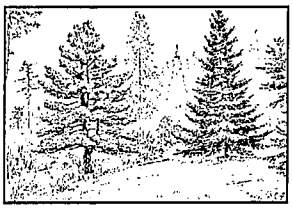
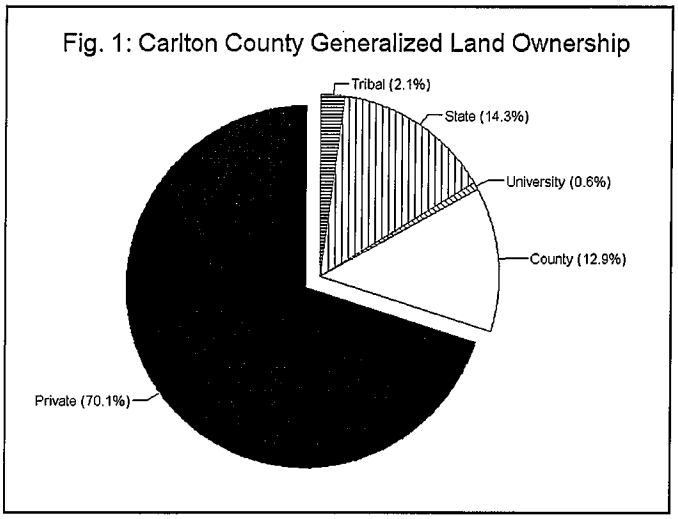


Resource Description

3.1 Land Ownership

Carlton County's tax forfeited lands represents just a small portion of the total land area of the county. There are roughly 559,000 total acres in Carlton County. Of these the 72,410 acres of tax forfeited lands equal almost 13%. Private ownership is the largest group with 392,000 acres (70%). The State of Minnesota owns just under 80,000 acres (14%) with lands in Jay Cooke State Park and several state forests. The Fond du Lac Reservation owns or controls another 11,800 acres (2%). The University of Minnesota, in the form of the Cloquet Forestry Center, has 3,400 acres (1%).

Fig. 1: Carlton County Generalized Land Ownership



3.2 Native Plant Communities

The discussion in Section 2.2 Ecological Context reviewed the Ecological Classification System (ECS) approach to defining the landscape. That discussion ended with the Landtype Association (LTA) level. Beneath the LTA level is a more targeted description of a smaller tracts of land. In this plan this level is called the Native Plant Community (NPC). In the Biophysical regime this level is referred to as Biophysical Land Unit (BLU); however, BLUs have not been determined yet for Carlton County.

The purpose of using ECS is to generate a reasonable understanding of the *potential* of a given tract of land to produce a forest and thus provide a basis for forest management. Given enough time and the absence of disturbance the forest on a given piece of land will evolve to a specific type of forest or biotic community. This "potential" is determined by such factors as soil, moisture, topography, surficial

geology, slope, and land form. Depending upon the author, this potential forest is called "habitat type", "biophysical land unit", or "native plant community" the term used in this plan.

The challenge in Carlton County was to *approximate* the native plant community units without having to resort to expensive and time consuming field work. Ultimately, over time the County will verify and amend the approximate NPC characterizations of any given stand through field work. However, for the purposes of this strategic plan, computer based technology, primarily Geographic Information Systems (GIS), was used to identify the probable NPC for each stand.

The primary data source used in this effort was Carlton County's detailed soil survey.[12] From previous work it was known that two soil characteristics, surface texture and drainage, provide the basis for understanding productivity and probable vegetation. This information was correlated with the "bearing tree" information from the original land survey conducted in the late 1880s to relate tree species and density to the underlying soil properties. The initial NPC types emerging from this analysis were reviewed by Minnesota DNR, County and consultant staff. Alterations were made to account for the unique characteristics in the Nemadji River basin.

General descriptions of the native plant communities found in Carlton County follow.[13]

Northern Dry-mesic Poor Mixed Woodland [FDn32]	
Description	Dry-mesic pine or black spruce woodlands, often mixed with paper birch and quaking aspen. Most common on relatively nutrient-poor, shallow loam soils over bedrock, but also can occur on sandy lacustrine plains. Community originates following crown fires.
Natural History	In the past, fires were occasional. Catastrophic fires occurred every 170 years; severe surface fires every 210 years. Windthrow is not common. **0-55 years**: young woodlands recovering from fire, dominated by jack pine and paper birch. **55-95 years**: transition period marked by gradual decline of jack pine and paper birch; red pine and paper birch are most abundant during transition; spruce, balsam fir, and white pine invade and increase in abundance. **>95 years:** mature woodlands characterized by mixed canopies dominated by spruce (primarily black) with some paper birch, balsam fir, white pine, and old jack pine.

[12] When the County's Biophysical Region information has been placed into a electronic database, it will be available to both test and verify NPC assignments and to create Biophysical Land Unit descriptions as well.

[13] Descriptions are from *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*, Minnesota Department of Natural Resources, 2003. The codes in brackets define the community as Fire Dependent (FD], Mesic Hardwood [MH], Wet Forest [WF], or Acid Peatland [AP]; the "n" refers to the northern floristic region in which the community lies; the first number identifies the degree of moisture on the site (0=none and 9=high) and the second number identifies the degree of nutrients in the soil (0=none and 9=high).

Map 4. NPC

Northern Dry-mesic Mixed Woodland [FDn33]

Description	Dry-mesic conifer, conifer-hardwood, or hardwood woodlands dominated by red pine, white pine, jack pine, black spruce, quaking aspen, or paper birch. Most common on sandy soils, but also present on shallow loamy soils over bedrock.
Natural History	In the past, fires were common. Rotation for catastrophic fires was about 220 years and 75 years for surface fires. Windthrow as not common. **0-35 years:** young woodlands recovering from fire, dominated by quaking aspen mixed with red pine, jack pine, and paper birch. **35-55 years:** transition period where quaking aspen and jack pine decline and are replaced by red pine and paper birch; white pine, white spruce and balsam fir seedlings become established in understory. **55-125 years:** mature woodlands with a mixed canopy of red pine, paper birch, and white pine with some old quaking aspen; cohorts of young red pine, white pine, and paper birch are present in understory in areas affected by surface fires – white spruce and balsam fir are present in unburned areas. **125 years:** around this age there is a rapid decline in red pine and corresponding increase in white pine and some white spruce. **>125 years:** old woodlands dominated by white pine with some red pine, paper birch, and white spruce; understory determined by presence of surface fires.

Northern Mesic Hardwood Forest [MHn35]

Description	Mesic to dry-mesic hardwood forests on well-drained to moderately well-drained loamy soils, most often on stagnation moraines and till plains and less frequently on bedrock hills..
Natural History	In the past, catastrophic disturbance was rare – rotation for catastrophic fires was 970 years and windthrow was in excess of 1,000 years. More common were events causing partial loss of trees, such as light surface fires and patchy windthrow with estimated rotation of 130 years. **0-55 years:** young forests recovering from fire or wind, dominated by paper birch and quaking aspen with less sugar maple, northern red oak and basswood. **55-95 years:** transition period marked by a gradual decline in paper birch, aspen and northern red oak and their replacement by sugar maple, white spruce, and basswood; some white pine seedlings are established. **95-205 years:** mature forests characterized by mixed canopies of paper birch, sugar maple, and white spruce with less basswood and white pine; some old aspen and northern red oak persist. **205-295 years:** transition period marked by a significant increase in white spruce and white pine and corresponding decline in paper birch. **>295 years:** very old forests dominated by white pine and sugar maple with modest amounts of paper birch (these old forests were uncommon and probably occurred as scattered groves of very large white pine mixed with younger white spruce and paper birch).

Northern Mesic Mixed Forest [FDn43]

Description	Mesic pine, white cedar, aspen, or birch forests on loamy soils over bedrock in scoured bedrock uplands and on loamy, rocky, or sandy soils on glacial moraines, till plains, and outwash plains.
Natural History	In the past fires were occasional. Rotation of catastrophic fire was about 220 years and 260 years for severe surface fires. Windthrow was not common. **0-35 years:** young forests recovering from fire, dominated by quaking aspen with less jack pine and paper birch. **35-55 years:** transition period where aspen and jack pine decline and are replaced by paper birch, white pine, red pine, and balsam fir; white spruce seedlings become established. **55-95 years:** mature forests with a mixed canopy of paper birch and white pine with less balsam fir and red pine and some old aspen; white spruce saplings are present in understory. **95-115 years:** transition period marked by significant increase in white spruce and decline of paper birch, red pine, and quaking aspen. **>115 years:** old forests dominated by white pine and white spruce with modest amounts of balsam fir and paper birch.

Northern Mesic Rich Hardwood Forest [MHn47]

Description	Mesic hardwood forests on well drained to somewhat poorly drained rich loamy soils on glacial drift and till in areas of undulating to hummocky topography.
Natural History	In the past, catastrophic disturbances were rare – rotations for fire and windthrow exceed 1,000 years; events with partial loss of trees, such as light surface fire and patchy windthrow, had estimated rotation of 330 years. **0-55 years:** young forest recovering from fire or wind, colonized immediately by sugar maple mixed with some earlier successional species including paper birch, basswood, and quaking aspen. **55-75 years:** transition period marked by the gradual decline of paper birch, aspen, and basswood; yellow birch, white pine and white spruce seedlings become established. **75-195 years:** mature forests composed of sugar maple, yellow birch, paper birch, and basswood, with modest amounts of white pine and white spruce. **>195 years:** very old forests dominated by sugar maple and white pine mixed with some yellow birch.

Northern Wet-mesic Boreal Hardwood-Conifer Forest [MHn44]

Description	Wet-mesic or mesic hardwood and hardwood-conifer forests, most commonly on level, clayey sites with high local water tables on glacial lake deposits, stagnation moraines, and till plains.
Natural History	In the past, catastrophic disturbances were rare – rotation of catastrophic fires was 430 years and windthrow as 960 years; events resulting in partial loss of trees, including light surface fires and patchy windthrow, had an estimated rotation of 160 years. **0-35 years:** young forests recovering from fire or wind, strongly dominated by quaking aspen with minor amounts of paper birch and balsam fir. **35-95 years:** transition period marked by a steady decline in quaking aspen and its replacement by white spruce, paper birch, and balsam fir; some white pine seedlings are established. **95-195 years:** mature forests characterized by mixed canopies of white spruce, quaking aspen, paper birch and balsam fir (modern forests can have considerable amounts of red maple and black ash which were rarely documented in the historic record). **>195 years:** very old forests similar in composition to mature forests but with more white pine and also some basswood.

Northern Mesic Wet/Dry Boreal Hardwood-Conifer Forest [MHn44b]

Description & Natural History	This is a variant of the previous community. It often occurs on slopes >10% that are influenced by groundwater seepage, as well as on level terrain. It has been documented only in the vincinity of Jay Cooke State Park in the South Superior Uplands. It is dominated by white pine, white spruce, or paper birch. White spruce is the most common subcanopy species but paper birch, balsam fir, sugar maple, black ash may be present. This is the only mesic hardwood forest system community that is usually dominated by conifers.

Wet Ash Swamp [WFn55]

Description	Wet hardwood forests on mucky mineral soils in shallow basins and groundwater seepage areas or on low, level terrain near rivers, lakes, or wetlands. Typically with standing water in the spring but draining by late summer.
Natural History	In the past, catastrophic disturbances were infrequent. Catastrophic fire occurred in excess of 1,000 years while windthrow was about every 370 years. Selective windthrow of patches of trees was more common, about every 140 years. **0-75 years:** young forests recovering from wind, strongly dominated by black ash; yellow birch, paper birch, quaking aspen, and balsam fir are occasional and peak during this stage. **75-195 years:** mature forests dominated by black ash, mixed with some white cedar, tamarack, and white spruce and less yellow and paper birch; quaking aspen and balsam fir are rare. **>195 years:** very old forests similar to mature forests but with more tamarack, white spruce and white cedar; young balsam fir are occasional in understory.

Northern Wet Cedar Forest [WFn53]

Description	Wet conifer or conifer-hardwood forests on muck or peat soils. Typically present in settings where saturated soils are present through most of the growing season such as depressions, low, level terrain along lakes, rivers, or wetlands, and gently sloping upland drains.
Natural History	In the past, catastrophic disturbances were infrequent -- rotation for catastrophic fire was 800 years and windthrow about 365 years. Events that result in partial loss of trees was also rare with a rotation of about 340 years. **0-55 years:** young forests recovering from windthrow, strongly dominated by balsam fir mixed with some white cedar, paper birch and black ash. **55-75 years:** transition period marked by a dramatic decline in balsam fir, mirrored by an increase in white cedar; white spruce also increases significantly, while black ash and paper birch persist as minor components. **75-105 years:** mature forests dominated by white cedar mixed with some paper birch, white spruce, and old balsam fir. **105-155 years:** transition period marked by substantial increases in balsam fir, tamarack, and white spruce at the expense of white cedar; black ash and paper birch persist or decrease slightly. **>155 years:** old forests dominated by a mixture of white cedar, white spruce, and balsam fir with some tamarack (modern old forests rarely have much white spruce or tamarack).

Northern Alder Swamp [FPn73]

Description	Tall shrub wetlands dominated by speckled alder on mineral, muck, or peat soils. Present in wetland basins on glacial moraines and till plains, along streams and drainage ways, or in laggs along peatland and upland borders.
Natural History	This community is nonforested with at most scattered trees over 6 feet tall. The water table can fluctuate but remains at or near the ground surface for much of the year. It often occurs adjacent to or as patches within forested rich swamp communities; it can originate following disturbances that cause elimination of trees in forested swamps enabling alder to become dominant. Conversion of forested swamps to alder swamps often follows fire, logging, windthrow, or temporary changes in hydrology caused by beaver activity. In Carlton County this community is predominantly found in the Nemadji River basin where depressions in the red clay permit higher water tables; the soil characteristics of these areas may be identical to adjacent boreal hardwood-conifer communities except for the elevated water tables which favor alder dominance.

Northern Spruce Bog [APn80]	
Description	Black spruce dominated peatlands on deep peat. Canopy is often sparse, with stunted trees. Understory is dominated by ericaceous shrubs and fine-leaved graminoids on high *sphagnum* hummocks.
Natural History	This community occurs where buildup of peat causes the peat surface to become isolated from mineral-rich runoff or subsurface flow so that all mineral inputs come from precipitation. Fires are not common in spruce bogs -- catastrophic fire occurs greater than every 1,000 years and superficial fires occur about every 120 years; such fires can kill black spruce trees and favor nearly continuous cover of leatherleaf. Severe catastrophic fires can convert bog to an open bog community or even a poor fen; recovery to forested conditions may take decades. Scattered tamarack may be found in addition to black spruce. Canopy can be dense and taller than 30 feet on well-developed crests of raised bogs.

Table 1 shows the distribution of each native plant community on Carlton County administered tax forfeited lands.

Table 1: Distribution of Native Plant Communities on Carlton County Tax Forfeit Lands

Native Plant Community	Acres	%
Dry Mesic Poor Mixed Woodland [FDn32]	429	0.6%
Dry Mesic Mixed Woodland [FDn33]	2,908	4.0%
Mesic Hardwood Forest [MHn35]	2,684	3.7%
Mesic Mixed Forest [FDn43]	16,226	22.5%
Mesic Rich Hardwood Forest [MHn47]	25	0.0%
Wet Mesic Boreal Hardwood-Conifer Forest [MHn44]	12,864	31.9%
Wet/Dry Boreal Hardwood-Conifer Forest [MHn44b]	4,480	6.2%
Wet Ash Swamp [WFn55]	754	1.0%
Wet Cedar Forest [WFn53]	18,774	26.0%
Wet Northern Alder Swamp [FPn73]	2,514	3.5%
Wet Spruce Bog [APn80]	10,510	14.6%

3.3 Cover Type

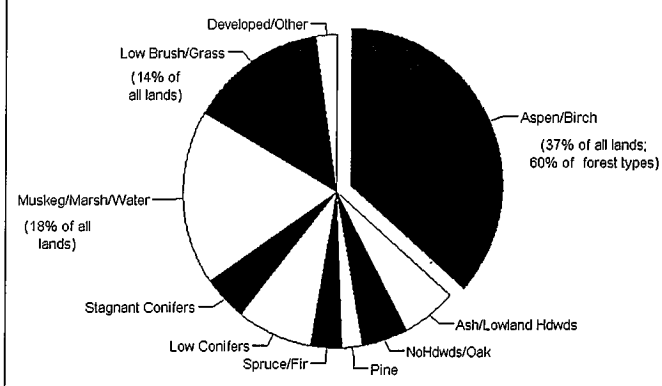
The term "cover type" is used to describe what type of forest (or land use) occupies a given stand. For forested areas, cover type is defined by the dominant overstory tree. However, in most stands there is a mix of species and the dominant, defining species may account for as little as 30% of the trees. Table 2 and Map 5 shows the distribution of cover type for Carlton County administered tax forfeited lands.

[Map 5: cover types]

Table 2: Cover Type on Carlton County Tax Forfeited Lands, 2003		
Cover Type	**Acres**	**Percent**
Ash	4,055	5.6%
Aspen	24,044	33.2%
Balm of Gilead	557	0.8%
Balsam Fir	1,304	1.8%
Birch	1,862	2.6%
Black Spruce, Lowland	3,086	4.3%
Lowland Hardwoods	144	0.2%
Northern Hardwoods	3,310	4.6%
Pine, Jack	22	0.0%
Pine, Red	1,399	1.9%
Pine, White	78	0.1%
Oak	244	0.3%
Tamarack	2,059	2.8%
White Cedar	626	0.9%
White Spruce	1,124	1.6%
Stagnant Cedar / Spruce / Tamarack	3,404	4.7%
Upland Grass / Brush	372	0.5%
Lowland Grass / Brush	10,376	14.3%
Marsh / Muskeg	12,004	16.6%
Permanent Water	405	0.6%
Non-permanent Water	663	0.9%
Developed / Roads / Agricultural / Other	1,269	1.8%
Total	72,407	100.0%

Figure 2 graphically shows the distribution of major cover types.

Fig. 2: Cover Type Groups, Carlton County Tax Forfeited Lands, 2003



An important attribute of forest cover types is understanding their distribution in terms of age

class (in 10 year increments). Age class distributions can indicate the expected flow of harvestable trees, the character of the forests (young vs old), and stands that may be naturally succeeding into other cover types. Table 3 shows the age class distributions for Carlton County's tax forfeited lands in 2003.

Table 3: Age Class for Selected Cover Types on Carlton County Tax Forfeited Lands, 2003 (acres per age class)

Cover Type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121+	Total
Ash	0	28	21	35	45	267	189	495	1,123	431	410	214	796	4,054
Lowland Hardwoods	0	0	0	0	0	48	29	52	0	0	0	0	16	145
Aspen	3,262	3,594	1,270	1,426	6,176	5,322	2,379	366	138	0	83	0	0	24,016
Birch	0	0	0	0	92	348	730	501	146	12	7	27	0	1,863
Balm of Gilead	28	28	25	0	32	46	86	182	130	0	0	0	0	557
Northern Hardwoods	4	13	0	358	282	506	844	982	145	146	29	0	0	3,309
Oak	0	0	0	0	0	0	45	71	27	4	97	0	0	244
White Pine	0	0	0	0	0	0	0	0	0	10	29	0	38	77
Red Pine	65	778	375	129	32	0	0	0	0	0	0	0	0	1,379
Jack Pine	7	0	0	13	0	0	0	3	0	0	0	0	0	23
White Spruce	14	216	29	2	12	26	60	0	404	178	69	105	0	1,115
Balsam Fir	0	0	0	0	2	155	598	423	94	33	0	0	0	1,305
Black Spruce, Lowland	53	60	51	59	115	80	387	894	556	205	78	158	385	3,081
Tamarack	10	28	0	133	16	123	302	395	159	515	123	39	216	2,059
White Cedar	0	0	0	28	0	0	41	33	123	293	0	101	6	625
Total	3,443	4,745	1,771	2,183	6,804	6,921	5,690	4,397	3,045	1,827	925	644	1,457	43,852

Nearly 4,500 acres of Carlton County's land base lies within the steep red clay slopes and highly erodible valleys of the Nemadji River basin. This land cannot be actively managed through timber harvesting and will essentially be allowed to undergo natural succession into old spruce-fir forests. In order to more accurately understand the County's true harvestable timber resource, these acres need to be removed from consideration. Table 3b presents the age class distribution for the timber types affected by this reduction in land area.

Table 3b: Age Class for Selected Cover Types on Carlton County Tax Forfeited Lands EXCLUDING the MHn44b Native Plant Community (Nemadji River basin slopes and valleys), 2003 (acres per age class)

Cover Type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121+	Total
Aspen	3,251	3,556	1,264	1,310	5,693	4,407	1,752	296	109	0	83	0	0	21,721
Birch	0	0	0	0	92	348	726	305	111	12	7	27	0	1,628
Balm of Gilead	28	28	25	0	30	31	86	30	2	0	0	0	0	260
White Pine	0	0	0	0	0	0	0	0	0	10	29	0	31	70
White Spruce	14	216	39	2	12	15	1	0	42	19	5	15	0	380
Balsam Fir	0	0	0	0	2	92	556	180	13	33	0	0	0	876

Deleting the Nemadji River basin slopes and valleys significantly impacts several key timber species. The aspen resource loses about 10% of its land base; birch declines over 200 acres; two-thirds of the white spruce resource is eliminated from harvest potential while one-third of the balsam fir cover type is removed from consideration.

The following series of graphs presents the age class distributions for a number of key cover types.

Fig. 3: Aspen Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

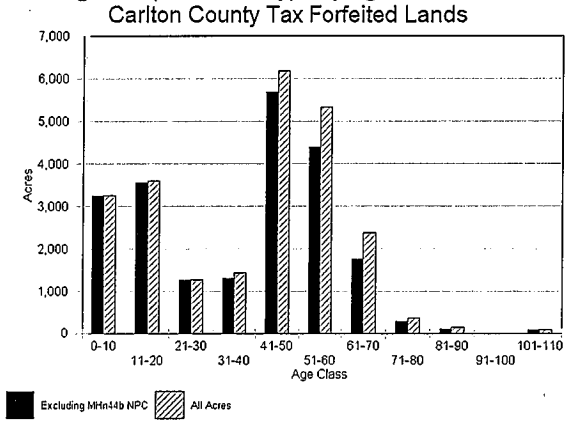


Fig. 4: Birch Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

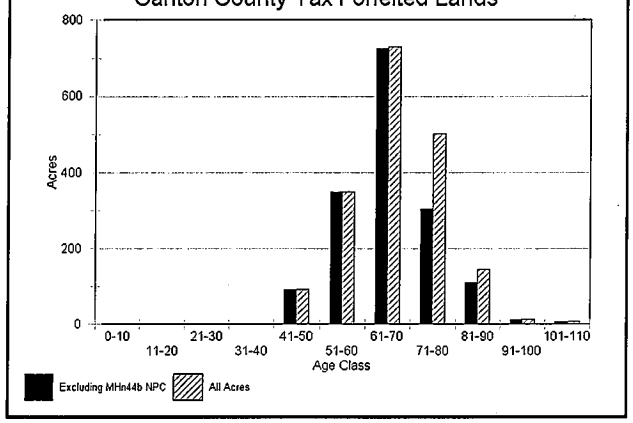


Fig. 5: Northern Hardwoods Cover Type by Age Class, 2003, Carlton County Tax Forfeited Lands

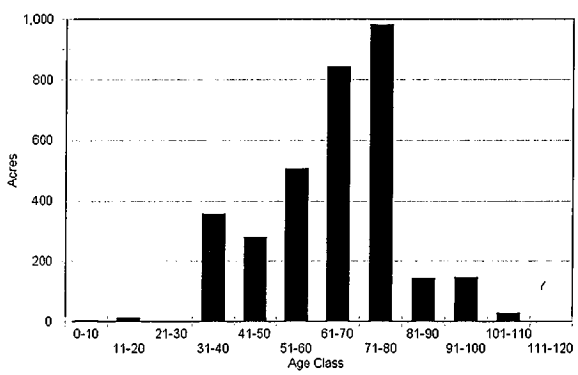


Fig. 6: White Spruce Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

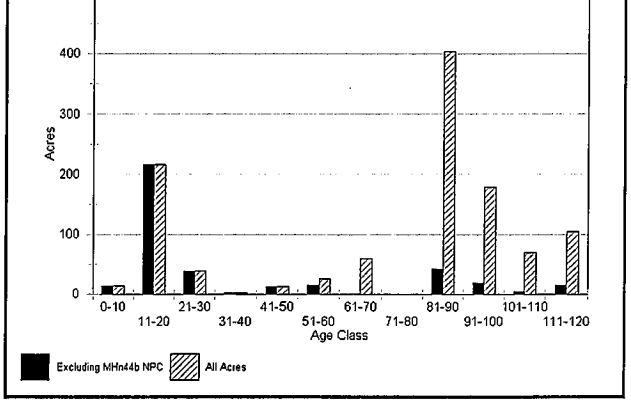


Fig. 7: Balsam Fir Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

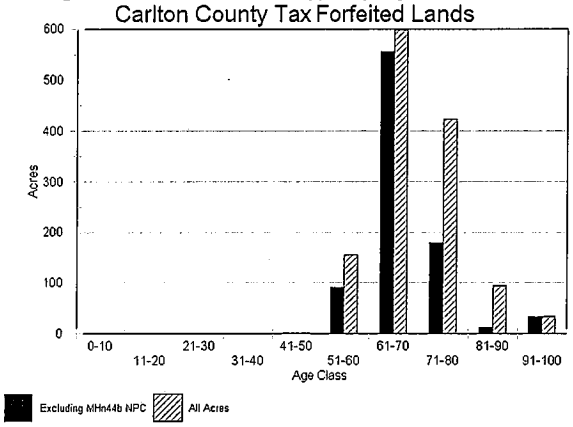


Fig. 8: Tamarack Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

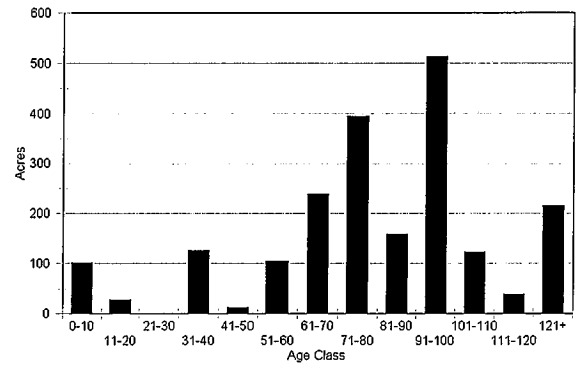


Fig. 9: Red Pine Cover Type by Age Class, 2003
Carlton County Tax Forfeited Lands

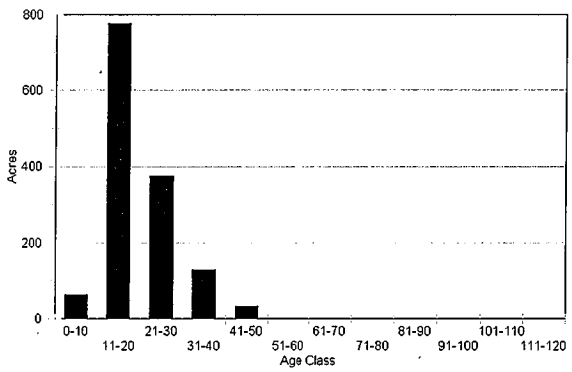


Fig. 10: Black Spruce-Low Cover Type by Age Class,
2003, Carlton County Tax Forfeited Lands

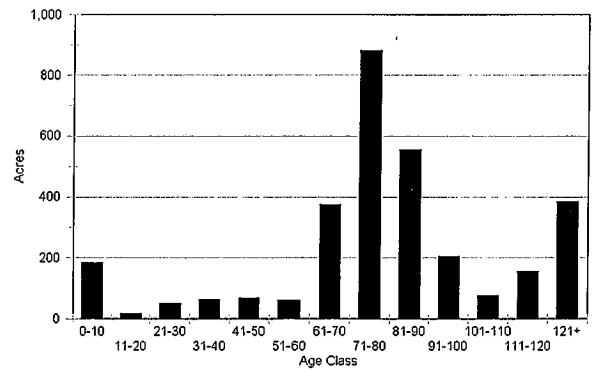


Table 4 identifies the generalized cover type distribution by Biophysical Region.

Table 4: Generalized Cover Type Composition of Biophysical Regions on Carlton County Tax Forfeit Lands, 2003

Biophysical Region	Pine	Aspen / Birch	Spruce / Fir	Oak / No. Hdwds	Ash / Low Hdwds	Blk Sp / Tam / Cedar	Grass / Brush	Marsh / Water	Dev. / Other*	Total
Wawina Hibbing Plain	1.7%	18.6%	0.1%	1.6%	1.8%	5.5%	12.2%	44.7%	13.7%	100%
Brookston Upland	2.3%	35.2%	0.7%	6.0%	6.1%	8.5%	15.7%	19.3%	6.2%	100%
Cloquet Island Lake Plain	3.3%	24.6%	3.1%	3.2%	7.9%	18.3%	19.1%	11.2%	9.1%	100%
Duluth Upland	10.2%	51.3%	0.0%	0.0%	2.3%	0.0%	23.4%	4.6%	8.4%	100%
Nemadji Plain	0.7%	60.7%	12.9%	0.8%	6.2%	1.9%	10.8%	3.2%	2.8%	100%

* Includes stagnant lowland conifers.

Tables 5 and 6 and Figure 11 evaluate the native plant communities – the potential of the landscape to grow late successional forests – in terms of current cover types.

Tables 5 and 6 highlight the degree of caution that must be taken with the data. The Wet Cedar Forest community shouldn't support ash, aspen, birch and other upland species but the table suggests that it does. It reality, the issue lies with soil and forest inventory polygons that do not align well in certain areas. Also, in the highly intermixed upland and lowlands of parts of Carlton County, certain soil types are supporting unlikely forests – in this case, poorly drained mucks that lie adjacent to or interwoven with upland soils have upland trees on them; this may be caused by a variety of unique physical conditions. It underscores the need to use the initial map of native plant communities as a solid beginning point, but one that requires ongoing field testing.

Table 5: Cover Type Distribution by Native Plant Communities on Carlton County Tax Forfeit Lands, 2003 (acres)†

Cover Type	FDn32 Poor Mixed Wdld	FDn33 Mixed Wdld	MHn35 Hdwd Forest	FDn43 Mixed Forest	MHn47 Rich No. Hdwd	MHn44 Boreal Hdwd-Conifer	MHn44b Wet-Dry Boreal Hd-Con	WFn55 Ash Swamp	WFn53 Cedar Forest	APn80 Spruce Bog	
Ash	14	96	61	424		1,012	141	72	1,885	208	3,913
Lowland Hdwds				4		5	134			1	144
Aspen*	123	1,265	1,393	9,084	3	6,683	2,595	93	1,554	385	23,178
Birch	34	309	52	928		136	235	5	98	51	1,848
North Hdwds		66	278	2,171		482	19	38	179	51	3,284
Oak		94	72	69					9	1	245
Red Pine	143	412	102	523		35	1	3	62	11	1,292
White Spruce				131		204	745	2	17	5	1,104
Balsam Fir	22	65	383	61		97	428	2	163	44	1,265
Black Spruce, low	8	40	46	74		83		11	1,612	1,166	3,040
Tamarack	5	21	10	78		26		7	1,669	226	2,042
Total	349	2,368	2,397	13,547	3	8,763	4,298	233	7,248	2,149	41,355

† Nonforested Alder Swamp NPC is not included.
* Includes Balm of Gilead.

Table 6: Generalized Cover Type Composition of Native Plant Communities on Carlton County Tax Forfeit Lands, 2003†

NPC	Pine	Aspen / Birch	Spruce / Fir	Oak / No. Hdwds	Ash / Low Hdwds	Blk Sp / Tam / Cedar	Grass / Brush	Marsh / Water	Dev. / Other*	Total
Poor Mixed Wdld / FDn32	32.9%	36.4%	5.1%	0.0%	3.2%	1.8%	7.8%	3.2%	9.5%	100%
Mixed Woodland / FDn33	14.3%	54.2%	2.2%	5.3%	3.3%	3.1%	8.8%	4.9%	3.9%	100%
Hardwood Forest / MHn35	3.8%	54.4%	14.4%	12.1%	2.3%	2.5%	4.4%	3.3%	2.7%	100%
Mixed Forest / FDn43	3.6%	63.4%	1.2%	11.4%	2.7%	1.0%	9.0%	5.3%	2.3%	100%
Rich Hardwood For. / Mhn47	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%	88.0%	0.0%	0.0%	100%
Boreal Hdwd/Con. / MHn44	0.1%	68.9%	11.8%	0.2%	2.8%	0.0%	11.6%	1.4%	3.3%	100%
Boreal Hdwd-Con / MHn44b	3.1%	48.8%	6.2%	8.3%	20.0%	2.0%	0.5%	4.9%	6.2%	100%
Ash Swamp / WFn55	0.5%	13.0%	0.5%	5.0%	9.6%	1.5%	50.3%	15.3%	4.3%	100%
Cedar Forest / WFn53	0.3%	8.8%	1.0%	0.7%	10.0%	20.1%	33.0%	20.7%	5.4%	100%
Spruce Bog / APn80	0.1%	3.4%	0.4%	0.4%	1.6%	12.0%	4.3%	57.6%	20.2%	100%

†Nonforested Alder Swamp NPC is not included.

* Includes stagnant lowland conifers.

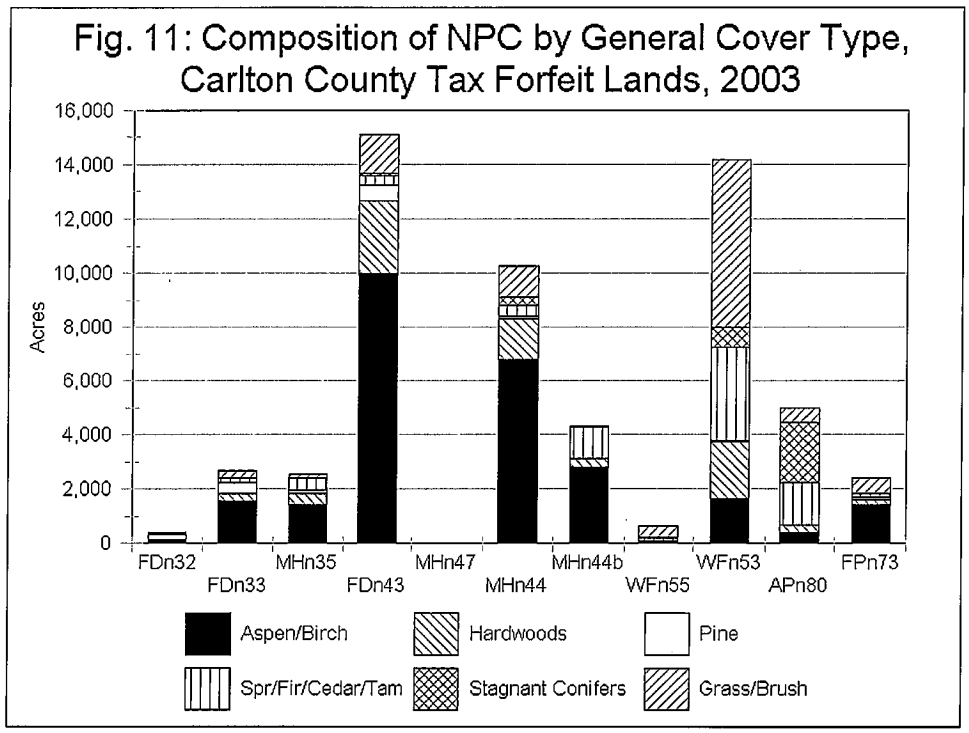


Table 7 interprets existing cover type on tax forfeited lands in terms of vegetation growth stage (VGS; also called forest succession phase). The general stage definitions are based on those presented in the MnDNR's "Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province". The table presents existing cover type in terms of the vegetation growth stage (forest succession phase) across each of the native plant communities. It must be kept in mind that the stands are evaluated by stand age which is determined by the average age of the dominant trees. Undisturbed stands may be much older than the age of the trees in it; as a consequence certain types of stands (e.g., lowland conifers, ash) may be older than as identified in the table.

Table 7: Distribution of Generalized Vegetational Growth Stages by Native Plant Community on Carlton County Tax Forfeited Lands, 2003*

NPC†	Young	Transition Young > Mature	Mature	Transition Mature > Old	Old	Forested Acres in NPC‡
Poor Mixed Wdld / FDn32	49.9%	47.9%	2.2%			361
Mixed Woodland / FDn33	19.3%	23.0%	57.5%	0.0%	0.2%	2,429
Hardwood Forest / MHn35	56.9%	36.3%	6.9%	0.0%	0.0%	2,416
Mixed Forest / FDn43	32.8%	35.8%	28.6%	2.1%	0.7%	13,666
Rich Hardwood For. / Mhn47	0.0%	100.0%	0.0%		0.0%	3
Boreal Hdwd/Con. / MHn44	19.9%	69.9%	9.8%		0.4%	9,123
Boreal Hdwd-Con / MHn44b	1.3%	63.6%	30.0%		5.1%	4,306
Ash Swamp / WFn55	37.6%		34.7%		0.0%	242
Cedar Forest / WFn53	23.2%	36.1%	34.8%	4.8%	1.0%	8,476
Spruce Bog / APn80	42.3%				57.7%	4,468

* Percent of NPC within the growth stage.
† Nonforested Alder Swamp NPC is not included.

‡ Excludes grass, brush, recreation, developed, roads, water, rock, marsh/muskeg.

It is difficult to apply the concept of Range of Natural Variability (RNV) to Carlton County's land because the County's ownership is small (in total and especially when divided into eleven native plant communities). The concept could be utilized in joint management planning with the DNR in areas where their combined ownerships controlled large tracts of the landscape. However, the concept is not being dismissed; rather, it is incorporated in the general management principle of attempting to maintain a representation of general vegetational growth stages within each native plant community on County lands.

3.4 Habitat

The forested landscape contains a wide range of habitats for plants and animals. Concern for the proper amount, location, and vigor of habitats is part of Carlton County's management. However, a restricted land base and limited departmental resources preclude the County undertaking significant amounts of management expressly for wildlife or non-commercial plants.

Carlton County's basic approach to habitat is what is known as "coarse filter / fine filter" under which the primary objective is to insure, within the limits of the resource, the full extent of habitats capable of being supported by the resource. This is the coarse filter. The fine filter is undertaking management for specific species in specific places where need, demand, or conditions warrant. The County works with the Minnesota DNR's game and non-game officials regarding habitat management.

Chapter 7 Habitat presents detailed information on the range of habitat's on county-administered tax forfeited land. It includes information on coarse filter descriptions of habitat types and listings of rare, endangered, or special concern species that are or may be found in Carlton County.