

**Erosion and Sediment Summary for Somonauk Creek Watershed  
DeKalb County, Illinois  
August 2008 – R.Windhorn**

This is a summary of the erosion and sedimentation occurring in the Somonauk Creek watershed above Lake Holiday. Initial stream bank erosion estimates were made during the summer of 2007. During this time, the complete 21 miles of the creek from the upper reaches to the lake itself were walked and erosion determinations made. In the summer of 2008, erosion estimates were completed for the entire watershed using the NRCS RAP-M process. (Available on the Illinois NRCS website) To select sample units for the sheet, rill, and ephemeral erosion procedure, 160-acre tracts were selected randomly throughout the watershed. A ten percent sample was used, which produced 25 of these sample units. (41,000 acres X 10% = 4100 acres, or 25 160-acre units). “Upland” stream segments were also selected randomly throughout the watershed. Sixteen one-quarter mile long segments were walked and erosion estimates were made.

Gully segments (or concentrated flow areas) were initially laid out on a sampling grid. However, all the segments appear to have been stabilized enough so that no significant erosion was identified. Ephemeral erosion was also not encountered or at least not listed on the summary sheets. Crop cover on many of the fields made these areas difficult to pick out. It is assumed from working in many similar watersheds that these erosion processes are continuing here but the sampling density was not great enough to quantify them. Because of this, erosion values for both ephemeral and “gully” were estimated from prior watershed work.



## **Sediment Transport**

Sediment that moves through a watershed is a product of the erosion that occurs within it. However, different types of erosion produce different quantities and morphologically different types of sediment. Sediment Delivery Rates (SDR) and Sediment Transport Factors (STF) are ways to estimate how much of the produced sediment actually moves to a concentrated flow of water. We then try to evaluate the sediment-carrying capacity and capabilities of the entire stream system to determine how much estimated sediment actually reaches the outlet end of a watershed or enters a sediment trap such as Lake Holiday.

### **Sheet and Rill**

	Erosion (T)	SDR/STR	Sediment (T)
Cropland			
A/B	38,911	0.18	6,860
C	7,890	0.45	3,550
D	824	0.62	510
Pasture/Grass/CRP	100	0.47	47
Forest	600	0.53	318
Residential/Disturbed	10	0.70	7
<b>Emphemeral</b>	4,753	0.68	323
<b>Gully (concentrated flow areas)</b>	500	0.70	350

### **Streambank**

Main Channel Somonauk Creek	3,519	0.95	3,343
“Upland” Streams	1,142	0.80	900
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		SEDIMENT TOTAL TO LAKE	16,200 T

**Summary Thoughts:**

Erosion total of 57,400 tons figures to be about 1.5 T/A/Year for every acre in the watershed. This value is quite low and probably reflects both the low relief, low dissection of this watershed plus the conservation efforts that have taken place in the past. Obviously the cultivated cropland produced the most erosion but only a very low percentage of this material moved through the system. Stream bank erosion totals varied from main channel to upland tribs. The main channel of Somonauk Creek had erosion rates of about 63 pounds of material per linear foot of channel. The upland tribs only produced about 14 pounds of material per linear foot. Message here is that if stream bank work is suggested, best return per dollar invested would be working on the severely eroding reaches of the main channel. Overall Sediment Delivery in the watershed of 16,200 tons or about 0.28 is typical of low gradient watersheds. Sediment produced per acre of watershed is less than 0.5 ton. This is a very low value and again indicates that sedimentation is not excessive throughout the watershed. If we assume a value of 40 pounds per cubic foot of sediment that is deposited directly in the water of Lake Holiday, then about 18.5 acre-feet of sediment deposition is occurring on an annual basis. If we assume the sediment has a chance to consolidate some, for example when the lake level drops in the summer, then we use a value of 60 pounds per cubic foot. This is about 12.3

acre-feet of sediment accumulation per year.