Stream bank Stabilization in the Midwest: Lesson Learned



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Benefits of Natural Solutions to Stabilization

- Minimize the amount of potentially contaminated material that needs to be removed from the banks
- **Ecosystem benefits**
- Benefits to downstream users
- **Permittable**
- Constructible
- **Reliable, self-sustaining low maintenance solution**
- **< $**

Challenges of Natural Solutions to Stabilization

- Education
- Use of experienced contractors
- Climatic conditions
- **Interdependence of Engineering Reasoning AND Biological Science**
- Geotechnical & Geomorphic understanding
- Unless you are committed to re-engineer the agronomic, biologic, and ecological conditions of the soil, you must design native landscapes within the limits of your site conditions

Range of Stabilization Alternatives

- Biological (plants)
  - Local ecotype native plants
- Biotechnical
  - Rolled erosion control products
  - Turf reinforcing matrices (TRM)
  - Coir logs
- Geotechnical
  - Geogrid reinforced slopes
  - Geocellular confinement
- Structural
  - Rock, concrete, articulated concrete block

Pure Biological Stabilization

- Reliance solely on existing geology and performance of deep rooted indigenous species
- Often used for economics of approach
- Follow-up repairs and improvements may be required
- Utilize erosion control blanket or bonded fiber hydraulic mulch for biodegradable erosion control phase

Lessons Learned

- Catastrophic storm event following construction
- Short term climatic influences
- Formulation of indigenous species in correct ratios to provide for balanced development of grasses and wildflowers
- Difficulty in incorporating mycorrhizal and bacterial inoculants
- **Education** of regulatory, impacted public and capital improvement authorities


But Can it Work?


Monolithic Structural
Installation in Combination
with Biological Stabilization


CAT

Don’t Mess with Mother Nature

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Lessons Learned

- Biogabions will not reseed themselves
- Tree removal is sometimes necessary
- Use of High-Tensile TRM is necessary in high flow/shear stress conditions

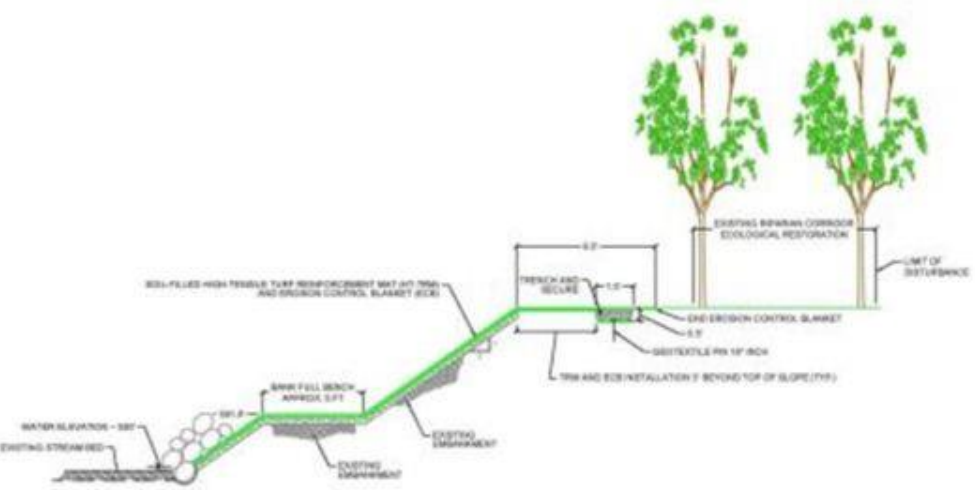

High Bank Stabilization


KOBELCO


OCT 30 2003

Lessons Learned

- Geomorphology was critical in design
- Loess soils on vertical slope continued to fail during construction
- Deep cell plugs/soil inoculation jump-starts growth
- Innovative construction practices saved $


EXISTING RIPARIAN CORRIDOR
ECOLOGICAL RESTORATION
LIMIT OF
DISTURBANCE
TRENCH AND
SECURE
END EROSION CONTROL BLANKET
GEOTEXTILE PIN 18" INCH
BANK FULL BENCH
APPROX. 5.0 FT
EXISTING
EMBANKMENT
EXISTING
EMBANKMENT


JUL 20 2009


AUG 17 2009


SEP 8 2009

Lessons Learned

- Mulch applied on TRM rather than soil filled – lack of soil-seed contact delayed germination
- Paper based hydro seed mulch not as native friendly; rapid decay of the fine newspaper fiber can cause fungal outbreaks if kept too wet
- High chlorine in irrigation water affected growth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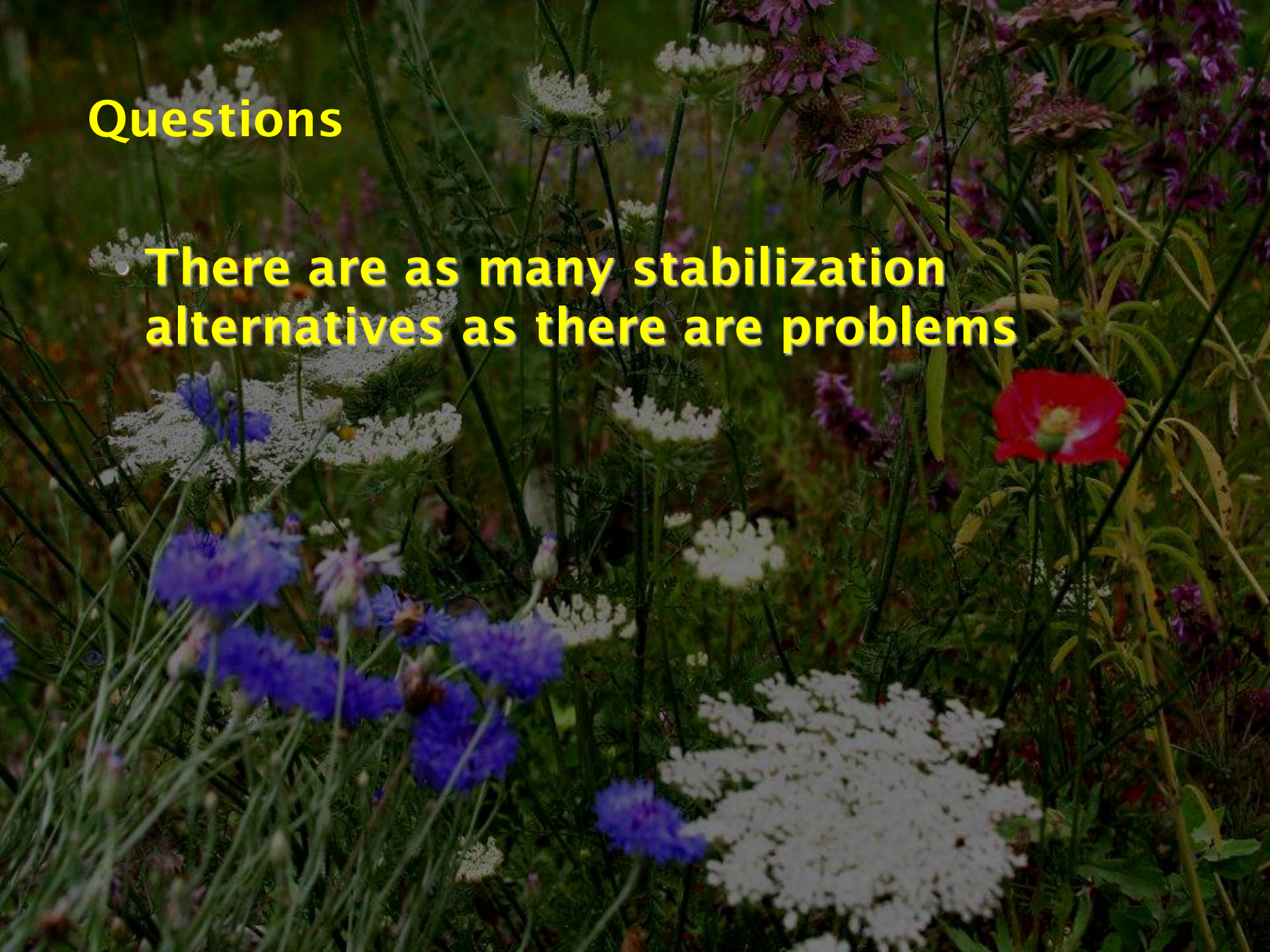
Questions
There are as many stabilization alternatives as there are problems