



Implementation of Timber Harvesting and Forest Management Guidelines on Public and private Forest lands in Minnesota

Monitoring for Implementation 2016 & 2017

MFRP Meeting

March 2018

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2016_17 Monitoring Report

Timber Harvesting and Forest Management Guidelines on Public and Private Forest Land in Forested Watersheds in Minnesota



2016 and 2017 Monitoring Implementation Results

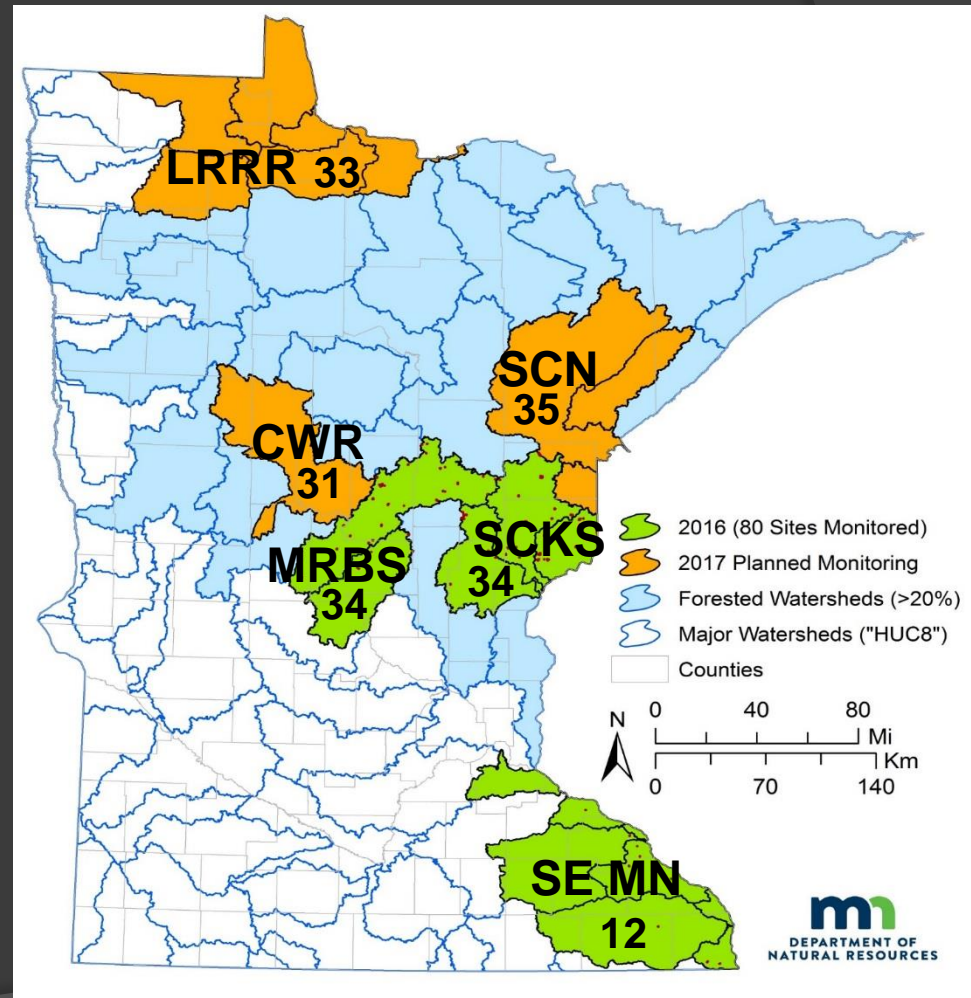
A report by the Minnesota Department of Natural Resources,
Forest Management Guideline Implementation Monitoring Program
Respectfully submitted to the Minnesota Forest Resources Council



<http://www.dnr.state.mn.us/publications/forestry/index.html>

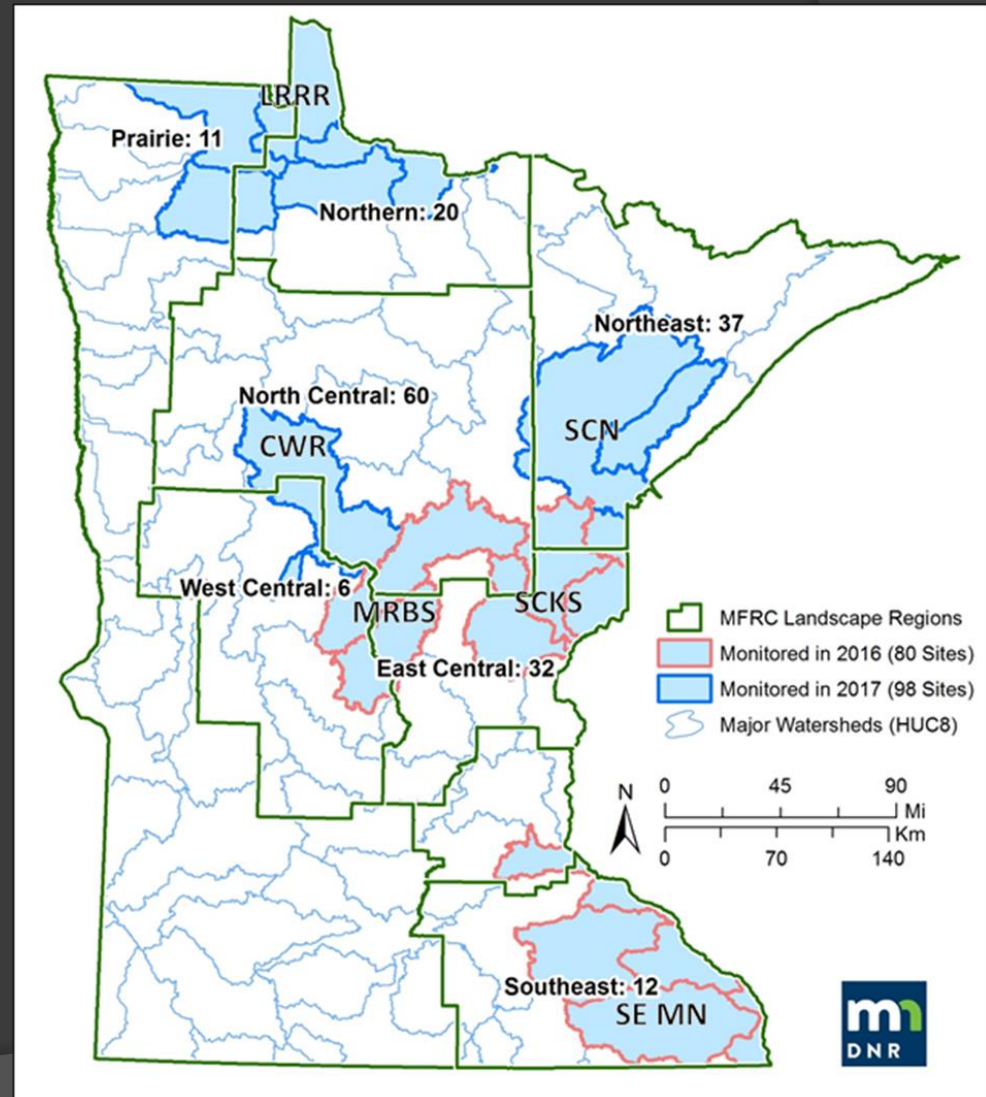
Watershed Sample Units

- **CWR:** Crow Wing River watershed (31 sites)
- **LRRR:** Lake of the Woods, Rapid River, Roseau River and Rainy River (33 sites)
- **MRBS:** Mississippi River – Brainerd and Sartell (34 sites)
- **SCKS:** Upper St. Croix, Kettle and Snake River watersheds (34 sites)
- **SCN:** St. Louis, Cloquet and Nemadji River watersheds (35 sites)
- **SE MN:** SE Minnesota watersheds including: Root River, Zumbro River, and Mississippi River – La Crescent, Lake Pepin, Reno, and Winona (12 sites)



Sites by MFRC Landscape Region

- Northern – 20
- Northeast - 37
- North Central – 60
- East Central – 32
- West Central – 6
- Southeast – 12
- Prairie - 11



Monitoring Sites

- 179 sites
- 6 watershed sample units
- Harvest activity summer 2014 - summer 2016
 - Average site size 52 acres

Watershed Unit	Land Ownership Category					
	County	Federal	Forest Industry & Corporate Lands	State	NIPF & Tribal	Total
CWR	8	0	3	11	9	31
LRRR	2	0	2	20	9	33
MRBS	8	0	1	7	18	34
SCKS	8	0	0	9	17	34
SCN	11	1	9	6	8	35
SE MN	0	0	0	12	0	12
Total	37	1	15	66	60	179

Overview of Results

Generally high and/or improved implementation:

- ◎ **Filter strip management** (97% / 91%)
- ◎ **RMZ management** (79% + 17% partial)
- ◎ **Leave tree (80%) & Snag retention**
 - Diversity of leave tree species
- ◎ **CWD retention** (96%)
- ◎ **Avoidance of rutting** on crossings (95%)
- ◎ **Minimizing infrastructure** (77%)
- ◎ **Condition & location of landings**
- ◎ **Use of 2012 revised guidelines** (90+%)

Overview of Results

Opportunities for improvement:

- ⦿ Avoidance of **wetland crossings**
 - 28% could have been avoided
- ⦿ Use of **erosion control practices** were needed
- ⦿ Retention of **FWD on biomass harvest sites**
- ⦿ Reported awareness of known **ETS species**
- ⦿ Issues with **VQ sensitivity interpretation**

- ⦿ **Certain guidelines in specific watersheds**

Filter Strips

1042 monitored



- 97% little or no soil disturbance
- 91% no soil disturbance as well as avoiding landings
- Erosion occurring in 13 Filter Strips
 - 4 with sediment reaching wetland

Riparian Management Zones

104 RMZs monitored on 71 sites



Only 3 used 2005 Standards



79% Compliance

17% partial (50%+ of width)

Riparian Management Zones

Table 8. RMZs meeting guideline recommendations by watershed sample unit.

Watershed Unit	Total Sites	Sites with RMZs	Total RMZs (#)	Trout Stream (%)	Non-trout Streams (%)	Lakes & OWW (%)	Total Compliance (%)	Partial Compliance (>50%)
CWR	31	11	24	-	60%	79%	75%	13%
LRRR	33	12	14	-	71%	-	71%	29%
MRBS	34	13	17	-	83%	73%	76%	24%
SCKS	34	11	16	-	92%	50%	81%	13%
SCN	35	22	30	100%	80%	100%	87%	13%
SE MN	12	2	3	67%	-	-	67%	33%
Grand Total	179	71	104	83%	79%	78%	79%	17%

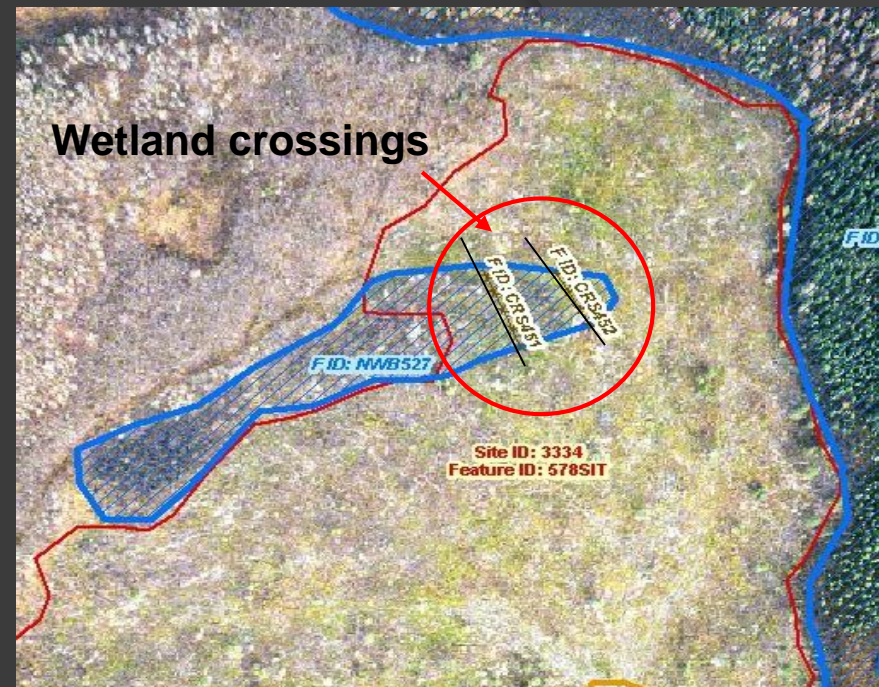
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LRRR	33	12	14	-	71%	-	71%	29%
MRBS	34	13	17	-	83%	73%	76%	24%
SCKS	34	11	16	-	92%	50%	81%	13%
SCN	35	22	30	100%	80%	100%	87%	13%
SE MN	12	2	3	67%	-	-	67%	33%
Grand Total	179	71	104	83%	79%	78%	79%	17%

Crossings

- 335 crossings
 - 307 NOWW crossings
 - 19 stream crossings
- Most (64%) from skid trails
- 28% avoidable
 - 94 on Non-open water wetlands
 - 1 avoidable stream crossing



NOWW Crossings by watershed

Watershed Unit	# Sites with crossing	Total # of crossings Observed	% Avoidable NOWW Crossings
CWR	10	21	33%
LRRR	19	104	28%
MRBS	22	50	56%
SCKS	29	109	26%
SCN	19	24	0%
SE MN	5	8	25%

Approaches and segments

- ◎ 659 approaches
- ◎ 95% in good shape
- ◎ 32 (5%) required erosion control (mostly skid trails)
 - Only 8 had erosion control implemented
 - 18 allowed sediment to water/wetland
- ◎ Most issues on MRBS, SCKS and SE MN
- ◎ Similar results for WQ segments



Infrastructure

- ◎ 77% of sites met 2012 recommendations
- ◎ Best compliance on smaller sites
 - <20 acres – 100% compliance
 - 20-30 acres – 90%
 - >30 acres – 63%



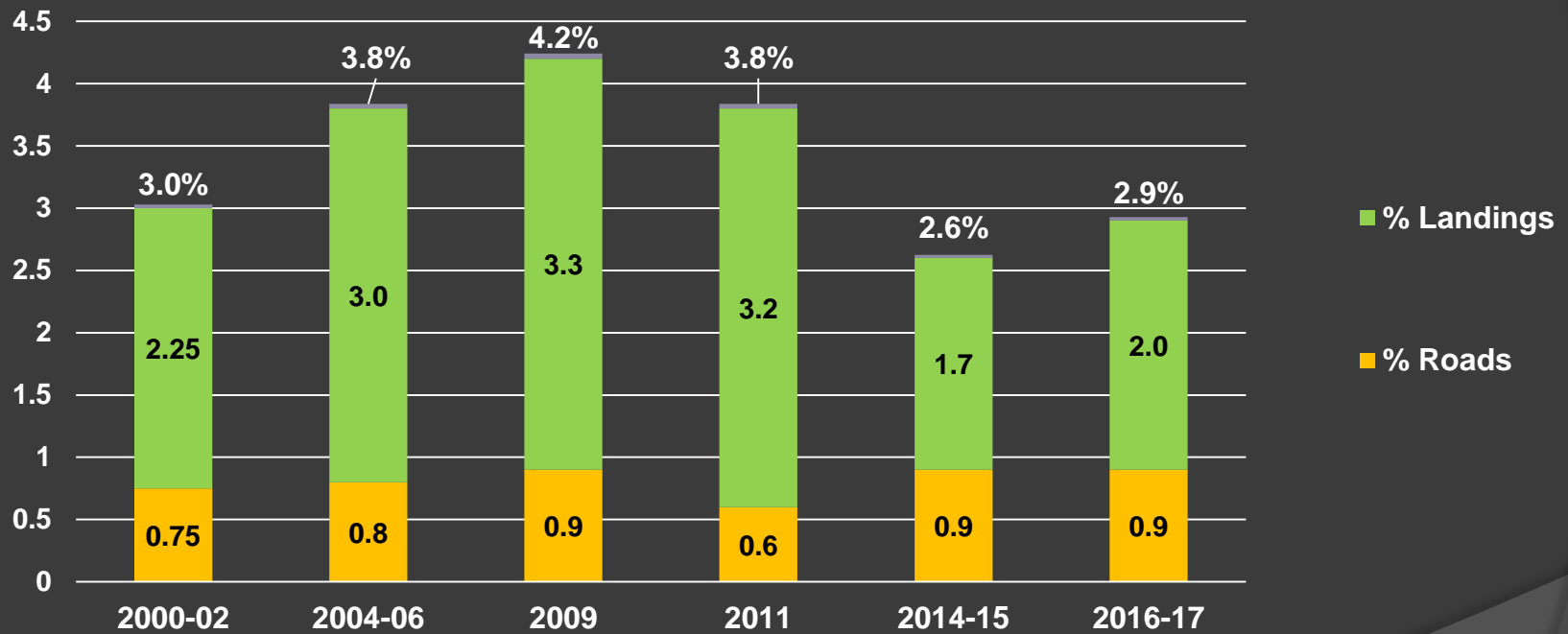
Infrastructure

- 77% of sites met 2012 recommendations
- Best compliance on smaller sites
 - <20 acres – 100% compliance
 - 20-30 acres – 90%
 - >30 acres – 63%
- CWR: 84%
- LRRR: 52%
- MRBS: 78%
- SCKS: 70%
- SCN: 94%
- SE MN: 100%



Infrastructure – Percent of Area

Percent of Area



Landing Locations

- ◎ 451 landings
- ◎ 91 (20%) located in wetland, filter strip or RMZ where alternative was available



Landing Locations

- ◎ 451 landings
- ◎ 91 (20%) located in wetland, filter strip or RMZ where alternative was available

Why?

- Operationally convenient?
- Landing sprawl?
- Wetland identification?
- 56% of responses “unsure”



Landing Locations

- 451 landings
- 91 (20%) located in wetland, filter strip or RMZ where alternative was available

% landings in wetland or filter strip

- CWR: 9%
- LRRR: 24%
- MRBS: 20%
- SCKS: 34%
- SCN: 7%
- SE MN: 9%



Leave Tree Retention

- ◎ 158 sites assessed for leave trees
- ◎ 80% met recommendations
 - 44% via scattered
 - 49% via Clumps & RMZs 👍
 - 3 sites – no leave trees due to safety or silviculture
 - All sites had some leave trees
- ◎ SE MN – 100%
- ◎ LRRR & SCKS - 65% and 69%



Leave Tree Retention



Watershed scale

Watershed Unit	Sites Evaluated for LTs	*Scattered	*LTC & RMZ	*Met both ways	% Sites Meeting Guidelines
CWR	27	12	15	4	89%
LRRR	31	13	16	9	65%
MRBS	28	15	9	4	82%
SCKS	29	14	12	7	69%
SCN	34	6	22	3	85%
SE MN	9	9	3	3	100%
Total	158	69	77	30	80%

Leave Tree Characteristics

- ◎ Species preference:
 - typically good-excellent species being retained
- ◎ Species richness & presence of large trees was variable:
 - SCKS & SE MN highest
 - SCN lowest richness

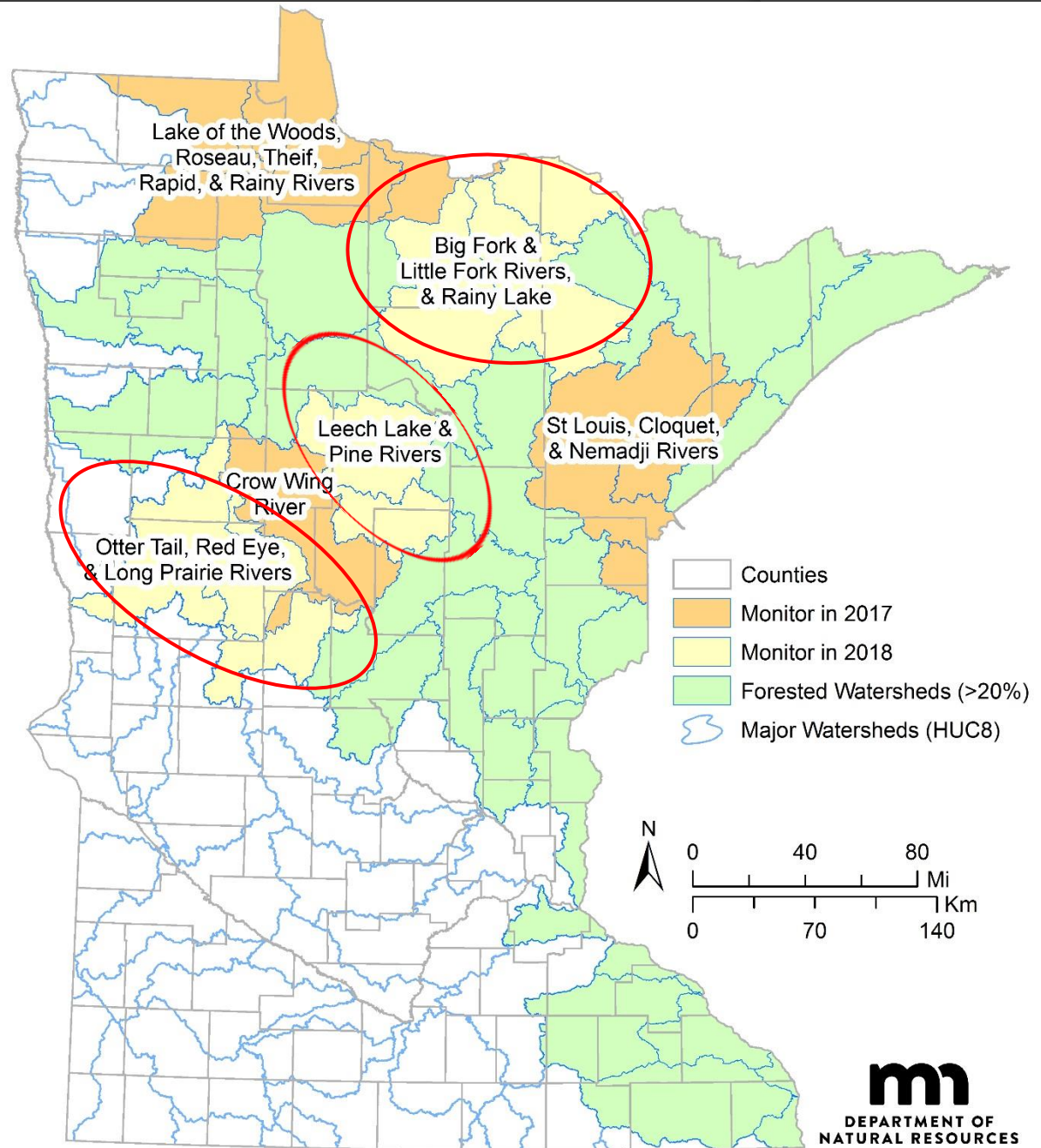


Conclusions

- ⦿ Generally similar to 2014_15 and improved over 2011 reports 👍
- ⦿ Conversion to revised guidelines 👍
- ⦿ Still some opportunities for improvement
 - Focus Outreach to address these
- ⦿ Watershed based Monitoring
 - Better understanding of implementation
 - Framework for localized outreach
 - Efficiencies in travel = reduced costs

2018 Monitoring

Goal: 90 sites



Forest Disturbance Sites – 2018 Monitoring

active summer 2016 – summer 2017

Watershed Unit	Land Ownership Category					
	County	Federal	Forest Industry & Corporate Lands	State	NIPF & Tribal*	Total
Rainy River@ Rainy lake, Little Fork, and Big Fork	184	56	116	245	149	750
Leech lake River and Pine River	79	8	8	31	76	202
Otter Tail, Redeye, and Long Prairie R	-	-	-	10	38	48
Total	263 (21%)	64 (6%)	124 (12%)	285 (29%)	263 (26%)	1000

Questions

Biomass, CWD, Snags

⦿ Biomass

- 31 sites utilized biomass as product
- 74% met FWD retention guidelines


⦿ CWD


- 96% compliance
- Over ½ with 20+ pieces of CWD/acre

⦿ Snags

- Nearly all retained some snags
- Mean range from 1.5 – 3.5 per acre

Rutting in NOWW Crossings & Sites

- ⦿ Rutting on only 5% of all NOWW crossings 
 - Improved from 13% last report & 33% from 2011
- ⦿ 74% were on skid trails
- ⦿ Half resulted in 50%+ of width rutted

- ⦿ At Site Scale:
 - 92% of sites – no rutting recorded
 - <2% (by area) of rutted sites impacted 

Visual Quality

- 141 sites rated for VQ
- 70% of agency and industry lands indicated awareness of the VQ rating
- 72% indicated the correct VQ rating
- For the 28% of sites incorrectly identifying the correct VQ,
 - most (77%) related to recreational trails, navigable streams etc.

ETS species

- Overall, 85% of Agency and Industry sites reported checking for ETS

For 99 sites in 2017

- NHIS query identified 22 sites with ETS on or near (3 of these NIPF)
 - 14 sites with ETS on sites
 - 8 sites with ETS within 660 ft.
- Only 6 indicated knowledge of ETS on or near
- Remaining (16) sites did not indicate any knowledge of ETS on or near sites
 - 4 did not check
 - 12 checked but did not indicate any known species

Filter strips Table 7

Table 7. Soil exposure, erosion, and sediment reaching a waterbody observations, and overall compliance rates of filter strips per watershed unit.

Watershed Unit	Total Filter Strips	Filter Strips w/ concentrated or $\geq 5\%$ dispersed Soil Exposure	Strips w/ avoidable landings & No soil exposure	Filter Strips with Erosion	Filter Strips w/ Sediment Reaching a Waterbody	Compliance* (%)
CWR	170	3	5	0	0	96%
LRRR	152	6	24	0	0	80%
MRBS	178	9	11	9	3	89%
SCKS	350	8	28	3	1	90%
SCN	162	0	1	0	0	99%
SE MN	30	3	1	1	0	87%
Total	1042	29	70	13	4	91%

- Non-compliance based on filter strips having $\geq 5\%$ dispersed exposed soil or any concentrated exposed soil as well
- as locating landings within filter strips that could have been located outside of filter strips.



Accumulation of Debris on Landings

- ◎ New in 2016 & 17
- ◎ 32% of landings – ½ or more covered
 - Slash, chipping debris, sawdust
- ◎ Regeneration issue ?
- ◎ Potential wetland impacts ?



Implementation & Effectiveness

○ Are BMPs needed?

○ Implemented at all?

○ Implemented properly?

○ Implemented properly and effective?



Operational
Effectiveness



Outreach

- Formal reports – biennial
- Group presentations
- Workshop development
- Data for forest certification
- Individual feedback with land managers
- Working with watershed plans
- Landscape plans



Stream Crossings



- ◎ 19 Stream Crossings
 - 11 roads
 - 8 skid trails
- ◎ Only 1 was avoidable (95% compliance)

RMZ

