

# Impacts of Management: 2004 - 2103

---

Carlton County  
Tax Forfeited Land  
Management Plan

*This chapter presents the likely changes to occur to Carlton County's forested lands over the course of 100 years if this management plan is implemented. These depictions of the future forest are projections developed through models. The most important aspect of these descriptions is the general direction and magnitude of the changes.*

---

## Summary Highlights

---

### I3.I

#### Summary

##### Aspen Resource

The acres of aspen as a *cover type* are reduced from 24,000 to 19,000 acres and brought into relatively balanced age classes. The reduction occurs as stands on the slopes and valleys of the Nemadji River Basin are allowed to naturally succeed to spruce-fir and as stands in the Nemadji uplands are managed as mixed species boreal hardwood-conifer forest.

##### Conifer Forest

White spruce and balsam fir gain as cover types through natural succession in the slopes and lowlands of the Nemadji River Basin and through active management in the Nemadji uplands. Overall the spruce-fir cover types grow by 300% but the harvestable acres increase by 350%.

##### Nemadji River Basin

Representing roughly 18% of the County's total tax forfeited lands, the complex terrain of this area will be the focal point of experimental forestry. The highly erodible red clay slopes and valleys will naturally succeed, generally into spruce-fir forest, with no harvesting or other forms of active management occurring there. The uplands will be managed as a mixed species boreal hardwood-conifer forest with an emphasis on the conifer component (white spruce or balsam fir depending upon the site). Experiments will be used to determine the best means of securing quality regeneration and preventing expansion of alder swamps.

##### Timber Resource

After two decades of slightly accelerated harvesting to address the mature condition of the aspen resource, aspen harvesting will settle into a relatively even flow. Because of the generally limited extent of the other cover types, their harvesting will occur in a predictable but uneven flow as resource becomes available. Among key resource species, balsam fir, as a cover type, will experience no harvesting for 20 years (2014-2033) but then as the greatly expanded resource base comes into play it develops into a productive timber supply. Similarly, white spruce, which currently sees little harvesting on its small resource base, will emerge around 2034 as a significant timber source.

##### Recreation

Additional recreational trails will likely cross County administered lands. No new facilities such as camping or picnicking areas will be developed. Pressures on public lands for recreational uses will increase.

### Department Administration

The Department will have employed a variety of mechanisms to insure a smooth transition from its long-standing current staff to the succeeding one. In addition, data management will have been enhanced to permit more effective management of the resources.

## I3.2

### Assumptions

The following assumptions underpin the decisions and expectations of this strategic plan and its 100-year outlook:

- The **amount of land** administered by Carlton County is expected to remain relatively unchanged in amount and quality.

The only potential factor that could substantially change the amount of tax forfeited land administered by Carlton County would be the sale of land to the Fond du Lac Band of Chippewa. On an irregular basis this topic has been discussed by the Band, but no formal initiatives have ever been taken. However, the possibility remains that it could be brought forward for serious consideration in the future.

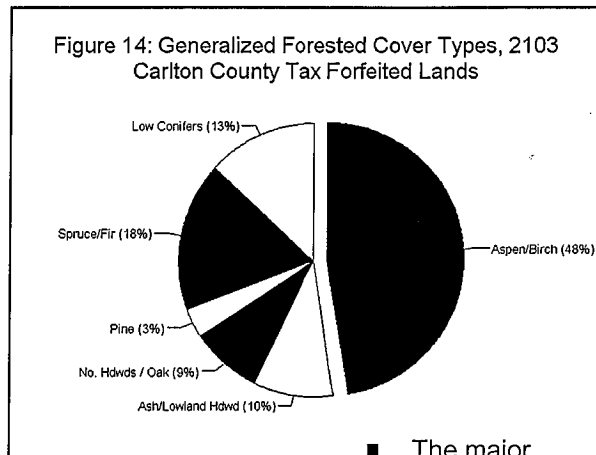
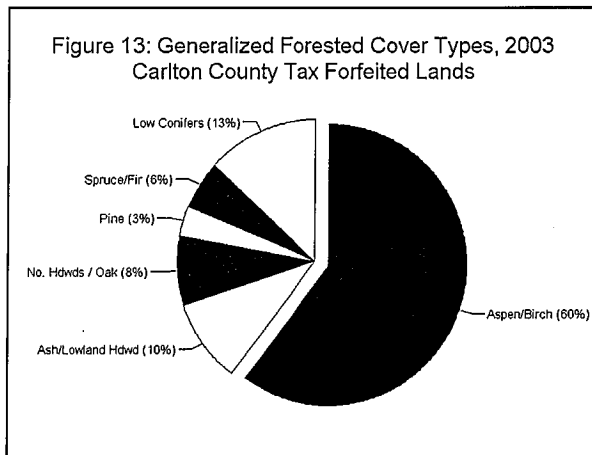
- The **legal authority** by which the County administers the land is assumed to remain unchanged. Tax-forfeited land is legally owned by the State of Minnesota. Under State Statute counties are given the authority to administer and manage these lands on behalf of the taxing jurisdictions of the county.
- The world's **climate** is apparently undergoing change – it is warming and becoming more erratic. Predicting the impact of this change over the course of a hundred years is impossible. However, because this plan is based upon the ecological features which support the forest, the County will be able to evaluate emerging impacts of change relative to the capacity of the land to produce forest cover and act accordingly.
- The **demand for forest products** is unpredictable over the life of the plan. Nonetheless, it is assumed that the markets will exist to support the management scheme.
- Many sets of **information** concerning soils, productivity, forest resource inventory, and resource growth and yield are essential to this plan. While this information varies in accuracy, it is the best that is available and, for the purposes of this strategic plan, is considered excellent. However, over time key components need to be ground proofed, refined, and updated; subsequent revisions of this plan need to utilize that improved information.

13.3  
Cover Type

This section highlights the changes in forest cover type and age class distribution that likely will result from the implementation of this strategic plan.

Table 14 and Figures 13 and 14 indicate the change in acres for the major forested cover types.

Table 14: Forested Cover Types on Carlton County Tax Forfeited Lands, 2004 & 2103						
Cover Type	2004		2103		Change	
	Acres	Percent	Acres	Percent	Acres	%
Ash	4,055	9.2%	4,055	9.2%	0	0%
Aspen	24,044	54.8%	19,010	43.3%	(5,034)	-21%
Balm of Gilead	557	1.3%	243	0.6%	(314)	-56%
Balsam Fir	1,304	3.0%	3,544	8.1%	2,240	172%
Birch	1,862	4.2%	1,627	3.7%	(235)	-13%
Black Spruce, Low.	3,086	7.0%	3,086	7.0%	0	0%
Lowland Hardwoods	144	0.3%	144	0.3%	0	0%
Northern Hardwoods	3,310	7.5%	3,545	8.1%	235	7%
Pine, Jack	22	0.1%	0	0.0%	(22)	-100%
Pine, Red	1,399	3.2%	1,421	3.2%	22	2%
Pine, White	78	0.2%	78	0.2%	0	0%
Oak	244	0.6%	244	0.6%	0	0%
Tamarack	2,059	4.7%	2,059	4.7%	0	0%
White Cedar	626	1.4%	626	1.4%	0	0%
White Spruce	1,124	2.6%	4,232	9.6%	3,108	277%
Total	43,914	100.0%	43,914	100.0%		



concerns the aspen cover type. Aspen acres in the Nemadji River Basin's slopes and valleys gradually convert through natural succession into spruce/fir. On the uplands in this area, a portion of the aspen is converted to spruce/fir.

- Balsam fir and white spruce gain acres in the Nemadji River Basin as noted above. Only the upland acres (about half of the converted acres) will be available for harvest – stands on the slopes and in the valleys will be managed as old forest with no harvesting to occur.
- Birch and Balm of Gilead also lose some acres to natural succession in the Nemadji River Basin.

I3.4  
The Nemadji River  
Basin

Over the course of the next century the most dramatic changes and, outside of accommodating the effects of climatic change, the most challenging forest management likely will occur in the Nemadji River Basin. The primary initiative of this strategic plan focuses on this area.

Cover Type	2003	2013	2023	2033	2043	2053
<b>Aspen</b>						
Nemadji Slopes	2,294	1,961	1,403	555	123	105
Nemadji Uplands	6,113	5,204	3,958	3,420	3,417	3,322
Rest of County	15,637	15,637	15,637	15,637	15,637	15,637
Total	24,044	22,802	20,998	19,612	19,177	19,064
<b>Balsam Fir</b>						
Nemadji Slopes	428	495	636	900	1,150	1,168
Nemadji Uplands	122	750	1,323	1,580	1,530	1,568
Rest of County	754	754	754	754	754	754
Total	1,304	1,999	2,713	3,234	3,434	3,490
<b>White Spruce</b>						
Nemadji Slopes	745	1,011	1,428	2,012	2,194	2,194
Nemadji Uplands	215	789	1,461	1,758	1,816	1,875
Rest of County	164	164	164	164	164	164
Total	1,124	1,964	3,053	3,934	4,174	4,233

- Because the highly erodible red clay slopes and valleys will receive no active management stands located there will follow natural succession most likely into spruce/fir forest.
- Management within the Nemadji uplands essentially will be a series of experiments to determine what actions produce vigorous stands and successful regeneration. The landscape is a boreal hardwood-conifer system dominated by aspen, white spruce, and balsam fir. Rather than retain all the stands with an aspen cover type

designation (and thereby suggest a larger aspen resource than really exists), the plan converts half to balsam fir/white spruce. In reality, all stands in the Nemadji uplands will be heavily mixed.

I3.5

Habitat

Table 16 indicates likely changes in the distribution of habitat types on Carlton County administered lands over the century.

Table 16: Change in Habitat Acres on Carlton County Lands , 2004 - 2103							
Habitat Categories		2004		2103		Acres Change 2004-2103	Comments
		Acres	%	Acres	%		
Open Habitat Types	Lowland open	22,380	32.6%	22,380	31.9%	0	Upland grass openings will likely decrease to 0 by 2103 due to lack of maintenance.
	Upland grass opening	221	0.3%	221	0.3%	0	
	Shrub-Sapling opening / Regeneration	3,594	5.2%	6,938	9.9%	3,344	
Upland Forest: Deciduous Aspen-Birch	Young	6,106	8.9%	12,037	17.2%	5,931	Roughly one-third of these stands are mixed forest. There may be some acres in the old category due to longer aspen rotation on selected stands.
	Mature	12,607	18.3%	4,410	6.3%	(8,197)	
	Old	3,397	4.9%	0	0.0%	(3,397)	
Upland Forest: Deciduous [NoHwd/Oak]*	Young	1,111	1.6%	938	1.3%	(173)	
	Mature	2,144	3.1%	574	0.8%	(1,570)	
	Old	0	0.0%	1,450	2.1%	1,450	
Upland Forest: Coniferous	Young	1,691	2.5%	1,849	2.6%	158	Most young and some mature stands are mixed forest.
	Mature	791	1.2%	1,813	2.6%	1,022	
	Old	1,362	2.0%	4,388	6.3%	3,026	
Lowland Forest: Deciduous	Young	444	0.6%	699	1.0%	255	Young stands are from estimated level of natural disturbance.
	Mature	2,944	4.3%	584	0.8%	(2,360)	
	Old	812	1.2%	2,750	3.9%	1,938	
Lowland Forest: Coniferous	Young	2,751	4.0%	2,960	4.2%	209	
	Mature	4,691	6.8%	2,702	3.9%	(1,989)	
	Old	1,669	2.4%	3,424	4.9%	1,755	
Total			100.0%		100.0%		

Findings and observations generated by the table include:

- Open types: In reality, upland grass openings will probably decrease to near zero due to lack of active maintenance. However, regenerating stands in their earliest years will help replace these losses.
- Upland aspen-birch: Total acres decline as cover type is converted to conifer in the Nemadji River basin. Most old stands disappear to two factors – management of the aspen to balanced age classes through age 55, and, conversion to conifer mixed forest [selected aspen stands on high quality sites may be managed to older ages – the exact extent of this management has not been estimated].
- Upland hardwoods/oak: Older forest grows significantly as high quality stands are managed as multi-aged multi-species stands with old forest qualities. Young and mature stands basically reflect lower quality sites that are managed as even-aged multi-species stands.
- Upland conifer: Total acres increase dramatically due to gains in the Nemadji River basin. Old forests are primarily found on the slopes and in the valleys of the Nemadji basin.
- Upland mixed forest: Model constraints preclude identification of future mixed forest stands. However, the nature of the aspen-birch and conifer forests means a high percentage of these stands are mixed forests.
- Lowland deciduous: This set of habitats shifts to the older phases due to the near absence of harvest activity. Some stands have been reset to younger ages to suggest the impact of natural disturbance.
- Lowland conifer: Harvesting of black spruce and tamarack drive the creation of younger and mature stands while the lack of harvest of cedar fuels the increase of older stands.

### I3.6 Roads

A limited number of new forest roads, outside of temporary logging roads, are expected to be constructed during the plan period. It is expected that management regimes requiring more frequent entries into stands (e.g., hardwoods) will require better constructed and maintained secondary access roads; these roads will be barricaded and signed appropriate to their recreation use designations.

### I3.7 Recreation

The number of recreational trails of all types and their use are expected to increase although no firm figure can be set at this time since most trails will be proposed by other entities. The County does not anticipate owning and/or maintaining additional miles of trails.

The County will not build any facility-based recreation areas (e.g., beaches, accesses, campgrounds, etc.) during the plan period. The primary use of the overall land base will remain hunting, hiking, and other forms of dispersed recreation. The County anticipates the level of pressure on public lands for these uses to increase as more private lands are sold into ever smaller parcels and posted. The impact of Potlatch's program to lease its lands for private recreation cannot be fully assessed but the assumption is that this will

eventually increase hunting pressure on County lands.

The County anticipates no change in the number of cabin leases.