Rip rap construction

Foto: BAW

Foto: SGI
Biological bank protection

- Sweden
- Europe
- US / Canada

Foto: BAW
Biological bank protection

- Material, plants, etc.
- Construction requirements,
- Design, slope, etc.
- Soil type
- Resistance
- Environmental impact
Goal

- Existing bank protection methods
- Classify according to use
- Joint work between:
  - Swedish Agency for Marine and Water Management
  - Swedish Environmental Protection Agency
  - Swedish Transport Administration
Water flow

Hjulström diagram
Ship generated waves

Foto: SGI
Ice induced erosion

Foto: SGI
Biological bank protection
Technical-biological bank protection
Hard structures, Rip-rap

Illustration: K. Gellerstam
Methodology

Identifying erosion

Socio-economic values?

No

No action

Yes

Should the bank be protected?
Authorising procedure

No

Retreat or adaptation

Yes

Type of bank protection:
- Biological
- Tech-biological
- Hard structure

Environmental impact analysis

Biological
- Design
- Construction

Tech-biological
- Design
- Construction

Hard structures
- Design
- Construction

Naturanpassade erosionsskydd
Biological bank protection

Illustration: K. Gellerstam
Natural vegetation Rönne å

Foto: SGI
Natural vegetation Suseån

Foto: SGI
Salix

Foto: SGI
Salix

Foto: SGI
Tech-biological bank protection

Illustration: K. Gellerstam
Rip-rap and vegetation

Foto: BAW
Rip-rap and plants

Foto: SGI
Geotextile and vegetation

Foto: SGI
Geotextile and vegetation

Foto: SGI
Gabions and vegetation

Foto: SGI
Tech-biological bank protection
Lerån, Lerum

Foto: Norconsult
Logs and roots

Photo:
Washington State Aquatic Habitat Guidelines Program
Integrated Streambank Protection Guidelines, 2003
Roots and logs, Ätran

Illustration: Swedish Agency for Marine and Water Management
Roots and logs, Ätran
Thanks!