APPENDIX B _____

Addendum 2013

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Executive Summary

2013 Addendum

The following information consists of key points from the 2013 Addendum to the 5 year Forest Plan Review and Monitoring and Evaluation Report. It captures some of the effects after the July 2012 wind storm.

1. Vegetation Composition and Age Class Objectives

- Vegetation Composition
    - Excesses in aspen occur on all LEs.
    - For jack pine, major shortages occur in the drier LEs.
    - Spruce-fir is well below objectives on all LEs except Dry Pine and Dry Mesic Pine Oak.
    - Northern hardwoods exceed objectives for all LEs.
    - Increases in white pine are desirable in the Dry Mesic Pine and Boreal Hardwood Conifer LEs.

- Age Class Distribution
    - For 0-9 age class, the Forest is below decade 1 and 2 objectives for all LEs except for Dry Pine which can easily be adjusted by the end of Decade 2.
    - In all LEs, the amount of mature/older (80+ years) decreased as a result of the July storm but still meets or exceeds decade 1 and 2 objectives. The oldest component, 180+ or 190+ should be retained to meet objectives specific to that age class.

2. MIH 13 -- Large, mature upland patches

- Forest plan standards and guidelines establishing minimum amounts of large, mature upland patches are being met. Despite the July 2, 2012 storm and storm-related treatments, there has been a forest-wide increase in the number and acres of large, mature upland forest patches since the inception of the Forest Plan in 2004.

3. Vegetation Composition and Structure

- To provide for diversity in species, structure, and processes on the landscape, the Forest retained areas of untreated storm damaged stands. There are roughly 74,200 acres with 0-20% stand damage; of these at least 94% are untreated. Of the about 34,000 acres of stands with 20-100% damage; at most 41% of these acres would be treated. Patches of storm damaged trees several hundred acres in size occur primarily in hardwood forest types located between Sucker Lakes and Pike Bay Experimental Forest.

4. Project specific Forest Plan amendment for mature and older jack pine forest

- The Blowdown Restoration Project decision (July 19, 2012) includes a project specific amendment that provides an exemption to meeting Forest Plan Standard S-WL-10. S-WL-10 requires maintaining 5,300 acres in mature or older jack pine forest types during the first 10 years of plan implementation. There is not enough mature and older jack pine

on the Forest to meet the standard. The Blowdown Restoration Project decision is the last large project decision to be signed and potentially implemented prior to the standard expiring in August 2014. The Blowdown Restoration project regenerates some jack pine stands with > 60% damage.

5. Salvage Sale Monitoring

Monitoring of salvage harvest units from the July 2012 wind storm indicated the following:

- Activities planned were appropriate, realistic, and implementable.
- Overall the stand damage classification served the Forest well, at least during these early efforts.
- The wind storm added structural and vegetative diversity to many stands which meets Forest Plan direction for increased diversity.
- Soil was adequately protected. Harvest operations occurred on frozen or dry soils. Soil disturbance was minimal but not detrimental. Where biomass removal occurred, at least 20% retention of woody debris was achieved.
- Protection of wetlands and heritage sites, where they occurred, was adequate.
- Good coordination between planning and implementation personnel is evident on some units and could be improved on other units.
- Desired snag densities were not achieved. Options to retain snags through timber contract clauses and verbal agreements were discussed with Forest personnel.

Further discussion and clarification is needed in the following areas:

- Review of timing of mechanical site preparation to determine if consistent with periods specified for protection of soils during harvest operation.
- Disturbance and impacts associated with disc trenching.
- Review the modified timber sale contracts to determine if post-storm harvest activities were consistent with salvage harvests used in the salvage categorical exclusions.
- Most suitable and appropriate conifer species to plant for jack pine communities.

6. Transportation Management

- Since implementation of 2004 Forest Plan, .3 miles of permanent road has been constructed. Decisions to decommission about 220 miles have been made – more than the 200 miles the Forest Plan estimated by the end of decade 1. Of these, approximately 160 miles are decommissioned. Undetermined miles of unauthorized roads may have been effectively closed by the July 2012 wind storm.

7. Eagle

The Forest proposes to correct the Forest Plan by replacing Forest Plan standard S-WL-3 which states:

> "Management activities for the bald eagle will be governed by Northern Lakes States Bald Eagle Recovery Plan (1983). " (p. 2-28)

with the 2007 FWS guidelines upon completion of Consultation with Leech Lake Band of Ojibwe.

8. Climate Change

The Forest is involved with several studies designed to provide insight into the effects of climate change.

- The SPRUCE project looks at the responses of peatland ecosytems to changed climate.
- The ongoing development of the LANDIS II model supports the Northwoods Ecosystem Vulnerability Assessment for the Chippewa NF.
- Adaptive Silviculture for Climate Change on the Chippewa National Forest is in the early phases of development. It will look at responses of silvicultural treatments to resistance, resilience, and adaptability to climate change.

9. MOU with Leech Lake Band of Ojibwe

- A Memorandum of Understanding (MOU) with the Leech Lake Band of Ojibwe was signed in June 2013. The MOU broadly defines how each party desires to work together for the benefit of current and future generations. The MOU expresses the will of the Chippewa National Forest and the Band to work together to protect and conserve the natural resources significant to the Band's way of life and cultural identity.

1. Vegetation Composition, Age Class, and MIH Objectives by Landscape Ecosystem (LE)---FY 2013

The information that follows incorporates the effects of July 2012 windstorm, the Blowdown Restoration project decision signed in July 2013, and includes all the planned activities from earlier vegetation decisions, including the salvage CEs.

Key Points

- Vegetation Composition
  Excesses in aspen occur on all LEs.
  For jack pine, major shortages occur in the drier LEs.
  Spruce-fir is well below objectives on all LEs except Dry Pine and Dry Mesic Pine Oak.
  Northern hardwoods exceed objectives for all LEs.
  Increases in white pine are desirable in the Dry Mesic Pine and Boreal Hardwood Conifer LEs.

- Age Class Distribution
  For 0-9 age class, the Forest is below decade 1 and 2 objectives for all LEs except for Dry Pine which can easily be adjusted by the end of Decade 2. In all LEs, the amount of mature/older (80+ years) decreased as a result of the July storm but still meets or exceeds decade 1 and 2 objectives. The oldest component, 180+ or 190+ should be retained to meet objectives specific to that age class.

- MIH
  Results are variable depending on LE and age group.

Vegetation Composition

- Aspen surpluses exist in all the LEs.
- Northern hardwoods are at or exceed objectives for all the LEs and for some LEs already meet the 100 year objectives. These numbers are expected to increase in the future because of aspen forest types are being converted to hardwoods.
- Spruce-fir increases are needed in all the LEs except Dry Pine and Dry Mesic Pine Oak. In the long term, aspen, aspen-fir, jack pine and paper birch are expected to shift to spruce-fir through succession. Prescriptions for treated stands frequently include planting of spruce.
- White pine increases are desirable in the Dry Mesic Pine and Boreal Hardwood conifer LEs and meet objectives for the other LEs.
- Jack pine shortages occur on the Dry Pine and Dry Mesic Pine Oak LEs.

Age class objectives

The July 2012 wind storm damaged thousands of acres of forest. Where 60% or more of the stand was damaged or blown down, the stand age was set to 0, and the stand was considered to contribute to the 0-9 age class. Of concern were the effects of the wind storm on the amount of mature/older and 0-9 age classes and the potential impact to outyear projects. Summaries are presented here. More detail and tables for each of the LEs are in the Attachment A.

Summary of 0-9 Age Class Objectives for uplands

Table 1-1. Summary of 0-9 Objectives for uplands

Landscape Ecosystem Uplands	LE acres	Post Storm Dec 2012		Objectives		2018*	
				Decade 1 2004-2014	Decade 2 2014-2024		
		Acres	%	%	%	Acres	%
Dry Pine	12,000	1521	12	12	10	1339	11
Dry Mesic Pine	82,000	4956	6	9	9	5050	6
Dry Mesic Pine Oak	157,400	8805	6	9	9	11,871	8
Boreal Hardwood Conifer	100,000	5632	6	9	10	8475	8
Mesic No. Hardwood	65,000	2198	3	5	6	2451	4
Tamarack Swamp	20,000	373	2	7	8	670	3
White Cedar Swamp	13,000	713	6	6	6	447	3

2018* Assumes all unaccomplished harvests will be completed in 2018.

- Forest is still below decade 2 0-9 age class objectives for all the LEs except Dry Pine. Roughly 8800 acres could be treated with even-aged regeneration harvest to create more acres in the 0-9 age class.
- Dry Pine is a small LE (12,000 acres) that currently exceeds the decade 2 objective by 1%. These acres can easily be adjusted by the end of decade 2.

Summary of mature/older (80+ years) for uplands

For the purposes of this analysis, age classes over 80 years are combined.

Table 1-2. Summary of 80+ age class objectives for uplands

Landscape Ecosystem Uplands	LE acres	Post Storm Dec 2012		Objectives		2018	
				Decade 1 2004-2014	Decade 2 2014-2024		
		Acres	%	%	%	Acres	%
Dry Pine	12,000	2317	19	19	17	3124	25
Dry Mesic Pine	82,000	26903	33	27	29	33825	41
Dry Mesic Pine Oak	157,400	57540	36	33	33	61325	39
Boreal Hardwood Conifer	100,000	24954	25	19	22	29464	29
Mesic No. Hardwood	65,000	23923	37	37	41	28768	44
Tamarack Swamp	20,000	7024	36	27	25	7971	41
White Cedar Swamp	13,000	4829	37	37	39	5393	42

- In all LEs, the amount of mature/older (80 years+) meets or exceeds decade 1 objectives and exceeds decade 2 age class objectives and may be available for even-aged harvests. Some of this would be retained to meet MIH 13 objectives for mature and older patches. The oldest component, 180+ or 190+ should be retained to meet objectives specific to that age class.

2. MIH 13 -- Large, mature upland patches

Key Point

- Forest plan standards and guidelines establishing minimum amounts of large, mature upland patches are being met. Despite the July 2, 2012 storm and storm-related treatments, there has been a forest-wide increase in the number and acres of large, mature upland forest patches since the inception of the Forest Plan in 2004.

Forest-wide, there are currently (2013) 109 large, mature upland patches containing a total of 106,718 acres, as shown in the table below. These figures reflect damage from the July 2, 2012 windstorm, with age of forest stands incurring 60% or more damage being set back to 0 years old. Hence, those mature forest stands that previously were counted as part of a large, mature upland patch that incurred this level of damage are no longer counted as part of that patch. Due to forest aging, despite the windstorm, number and acres of large, mature forest patches has increased since inception of the 2004 Forest Plan.

Table 2-1. Large, mature upland forest patches on Chippewa National Forest Pre- and Post-Storm

Patch size class	2004 Forest Plan		2011		Existing (2013)		2018	
	No.	Acres in size class	No.	Acres in size class	No.	Acres in size class	No.	Acres in size class
301-500	46	17325	51	19804	53	21,061	66	25,958
501-1000	31	20897	29	20710	33	22,107	41	28,170
1001-2500	14	20844	14	21319	15	24,236	19	28,016
2501-5000	2	6072	2	6082	3	8,846	2	6,056
5001-10000	5	31521	5	32300	5	30,468	5	31,394
Total > 300 ac	98	96659	101	100215	109	106,718	133	119,594
Total > 1000 ac	21	58437	21	59701	23	63,550	26	65,466

The numbers for 2018 include the effects of past and recent post-storm decisions that are not yet fully implemented (i.e. regeneration harvests not yet implemented). The post-storm decisions propose new harvest treatments within these patches. These include harvests which will maintain the canopy closure as much as possible following the storm, such as single-tree or group selection cuts, as well as even-aged regeneration harvests. Even-aged regeneration harvests reduce patch acres; treatments which maintain a minimum of 50% canopy closure do not reduce patch acres.

The following Forest Plan Objectives, Guidelines, and Standards have been met:

- O-VG-19 Maintain or increase the acres and number of patches of mature or older upland forest in patches 300 acres or greater.
- G-VG-1 Maintain a minimum of 19 patches of mature or older upland forest in patches of 1,000 acres or greater.
- S-VG-1 Maintain a minimum of 85,000 acres of mature or older forest in patches 300 acres or greater.

3. Vegetation Composition and Structure

Key Points

- To provide for diversity in species, structure, and processes on the landscape, the Forest retained areas of untreated storm damaged stands. There are roughly 74,200 acres with 0-20% stand damage; of these at least 94% are untreated. Of the about 34,000 acres of stands with 20-100% damage; at most 41% of these acres would be treated. Patches of untreated damaged trees several hundred acres in size occur primarily in hardwood forest types located between Sucker Lakes and Pike Bay Experimental Forest.

To provide for diversity in species, structure, and processes on the landscape, the Forest retained areas of untreated storm damaged stands. The Forest Plan (FP) states

> "Retain an adequate representation of naturally disturbed forest that is not salvaged, such as burned, flooded, blowdown, or insect or disease killed areas. Maintain these in a variety of patch sizes and distributions on the landscape." (FP, O-VG-12, p. 2-23).

This direction allows for reserving areas shaped by natural events, such as the July 2012 windstorm, on the landscape. Standing dead and dying, higher levels or concentrations of down woody debris and patches of untreated damaged stands are desirable and consistent with this direction.

About 108,500 forested acres on National Forest lands were damaged to some extent during the July 2012 wind storm. During FY 2013 year, numerous decisions for salvage and restoration activities were made. Decisions covered activities in the Blowdown Restoration EA, Salvage Categorical Exclusions, and adjustments to existing timber sales. Treatments include harvest, mechanical fuels reduction, prescribed burning, or pile burning. Highest priority stands to be treated were those with 40% or more damage. The table below provides context as to the acres of storm damage, acres with proposed treatments, and the acres with no treatment.

Table 3-1. Forested acres damaged, acres and percentages proposed for treatment and with no treatments.

Detectable Damage (% stand damaged)	Acres	Percent	Proposed Treatments		No Treatments	
			Acres	%	Acres	%
0-20%	74,184	68%	4700	6%	69,400	94%
20-40%	14,815	32%	14,000	41%	20,200	59%
40-60%	10,517					
60-80%	6,846					
80-100%	2,154					
	108,516	**100**	**18,700**	**47%**		

There are roughly 74,200 acres with 0-20% stand damage; of these at least 94% are untreated. Of the about 34,000 acres of stands with 20-100% damage; at most 41% of these acres would be treated. An estimated 47% of the storm damaged stands are proposed for treatment.

Patches of damaged stands were left untreated. This creates large, early seral openings consistent with Forest Plan direction for:

- Diversity of size, shape, and distribution of temporary forest openings on the landscape. This included opening sizes from 1 to 1,000 acres, (D-VG-7 (c), pg. 2-22); and

- Where ecologically appropriate, increase acres and number of patches of temporary openings up to and including 1000 acres (O-VG-23, pg. 2-24); and

- Increase average size of temporary forest openings. Reduce amount of forest edge created through vegetation management activities, while still retaining a range of small patches and edge habitat (O-VG-24, p. 2-24).

Patches of untreated, damaged trees several hundred acres in size occur primarily in hardwood forest types. They are located between Sucker Lakes and Pike Bay Experimental Forest and FS roads 2133 and 2135 (Sec 4, T144N, R30W; and Sec. 34, T145 R30W).

It is possible that future NEPA efforts will propose treatment in an unknown number of acres, but this NEPA is currently not being planned.

4. Project Specific Forest Plan amendment for mature and older jack pine forest

Key Points

- The Blowdown Restoration Project decision (July 19, 2013) includes a project specific amendment that provides an exemption to meeting Forest Plan Standard S-WL-10. S-WL-10 requires maintaining 5,300 acres in mature or older jack pine forest types during the first 10 years of plan implementation. There is not enough mature and older jack pine on the Forest to meet the standard. The Blowdown Restoration Project decision is the last large project decision to be signed and potentially implemented prior to the standard expiring in August 2014. The Blowdown Restoration project regenerates some jack pine stands with > 60% damage.

Forest Plan Direction

The Forest Plan requires retention of a specified amount of mature and older jack pine through the first decade with Forest Plan Standard S-WL-10. This standard is in effect until early August 2014.

The Forest Plan states (p. 2-32):

> MIH 8: Mature and older jack pine forest
> S-WL-10 Maintain at least 5,300 acres in mature or older jack pine forest types during the first 10 years of plan implementation.

Jack pine is a component of management indicator habitat (MIH) 8. The Forest Plan defines mature jack pine as 40 years or older. The Forest Plan does not provide direction for jack pine for decade 2.

Status of mature and older Jack Pine

At the time the Forest Plan was signed in July 2004, there was an estimated 7,700 acres of mature and older jack pine on the Forest. Since then projects have been closely monitored to ensure compliance with this Forest Plan standard.

Despite careful project planning and forest aging from 2004 to 2013, there is less than 5,300 acres of mature and older jack pine forest. Analysis shows that prior to the July 2012 wind storm, there were 4968 acres of mature and older jack pine. After the July storm, because of extensive wind damage, mature or older jack pine stands with 60% or more damage had their age set back to 0 years old. These stands were not counted towards S-WL-10. The current condition, post-storm, shows 4617 acres of mature and older jack pine.

The Forest is unable to meet the standard for several reasons:

- The amount of mature and older jack pine on the landscape at the time of Forest Plan revision was over-estimated because of limited or outdated stand exam data. Recent exams show that what were thought to be jack pine stands were actually some other forest type, often red pine. This reflects a disconnect between what our databases and records say the Forest has and what occurs on the ground.

- Mature and older jack pine stands are senescent and in the process of falling to the ground. On the Chippewa National Forest, jack pine stands 60 years or older often begin to fall apart although that varies depending on site conditions. About 98% of the mature and older jack pine stands are over 60 years old.

- There was not a balanced age class distribution within the jack pine forest type at the time of the Forest Plan revision. There was a glut of acres in the 0-9 and mature/older age classes (42% and 64%, respectively) rather than an even age class distribution. The remaining acres in the 10-39 year age class (1,700 acres or 14% of jack pine acres) would provide the pool of acres that would replace the mature stands, but is insufficient to replace the mature and older component that is being lost. This was recognized in the analysis for the Forest Plan. Effects in the Final Environmental Impact Statement (FEIS) disclose that mature/old forest in jack pine (MIH 8) would fall to levels approximately 70% below existing levels by decade 2 (FEIS, pg. 3.3.1-37). The Forest Plan does not provide direction for jack pine in decade 2.

Project Specific Forest Plan amendment

The project specific, non-significant Forest Plan amendment provides an exception to meeting Forest Plan Standard S-WL-10 for the Blowdown Restoration Project. The amendment was included in the Environmental Assessment for the Blowdown Restoration Project which was available for public review and comment. The decision was signed on July 19, 2013. The Blowdown Restoration project regenerates some jack pine stands with > 60% damage. This amendment does not change any Forest Plan goals, objectives, desired conditions or any associated outputs.

5. Salvage Sale Monitoring

Key Points

Monitoring of salvage harvest units from the July 2012 wind storm indicated the following:

- Activities planned were appropriate, realistic, and implementable.
- Overall the stand damage classification served the Forest well during these early efforts.
- The wind storm added structural and vegetative diversity to many stands which meets Forest Plan direction for increased diversity.
- Soil was adequately protected. Harvest operations occurred on frozen or dry soils. Soil disturbance was minimal but not detrimental. Where biomass removal occurred, at least 20% retention of woody debris was achieved.
- Protection of wetlands and heritage sites, where they occurred, was adequate.
- Good coordination between planning and implementation personnel is evident on some units and could be improved on other units.
- Options to retain snags through timber contract clauses and verbal agreements were discussed with Forest personnel.

Further discussion and clarification is needed in the following areas:

- Review of timing of mechanical site preparation to determine if consistent with periods specified for protection of soils during harvest operation.
- Disturbance and impacts associated with disc trenching.
- Review the modified timber sale contracts to determine if post-storm harvest activities were consistent with salvage harvests used in the salvage categorical exclusions.
- Most suitable and appropriate conifer species to plant for jack pine communities.

Brief Background

The July 2, 2012 windstorm resulted in 108,000 acres of National Forest land damaged to some degree. Approx. 20,000 acres had 40% or more of the stand damaged. Using post-harvest aerial photography, stands were classified based on the extent of damage (1 = 0-20%, 2 = 20-40%, 3 = 40-60%, 4 = 68-80%, 5 = 80-100%).

Early efforts by the Forest were to identify the highest priority stands that could be covered using a categorical exclusion (CE) for salvage harvest. Direction was to focus on heavily damaged stands of which pine stands were the highest priority followed by aspen. Emphasis on treating pine was because of the rapid loss in value with time and the need for prompt regeneration to increase stocking success. Salvage of hardwoods was low priority as their value does not decline as rapidly as other species.

Fifteen decisions using salvage CEs were made on the three districts. Project areas were 250 acres in size or less. Treatments varied from salvage harvest only to harvest followed by site preparation and planting. Of the 15, 10 CEs obtained Emergency Situation Determination (ESD)

from Chief. Decision Memos were signed in mid-late November; sales were sold in late November/December 2012.

Another 5 decision memos with no ESD, were signed in late November/early December, appealed in January 2013, and sold in March/April 2013.

An incredible amount of work was accomplished in the last year in response to the July 2012 blowdown event. Approximately 3000 acres were identified for treatment in the CEs. Planning, sale prep and timber sales were accomplished in a matter of months. Another 7 timber sales had contracts modified due to catastrophic damage. In addition, a Blowdown Restoration Project EA was signed in July 2013 with an estimated implementation date of fall 2013.

Monitoring Goals
Goals were to conduct implementation and effectiveness monitoring to determine the following:

- Did we implement what we said we were going to do in the salvage CEs with respect to material removed, treatments, mitigation measures, FP standards and guidelines?
- Were planned activities realistic and achievable?
- Were FP standards and guidelines and mitigation measures effective?
- Were there complications? If so, why?
- What lessons learned should we keep in mind for the Blowdown Restoration EA implementation?

Monitoring Approach
Four recently harvested units were selected and monitored July 2013. Three were covered by different decision memos; the fourth was a modified timber sale contract. Units were located on each of the three districts. Each unit represented a different forest type. Some of the units were salvage only; others included site preparation and planting.

Teams of Forest line officers, specialists, planners, sale administrators, and implementation crew members evaluated the units with respect to wildlife, vegetation, soils, wetlands and riparian areas.

Monitoring Findings
Overall, planning and implementation were generally good at all stages from planned treatments, to the written prescriptions, to the sale layout out and contract preparation, to sale administration.

Based on monitoring of four salvage harvest units, the following findings were identified.

1. Activities planned were appropriate, realistic, and implementable. Extent of damage, determined from photo interpretation, was effective in identifying highest priority stands for treatment and appropriately identified regeneration activities. Overall the stand damage classification served the Forest well, at least during these early efforts. The wind storm added structural and vegetative diversity to many stands which meets Forest Plan direction for increased diversity (FP, D-VG-6, Vegetation Composition and Structure, p. 2-21).

2. Desired snag densities were not achieved. With the exception of one unit, designation by damage clause was used in the timber sale contract. This clause defined "damaged trees" available for harvest. In the process, many of the snags were removed and desired snag densities were not achieved. Because of safety concerns, snags were not marked to retain. Key personnel in sale layout, implementation, and sale administration met to discuss options to provide for retention of snags through contract clauses or verbal agreements with the purchaser.

3. Soil was adequately protected. Harvest operations occurred on frozen or dry soils. Soil disturbance was minimal but not detrimental. Where biomass removal occurred, at least 20% retention of woody debris was achieved. Additional review is needed to determine if mechanical site preparation activities occur on dry soils or during periods specified for harvest operations. Also, discussion on disc trenching is warranted to address concerns on potential disturbance and impacts.

4. Protection of wetlands, where they occurred, was adequate.

5. In the modified timber sale contract unit, the unit boundary identification appeared to be outside existing authorizations. Modification specified removal of all damaged trees as well as jack pine, aspen, and hardwoods. Additional review is needed to determine if salvage harvest in the modified contracts was consistent with salvage approach for other storm damaged areas.

6. Good coordination between planning and implementation personnel is evident on some units but could be improved on other units.

7. Heritage sites were adequately protected.

8. Clarify suitable conifer species for jack pine communities. A component of white spruce was planted because of the higher probability of survival than white pine and red pine.

6. Transportation Management

Key Point

- Since implementation of 2004 Forest Plan, .3 miles of permanent road has been constructed. Decisions to decommission about 220 miles have been made – more than the 200 miles the Forest Plant estimated by the end of decade 1. Of these, approximately 160 miles are decommissioned. Undetermined miles of unauthorized roads may have been effectively closed by the July 2012 wind storm.

With each of the vegetation management projects, the Forest identifies roads, either system or unauthorized, to be decommissioned and removed from the transportation system. Since implementation of the 2004 Forest Plan, 220 miles of road have decisions to decommission. Approximately 162 miles have been decommissioned thus far.

The blowdown from the July 2012 storm likely closed numerous unauthorized roads although details on where all of these roads are not available at this time. Unauthorized or system roads with decisions to decommission that are closed by blowdown are considered to be decommissioned and will remain so unless needed for treatment access.

In FY 2012, .3 mile of permanent road was constructed. This is the only permanent road constructed since the inception of the 2004 Forest Plan.

Table 6-1. Summary of permanent road construction, miles of road decommissioning, and miles with decisions to decommission.

Activity or Practice	FP Estimated Amount decade 1	Total	FY 2012	FY 2011	FY 2005-2010 (sub-total)
Roads Constructed (only OML –1 roads being constructed)	19 miles	.3	0.3	0	0
Roads decommissioned (miles) system roads	200 miles	82	9.03	16.9	74.1
unauthorized roads		80	0.74 miles unauthorized	15.4 miles unauthorized	63.9
Total miles with decisions to decommission		220.0	220.0 miles	?	128.8 miles

7. Eagle

Key Point
The Forest proposes to correct the Forest Plan by replacing Forest Plan standard S-WL-3 which states:

> "Management activities for the bald eagle will be governed by Northern Lakes States Bald Eagle Recovery Plan (1983). " (p. 2-28)

with the 2007 FWS guidelines upon completion of Consultation with Leech Lake Band of Ojibwe.

Since the delisting of the bald eagle in 2007, the Forest has been using the 2007 US Fish and Wildlife Service (FWS) guidelines which incorporate new statutory or regulation requirements. The FWS guidelines represent the best available science on the eagle. The guidelines are peer-reviewed and replace the outdated Northern Lake States Bald Eagle Recovery Plan (1983).

The Forest proposes to correct the Forest Plan by replacing Forest Plan standard S-WL-3 which states:

> "Management activities for the bald eagle will be governed by Northern Lakes States Bald Eagle Recovery Plan (1983). " (p. 2-28)

The Forest Plan correction would be completed after Consultation with the Leech Lake Band of Ojibwe.

8. Climate Change

Key Points
The Forest is involved with several studies designed to provide insight into the effects of climate change.

- The SPRUCE project looks at the responses of peatland ecosytems to changed climate.
- The ongoing development of the LANDIS II model supports the Northwoods Ecosystem Vulnerability Assessment for the Chippewa NF.
- Adaptive Silviculture for Climate Change on the Chippewa National Forest is in the early phases of development. It will look at responses of silvicultural treatments to resistance, resilience, and adaptability to climate change.

Spruce and Peatland Responses under Climatic and Environmental Change Experiment (SPRUCE) Project is designed to develop an understanding of the responses of carbon-rich peatland ecosystems to changed climate. The Department of Energy and the USFS Northern Research Station collaborate in research efforts located on the Marcell Experimental Forest which is located on the Chippewa National Forest. The Decision was signed on June 10, 2011. Construction of the facilities is underway.

Development of the LANDIS II model is in progress through efforts with Portland State University (lead agency), Northern Research Station (Rhinelander, WI), and the Chippewa National Forest. The model will be used to simulate forest disturbance and succession in response to anticipated climate, natural disturbance, forest management, and their interactions across all land ownerships in the Chippewa National Forest landscape. The project supports the Northwoods Ecosystem Vulnerability Assessment by providing key components of the Northwoods Climate Change Response Framework for the Chippewa NF.

Just initiated is the Adaptive Silviculture for Climate Change on the Chippewa National Forest which is part of a National program. Research in red pine stands on the Cut Foot Experimental Forest will study the effects of applied silvicultural treatments to increase forests resistance, resilience, and adaptability to climate change. This cooperative project involves the Northern Research Station, the University of Minnesota, Michigan Technological University, and Chippewa National Forest.

9. MOU with Leech Lake Band of Ojibwe

In June 2013 the Chippewa National Forest and Leech Lake Band of Ojibwe (LLBO) signed a new Memorandum of Understanding (MOU) which is the product of several formal meetings over the course of four years. The passage of Tribal Resolution number 2013-118 authorizes and approves a MOU between the Leech Lake Band and the Chippewa National Forest. Nearly 20 years ago, a one page MOU was executed that broadly defined how each party desires to work together for the benefit of current and future generations. The new MOU expresses the will of the Chippewa National Forest and the Band to work together to protect and conserve the natural resources significant to the Band's way of life and cultural identity. Provisions included within the MOU affirm the federal government's Trust Responsibilities and broadly define a Consultation framework and decision making process.

Attachment A --Vegetation Composition, Age Class, and MIH Objectives by Landscape Ecosystem ---Tables

The information that follows incorporates the effects of July 2012 windstorm, Alternative C of the Blowdown Restoration decision signed in July 2013, and includes all the planned activities from earlier vegetation decisions, including the salvage CEs. The tables are based on January 2013 queries used for alternative analysis for the Blowdown Restoration EA. These tables supersede tables based on 2011 data found in Section C and in Appendix A.

July 2012 windstorm
On July 2, 2012 a windstorm with 80-85 mile per hour winds moved across the Chippewa National Forest creating a corridor with damage approximately 10 miles by 40 miles wide parallel to Hwy 2.

Using aerial photography flown in late July 2012, the Forest categorized forested stands on the National Forest based on the level of detectable damage: 0-20%; 20-40%; 40-60%; 60-80%; and 80-100%.

Detectable Damage	Storm Damage Class	Acres
0-20%	1	74,184
20-40%	2	14,815
40-60%	3	10,517
60-80%	4	6,846
80-100%	5	2,154
	Total	**108,516**

Based on this approach, 19,517 acres have 40% or more of the stand blown down or damaged. This does not include non-forested stands. Stands that are bowed/tipped were not readily identifiable on the photos so generally are not included in the above numbers.

Landscape Ecosystem Objectives
Age Class Tables
To determine the existing condition, it was assumed that any stands with greater than 60% damage set the age class back to 0-9. This was used as the basis for each LE to calculate the age class acres and percentages. Although this results in substantial amounts of young seedling MIH in multiple LE tables, young seedling aged stands of red, white, and jack pine are not assured unless reforestation activities are planned for the storm damaged sites.

In the tables that follow, the " Post Storm Dec 2012" column reflects the existing condition which considers amount of 0-9 or seedlings on the Forest resulting from management activities and the storm. It includes those stands 0-9 years old resulting from previous harvest. It is the even-aged regeneration harvest treatments (clearcut, coppice, seedtree, and shelterwood) that set the stand age to 0. Any even-aged regeneration harvest that occurred in the last 9 years would contribute to the amount of 0-9 on the landscape. The existing condition also took into consideration the storm damaged stands. It assumed stands with more than 60% damage (damage class 4 and 5) would set the stand age back to 0 and contribute to the 0-9 age class.

Future conditions (2018) for 0-9 include all the planned even-aged harvest activities that are currently unaccomplished and assumes they would be accomplished in 5 years. Stands with more than 60% damage (damage class 4 and 5) that contributed to the 0-9 age class are included in these figures. The analysis took into consideration even-aged harvests in stands with greater than 60% damage to make sure acres were not counted twice. Comparisons are made to decade 2 objectives because 2018 data would move beyond the end of the first decade (2014) and slightly into the second decade.

Many of the stands with damage class 4 and 5 were harvested under the Salvage CEs or included in the Blowdown EA. However, there were stands that are not treated based on input from the LLBO tribe and Pike Bay Experimental Forest staff. In particular there is an area between Pike Bay and Sucker Lakes that was intentionally left untreated to create a large, natural block of early seral stands. These stands are included in the 0-9 numbers for 2018.

The tables contain information from 2011 that were calculated for a five year review of the Forest Plan. The information on 2011 was retained because it provides some sense of the impacts of the storm on age class although consideration has to be given to the fact that there has been some outgrowth and ingrowth during the two year period from early 2011 to late 2012. Species composition and age class acres and percentages for 2011 were based on the database runs that occurred in January 2011 and reflect what was accomplished at that time.

Vegetation Composition Tables

Changes in vegetation composition likely resulted from stand exam data that was collected and used to update the database. Composition is not likely to have changed from the storm. Shifts in species composition resulting from storm damage are not reflected in the species composition tables for each of the LEs. Conversions included in recent projects are considered to be longer term shifts, will not be reflected in the data for years because of the time lag from planning to harvesting to reforestation to certification. Conversion would be noted at the time of stocking certification.

MIH tables

Based upon the forest types and age groupings for MIH, acres occurring in each of the MIHs were calculated post storm (data source: GIS Corporate Stands Layer). The calculations were completed for each landscape ecosystem (LE) and forest-wide. The acreage amount in each MIH category was then compared to the corresponding amount that occurred with the initiation of the 2004 Forest Plan to determine the current trajectory for that particular MIH.

Comparisons were made at the LE level to determine if the MIH trends were on track to meet the stated objectives for the first two decades of Forest Plan implementation (CNF Forest Plan, pages 2-53 thru 2-80) because 2018 data would move beyond the end of the first decade (2014) and slightly into the second decade. The results are provided for each LE below. Decadal Forest Plan objectives are expressed in terms of desired change from 2004 condition: increase (+), decrease (-), or maintain (m). Trends are expressed in the same manner, with those trends that depart from the objective shown in the cell highlighted grey. Bullets following the tables are used to highlight notable departures from Forest Plan objectives.

Dry Pine Landscape Ecosystem

Table DRP-1. Vegetation Composition Objectives for Dry Pine Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	2579	22	2506	21	35	41	2621	22
Red Pine	4942	41	5007	42	39	37	5003	42
White Pine	221	2	250	2	2	2	223	2
Spruce-fir	123	1	143	1	1	2	143	1
Oak	504	4	468	4	3	3	468	4
Northern Hdwds	347	3	402	3	1	1	402	3
Aspen	2670	22	2676	22	16	12	2574	22
Paper Birch	533	4	497	4	2	2	498	4
TOTAL	11,918	100	11949	100	100	100	11931	100
LOWLANDS								
Black Spruce	222	55	178	46	71	71	178	46
Tamarack	63	16	58	15	13	13	58	15
Lowland Hdwds	38	9	26	7	13	13	26	7
White Cedar	83	20	124	32	3	3	124	32
TOTAL	405	100	386	100	100	100	386	100

Table DRP-2. Vegetation Age Class Objectives for Dry Pine Landscape Ecosystem.

Age Class	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS & LOWLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	799	6	1521	12	12	10	1339	11
10-39	4906	40	4771	39	45	45	4676	38
40-79	3687	30	3725	30	24	28	3179	25
80-179	2927	24	2314	19	19	17	3121	25
180+	3	0	3	0	0	0	3	0
TOTAL	12,323	100	12335	100	100	100	12317	100

- As a result of the 2012 storm, Decade 1 objectives for 0-9 have been met.
- Close consideration of Decade 2 objectives should occur for future planning projects. Decade 2 has been exceeded by 1%. Since this occurs early in the decade, adjustments can be made. This LE is only about 12,000 acres in size. Consequently it only takes about 120 acres to cause a 1% shift.
- There is a substantial shortage of jack pine forest type and an overabundance of aspen. A surplus of red pine could be converted to jack pine. However, much of this LE occurs in tribal high interest areas. Input from the tribe is that they would rather retain older red pine stands than convert them to jack pine. Due to disease factors, red pine overstory generally needs to be removed if regenerating jack or red pine in these stands.

Table DRP-3a. Young Seedling Management Indicator Habitat Objectives for Dry Pine Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objec. Decade 2	2018	Trend
1	Upland forest	2200	799	1483	-	-	-	1302	-
2	Upland deciduous	500	322	533	+	-	-	494	-
3	Northern hardwoods	0	55	55	**+**	m	m	44	+
4	Aspen-birch	500	267	478	-	-	-	450	-
5	Upland conifer	1700	478	951	-	-	-	808	-
6	Upland spruce-fir	0	0	0	m	m	m	10	+
7	Red and white pine	300	96	578	+	-	-	504	+
8	Jack pine	1400	382	372	**-**	+	-	294	-
9	Lowland black Spruce-tamarack	0	5	38	**+**	m	m	38	+

Table DRP-3b. Mature Management Indicator Habitat Objectives for Dry Pine Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	2012	Trend	Plan Obj Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	2700	3115	2787	**+**	-	+	3085	+
2	Upland deciduous	1300	1143	1103	-	-	-	1169	-
3	Northern hardwoods	100	713	651	**+**	m	m	670	+
4	Aspen-birch	900	430	452	-	-	-	490	-
5	Upland conifer	1400	1972	1684	+	+	+	1916	+
6	Upland spruce-fir	0	26	44	**+**	m	m	35	+
7	Red and white pine	1200	1924	1618	+	+	+	1864	+
8	Jack pine	200	22	22	-	-	-	18	-
9	Lowland black Spruce-tamarack	200	170	94	**-**	m	-	77	-

Table DRP-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Dry Pine Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Plan Obj Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	1700	1732	1535	-	-	-	1613	-
2	Upland deciduous	100	625	534	+	+	+	606	+
3	Northern hardwoods	0	13	81	+	m	m	84	+
4	Aspen-birch	100	613	453	+	+	+	522	+
5	Upland conifer	1600	1107	1001	-	m	-	1008	-
6	Upland spruce-fir	0	33	34	+	m	m	34	+
7	Red and white pine	100	46	44	-	m	m	65	-
8	Jack pine	1500	1028	922	-	-	-	909	-
9	Lowland black Spruce-tamarack	100	58	48	-	m	+	64	-

The Dry Pine LE is the smallest LE on the Chippewa National Forest, containing the smallest amount of upland acres of any of the LE's. Post-storm MIH highlights include:

- The July 2012 storm doubled the amount of young seedling MIH in this small LE, primarily at the cost of mature red and white pine MIH.
    - A similar amount of young would occur in 2018 from the Blowdown Restoration EA; aging 5 years would allow ingrowth into the mature red and white pine MIH.
- Old/old growth and multi-aged red/white pine is currently declining rather than maintaining as desired.

Dry-Mesic Pine Landscape Ecosystem

Table DMP-1. Vegetation Composition Objectives for Dry-Mesic Pine Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives Decade 1	Objectives Decade 2	2018	
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	713	1	662	1	1	1	662	1
Red Pine	12168	15	12443	15	15	16	11945	15
White Pine	1203	1	1269	2	4	6	1310	2
Spruce-fir	2997	4	2951	4	8	9	2921	4
Oak	3235	4	3074	4	6	6	3074	4
Northern Hdwds	17678	22	18542	23	15	15	18548	23
Aspen	36967	45	37012	45	41	37	37000	45
Paper Birch	6849	8	6342	8	10	10	6342	8
TOTAL	81,812	100	82296	1	100	100	81803	100
LOWLANDS								
Black Spruce	3266	44	3089	42	53	53	3089	42
Tamarack	703	9	716	10	9	9	716	10
Lowland Hdwds	2146	29	2043	28	24	24	2035	28
White Cedar	1361	18	1521	21	13	13	1521	21
TOTAL	7,475	100	7368	100	100	100	7360	100

Table DMP-2. Vegetation Age Class Objectives for Dry-Mesic Pine Landscape Ecosystem.

Age Class	2011		Post Storm Dec 2012		Objectives Decade 1	Objectives Decade 2	2018	
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	3658	4	4956	6	9	9	5050	6
10-39	25084	31	24484	30	37	40	22545	28
40-79	25364	31	25953	32	27	22	20383	25
80-179	27587	34	26861	33	27	29	33783	41
180+	119	0	42	0	0	0	42	0
TOTAL	81,812	100	82296		100	100	80803	100
LOWLANDS								
0-9	76	1	76	1	4	4	21	0
10-39	250	3	215	3	3	5	289	4
40-79	847	11	738	10	7	5	530	7
80-119	4273	57	4222	57	57	45	4031	55
120-179	1927	26	2016	27	28	38	2353	32
180+	102	1	102	1	2	2	137	2
TOTAL	7475	100	7368		100	100	7360	100

- With regard to forest types, increase white pine and spruce-fir and decrease the amount of aspen and possibly northern hardwoods.
- Opportunities exist to increase the amount of 0-9 by decreasing the 40-79 and 80-179 age class.

Table DMP-3a. Young Seedling Management Indicator Habitat Objectives for Dry-Mesic Pine Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Plan Obj Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	9,500	3658	4956	-	-	-	5050	-
2	Upland deciduous	8,200	3139	4095	-	-	-	4347	-
3	Northern hardwoods	600	859	1297	+	-	-	1015	+
4	Aspen-birch	7,200	2280	2798	-	-	-	3333	-
5	Upland conifer	1,200	519	861	-	+	m	702	-
6	Upland spruce-fir	500	87	104	-	-	-	25	-
7	Red and white pine	400	404	719	+	+	+	610	+
8	Jack pine	300	28	38	-	-	+	67	-
9	Lowland black Spruce-tamarack	100	39	35	-	+	+	19	-

Table DMP-3b. Mature Management Indicator Habitat Objectives for Dry-Mesic Pine Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Plan Obj Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	35,200	32037	32650	-	-	-	30118	-
2	Upland deciduous	28,300	25040	25707	-	-	-	21980	-
3	Northern hardwoods	10,500	17302	18082	+	-	-	17711	+
4	Aspen-birch	13,700	7738	7625	-	-	-	4269	-
5	Upland conifer	6,900	6997	6943	+	+	+	8138	+
6	Upland spruce-fir	1,200	1047	968	-	+	+	830	-
7	Red and white pine	5,600	5950	5975	+	+	+	7308	+
8	Jack pine	200	1	1	-	-	-	1	-
9	Lowland black Spruce-tamarack	3,000	2487	2365	-	-	-	2262	-

Table DMP-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Dry-Mesic Pine Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	7,800	12969	11486	+	+	+	14417	+
2	Upland deciduous	6,800	11835	10534	+	+	+	13067	+
3	Northern hardwoods	800	1495	1036	+	+	+	1100	+
4	Aspen-birch	5,600	10340	9498	+	+	+	11967	+
5	Upland conifer	1,000	1134	952	+	+	+	1350	+
6	Upland spruce-fir	200	258	174	-	+	+	393	+
7	Red and white pine	100	422	385	+	+	+	610	+
8	Jack pine	700	454	393	-	+	-	347	-
9	Lowland black Spruce-tamarack	800	1085	1043	+	+	+	1207	+

- Young seedling MIH increased in the DMP LE due to the July 2012 storm, including a mix of aspen-birch, northern hardwoods, and red/white pine, primarily coming from the old/old growth and multi-aged aspen-birch and northern hardwood LE's.
- Primarily due to projects planned prior to the July storm, the mature aspen-birch MIH is substantially reduced. The MIH trend matches the objective.

Dry-Mesic Pine/Oak Landscape Ecosystem

Table DPO-1. Vegetation Composition Objectives for Dry-Mesic Pine/Oak Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives Decade 1	Objectives Decade 2	2018	
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	6832	4	6797	4	9	11	6895	4
Red Pine	47734	30	48352	31	31	33	47643	30
White Pine	2909	2	3080	2	2	2	3223	2
Spruce-fir	5577	4	5618	4	5	4	5566	4
Oak	2482	2	2696	2	2	2	2696	2
Northern Hdwds	17176	11	17163	11	10	11	17163	11
Aspen	63067	40	62657	40	34	30	62482	40
Paper Birch	11839	8	11685	7	7	7	11685	7
TOTAL	157,616	100	158047		100	100	157353	100
LOWLANDS								
Black Spruce	9956	49	9652	48	52	52	9650	48
Tamarack	3139	16	3144	16	15	15	3193	16
Lowland Hdwds	3570	18	3641	18	18	18	3563	18
White Cedar	3578	18	3804	19	15	15	3804	19
TOTAL	20,243	100	20241		100	100	20211	100

Table DPO-2. Vegetation Age Class Objectives for Dry-Mesic Pine/Oak Landscape Ecosystem.

Age Class	2011		Post Storm Dec 2012		Objectives Decade 1	Objectives Decade 2	2018	
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	5034	3	8805	6	9	9	11871	8
10-39	50983	32	48962	31	35	34	43434	28
40-79	41978	27	42740	27	24	25	40700	26
80-119	50968	32	48861	31	27	24	50788	32
120-179	7797	5	7891	5	5	8	9735	6
180+	847	1	788	0	1	1	802	1
TOTAL	157,616	100	158047		100	100	157356	100
LOWLANDS								
0-9	66	0	132	1	2	3	207	1
10-39	850	4	896	4	4	5	819	4
40-79	2467	12	2490	12	10	6	2002	10
80-119	10871	54	10572	52	53	38	9569	47
120-179	5789	29	5988	30	30	46	7426	37
180+	200	1	163	1	1	2	188	1
TOTAL	20,243	100	20241		100	100	20211	100

- This LE provides the most acres and best potential for increasing the amount of jack pine by converting some of the aspen. The other forest types are at decade 2 objectives.
- In the uplands, opportunities exist to increase the amount of 0-9 drawing from the 80-119 age class and to a lesser degree the 40-79 age class.

Table DPO-3a. Young Seedling Management Indicator Habitat Objectives for Dry-mesic Pine/Oak Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	17,500	5034	8805	-	-	-	11871	-
2	Upland deciduous	11,200	3224	4970	-	-	-	7458	-
3	Northern hardwoods	300	178	691	+	-	-	677	+
4	Aspen-birch	10,800	3046	4279	-	-	-	6780	-
5	Upland conifer	6,300	1810	3834	-	+	+	4413	+
6	Upland spruce-fir	700	183	269	-	-	-	384	-
	Red and white pine	2,600	695	2369	-	-	m	3006	+
8	Jack pine	3,000	932	1196	-	+	+	1023	-
9	Lowland black Spruce-tamarack	300	166	192	-	+	+	231	-

Table DPO-3b. Mature Management Indicator Habitat Objectives for Dry-mesic Pine/Oak LE

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	63,000	56171	54876	-	-	-	53376	-
2	Upland deciduous	32,800	27424	26671	-	-	-	23997	-
3	Northern hardwoods	10,800	15282	14841	+	+	+	14275	+
4	Aspen-birch	19,700	12141	11830	-	-	-	9722	-
5	Upland conifer	30,200	28748	28205	-	-	+	29379	-
6	Upland spruce-fir	2,300	1584	1505	-	m	-	1356	-
7	Red and white pine	27,300	27056	26597	-	-	+	27888	+
8	Jack pine	600	108	103	-	-	-	136	-
9	Lowland black Spruce-tamarack	9,500	8316	7835	-	-	-	6975	-

Table DPO-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Dry-Mesic Pine/Oak Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	19,600	30070	29271	+	+	+	31946	+
2	Upland deciduous	11,500	20001	19532	+	-	-	21301	+
3	Northern hardwoods	1,100	2406	2525	+	+	+	3299	+
4	Aspen-birch	9,900	17595	17007	+	-	-	18003	+
5	Upland conifer	8,100	10068	9739	+	+	+	10645	+
6	Upland spruce-fir	300	744	802	+	+	+	983	+
7	Red and white pine	3,500	6254	6141	+	+	+	7230	+
8	Jack pine	4,300	3070	2797	-	-	-	2432	-
9	Lowland black Spruce-tamarack	1,800	3401	3546	+	+	+	4378	+

A very large Landscape Ecosystem on the Chippewa National Forest, the Dry-Mesic Pine/Oak (DMPO) LE contains more upland acres than any other LE.

- Young seedling MIH increased 75% post-storm on this LE, primarily at a loss of mature and older aspen-birch, northern hardwood, and red/white pine MIH's.
- Mature and older conifers increase (5%) due to forest aging; mature and older aspen-birch declines (6%).

Boreal Hardwood/Conifer Landscape Ecosystem

Table BHC-1. Vegetation Composition Objectives for Boreal Hardwood/ Conifer Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	513	1	446	0	0	0	446	0
Red Pine	3554	4	3651	4	4	4	3624	4
White Pine	664	1	645	1	3	4	648	1
Spruce-fir	8662	9	8402	8	12	13	8364	8
Oak	42	0	42	0	0	0	42	0
Northern Hdwds	16247	16	16495	16	13	13	16495	16
Aspen	64351	64	64433	64	63	60	64466	64
Paper Birch	5965	6	6003	6	6	6	6013	6
TOTAL	100,000	100	100119		100	100	100098	100
LOWLANDS								
Black Spruce	13450	43	12977	42	49	49	12977	42
Tamarack	2860	9	2913	9	8	8	2958	10
Lowland Hdwds	10592	34	10568	34	32	32	10414	34
White Cedar	4296	14	4541	15	11	11	4541	15
TOTAL	31,199	100	30998		100	100	30889	100

Table BHC-2. Vegetation Age Class Objectives for Boreal Hardwood/Conifer Landscape cosystem.

Age Class	2011		Post Storm Dec 2012		Objectives Decade 1	Objectives Decade 2	2018	
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	3815	4	5632	6	9	10	8475	8
10-39	45050	45	43406	43	47	45	38331	38
40-79	26031	26	26127	26	25	23	23828	24
80-179	25100	25	24951	25	19	22	29449	29
180+	3	0	3	0	0	0	15	0
TOTAL	100,000	100	100119		100	100	100098	100
LOWLANDS								
0-9	202	1	299	1	4	4	666	2
10-39	1464	5	1516	5	5	8	1456	5
40-79	3979	13	3785	12	9	4	2767	9
80-119	16770	54	16472	53	52	40	15738	51
120-179	8476	27	8634	28	29	42	9398	32
180+	307	1	278	1	1	2	409	1
TOTAL	31,119	100	30998		100	100	30889	100

- Opportunities exit to increase the amount of white pine and spruce-fir in this LE by reducing the amount of aspen and northern hardwoods.
- Creating more 0-9 can be achieved with even-aged harvests in the 80-179 age class for the uplands.

Table BHC-3a. Young Seedling Management Indicator Habitat Objectives for Boreal Hardwood/Conifer Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 2	Objective Decade 2	2018	Trend
1	Upland forest	12,000	3815	5632	-	-	-	8475	-
2	Upland deciduous	10,600	3361	4879	-	-	-	7609	-
3	Northern hardwoods	200	312	647	+	-	-	600	+
4	Aspen-birch	10,400	3049	4232	-	-	-	7009	-
5	Upland conifer	1,400	454	753	-	-	-	866	-
6	Upland spruce-fir	1,000	311	503	-	-	-	530	-
7	Red and white pine	100	138	242	+	+	m	291	+
8	Jack pine	300	4	8	-	-	-	46	-
9	Lowland black Spruce-tamarack	900	411	392	-	+	+	578	-

- Young seedling MIH doubled post-storm on this LE.
- Young seedling aspen-birch substantially increases supported heavily by projects planned prior to the July 2012 storm.

Table BHC-3b. Mature Management Indicator Habitat Objectives for Boreal Hardwood/Conifer Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	33,000	29692	28700	-	-	-	25101	-
2	Upland deciduous	26,800	25203	24296	-	-	-	19867	-
3	Northern hardwoods	10,200	13634	13363	+	+	-	12589	+
4	Aspen-birch	16,600	11570	10932	-	-	-	7278	-
5	Upland conifer	6,200	4489	4404	-	+	+	5234	-
6	Upland spruce-fir	4,600	2743	2453	-	m	m	2645	-
7	Red and white pine	1,600	1746	1951	+	+	+	2585	+
8	Jack pine	0	0	0	m	m	m	4	+
9	Lowland black Spruce-tamarack	12,200	10717	10280	-	-	-	9353	-

Table BHC-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Boreal Hardwood/Conifer Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	7,600	13053	13084	+	+	+	16415	+
2	Upland deciduous	6,700	11495	11762	+	+	+	15037	+
3	Northern hardwoods	900	1514	1496	+	+	+	2391	+
4	Aspen-birch	5,700	9980	10267	+	m	+	12646	+
5	Upland conifer	900	1558	1322	+	+	+	1377	+
6	Upland spruce-fir	500	1100	968	+	+	+	1085	+
7	Red and white pine	200	226	188	-	+	+	169	–
8	Jack pine	200	232	166	-	-	-	124	-
9	Lowland black Spruce-tamarack	3,100	4008	3999	+	+	+	4638	+

Mesic Northern Hardwood Landscape Ecosystem

Table MNH-1. Vegetation Composition Objectives for Mesic Northern Hardwood LE.

Forest Type	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	117	0	116	0	0	0	116	0
Red Pine	1809	3	1912	3	3	3	1854	3
White Pine	476	1	432	1	1	1	432	1
Spruce-fir	2855	4	2861	4	6	7	2861	4
Oak	634	1	637	1	1	1	637	1
Northern Hdwds	24178	37	24475	38	32	37	24475	38
Aspen	29658	46	29342	45	47	43	29342	45
Paper Birch	5025	8	5014	8	10	8	5014	8
TOTAL	64,751	100	64789		100	100	64731	100
LOWLANDS								
Black Spruce	2824	42	2771	41	52	52	2771	41
Tamarack	555	8	537	8	8	8	537	8
Lowland Hdwds	2269	34	2273	34	31	31	2261	34
White Cedar	1054	16	1113	17	9	9	1113	17
TOTAL	6,703	100	6694	100	100	100	6683	100

Table MNH-2. Vegetation Age Class Objectives for Mesic Northern Hardwood LE.

Age Class	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	2373	4	2198	3	5	6	2451	4
10-39	20735	32	20617	32	35	28	18571	29
40-79	18795	29	18052	28	24	26	14942	23
80-119	20263	31	21437	33	32	33	25826	40
120-189	2496	4	2396	4	5	8	2852	4
190+	90	0	90	0	0	0	90	0
TOTAL	64,751	100	64789		100	100	64731	100
LOWLANDS								
0-9	17	0	33	0	1	2	29	0
10-39	182	3	213	3	1	2	163	2
40-79	1125	17	1084	16	12	6	828	12
80-119	3779	56	3765	56	57	51	3782	57
120-179	1561	23	1560	23	28	39	1829	27
180+	39	1	39	1	0	1	52	1
TOTAL	6703	100	6694		100	100	6683	100

- Increase the amount of spruce-fir by decreasing the amount of aspen and possibly northern hardwoods.
- Increase the amount of 0-9, decrease the amount of 80-119.

Table MNH-3a. Young Seedling Management Indicator Habitat Objectives for Mesic Northern Hardwood Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Stom 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	7200	2373	2198	-	-	-	2451	-
2	Upland deciduous	6800	2160	1961	-	-	-	2293	-
3	Northern hardwoods	300	253	425	+	-	-	304	+
4	Aspen-birch	6500	1907	1536	-	-	+	1989	-
5	Upland conifer	300	213	237	-	-	+	158	-
6	Upland spruce-fir	200	96	64	-	-	+	25	-
7	Red and white pine	200	105	162	-	-	-	121	-
8	Jack pine	0	11	11	+	m	m	11	+
9	Lowland black Spruce-tamarack	0	10	24	+	+	+	29	+

Table MNH-3b. Mature Management Indicator Habitat Objectives for Mesic Northern Hardwood Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	30500	28352	27722	-	-	-	26795	-
2	Upland deciduous	29100	27148	26528	-	-	-	24958	-
3	Northern hardwoods	17300	20928	20941	+	+	+	20690	+
4	Aspen-birch	11100	6219	5586	-	-	-	4267	-
5	Upland conifer	1400	1204	1195	-	+	+	1837	+
6	Upland spruce-fir	1000	682	664	-	+	+	892	-
7	Red and white pine	400	522	530	+	+	+	946	+
8	Jack pine	0	0	0	m	m	m	0	m
9	Lowland black Spruce-tamarack	2600	2214	2208	-	-	-	2021	-

Table MNH-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Mesic Northern Hardwood Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	4800	8670	9130	+	+	+	10902	+
2	Upland deciduous	4300	8192	8715	+	+	+	10362	+
3	Northern hardwoods	1700	2366	2265	+	+	+	2682	+
4	Aspen-birch	2600	5826	6450	+	+	+	7680	+
5	Upland conifer	500	478	415	-	+	+	540	+
6	Upland spruce-fir	300	225	230	-	+	+	365	+
7	Red and white pine	200	181	114	-	m	+	105	-
8	Jack pine	0	72	71	+	m	m	71	+
9	Lowland black Spruce-tamarack	700	844	785	+	+	+	976	+

Tamarack Swamp Landscape Ecosystem

Table TSF-1. Vegetation Composition Objectives for Tamarack Swamp Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack pine	200	1	200	1	1	1	200	1
red pine	1523	8	1519	8	8	9	1514	8
white pine	103	1	102	1	1	1	107	1
spruce-fir	2028	10	1991	10	16	21	1986	10
oak	129	1	161	1	0	0	161	1
Northern Hdwds	2944	15	2924	15	11	11	2924	15
aspen	11309	58	11319	58	56	49	11319	58
paper birch	1375	7	1400	7	6	5	1400	7
TOTAL	19,611	100	19615		100	100	19611	100
LOWLANDS								
tamarack	8954	29	8869	29	27	27	8876	29
Black spruce	12216	39	12057	39	47	47	12049	39
white cedar	6196	20	6304	20	15	15	6304	20
lowland hdwds	3710	12	3801	12	11	11	3685	12
TOTAL	31077	100	31030		100	100	30914	100

Table TSF-2. Vegetation Age Class Objectives for Tamarack Swamp Landscape Ecosystem.

Age Class	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	374	2	373	2	7	8	670	3
10-39	6761	34	6680	34	42	41	6143	31
40-79	5725	29	5537	28	23	25	4827	25
80-119	5662	29	5920	30	23	19	6388	33
120-189	1086	6	1101	6	4	6	1573	8
190+	3	0	3	0	0	0	10	0
TOTAL	19,611	100	19615		100	100	19611	100
LOWLANDS								
0-9	253	1	185	1	4	4	234	1
10-39	1153	4	1174	4	4	6	1198	4
40-79	4740	15	4344	14	11	8	3577	12

80-119	15884	51	16259	52	47	35	14785	48
120-179	8861	29	8904	29	34	46	10922	35
180+	164	1	164	1	1	1	197	1
TOTAL	31,077	100	31030		100	100	30914	100

- The largest shifts need to be made by increasing spruce-fir and decreasing aspen.
- Increasing the amount of 0-9 can be achieved by even-aged harvests in primarily the 80-119 age class with lesser amounts in the 120-189 age class.

Table TSF-3a. Young Seedling Management Indicator Habitat Objectives for Tamarack Swamp Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	1700	374	373	-	-	-	670	-
2	Upland deciduous	1500	342	325	-	-	-	628	-
3	Northern hardwoods	100	14	19	-	-	-	23	-
4	Aspen-birch	1400	327	306	-	-	-	605	-
5	Upland conifer	200	32	48	-	+	+	42	-
6	Upland spruce-fir	100	27	38	-	-	-	18	-
7	Red and white pine	200	6	10	-	m	m	24	-
8	Jack pine	100	0	0	-	-	+	0	-
9	Lowland black Spruce-tamarack	700	404	337	-	+	+	313	-

Table TSF-3b. Mature Management Indicator Habitat Objectives for Tamarack Swamp LE.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	6200	6448	6250	+	-	-	5394	-
2	Upland deciduous	4700	4787	4646	-	-	-	3729	-
3	Northern hardwoods	1300	2213	2229	+	+	m	1950	+
4	Aspen-birch	3300	2574	2417	-	-	-	1778	-
5	Upland conifer	1500	1661	1604	+	m	m	1665	+
6	Upland spruce-fir	1200	973	906	-	-	-	800	-
7	Red and white pine	300	688	698	+	+	+	866	+
8	Jack pine	0	0	0	m	m	m	0	m
9	Lowland black Spruce-tamarack	15700	12926	12593	-	-	-	11520	-

Table TSF-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for Tamarack Swamp Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	2000	4376	4652	+	+	+	5790	+
2	Upland deciduous	1400	3326	3580	+	+	m	4557	+
3	Northern hardwoods	100	577	570	+	+	+	1034	+
4	Aspen-birch	1300	2749	3010	+	+	-	3523	+
5	Upland conifer	500	1050	1072	+	+	+	1232	+
6	Upland spruce-fir	100	581	605	+	+	+	755	+
7	Red and white pine	300	366	365	+	+	+	375	+
8	Jack pine	0	103	103	+	m	-	103	+
9	Lowland black Spruce-tamarack	4100	5782	5925	+	+	+	7280	+

White Cedar Swamp Landscape Ecosystem

Table WCS-1. Vegetation Composition Objectives for White Cedar Swamp Landscape Ecosystem.

Forest Type	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
UPLANDS and LOWLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack pine	23	0	23	0	--	--	23	0
red pine	31	0	31	0	0	0	31	0
spruce-fir	384	3	379	3	6	8	379	3
oak	16	0	16	0	0	0	16	0
No. hardwoods	552	1	552	4	2	2	552	4
aspen	7,975	62	7985	62	57	52	7985	62
paper birch	214	2	214	2	0	0	214	2
black spruce	968	8	968	7	8	8	968	8
tamarack	109	1	109	1	1	1	109	1
lowland hdwds	1,749	14	1808	14	18	18	1740	14
white cedar	862	7	862	7	9	11	862	7
TOTAL	12,883	100	12947		100	100	12879	100

Table WCS-2. Vegetation Age Class Objectives for White Cedar Swamp Landscape Ecosystem.

Age Class	2011		Post Storm Dec 2012		Objectives		2018	
					Decade 1	Decade 2		
	Acres	%	Acres	%	%	%	Acres	%
0-9	829	6	713	6	6	6	447	3
10-49	4960	39	5105	40	46	49	5520	43
50-79	2348	18	2232	17	11	6	1519	12
80-109	2396	19	2449	19	16	12	2436	19
110-139	1829	14	1673	13	15	18	2108	16
140+	521	4	707	5	6	9	849	7
TOTAL	12,883	100	12879		100	100	12897	100

- Increase spruce-fir and decrease aspen.
- Opportunities exist to create 0-9 from the 80-109 age class. Some of the 80-109 is needed for ingrowth into the 110-139+ age classes.

Table WCS-3a. Young Seedling Management Indicator Habitat Objectives for White Cedar Swamp Landscape Ecosystem.

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	1800	815	699	-	-	-	447	-
2	Upland deciduous	1800	781	665	-	-	-	447	-
3	Northern hardwoods	0	0	0	m	m	m	0	m
4	Aspen-birch	1800	781	665	-	-	-	447	-
5	Upland conifer	0	34	34	+	m	m	0	m
6	Upland spruce-fir	0	34	34	+	m	m	0	-
7	Red and white pine	0	0	0	m	m	m	0	m
8	Jack pine	0	0	0	m	m	m	0	m
9	Lowland black Spruce-tamarack	0	29	29	+	m	m	0	m

Table WCS-3b. Mature Management Indicator Habitat Objectives for White Cedar Swamp Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	2500	2240	2128	-	-	-	1584	-
2	Upland deciduous	2300	2087	1980	-	-	-	1417	-
3	Northern hardwoods	200	225	223	+	m	-	203	+
4	Aspen-birch	2100	1862	1757	-	-	-	1214	-
5	Upland conifer	300	153	148	-	-	-	167	-
6	Upland spruce-fir	300	145	140	-	-	-	139	-
7	Red and white pine	0	8	8	m	m	m	28	+
8	Jack pine	0	0	0	m	m	m	0	m
9	Lowland black Spruce-tamarack	900	758	724	-	-	-	678	-

Table WCS-3c. Old/Old Growth and Multi-aged Management Indicator Habitat Objectives for White Cedar Swamp Landscape Ecosystem

#	Management Indicator Habitats	2004 Forest Plan	2011	Post Storm 2012	Trend	Objective Decade 1	Objective Decade 2	2018	Trend
1	Upland forest	400	1293	1382	+	+	+	1747	-
2	Upland deciduous	300	1244	1332	+	+	+	1696	-
3	Northern hardwoods	0	336	336	+	m	m	356	+
4	Aspen-birch	300	908	997	+	+	+	1340	-
5	Upland conifer	0	50	50	+	m	+	51	-
6	Upland spruce-fir	0	27	27	+	m	+	29	-
7	Red and white pine	0	0	0	m	m	m	0	m
8	Jack pine	0	23	23	+	m	m	23	+
9	Lowland black Spruce-tamarack	200	261	295	+	+	+	341	-

Summary of 0-9 Objectives for uplands

Landscape Ecosystem Uplands	LE acres	2011		Existing Condition Post Storm Dec 2012		Objectives		2018	
						Decade 1	Decade 2		
		Acres	%	Acres	%	%	%	Acres	%
Dry Pine	12,000	799	6	1521	12	12	10	1339	11
Dry Mesic Pine	82,000	3658	4	4956	6	9	9	5050	6
Dry Mesic Pine Oak	157,400	5034	3	8805	6	9	9	11,871	8
Boreal Hdwd Conifer	100,000	3815	4	5632	6	9	10	8475	8
Mesic No. Hdwd	65,000	2373	4	2198	3	5	6	2451	4
Tamarack Swamp	20,000	374	2	373	2	7	8	670	3
White Cedar Swamp	13,000	829	6	713	6	6	6	447	3

Key Points:

- Forest is currently below but on track to meet Decade 2 objectives for all the LEs except Dry Pine. Roughly 8800 acres could be created at this time to meet decade 2 objectives.
- Dry Pine is a small LE (12,000) acres that currently exceeds the objective by 1%. These acres can easily be adjusted by the end of decade 2.

Summary of mature and older (80+ years) for uplands

For the purposes of this analysis, this group collapses the following categories age classes which vary by LE 80-119, 80-179, 119-179, and 180+ into 80+ years.

Landscape Ecosystem Uplands	LE acres	2011		Existing Condition Post Storm Dec 2012		Objectives		2018	
						Decade 1	Decade 2		
		Acres	%	Acres	%	%	%	Acres	%
Dry Pine	12,000	2930	24	2317	19	19	17	3124	25
Dry Mesic Pine	82,000	27706	34	26903	33	27	29	33825	41
Dry Mesic Pine Oak	157,400	59612	38	57540	36	33	33	61325	39
Boreal Hdwd Conifer	100,000	25103	25	24954	25	19	22	29464	29
Mesic No. Hdwd	65,000	22849	35	23923	37	37	41	28768	44
Tamarack Swamp	20,000	6751	35	7024	36	27	25	7971	41
White Cedar Swamp	13,000	4746	37	4829	37	37	39	5393	42

Key Points:

- In all LEs, the amount of mature and older (80 years+) exceeds Forest Plan objectives. The amount or 80-119 or 80-179 is exceeded in all the LEs and generally is available for even-aged harvests. The oldest component, 180+ or 190+, should be retained to meet objectives specific to that age class.

Summary vegetation composition

This section is organized differently to provide an overview of the overall status of a species across all the LEs. Numbers are taken from the LE vegetation composition tables.

Forest Type	LE	Post Storm 2012		Decade 2 %	2018		Comments
		Acres	%	%	Acres	%	
Jack Pine	DP	2506	21	41	2621	22	Major deviations occur in DP & DMPO. DMPO is the larger LE and entails more acres of JP needed (11,000 vs 2300). LEs occur in high tribal interest areas where older red pine retention is important. Jack pine in not concern in hardwoods or lowland sites.
	DMP	662	1	1	662	1	
	DMPO	6797	4	11	6895	4	
	BHC	446	0	0	446	0	
	MNH	116	0	0	116	0	
	TS	200	1	1	200	1	
	WCS	23	0	0	23	0	
Red Pine	DP	5007	42	37	5003	42	Biologically possible to convert to jack pine. See comments above.
	DMP	12443	15	16	11945	15	
	DMPO	48352	31	33	47643	30	Increase of ~4500 to meet objective.
	BHC	3651	4	4	3624	4	
	MNH	1912	3	3	1854	3	
	TS	1519	8	9	1514	8	
	WCS	31	0	0	31	0	
White Pine	DP	250	2	2	223	2	
	DMP	1269	2	6	1310	2	Increase of ~3300 ac.
	DMPO	3080	2	2	3223	2	
	BHC	645	1	4	648	1	Increase of ~3100 ac.
	MNH	432	1	1	432	1	
	TS	102	1	1	107	1	
	WCS						
Spruce-fir	DP	143	1	2	143	1	Significant increases needed in all LEs except DP & DMPO. Lot of planting of spruce-fir. Long term – succession in older aspen, aspen-fir, jack pine, & paper birch becomes spruce-fir.
	DMP	2951	4	9	2921	4	
	DMPO	5618	4	4	5566	4	
	BHC	8402	8	13	8364	8	
	MNH	2861	4	7	2861	4	
	TS	1991	10	21	1986	10	
	WCS	379	3	8	379	3	
Northern Hardwoods	DP	402	3	1	402	3	At or exceeds objectives in all LEs. Re-typing increased the amount of northern hardwoods. Already exceed 100 yr. objective by 13,000+ acres. More acres will show up in future with Rxs planned. Amount of northern hardwood at time of revision was less than half of RNV. Not sure we want to convert unless there are opportunities to convert to WP.
	DMP	18542	23	15	18548	23	
	DMPO	17163	11	11	17163	11	
	BHC	16495	16	13	16495	16	
	MNH	24475	38	37	24475	38	
	TS	2924	15	11	2924	15	
	WCS	552	4	2	552	4	

Forest Type	LE	Post Storm 2012		Decade 2 %	2018		Comments
		Acres	%	%	Acres	%	
Aspen	DP	2376	22	12	2574	22	Over in all LEs. Don't have numbers on the amount of aspen left for succession to another Forest Type. Expensive to convert, takes years before conversion is achieved. Conversion probably occurring at a slower rate than perhaps anticipated.
	DMP	37012	45	37	37000	45	
	DMPO	62657	40	30	62482	40	
	BHC	64433	64	60	64466	64	
	MNH	29342	45	43	29342	45	
	TS	11319	58	49	11319	58	
	WCS	7985	62	52	7985	62	
Paper Birch	DP	497	4	2	498	4	
	DMP	6342	8	10	6342	8	
	DMPO	11685	7	7	11685	7	
	BHC	6003	6	6	6013	6	
	MNH	5014	8	8	5014	8	
	TS	1400	7	5	1400	7	
	WCS	214	2	0	214	2	