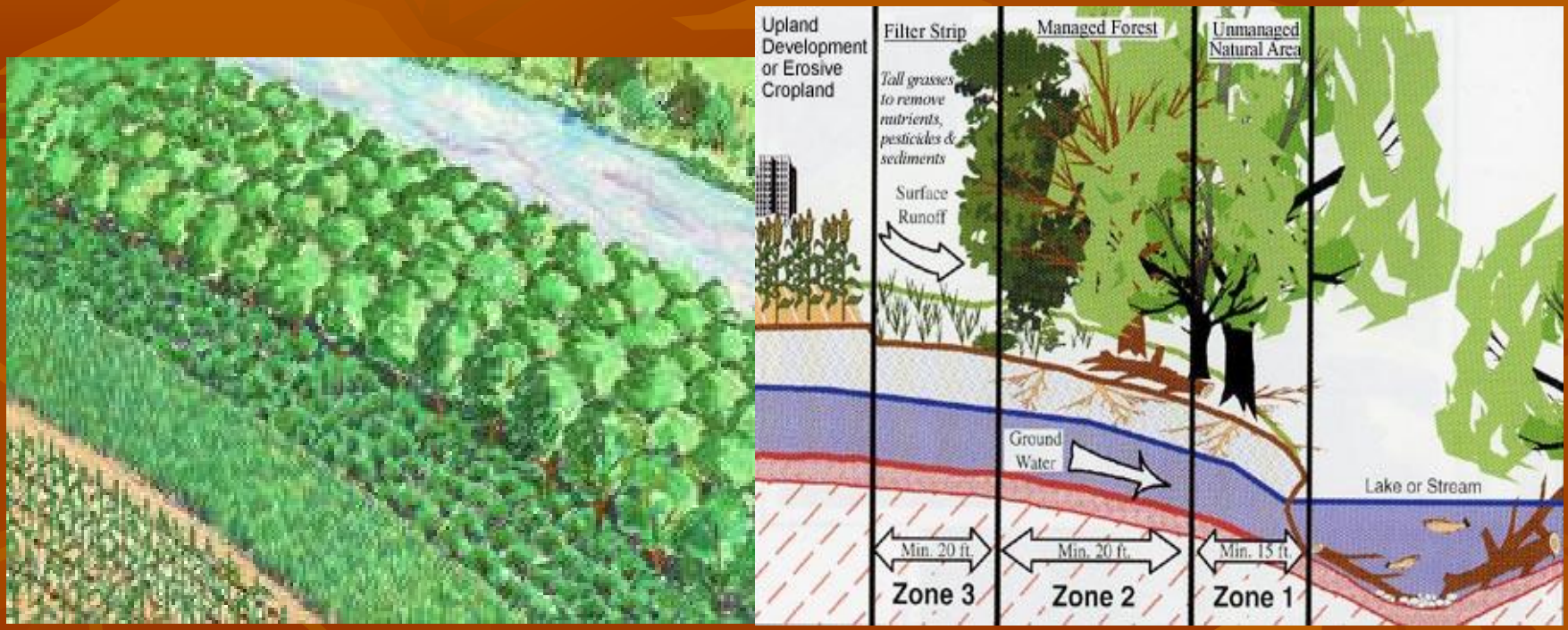
Achieving Hydrologic & Water Quality Benefits with Riparian Buffers

Ken Brooks and Joe Magner

Elm Creek: degraded riparian zone – can become productive & regain hydrologic function

Riparian buffers can be designed for working lands



Phytoremediation: A consideration in selecting plant materials

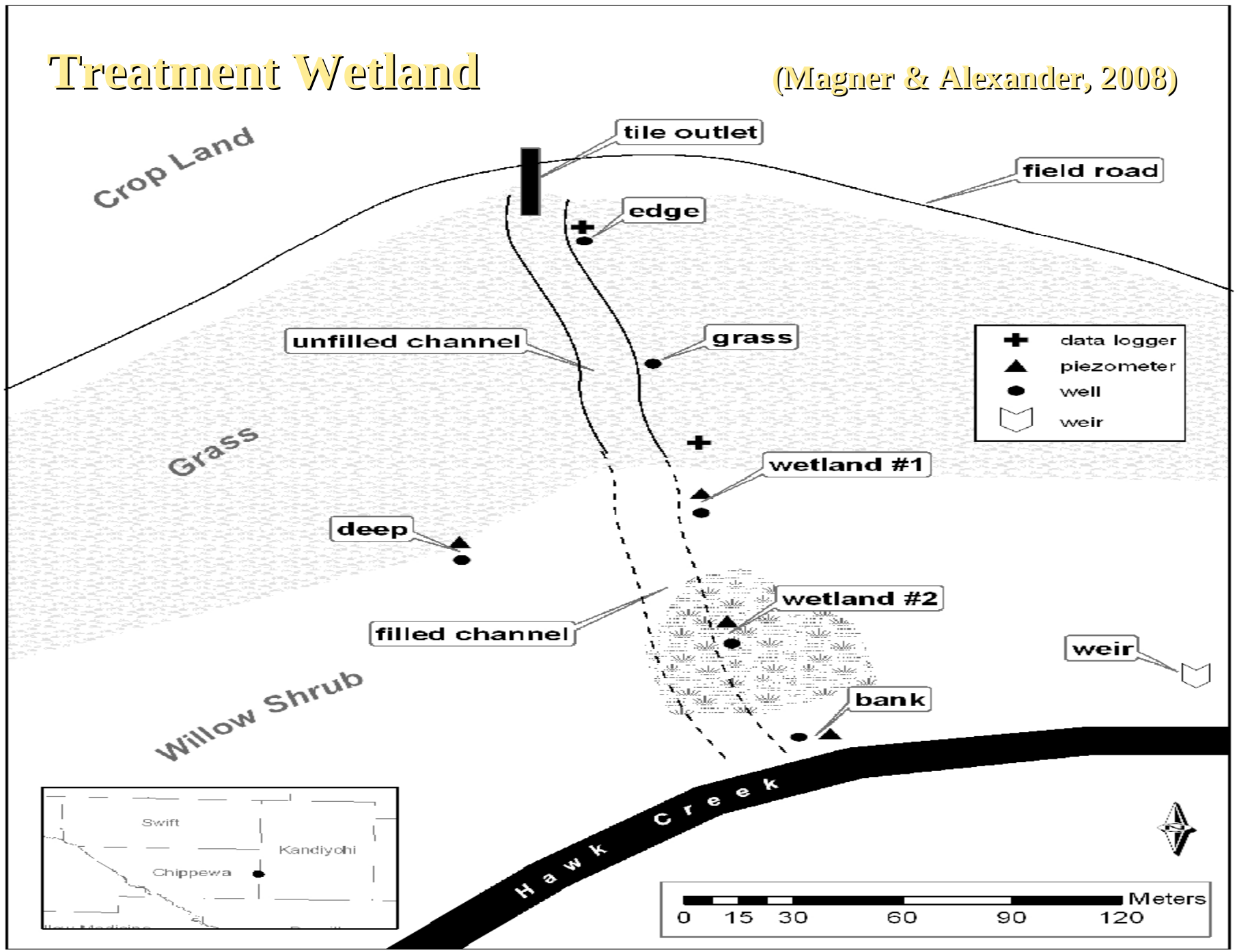
- Riparian trees – willows, cottonwood, poplars take up water & organic contaminants such as nutrients, metals & herbicides
- Grasses – filter overland runoff, dense root systems stabilize soil & sorb/bind contaminants
- Wetlands & wetland plants – promote denitrification and can reduce P
- Challenge is to design system that removes contaminants AND produces biomass/products

Buffer designs where drain tiles exist

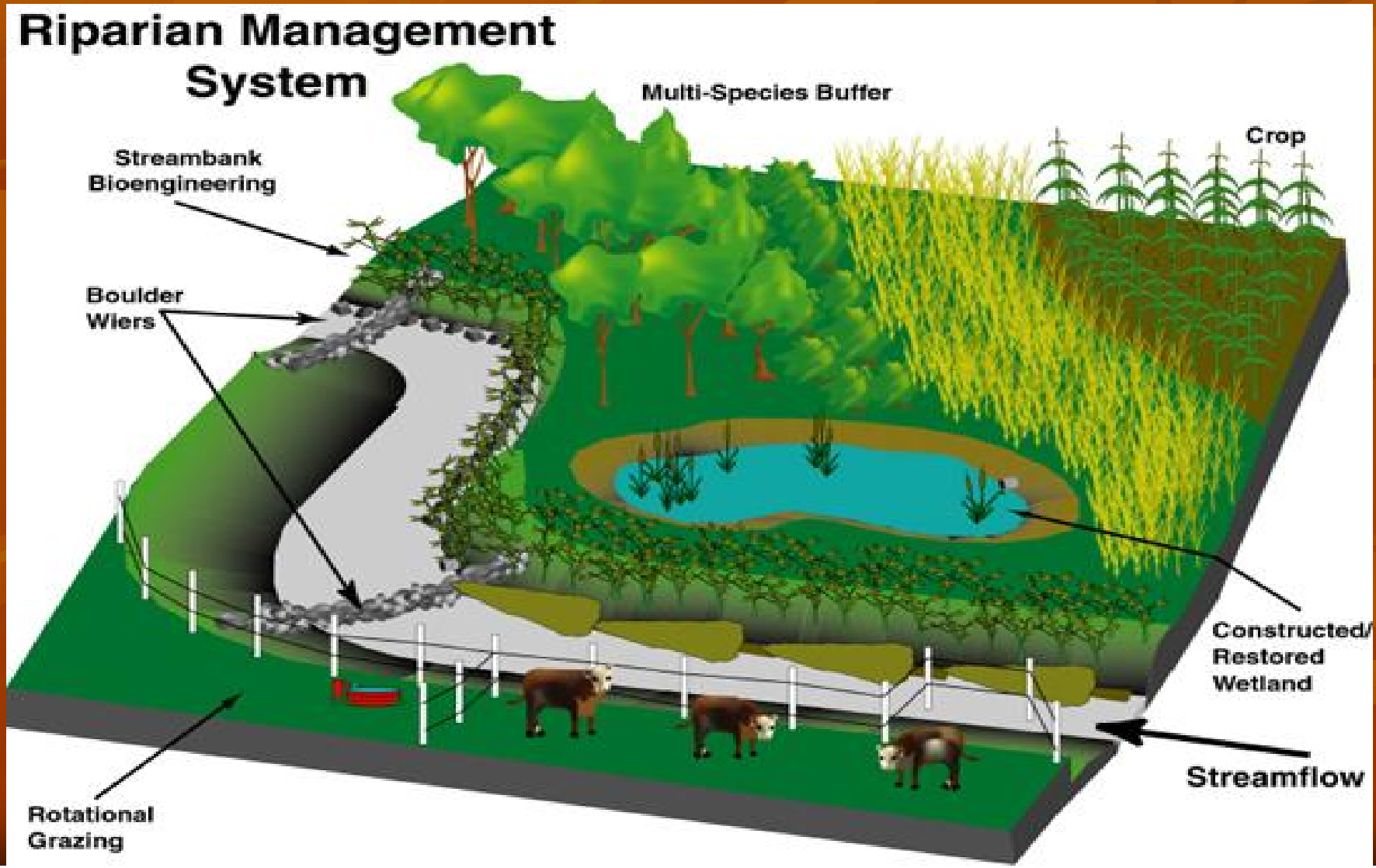
- Drain tiles bypass riparian vegetation & carry excessive nitrate-N to receiving waters
- Elm Creek wetland treatment: 18-20 mg/l of NO3-N from corn fields reduced to 0.2 – 4 mg/l by wetland.
- Grass & cattail-willow wetlands reduce N & P in central MN (Magner and Alexander, 2008)

Treatment Wetland

(Magner & Alexander, 2008)



Wetlands in Riparian Buffers
(Schultz et al., 2004)



Restoring floodplains and riparian functions for water quality, habitat & biomass

Relict channel along Elm Creek at Mair site

Elm Creek oxbows