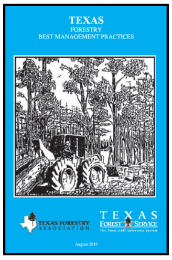
Best Management Practices (BMPs)

- Forestry BMP Bluebook for Texas
  - http://txforestservice.tamu.edu/main/article.aspx?id=71
- Best Management Practices (BMPs) are practices developed to reduce nonpoint pollution in response to the Clean Water Act requirements



Erosion involves 3 basic processes

- **Detachment**: We use BMPs to minimize detachment.
- **Transport**: We use BMPs to alter transport
- **Deposition**: We use BMPs to cause deposition before it reaches the stream

Detachment BMPs

Transport BMPs

Deposition BMPs

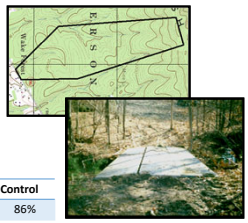
Cutting trees has only a small impact

Preharvest Planning

- Streams and stream crossings
- SMZs
- Topography
- Existing roads
- Future roads, decks, trails
- Sensitive areas
- Viewsheds

Preharvest Training

- Results in 2 MAJOR changes:
  - More use of topo maps
  - Planning for stream crossings



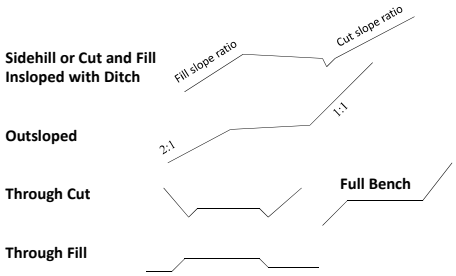
	Trained	Control
BMP implementation	90%	86%
Landowner satisfaction	87.5%	80%
Weather related down-time	25 d / yr	33 d / yr

(Shaffer and Meade 1997)

Getting Water Off Roads

- Road Template
  - Insloped
  - Outsloped
- Structures
  - Waterbars
  - Rolling Dips
  - Broad based dips
  - Water turnouts
  - Ditches and culverts
  - Daylight
  - Gravel
  - Laps
  - Seeding

R3. Road Template Terminology



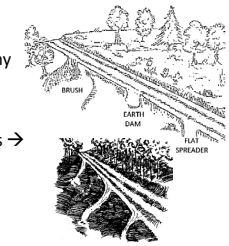
Water Bars on Skid Trails

Rolling Dips

- Used on roads w/ light, infrequent traffic
- Not for use when hauling
- Shorter & deeper than rolling dip
- Very difficult to construct properly

Water Turnouts

- Use on temporary and secondary roads
- Make use of topography
- Will fill over time
- Can create gullies
- Used with wing ditches → and sediment traps



Ditches and Culverts

- For insloped situations can provide adequate drainage
- Expensive
- Require maintenance

Daylighting a Road

Site Closure A Key to BMP Success

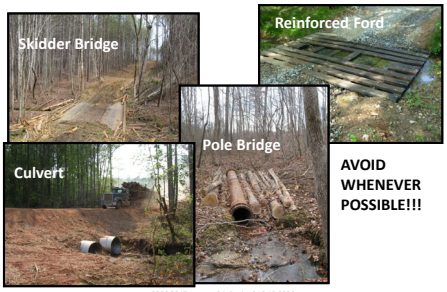
- 1-8 Years Post-Harvest
  - Harvest areas were recovered
  - Roads and skid trails continued to erode
  - Road closure not long-term in many cases
- ORV traffic **MAJOR** problem with closure

(Christopher 2002)

Stream Crossing BMPs

- Type of crossing
- Location of crossing
- Approaches
- Water/erosion control structures
- Permanency
- Stream channel alterations
- Permits?

Stream Cro$$ings



AVOID WHENEVER POSSIBLE!!!

Stream Crossings

- Control of water on approaches at least as important as crossing type.
- Portable bridges minimize in-stream disturbances.
- Installation and maintenance of crossings as important as crossing type

Streamside Management Zone BMPs

- SMZ types
- Stream type
- Width
- Management
- Forested SMZs in ag environs

Streamside Management Zones

- Perennial & intermittent streams
  - Flow > 30% of year
  - 50 feet on each side measured from stream bank
  - Can harvest to 50 ft^2 / acre residual in SMZ
  - **50 & 50**
- Ephemeral streams
  - Carry water less than 30% of year
  - Do not Require SMZ

Site Preparation & Afforestation BMPs

- Mechanical
- Chemical
- Fire

Harvesting BMPs

- Minimize rutting/bare soil
- Redistribute slash
- Wide Tires
- Shovel logging
- Forwarders
- Cable system
- Helicopter

Intermediate Operations

- Thinning
- TSI operations
- Fertilization
- Pesticide applications
- Fire control
- Road maintenance

Wetland (Federal) BMPs

- Silvicultural Exemption
  - Ongoing
  - Normal silvicultural operations
  - Follow BMPs
    - Federal mandatory, state implied
  - Minimal alteration of hydrology
  - No introduction of Toxins
- Need Permit to convert listed bottomland types to pine plantations

Positive Effects of BMP Investments

- Improved water quality
- Sustained site productivity
- Legal compliance
- Public/Landowner approval
- Professional improvement
- Fewer days lost to weather related down-time

Putting it all together: Implementing BMPs

- Study applicable maps and conduct on the ground reconnaissance of the harvest area
- Identify and mark required SMZs
- Locate and flag log decks
- Locate and mark logging road stream crossing
- Locate and mark logging road entrance points from public roads
- Locate logging road control points
  - Places a logging road must either connect or avoid
- Locate and flag the logging road
- Locate and flag designated skid trails, if necessary
- Specify logging road construction standards
- Specify stream crossing structures (culverts, ford, bridge)
- Schedule operations and harvest patterns to best fit site conditions
- Specify close down requirements

Forest Certification

FSC

SFI

FSC vs. SFI

- FSC: 120 M Acres in North America (2010)
- SFI: 193 M Acres in North America (2010)

- Also recognizes American Tree Farm & Canadian Standards Association: brings total to 383 M acres

SUSTAINABLE FORESTRY INITIATIVE
Good for you. Good for our forests.

TREE FARM

FSC

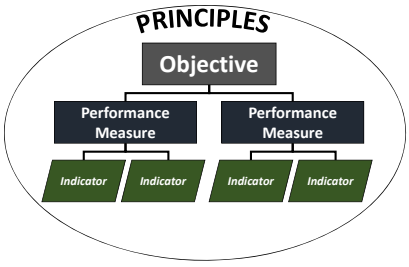
Steps to Certify (SFI)

1. Submit application
2. Contact accredited certification body
3. Implement SFI standards
4. On-site audit (2-4 days) by several experts
5. Complete surveillance audits every 12 months, full re-certificaton every 3 years

Audit Findings (SFI)

- Conformance
  - Certificate issued
- Major nonconformity
  - No certificate issued until corrective ***action*** has been implemented and approved by lead auditor
- Minor nonconformity
  - No certificate issued until corrective action ***plan*** has been created to resolve issue within one year and has been approved by lead auditor
- Audit reports are published online (transparency)

SFI Organization



SFI Principles

1. Sustainable Forestry
2. Forest Productivity and Health
3. Protection of Water Resources
4. Protection of Biological Diversity
5. Aesthetics and Recreation
6. Protection of Special Sites
7. Responsible Fiber Sourcing Practices in North America
8. Avoidance of Controversial Sources including Illegal Logging in Offshore Fiber Sourcing
9. Legal Compliance
10. Research
11. Training and Education
12. Public Involvement
13. Transparency
14. Continual Improvement

SFI Objectives (2010-2014)

- **Objectives 1-7**: Forest Land Management
- **Objective 8-13**: Fiber Sourcing
- **Objectives 14-20**: Forest Land Management & Fiber Sourcing

Objective 1

To broaden the implementation of **sustainable forestry** by ensuring **long-term** harvest levels based on the use of the **best scientific information** available.

Performance Measure 1.1

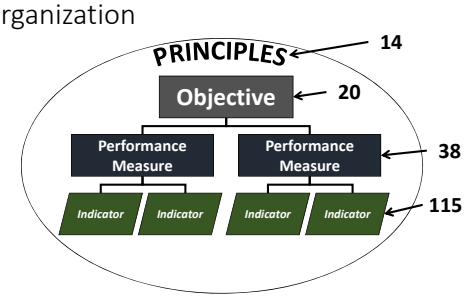
Program Participants shall ensure that forest management plans include **long-term** harvest levels that are sustainable and consistent with appropriate **growth-and-yield** models.

Indicator 1

Forest management planning at a level appropriate to the size and scale of the operation, including:

a) a long-term resources analysis;
b) a periodic or ongoing forest inventory;
c) a land classification system;
d) soils inventory and maps, where available;
e) access to growth-and-yield modeling capabilities;
f) up-to-date maps or a geographic information system (GIS);
g) recommended sustainable harvest levels for areas available for harvest; and
h) a review of non-timber issues (e.g. recreation, tourism, pilot projects and economic incentive programs to promote water protection, carbon storage, bioenergy feedstock production, or biological diversity conservation, or to address climate-induced ecosystem change).

SFI Organization



Key SFI Indicators

- Program to implement state or provincial BMPs during all phases of management activities.
- Contract provisions that specify conformance to BMPs.
- Plans that address wet-weather events (e.g. forest inventory systems, wet-weather tracts, definitions of acceptable operating conditions).
- Monitoring of overall BMP implementation.

Key SFI Indicators

- Program Participants shall implement forest management practices to protect and maintain forest and soil productivity.

Key SFI Indicators

- **<u>Average size</u>** of clearcut harvest areas does not exceed **120 acres** (50 hectares), except when necessary to meet regulatory requirements or to respond to forest health emergencies or other natural catastrophes.

Key SFI Indicators

- Reforestation, unless delayed for site-specific environmental or forest health considerations or legal requirements, through **planting within two years** or two planting seasons, or by planned **natural regeneration** methods **within five years**.

Key SFI Indicators

- Trees in clearcut harvest areas are at least **3 years old or 5 feet** (1.5 meters) high at the desired level of stocking **before adjacent areas are clearcut**, or as appropriate to address operational and economic considerations, alternative methods to reach the performance measure are utilized by the Program Participant.

Key SFI Indicators

- Clear criteria to judge **adequate regeneration** and appropriate actions to **correct understocked areas** and achieve **acceptable species composition** and stocking rates for both planting and natural regeneration.

Key SFI Indicators

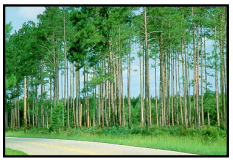
- Minimized plantings of exotic tree species, and research showing that exotic tree species, planted operationally, pose minimal risk.

Key SFI Indicators

- Retention of vigorous trees during partial harvesting, consistent with scientific silvicultural standards for the area.

Key SFI Indicators

- Program to address visual quality management.
- Incorporation of aesthetic considerations in harvesting, road, landing design and management, and other management activities where visual impacts are a concern.



Key SFI Indicators

- Program Participants shall minimize chemical use required to achieve management objectives while protecting employees, neighbors, the public and the environment, including wildlife and aquatic habitats.

Tree Farm System

- Oldest certification system – 1941
- 74,000 tree farms
- 20.5 million acres in US
- Apply through TFA

Tree Farm System

Selected Landowner Requirements

1. Acreage ranging from 10 to 10,000 acres
2. Ownership must be privately held and not publicly traded (can be municipalities, schools, private universities, watersheds, state government organizations, small local businesses)
3. Owner must clearly exhibit commitment to sustainable management though management objectives or management plan

Tree Farm System

Management Plan Must Contain:

- landowner objectives
- forest condition and health
- management activities/ prescriptions
- tract map
- soils and water resources
- wood and fiber production
- threatened and endangered species, high conservation value forests and other special sites
- invasive species and integrated pest management

EQIP

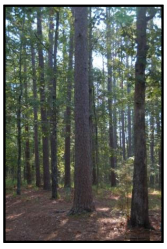
- The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that promotes agricultural production and environmental quality as compatible National goals. The Natural Resources Conservation Service (NRCS) administers EQIP.

NRCS Photo

United States Department of Agriculture
NRCS Natural Resources Conservation Service

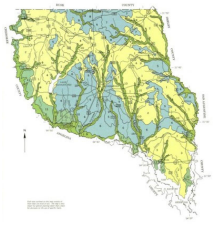
EQIP

- Through EQIP, farmers and ranchers may receive financial and technical help to install or implement structural and management conservation practices on eligible agricultural land.



EQIP

- EQIP was reauthorized in the Food, Energy and Conservation Act of 2018 (Farm Bill).

EQIP

- Fund up to $300,000 over 6 year period
- Varies state by state
- Varies county by county
- Nacogdoches
  - Timber Stand Improvement
  - Prescribed Burn
  - Firebreak
  - Site Prep (Mech & Chem)
  - Planting Stock & Costs
    - High Density: 6 x 10 ft
    - Low Density: 8 x 12 ft