Power), Spaulding Dam and Saddle Dam, and the Lake Sangchris Dam (owned by Kincaid Generation LLC). The latter is located just over the county line in Christian County but the impact of its failure would be almost entirely within Sangamon County. The location of these dams is shown in Figure 8-1.

### **The extent of previous dam failures in Sangamon County.**

To date none of these dams have failed.

### **The locations affected by dam failure.**

The locations that could be affected by complete failure of each of the dams are shown in Figures 8-2, 8-3, and 8-4. FLDWAV, dam failure software from the National Weather Service, was used to model the dam failure scenarios for Lake Sangchris Dam and Spaulding Dam. The Saddle Dam inundation area was determined using a less sophisticated method but does provide some idea of the potential consequence of failure. The scenarios depict an immediate failure of the entire length of each dam which would be a worst case situation.

Figure 8-1

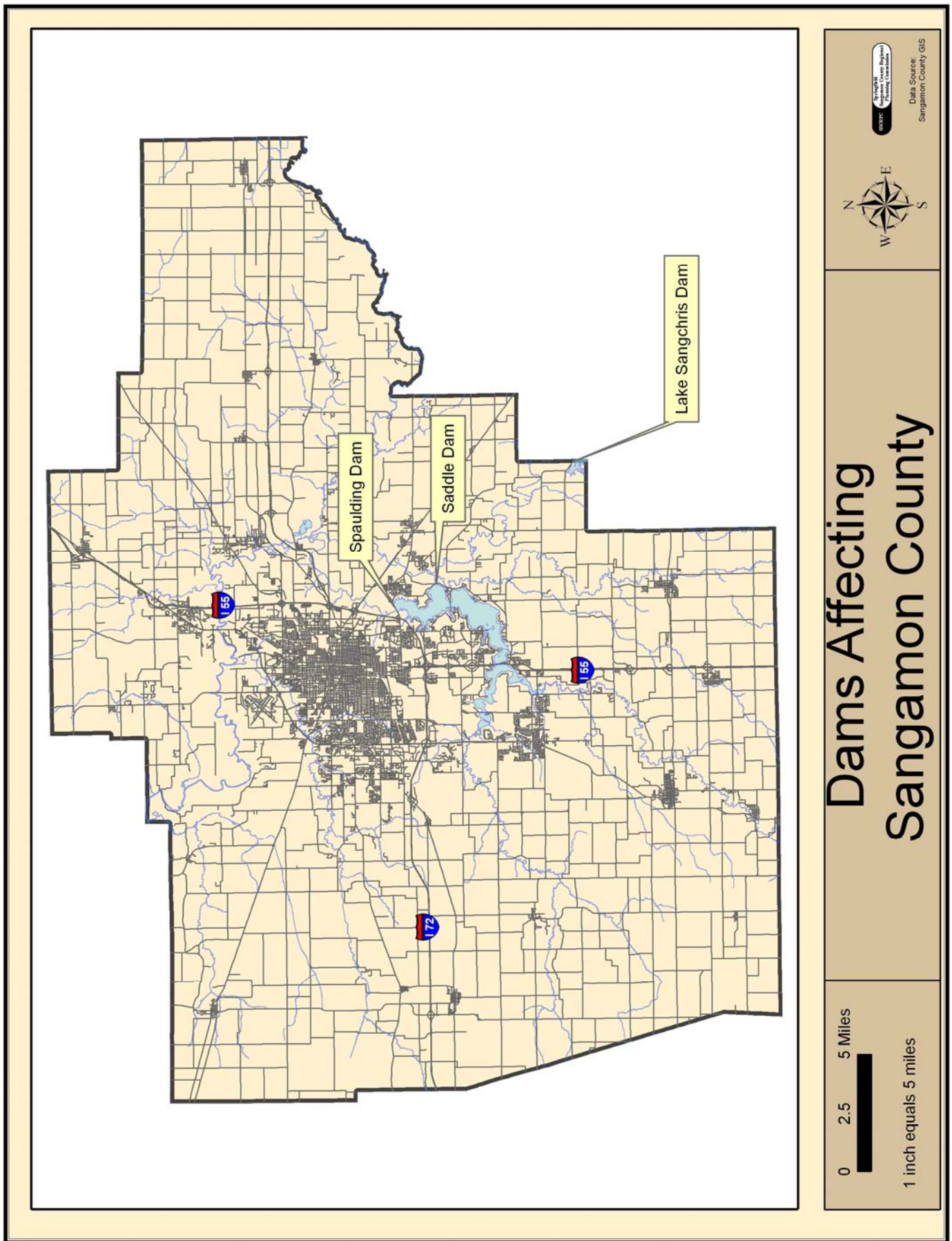


Figure 8-2

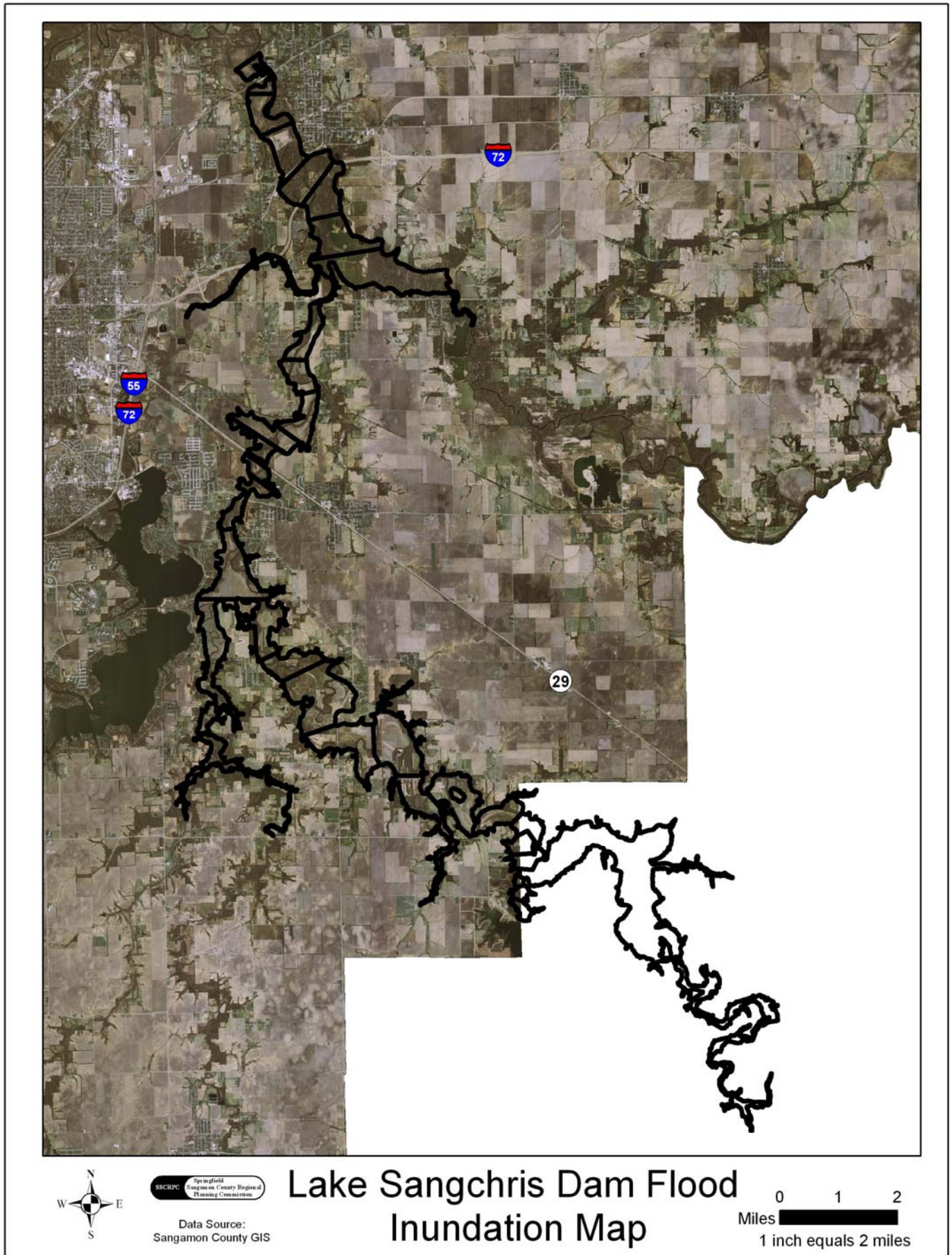


Figure 8-3

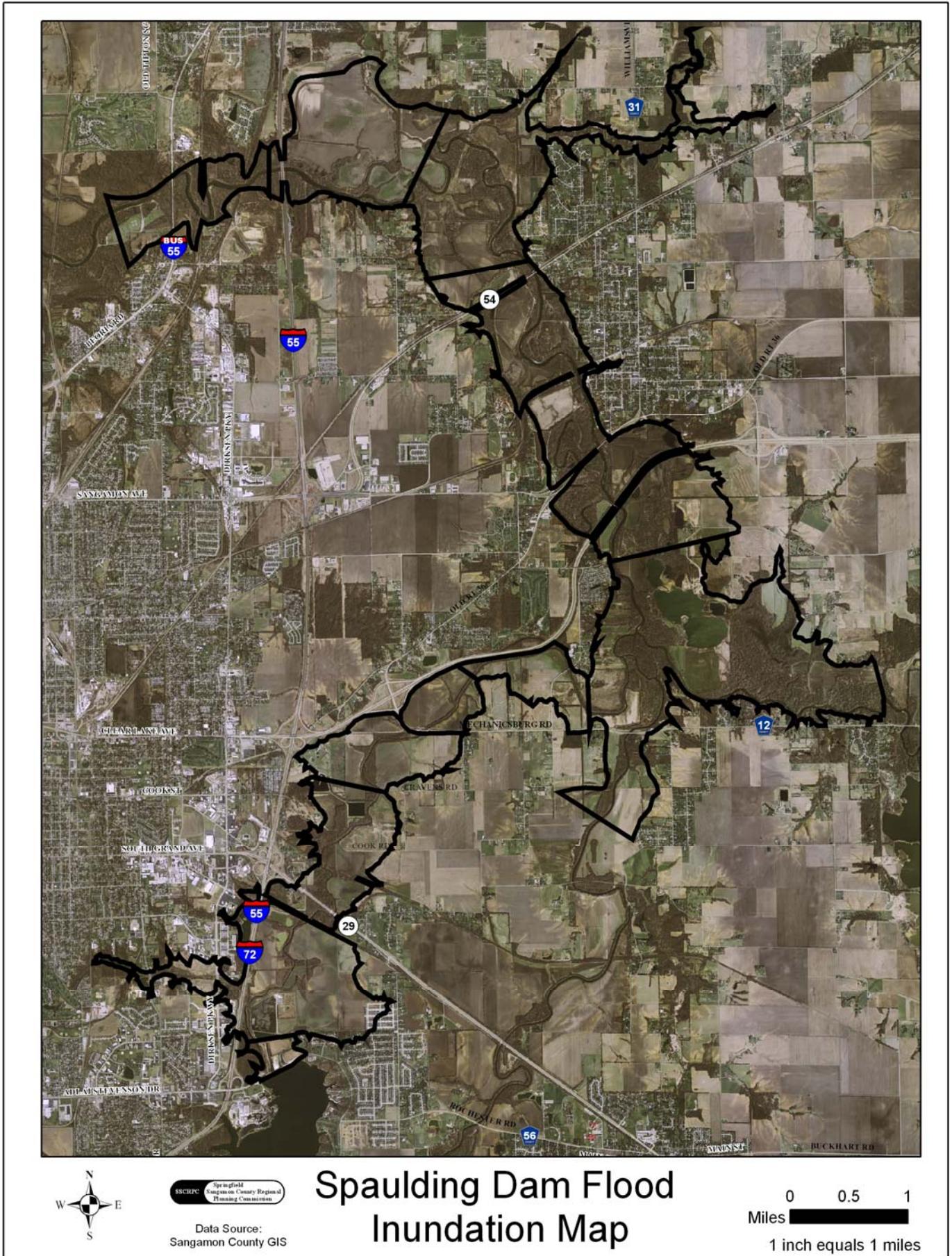
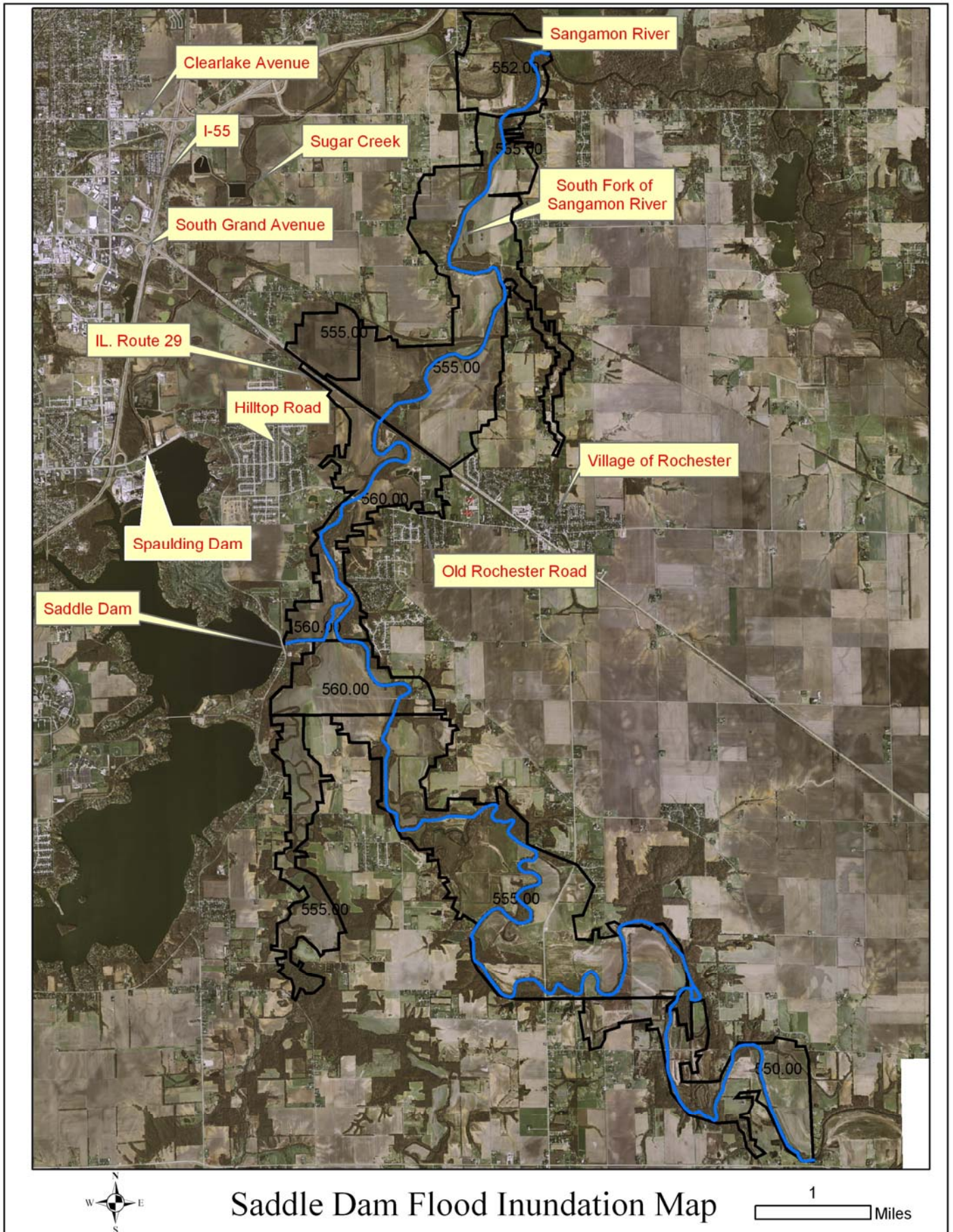


Figure 8-4



### **Probability of future dam failure events.**

The probability of a dam failure affecting Sangamon County cannot be specifically established but is relatively low.

### **DAM FAILURE –Assessing Vulnerability**

From the dam failure flood inundation scenarios generated the following consequences could occur if complete failure happened all at once, although this is highly unlikely. Each of the dams is earth filled so it is more likely that failure would occur over time as scouring removes the soil comprising the structure.

**Figure 8-5 Worst Case Scenario Dam Failure**

<b>Dam</b>	<b>Buildings Affected*</b>
Lake Sangchris Dam	65
Spaulding Dam	301
Saddle Dam	undetermined at this time

\* The numbers of buildings indicated are derived from the planimetric layer of the County GIS map. The types of buildings affected are not specifically identified at this time.