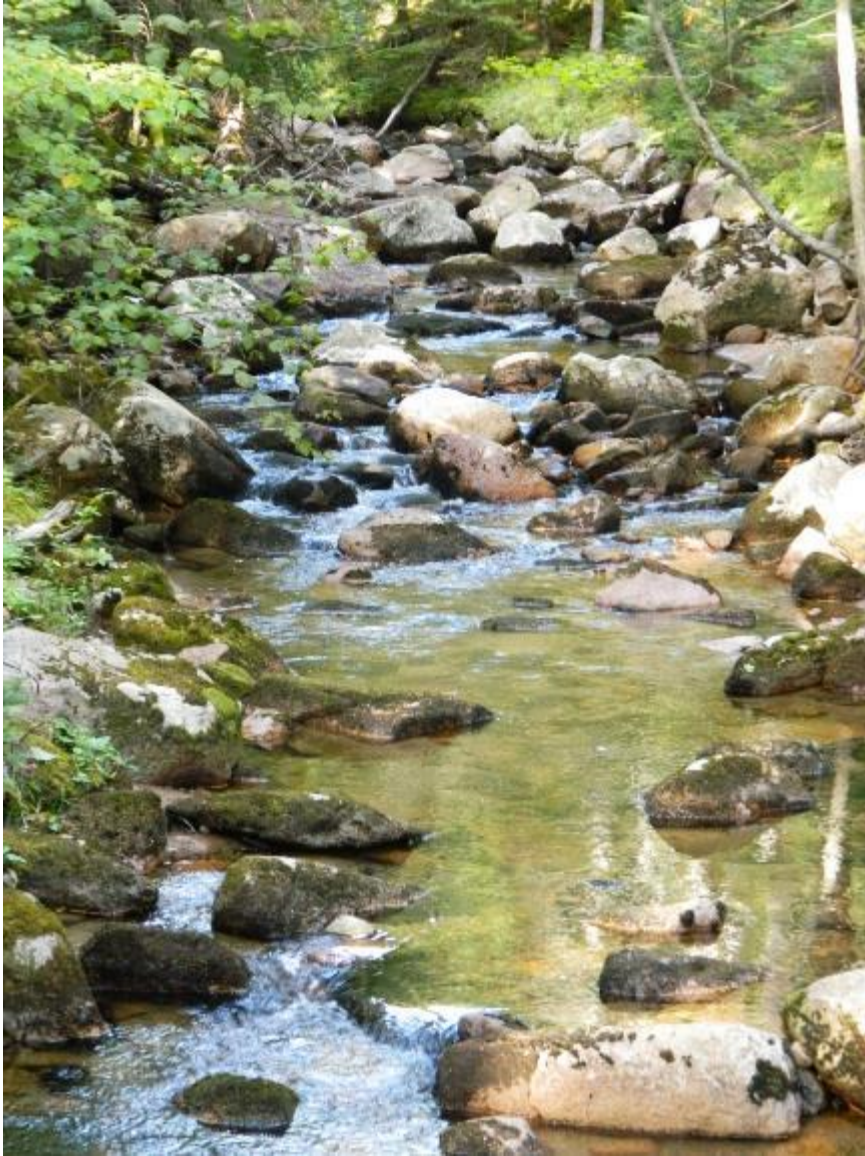


# Statewide BMP Study



Presentation for:  
**MI SAF Annual Meeting**  
**Forests for Fish**  
March 2017



**STEIGERWALDT**  
Your confidence lands here.

Presented by: Laura B. Heier, ACF

# Acknowledgments

Project Funding: State of Michigan

Grant Administration



Project Coordination/Oversight

Others:

Consulting Partners:



**Green Timber  
Consulting Foresters, Inc.**

**Martell Forestry, Inc.**



Landowners  
Consultants  
Loggers  
Mills

Countless others

Agency Representatives:







## MICHIGAN FORESTRY BEST MANAGEMENT PRACTICES

Look for this report on the  
MFPC Website

[www.michiganforest.com](http://www.michiganforest.com)



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### Protecting, Promoting and Sustaining Michigan's Forest Products Economy

Look closer at Michigan's forests. Sweeping vistas and critical habitat. Jobs that help our economy thrive. Bowling pins, eyeglasses, sailboats and syrup. Precious resources and vast opportunities. This is what we protect, this is what we grow.

[Just released: 2017 SFI Training Schedule](#)

[2016 Statewide BMP Monitoring Study \(Region 2 & 3 - Eastern U.P., Lower Peninsula and Statewide Summary Results\)](#)

[2015 Statewide BMP Monitoring Study \(Region 1 - Western U.P.\)](#)

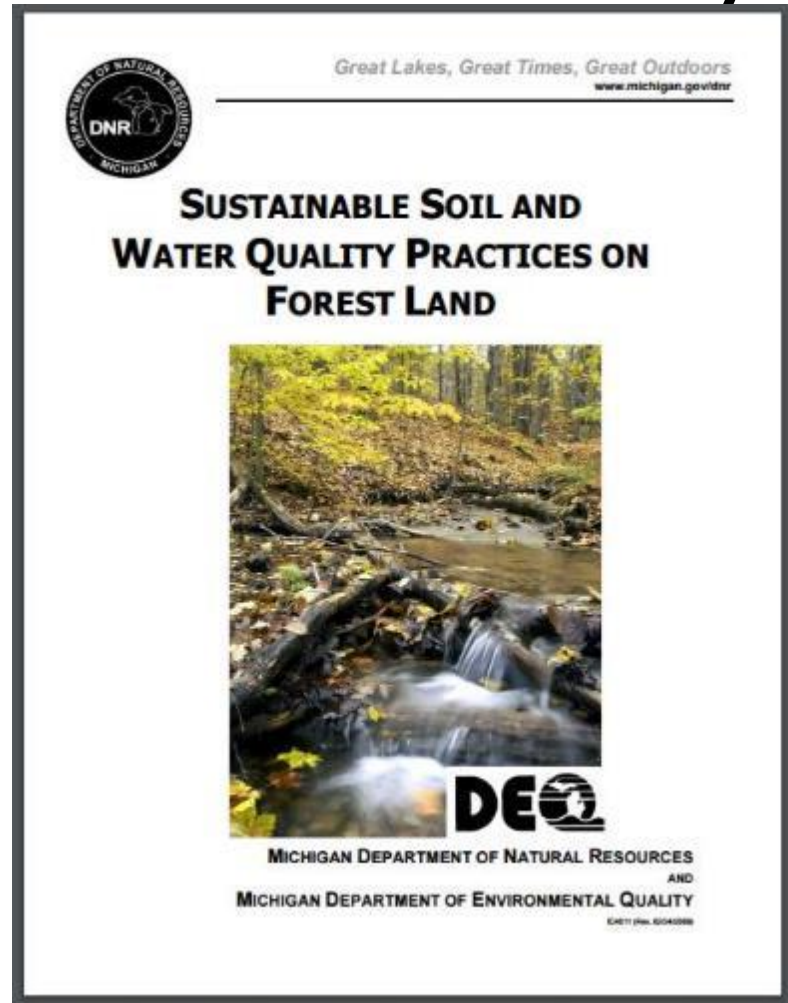
# BMP's...What are they?

*Developed following the Clean Water Act passed in 1970.*

*State specific generally accepted VOLUNTARY practices utilized for the protection of:*

**Water  
Soil**

*Goal- Prevent and/or reduce nonpoint source pollution*



[http://www.michigan.gov/documents/dnr/IC4011\\_SustainableSoilAndWaterQualityPracticesOnForestLand\\_268417\\_7.pdf](http://www.michigan.gov/documents/dnr/IC4011_SustainableSoilAndWaterQualityPracticesOnForestLand_268417_7.pdf)



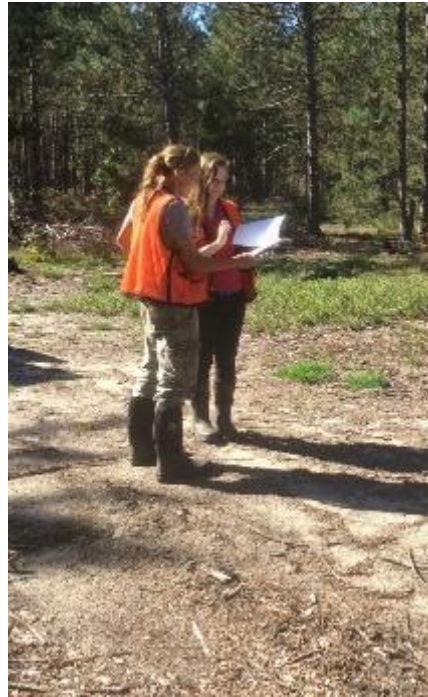
# Project Background

- 2011 & 2014 SFI audits performed
- Identified the importance and need of detailed statewide BMP evaluation, comparable to past efforts
- Record of results, proof of BMP evaluation
- Evaluate regional differences across the state and by “ownership” types

Are BMP's utilized?

Are they successfully protecting and/or reducing nonpoint source pollution?

Should they remain voluntary?



# BMP Monitoring Regions



Region Boundary  
2015 Study Extent  
2016 Study Extent  
Cities

Region 1 - Western Upper Peninsula  
Region 2 - Eastern Upper Peninsula  
Region 3 - Lower Michigan

# Site Selection Targets

# of sites per landowner type based on flow of wood to mills  
Not based on ownership size

Sites Per Ownership and Region				
Ownership	All Regions	Region 1 Western UP	Region 2 Eastern UP	Region 3 Lower Peninsula
Large Private	59	39	20	0
Small Private (NIPF)	137	33	39	65
State/County	86	19	37	30
National Forest	17	8	4	5
<b>Total</b>	<b>299</b>	<b>99</b>	<b>100</b>	<b>100</b>

## Site Requirements

1. Active between May 1, 2014 and April 30, 2016
2. At least 5 acres in size
3. Sale has a mapped water feature (lake, river, stream, or wetlands) within one of the quarter-quarter descriptions the sale is located in
4. Must have a road accessible by two-wheel drive vehicle (all mapped roads in the MI base road layer) bisecting the selected quarter-quarter section(s) that the sale occurred within (GIS road layer sourced from the MI Department of Technology).



# Site Ratings and Questions

Rating system developed for previous audits, site questions were slightly modified for 2015/2016 projects

Code	Rating Description
<b>A</b>	BMP needed and applied correctly (as per guidelines)
<b>V</b>	BMP needed, acceptable variation (differs from guidelines, no erosion or negative impact to water quality, soil productivity, or wetlands)
<b>1</b>	BMP needed, applied incorrectly (inadequate effectiveness)
<b>2</b>	BMP needed, not applied (comment on severity of neglect)
<b>NA</b>	BMP not applicable (practice not needed)
<b>0</b>	Insufficient information to rate (minimal use if representative present)

## Site Questions- total of 9 categories

- 1) Equipment Operation and Maintenance
- 2) Roads
- 3) Road Closure and Retirement
- 4) Stream Crossings
- 5) Skidding and Skid Trails
- 6) Landings and/or Decking Areas
- 7) Riparian Management Zones
- 8) Wetlands
- 9) Other Considerations (archeological and NHI protection, site preparation practices, harvest timing, etc.)





# Field training held in September, preparing monitoring staff



**Field work completed October 2017**  
**Report of findings completed February 2017**

# Results- Statewide

When needed, BMP guidelines were Applied Correctly **96.1%**

Results Summary		
Rating	No. of Observations	Percent of BMPs Needed
BMP Applied Correctly (A)	8,400	96.1
BMP Acceptable Variation (V)	149	1.7
BMP Applied Incorrectly (1)	67	0.8
BMP Needed & Not Applied (2)	122	1.4
BMP Application Not Needed (NA)	13,630	-
Insufficient Information (0)	879	-
Total BMP Applications Needed	8,738	-
Total BMP Applications Assessed	23,247	-

- Region 1- Western UP  
Applied Correctly 95%

- Region 2- Eastern UP  
Applied Correctly 97%

- Region 3-Lower Peninsula  
Applied Correctly 96%

## Compared to:

Wisconsin- 2015 report identified a 90% AC rating (36 sites)

Indiana- 1996 though 2015 report identified a 89.59% AC rating (400 sites)

2011- MI SFI audit 93% (29 sites)

2014- MI SFI audit 88.56% (36 sites)



# Results- Statewide

- 81 questions/applications were evaluated for each of the 299 sites
- Most common rating was BMP Application Not Needed (NA)
  - Region 1- 51%
  - Region 2- 62%
  - Region 3- 66%
- All sites had at least 1 BMP needed





# Results- Statewide

Observations by Category			
Category	No. of Times BMP Was Needed	Total Possible Ratings	Percent BMP Needed of Total
1. Equipment Operation and Maintenance	513	1,097	46.8
2. Roads	1,901	4,186	45.4
3. Road Closure and Retirement	803	1,794	44.8
4. Stream Crossing	304	4,784	6.4
5. Skidding and Skid Trails	1,562	2,391	65.3
6. Landing and/or Decking Areas	1,530	1,794	85.3
7. Riparian Management Zones	1,488	4,809	30.9
8. Wetlands	76	1,196	6.4
9. Other Considerations	561	1,196	46.9
Overall	8,738	23,247	37.6



- Most common categories needing BMPs
  - Landings and skidding
- Least frequently needed BMP applications for all regions
  - Wetlands and Stream Crossing
- Regions 2 & 3 needed on average 25 BMP's per site (max= 58, min=10)
- Region 1 needed 37 BMP's on average per site (max=71, min=18)

# Results- Acceptable Rating Evaluation

Statewide results show 96% acceptable rating

BMPs answered as Acceptable for greater than 75% of sites

- Landings: Re-vegetated/stabilized/leveled as needed
- Equipment Operation and Maintenance: Provided for adequate storage and disposal of fuel, debris, lubricants, fluids, and rinsate from equipment cleanup.
- Road Closure: Erodible soils stabilized by seeding, natural vegetation, or brush
- Landing and/or Decking Areas: Drain surface water into buffer strip or vegetation and logging residue does not enter water bodies.

# Acceptable Variation Rating

Only 1 question identified as AV on > 10 percent of sites that required the BMP

## RMZ minimum width $\geq$ 100 feet?

- Statewide, 45.2% of RMZs were less than the min. recommendation of 100 feet
- 4.1 percent of the RMZs measured, were found to not adequately protect water quality (Specifically providing recommended shading and filter runoff)
  - RMZ widths were measured at 3 random points and averaged

RMZ Width Analysis	
% of Sites With RMZs Averaging <100 feet	45.2
% of Sites With RMZs Averaging $\geq$ 100 feet	54.8
% of Sites With Ruts in the RMZ	0.0



# Results- Culverts

The 2015 results show that culverts had a slightly higher likelihood of being installed incorrectly if they were being used for a stream crossing

## Region 1

Culvert Inspection (Percent Properly Installed)		
	Cross Drainage	Stream Crossing
Percent Yes	80.5 percent	76.9 percent
Percent No	19.5 percent	23.1 percent

Percent of Culverts Properly Installed - Regions 2 & 3		
	Region 2	Region 3
Percent Yes	66.7	100.0
Percent No	33.3	0.0

Culverts specifically installed for completion of a timber sale were evaluated for this project

# Results- Improvement Areas

## Region 1- Western UP

BMP Questions Receiving Applied Incorrectly (1) or Not Applied (2)			
Questions Answered as Not Acceptable Most Frequently	Question ID	No. of Sites Coded 1	No. of Sites Coded 2
Skidding and Skid Trails: Excessive rutting avoided: 6 inches deep and 25-feet long in RMZ, 12 inches deep and 50 feet long in other areas (pg. 64)	5f	4	4
RMZs: No logging slash/debris disposed from outside of strip into strip (pg. 21)	7i	1	7
Roads: Cross drainage culverts properly sized (min. 12") and installed (pgs. 49-50)	2f	3	2
Roads: Drain surface water into filter strip or vegetative draw (pgs. 47-49)	2g	2	3
Roads: Energy dissipaters at cross drainage and/or stream culvert outlets where necessary (pg. 35)	2h	3	2
Skidding & Skid Trails: Water bars properly installed as needed (pgs. 40 and 42)	5b	1	4
Skidding & Skid Trails: Rehabilitate skid trails as needed (pg. 68)	5h	1	4
Stream Crossing: Culverts properly armored if needed (pg. 56)	4h	1	3
Skidding & Skid Trails: Gullies, seeps and other permanently wet areas avoided where feasible (pg. 68)	5d	2	2
RMZs: Minimum width $\geq$ 100 feet (pgs. 20, 22-23)	7d	4	0

# Results- Improvement Areas

## Region 2- Eastern UP

### Questions Receiving Applied Incorrectly (1) or Not Applied (2) (Region 2)

Questions Answered as Not Acceptable	Question ID	No. of Sites Coded 1	No. of Sites Coded 2
<b>Skidding and Skid Trails: Excessive rutting avoided: 6 inches deep and 25 feet long in RMZ, 12 inches deep and 50 feet long in other areas.</b>	5f	5	3
<b>Skidding and Skid Trails: Rehabilitate skid trails as needed.</b>	5h	0	4
<b>Roads: Water diversion ditches installed properly.</b>	2e	2	1
<b>Roads: Crown road on sections crossing level ground or low areas.</b>	2c	1	1
<b>Roads: Cross drainage culverts properly sized (min. 12 inches) and installed.</b>	2f	1	1
<b>Road Closure: Water bars properly spaced and installed where slope of road requires and where temporary cross drainage culverts were removed.</b>	3b	0	2
<b>Road Closure: Erosion control features functional.</b>	3c	1	1
<b>RMZs: Buffer strip clearly established.</b>	7c	0	2
<b>Wetlands: Excessive rutting avoided: &gt; 6 inches deep and 25 feet long.</b>	8d	1	1
<b>Other: Harvesting is timed for appropriate conditions and operations minimize rutting and compaction damage.</b>	9d	1	1



# Results- Improvement Areas

## Region 3- Lower Peninsula

### Questions Receiving Applied Incorrectly (1) or Not Applied (2) (Region 3)

Questions Answered as Not Acceptable	Question ID	No. of Sites Coded 1	No. of Sites Coded 2
Roads: Broad base dips installed properly.	2d	2	6
Road Closure: Erosion control features functional.	3c	2	5
Road Closure: Erodible soils stabilized by seeding, natural vegetation, or brush.	3d	0	5
Skidding and Skid Trails: Rehabilitate skid trails as needed.	5h	0	5
Skidding and Skid Trails: Excessive rutting avoided: 6 inches deep and 25 feet long in RMZ, 12 inches deep and 50 feet long in other areas.	5f	1	3
Roads: Crown road on sections crossing level ground or low areas.	2c	2	1
Roads: Water diversion ditches installed properly.	2e	0	3
Road Closure: Water bars properly spaced and installed where slope of road requires and where temporary cross drainage culverts were removed.	3b	0	3
Skidding and Skid Trails: Water bars properly installed as needed.	5b	1	2
Skidding and Skid Trails: Gullies, seeps, and other permanently wet areas avoided where feasible.	5d	0	3

# Results- Supplemental Comments

Following each site visit, the monitoring teams were asked to answer eight supplemental questions about the overall implementation of BMPs on the timber sale

- Results of these supplemental BMP questions reported a high confidence in BMP conformance
- The analysis found that 0 sales in Region 2, and 3% of timber sales did not meet the monitoring teams' expectations in protecting water quality in Regions 1 & 3
- Sites that did not meet expectations had unacceptable ratings that included
  - erosion of roads, excessive rutting in wetlands, or improper stream crossings
- Even with a rating of "Does not meet expectations," most of these concerns were found in sites rated as having either a moderate or slight impact on water quality
- Only one site was rated as having a severe impact on water quality

# Landowner Type Comparison

Result by Ownership (All Regions)				
	Federal	Large Private	State/County	NIPF
<b>No. of Audit Sites</b>	<b>17</b>	<b>59</b>	<b>86</b>	<b>137</b>
<b>Percent of Needed:</b>				
Applied Correctly (A)	95.4	96.2	95.9	96.4
Acceptable Variation (V)	1.4	2.1	1.7	1.5
Applied incorrectly (1)	1.6	1.0	0.6	0.6
Not Applied (2)	1.6	0.7	1.8	1.5
<b>Percent of Total Sum:</b>				
Applied Correctly (A)	34.1	42.8	33.9	35.0
Acceptable Variation (V)	0.5	1.0	0.6	0.5
Applied incorrectly (1)	0.6	0.4	0.2	0.2
Not Applied (2)	0.6	0.3	0.6	0.5
Not Applicable (NA)	61.0	52.7	60.3	60.0
Insufficient Info (0)	3.2	2.8	4.4	3.8
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Little difference between the groups (1.7 to 3.2 %)



# Summary- Statewide findings of interest:

- The monitoring effort found that when BMPs were needed, the guidelines were Applied Correctly (A)
  - 95.0% Region 1
  - 97.0% Region 2
  - 96.1% Region 3
- The BMP category of “Landings and/or Decking Areas” had the highest occurrence of Applied Correctly (A) ratings in Region 2 (100.0 percent), and the BMP category of “Equipment Operation and Maintenance” had the highest occurrence of applied correctly (A) ratings in Region 3 (100.0 percent)
- The question “Skidding and Skid Trails: Excessive rutting avoided: 6 inches deep and 25 feet long in RMZ, 12 inches deep and 50 feet long in other areas” was most frequently rated as unacceptable (Applied Incorrectly (1) or Not Applied (2)) for Region 2 and occurred on eight timber sales
- The question “Roads: Broad base dips installed properly” was most frequently rated as unacceptable (Applied Incorrectly (1) or Not Applied (2)) for Region 3 and occurred on eight timber sales
- RMZ BMPs are needed nearly 50 percent of the time in Region 1, 30 percent in Region 2, and only 15 percent in Region 3. Both Regions 2 and 3 had lower percent of BMPs needed in almost every category when compared to Region 1
- A total of 45.2 percent of RMZs statewide were less than the minimum recommendation of 100 feet; yet, only 4.1 percent of the RMZs measured during the study do not adequately protect water quality (specifically providing recommended shading and filter runoff capacities
- The monitoring teams found that over 93 percent of the timber sale sites had a “negligible” to “no impact” assessment ratings on water quality
- Little variation in BMP compliance occurred across landowner classes. Total BMP applied correctly (A) ratings varied by less than two percent among the ownership types

# What's next?

Further discussion and analysis to:

- 1) Determine if alterations to current BMP guidelines are applicable?
- 2) Evaluate negative affects of improperly or ignored BMP practices?
- 3) Schedule future BMP monitoring across the State?
- 4) Create field "pocket" manual for industry professionals?
- 5) Work to keep BMP guidelines voluntary?
- 6) .....



Thank you for your time and interest!



Questions?