What is conservation planning?
Objectives:

• Planning Ideas and solutions to challenges
• Understand resource concerns and steps to planning
• What are the options, What can I offer, How do I handle the changes
• Focus on Sustainability & resource management
FIGURE 6.3 Severe gully erosion. (Courtesy U.S. Soil Conservation Service.)
Planning is a Process

Phase I
Collection and Analysis
1. Identify Problems
2. Determine Objectives
3. Inventory Resources
4. Analyze Resource Data

Phase II
Decision Support
5. Formulate Alternatives
6. Evaluate Alternatives
7. Make Decisions

Phase III
Application & Evaluation
8. Implement the Plan
9. Evaluate the Plan
What do we do to Identify Problems and Opportunities?
Documentation

Step 1

Step 2

Step 5
NPPH Resource Concerns

• **SOIL EROSION**
  • Sheet, Rill, & Wind Erosion
  • Concentrated Flow Erosion
  • Excessive Bank Erosion From Streams, Shorelines, or Water Conveyance Channels

• **DEGRADED PLANT CONDITION**
  • Undesirable Plant Productivity and Health
  • Inadequate Structure and Composition
  • Excessive Plant Pest Pressure
  • Wildfire Hazard, Excessive Biomass Accumulation

• **SOIL QUALITY DEGRADATION**
  • Subsidence
  • Compaction
  • Organic Matter Depletion
  • Concentration of Salts and Other Chemicals

• **INADEQUATE HABITAT FOR FISH AND WILDLIFE**
  • Habitat Degradation (Food, Water, Cover/Shelter, and Habitat Continuity/Space)

• **EXCESS / INSUFFICIENT WATER**
  • Ponding, Flooding, Seasonal High Water Table, Seeps, and Drifted Snow
  • Inefficient Moisture Management
  • Inefficient Use of Irrigation Water

• **LIVESTOCK PRODUCTION LIMITATION**
  • Inadequate Feed and Forage
  • Inadequate Livestock Shelter
  • Inadequate Livestock Water

• **WATER QUALITY DEGRADATION**
  • Excess Nutrients in Surface and Groundwaters
  • Pesticides Transported to Surface and Groundwaters
  • Excess Pathogens and Chemicals From Manure, Bio-solids, or Compost Applications in Surface Waters and Groundwaters
  • Excessive Salts in Surface Waters and Groundwaters
  • Petroleum, Heavy Metals, and Other Pollutants, Transported to Waters
  • Excessive Sediment in Surface Waters
  • Elevated Water Temperature

• **AIR QUALITY IMPACTS**
  • Emissions of Particulate Matter (PM) and PM Precursors
  • Emissions of Greenhouse Gases (GHGs)
  • Emissions of Ozone Precursors
  • Objectionable Odors

• **INEFFICIENT ENERGY USE**
  • Equipment and Facilities
  • Farming/Ranching Practices and Field Operations
Define Existing Resource Concern

- State the Facts
- Get enough information to define a benchmark condition
- Provide information on SWAPAE + H (Soil, Water, Air, Plants, Animals, Energy + Humans)
- Use section III for guidance on the resource concern and always ground it in the practice standard
RESOURCE CONCERNS:

A. Soil Erosion-Sheet, rill, gully

B. Soil Erosion-Wind

C. Degraded Plant Condition

D. Water Quality Degradation-Excessive nutrients in surface water
Erosion Prediction
Conservation Planning Data Needed

1. Locate the “Significant Planning Area” for the field.
2. Length and Steepness of Slopes.
3. Crops grown and sequence of crops.
4. Crop Yields (realistic)
5. Soil types.
TOLERABLE Erosion Rate Contributing Factors?

- Climate Rainfall Factor (R)
- Soil Erodibility Factor (K)
- Length x Steepness (LS)
- Crop Rotation & Tillage (C) - Management
- Supporting Practices (P)
RUSLE2 Assumes no serious rilling, ephemeral, or Classic gully erosion

What do we see?

NO RUN OFF ISSUES!!
Significant “Planning Area”

- 8% @ 200 ft. 20% Area
- 6% @ 200 ft. 25% of area
- 5% @ 250 ft 15% of Area
- 4% @ 250 ft
- 40% Area
Types of Water Erosion

- Ephemeral
- Classic Gully
- Rill / Interill
  (Sheet & Rill)
Degrades soil resource
1. Reduces soil productivity
2. Reduces soil O. M.
3. Removes plant nutrients

Reduces soil productivity

Removes plant nutrients

Causes downstream sedimentation

Produces sediment which is a pollutant

Produces sediment that carries other pollutants (eg. nutrients, pesticides)
What would I say....
SOLUTIONS when Planning gets difficult:

• What Soil Unit do I need to use? Critical Dominant Soil
• Split the field for better management
• Will a buffer system work?
• Can we change tillage and/or rotation?
• What will cover crops offer?
• Where to Terraces fit?
• CRP???
• More grass in the rotation?
• Any options for double cropping, trees, wildlife, prairie plantings?
Ag Conservation Practices - Questions to Answer

• Economically viable?

• Agronomically sound?

• Environmentally friendly?
Management – “C” Factors

The presence or absence of crop canopy or crop residue is one of the most important factors determining whether erosion will occur, even during periods of high erosion rates.
Continuous No-till

• Results in greatest environmental results
  • Erosion reduced > 95% compared to conventional tillage
• Will take on average 5 years for soil to make the transition
• Soil consolidation is important
• Increased organic matter and improved infiltration will result in higher yields in years that moisture is limiting
Improved Water Quality with No-till

No-till significantly limits sediment reaching water systems.
Cover Crop

- Reduce erosion from wind and water.
- Sequester carbon in plant biomass and soils to increase soil organic matter content.
- Capture and recycle excess nutrients in the soil profile.
- Promote biological nitrogen fixation.
- Weed suppression.
- Provide supplemental forage.
- Soil moisture management.
- Reduce particulate emissions into the atmosphere.
Field Border

• Reduce erosion from wind and water
• Soil and water quality protection
• Provide wildlife food and cover
• Increase carbon storage in biomass and soils
FIELD BORDERS
Grass Waterway
Supporting Practices

Contour Stripcropping

Contouring

Contour Buffer Strips
**RIPARIAN BUFFERS**

Plantings of trees, shrubs, and grasses that catch pollutants in both surface runoff and ground water before those pollutants reach a waterbody, such as a stream or lake. Riparian buffers also improve fish and wildlife habitat.

**FILTER STRIPS**

Strips of grass used to trap sediment, fertilizers, pesticides, and other pollutants before they reach streams and lakes.

**GRASSED WATERWAYS**

Strips of grass seeded within cropland where water tends to concentrate or flow off a field. While they are primarily used to prevent gully erosion, waterways can be combined with filter strips or riparian buffers to trap sediment and other pollutants.

**SHELTERBELTS/FIELD WINDBREAKS**

A row or rows of trees or shrubs used to reduce wind erosion, protect young crops, and control blowing snow. These practices...
Comprehensive Planning