

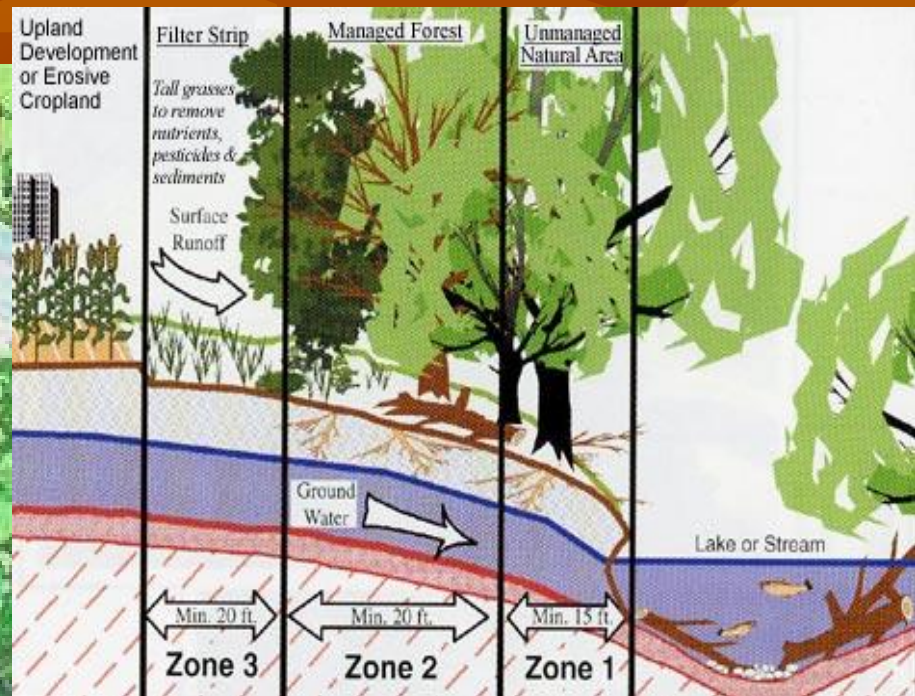
**Achieving Hydrologic &
Water Quality Benefits with
Riparian Buffers**

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

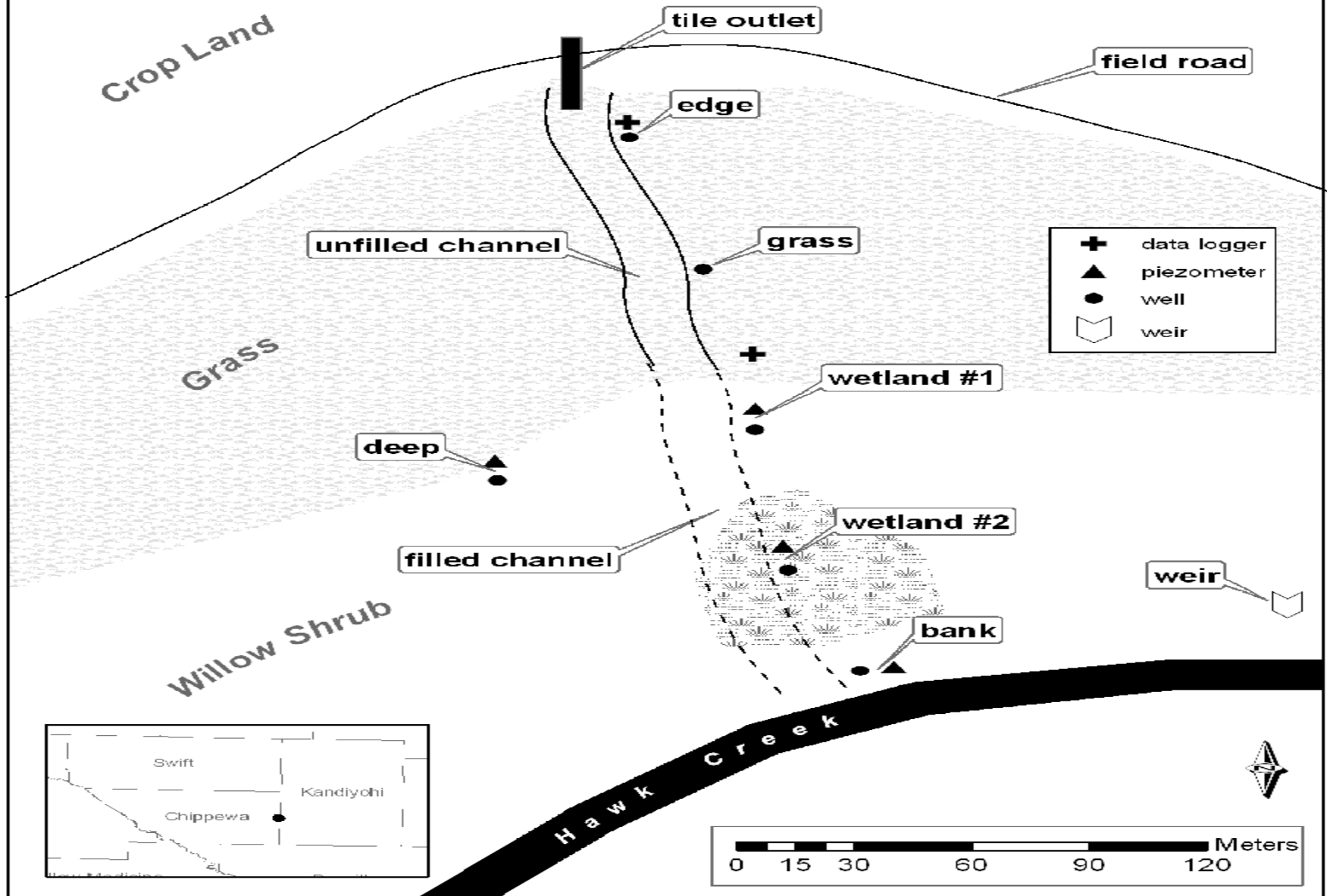
- n Riparian trees – willows, cottonwood, poplars take up water & organic contaminants such as nutrients, metals & herbicides
- n Grasses – filter overland runoff, dense root systems stabilize soil & sorb/bind contaminants
- n Wetlands & wetland plants – promote denitrification and can reduce P
- n Challenge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

Buffer designs where drain tiles exist

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

Treatment Wetland

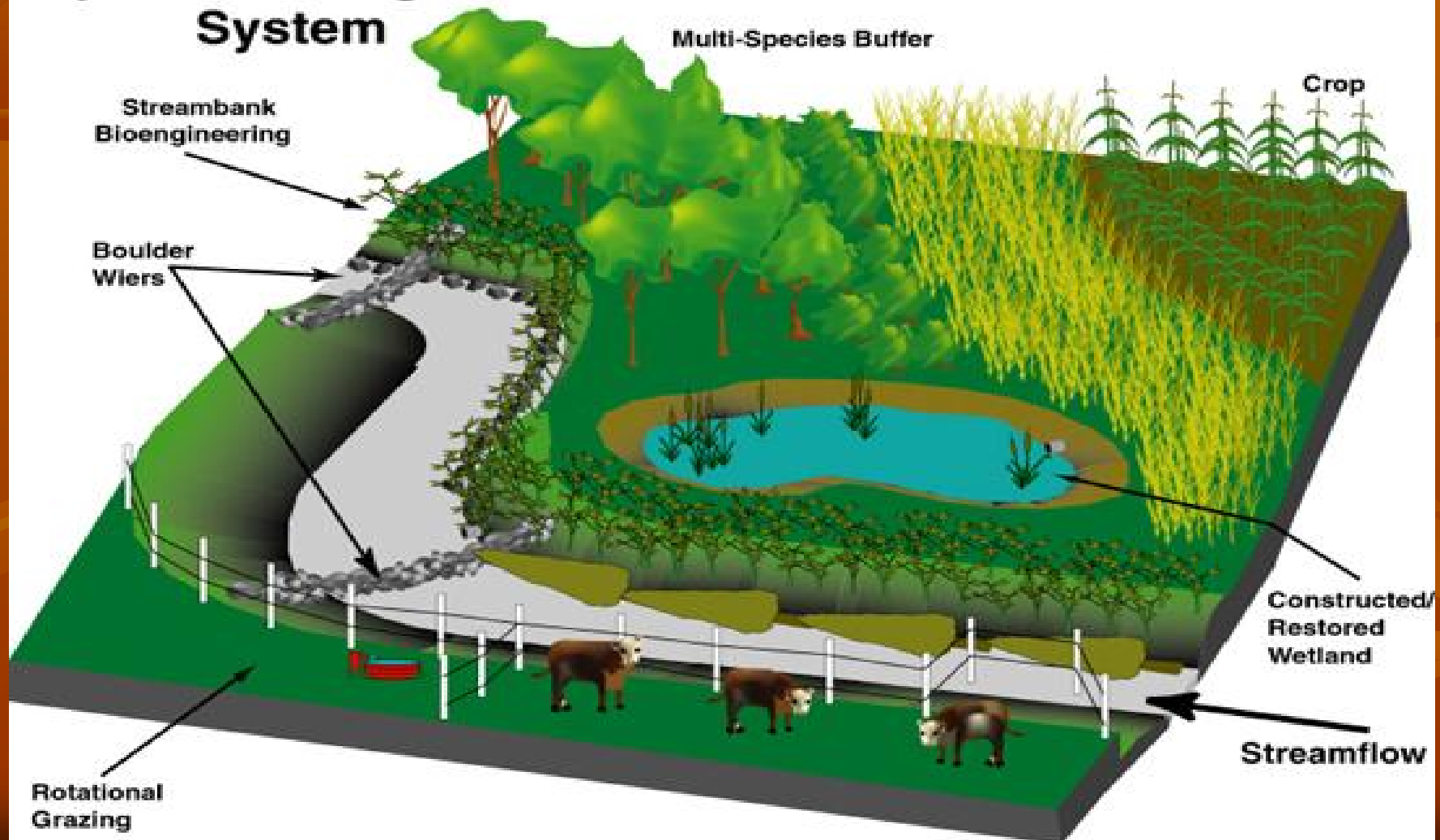
(Magner & Alexander, 2008)



Wetlands in Riparian Buffers

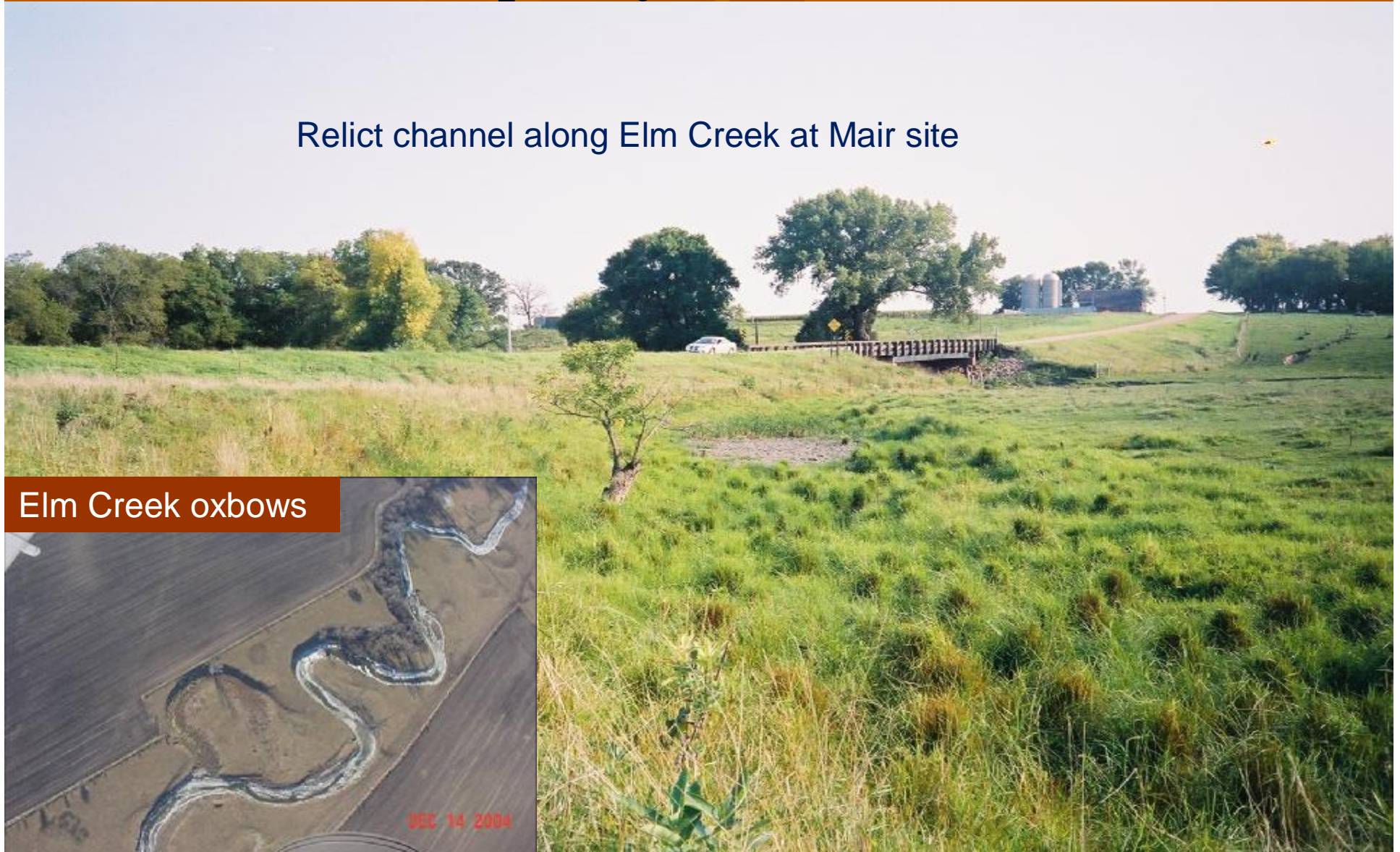
(Schultz et al., 2004)

Riparian Management System



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

Relict channel along Elm Creek at Mair site



Elm Creek oxbows

