



# Minnesota Department of Natural Resources

500 Lafayette Road  
St. Paul, Minnesota 55155-40\_10

January 28, 2009

The Honorable Ellen R. Anderson  
Environment and N.R. Finance Division chair  
Capitol Building, Room 120  
75 Rev. Dr. Martin Luther King Jr. Blvd  
St. Paul, Minnesota 55155-1606

The Honorable Jean Wagenius  
Environment and N.R. Finance Division chair  
449 State Office Building  
100 Rev. Dr. Martin Luther King Jr. Blvd.  
St. Paul, Minnesota 55155-1206

Dear Senator Anderson and Representative Wagenius:

According to Minnesota Session Laws Chapter 368, Article 1, section 19, the Commissioner of the Department of Natural Resources (DNR) must provide quarterly forest management investment account (FMIA) fund statements, including a report on the methodology used in calculating the revenue forecasts:

Attached for your review are the four documents:

1. The Forest Management Investment account fund statement updated to reflect anticipated un-allotments,
2. A summary report outlining revenue forecast trends and methods,
3. An executive summary – Timber Sales Revenue Forecast, and
4. Timber Sales Revenue Forecast.

Additional detail is available upon request.

Sincerely,

Joseph M. Kurcinka,  
Acting Assistant Commissioner

Enclosures

c: Mike Salzwedel  
Bob Meier  
Denise Anderson  
Dave Epperly

DNR Information: 651-296-6157 ■ 1-888-646-6367 • TTY: 651-296-5484 ■ 1-800-657-3929





DATE: 01/27/09

**LEGISLATIVE REPORT – Cost of Preparation**

NAME OF LEGISLATIVE REPORT – Forest Management Investment Account Unallotments

Based on:

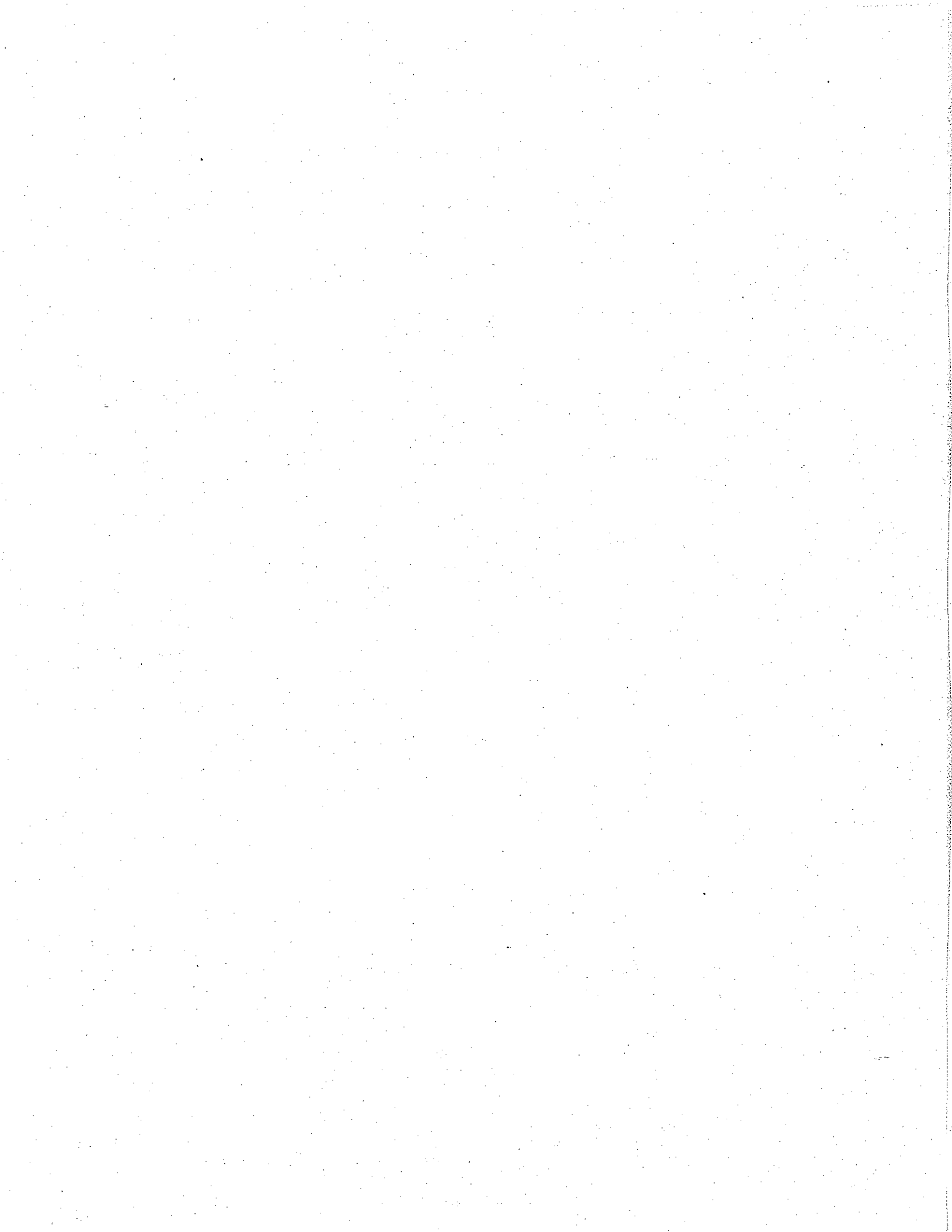
Minnesota Statute Reference: Minnesota Session Law Chapter 368, Section 19

Prepared by: André Prah, Department of Natural Resources

Phone: 651-259-5548

E-Mail: Andre.Prah@dnr.state.mn.us

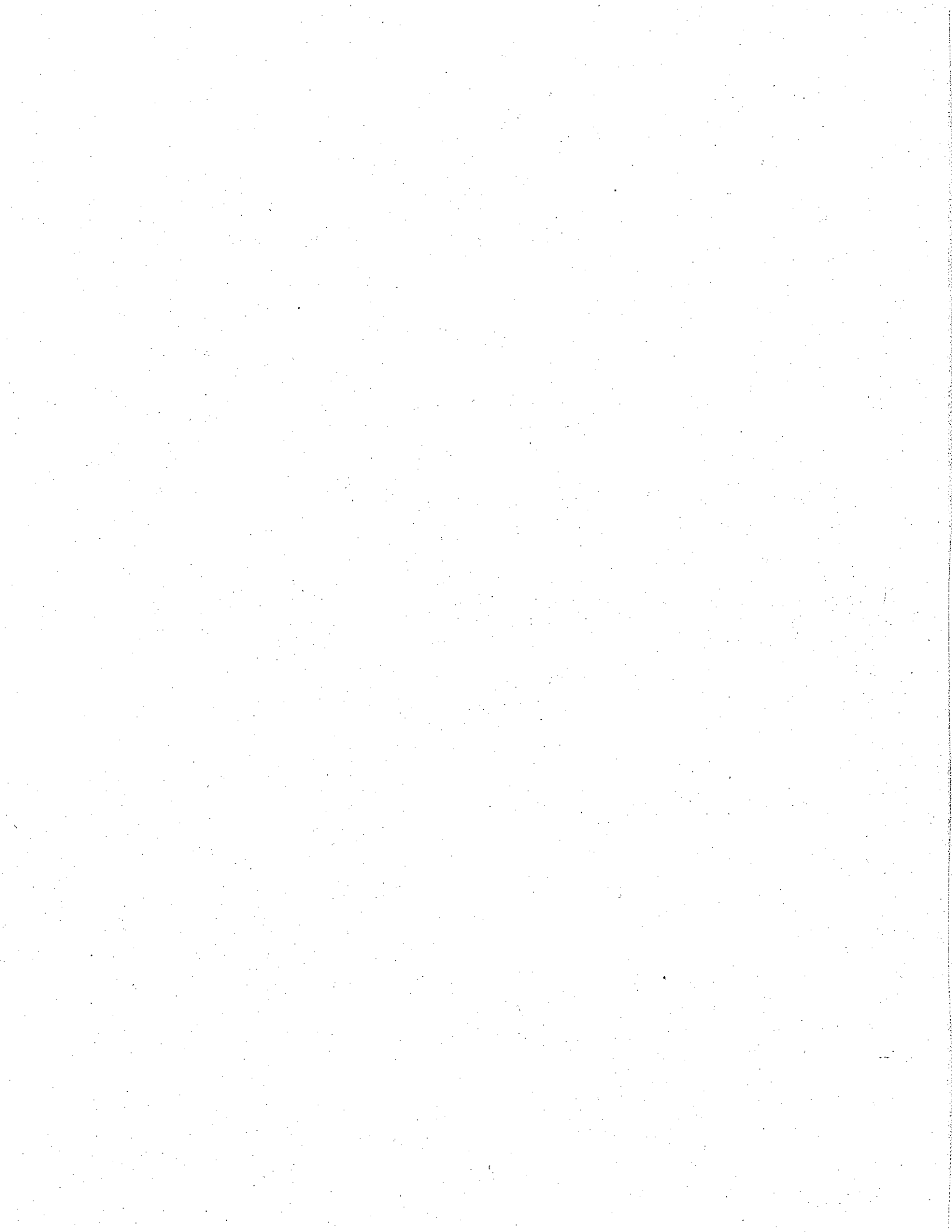
Description of Cost	Further explanation if necessary	Amount
Staff Time	2 weeks staff time (multiple staff)	\$3,000
Duplication Cost (includes paper)	Negligible, most work done electronically	
Other:		
<b>TOTAL TO PREPARE REPORT</b> <i>(Note: Right click on amount cell and choose update to complete)</i>		\$3,000



**Department of Natural Resources  
Natural Resources Fund Statement  
January 2009 Forecast Update**

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
	Actual	Actual	Planning Est(1)	Planning Est	Planning Est	Planning Est	Planning Est
<b>18J Forestry Management Investment Account</b>							
<b>Legal Citation: M.S. 89.039</b>							
Balance Forward In	6,497,722	9,065,146	5,848,635	1,291,635	(191,365)	(442,365)	(693,365)
	<u>44,707</u>	<u>16,201</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Prior Year Adjustments	6,542,429	9,081,347	5,848,635	1,291,635	(191,365)	(442,365)	(693,365)
Adjusted Balance Forward							
5348 Timber Sales	5,893,701	5,297,011	4,302,000	3,999,000	4,049,000	4,049,000	4,049,000
5349 Timber sales interest and penalty	4,937	158,697	10,000	3,000	3,000	3,000	3,000
8000 Investment Income	348,047	202,041	100,000	150,000	200,000	200,000	200,000
8340 Credit Agreement Rebate		67	0	0	0	0	0
8360 Refunds of Prior Yr Expenditure	<u>0</u>	<u>5</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal Receipts	6,246,685	5,657,821	4,412,000	4,152,000	4,252,000	4,252,000	4,252,000
From Fund 200, CON. CON Areas Account	2,428,469	3,070,133	2,743,000	2,549,000	2,581,000	2,581,000	2,581,000
From Fund 610, University Susp Account	31,898	30,743	40,000	35,000	35,000	35,000	35,000
From Fund 860, School Susp Account	4,088,530	3,940,487	5,181,000	4,406,000	4,406,000	4,406,000	4,406,000
Total Transfer in	6,548,897	7,041,363	7,964,000	6,990,000	7,022,000	7,022,000	7,022,000
Total Receipts and Transfers In	12,795,583	12,699,183	12,376,000	11,142,000	11,274,000	11,274,000	11,274,000
<b>TOTAL RESOURCES AVAILABLE:</b>	19,338,012	21,780,530	18,224,635	12,433,635	11,082,635	10,831,635	10,580,635
<b>Expenditures</b>							
Lands Records Management System	0	0	344,000	344,000	344,000	344,000	344,000
Forest Management	10,219,351	12,898,681	14,676,000	14,093,000	14,093,000	14,093,000	14,093,000
Enhance Sales FMIA (Appr. 302)	0	407,423	508,000	750,000	750,000	750,000	750,000
Forest Improvement FMIA (Appr. 303)	0	596,567	403,000	1,000,000	1,000,000	1,000,000	1,000,000
Forest Road Maintenance FMIA (Appr. 304)	0	787,131	278,000	0	0	0	0
Ecological classification FMIA (Appr. 301)	0	104,430	216,000	600,000	600,000	600,000	600,000
Invasive Species FMIA (Appr. 305)	0	87,198	143,000	350,000	350,000	350,000	350,000
Re-Inventory FMIA (Appr. 306)	0	116,542	273,000	400,000	400,000	400,000	400,000
Logger Refund - Relief Payments Timber	0	851,122	4,000	0	0	0	0
Minnesota Conservation Corps	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Statewide Indirect Costs (Forestry)	28,515	57,802	63,000	63,000	63,000	63,000	63,000
Planned Reduction			<u>(5,000,000)</u>	<u>(5,000,000)</u>	<u>(6,100,000)</u>	<u>(6,100,000)</u>	<u>(6,100,000)</u>
Total Expenditures	10,272,866	15,931,896	16,933,000	12,625,000	11,525,000	11,525,000	11,525,000
<b>FUND BALANCE</b>	<u>9,065,146</u>	<u>5,848,635</u>	<u>1,291,635</u>	<u>(191,365)</u>	<u>(442,365)</u>	<u>(693,365)</u>	<u>(944,365)</u>

(1) FY 2009 planning estimate reflects \$4,726,000 in appropriation unallotments (+) add'l anticipated \$700,000 in appropriation unallotments = total \$5,426,000





## MINNESOTA DEPARTMENT of NATURAL RESOURCES

### Background

In addition to requirements under Minn. Stat. §16A.152, quarterly timber sales revenue forecasts are completed to provide updated revenue estimates utilized to monitor the forest management investment account (FMIA) balance [see 2008 Laws, Chapter 368, Article 1, section 19]. The revenue forecast provides critical budget planning information. We strive to produce the most accurate and objective forecast possible within the limitations of available information and resources. Actual timber revenues are determined by a combination of external market forces, physical sale conditions, and administrative policies.

The Division of Forestry manages 4.2 million acres of State owned forestland, provides forest management assistance to family forest owners and protects 45.5 million acres from wildfire. Confronted with declining timber revenue prospects, the Division implemented a fiscal strategy in early FY08 that successfully managed down \$5.4 million in FMIA expenditures to date. Cost cutting was accomplished by holding positions vacant and reduced efforts in: forest improvement, forest roads, ecological classification, forest re-inventory, private land management, and other programs.

### January 2009 Forecast Timber Sales Revenue Summary Table

Scenario	FY09	FY10	FY11
Feb09 MED	\$21,510,500	\$19,995,200	\$20,243,950
Nov08 MED	\$22,886,200	\$21,182,800	\$21,320,800
Change (%)	(6.0%)	(5.6%)	(5.1%)

### Trends

- Year-to-date timber DNR sell rate = 80% of volume offered, down 13% from last year; significant downside risk to forecast sales volume. The sell rate is expected to improve over the remainder of FY09.
- FY09 second quarter economic meltdown; GDP dropped 5.5% driven by a decline in consumer spending. No expectation of positive GDP until first quarter FY10 with slow recovery.
- Pulp & paper started to feel the economic pain in the form of reduced demand and falling prices. Boise, International Falls and VERSO, Sartell took market related downtime.
- Ainsworth Lumber LTD Bemidji and Cook, MN oriented strand board (OSB) plants remain shut indefinitely. Combined wood consumption capacity for the two plants estimated at 540,000 cords. At this point in time, a cloud of uncertainty surrounds these most recent shuts combined with slowdowns in paper demand with respect to potential negative impacts on statewide and DNR harvest levels.

### Key Changes Since the October 2008 Forecast

- Forecast sales volumes were reduced to reflect lower than "normal" stumpage selling rates through second quarter FY09 with an expectation to carryover into FY10.
- Permit default risk adjustments were refined to focus on aspen cordwood only with 89,000 cords at >=\$60 per cord book value written off and an additional 140,000 cords at \$40-\$60 per cord book value at moderate risk of default. Defaults reduce the book value of volume under contract yet to be harvested hence, reduce anticipated revenues.
- School/University Trust cost reimbursement estimates were shifted from a "revenue basis" to a "cost basis" in order to account for relatively fixed forest management costs with declining per-unit timber revenues.
- ITC investment income was added to the watch list as the 18J FMIA balance and interest rates declined for an estimated revenue reduction of \$200,000 - \$250,000.
- Market related emergency timber permit extensions effective December 1, 2008 will postpone forfeit of economically inoperable timber permits due to expire during CY2009.

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## Forecast Methods

The timber sales revenue forecast is a combination of four distinct forecast variables. An additional step is then required to estimate the portion of timber revenue allocated to the Division of Forestry budget. Approximately 50% of timber sales revenue is eventually available for Division budgeting while the other 50% is distributed to various accounts and entities including the School / University Trust accounts, General Fund, and Minnesota counties. Each component of the revenue forecast has its own unique set of metrics, range of variation, drivers, constraints, and inherent uncertainties. The four forecast variables and metrics are:

1. sales volume (volume offer "target" minus an estimate of no-bid sales),
2. sales average per-unit price (regression model utilizing historic stumpage and product price data),
3. removals volume (most recent 5-year adjusted for forecast sales and operational constraints), and
4. removals average per-unit price, (value of timber under contract by fiscal year expiration adjusted for current fiscal year sales price expectations and default risk).

### 1. Forecast Sales Volume

Stumpage sell rate has become a significant consideration. Last quarter, freshly idled OSB capacity combined with an abrupt decline in pulp & paper demand and prices slowed purchasing as industry managed cash flow to improve year-end financials. Through FY09 second quarter, the Division of Forestry sell rate was 80% as compared to 93% last year, down 13%. The January 2009 forecast sales volume was reduced from 920,000 cords to 886,000 cords (92% sell rate) for the fiscal year. In addition, the FY10 forecast sales volume was reduced to 914,000 cords (95% sell rate).

### 2. Forecast Sales Average Per-Unit Price

FY09 YTD all-species average cordwood price was \$21.10 per cord on 396,345 cords sold (preliminary) as compared to last year at \$21.50 on 619,000 cords sold. Selling prices are expected to remain flat through the remainder of FY09 and slowly increase over FY10 and FY11 as housing market conditions start to improve. Forecast sales average per-unit prices were adjusted as follows: FY09, from \$22 to \$21.50 per cord, FY10, from \$24 to \$22.50 per cord, and FY11, from \$25 to \$23.50 per cord.

### 3. Forecast Removals Volume

For FY09, forecast removals volume is unchanged at 762,000 cords including sawtimber. For FY10-11, forecast removals volume was increased by 10,000 cords to 772,000 cords including sawtimber. Division management has made a commitment to maximize summer harvest potential. The expectation is for public sourced stumpage to be a critical component of industrial wood supply as private timber availability remains tight due primarily to low stumpage prices.

### 4. Forecast Removals Average Per-Unit Price

Market related emergency timber permit extensions were implemented covering the period from December 1, 2008 to December 31, 2009. Default risk remains high on some permits as DNR is holding 1.1 million cords of aspen under contract with approximately 200,000 cords at book value  $\geq$ \$40 per cord (21% of aspen under contract) including approximately 90,000 cords of high risk aspen with a book value of  $\geq$ \$60 per cord (8% of aspen under contract). Unsecured permit defaults do not generate new revenue for DNR because the forfeited down payment amount is accounted for at the time of purchase. Fiscal effects are to increase program costs through sale re-offers and to reduce revenue projections as the per-unit value of volume to be harvested decreases.

For more information, contact Don Deckard, State Forest Economist, <mailto:donald.deckard@dnr.state.mn.us>, phone: (651) 259-5287.



January 2009

**Executive Summary**

**Timber Sales Revenue Forecast**

For lands administered by the Division of Forestry and Section of Wildlife

*Fiscal Year 2009 - Second Quarter*

Prepared by  
Don Deckard  
State Forest Economist  
DNR – Division of Forestry



## EXECUTIVE SUMMARY

### Background

The quarterly timber sales revenue forecast provides critical budget planning information for the Division of Forestry. As required by State law, [see 2008 Laws, Chapter 368, Article 1, Section 19], forecast updates are completed to provide current revenue estimates based on new information and changing expectations. We strive to produce the most accurate and objective forecast possible within the limitations of available information and resources. However, actual timber revenues are determined by a combination of external market forces, physical site conditions, and DNR timber sale policies.

The Division of Forestry manages 4.2 million acres of State owned forestland, provides forest management assistance to family forest owners and protects 45.5 million acres from wildfire. Confronted with declining timber revenue prospects, the Division implemented a fiscal strategy in early FY08 that successfully managed down \$5.4 million in FMIA expenditures to date. Cost cutting was accomplished by holding positions vacant and reduced efforts in: forest improvement, forest roads, ecological classification, forest re-inventory, private land management, and other programs.

**February 2009 Forecast Timber Sales Revenue Summary Table**

Scenario	FY09	FY10	FY11
Feb09 MED	\$21,510,500	\$19,995,200	\$20,243,950
Nov08 MED	\$22,886,200	\$21,182,800	\$21,320,800
Change (%)	(6.0%)	(5.6%)	(5.1%)

### Trends

- Year-to-date timber DNR sell rate = 80% of volume offered, down 13% from last year; significant downside risk to forecast sales volume.
- FY09 second quarter economic meltdown; GDP dropped 5.5% driven by a decline in consumer spending. No expectation of positive GDP until first quarter FY10 with slow recovery.
- Pulp & paper started to feel the economic pain in the form of reduced demand and falling prices. Boise, International Falls and VERSO, Sartell took market related downtime.
- Ainsworth Lumber LTD Bemidji and Cook, MN oriented strand board (OSB) plants remain shut. Combined wood consumption capacity for the two plants estimated at 540,000 cords. At this point in time, a cloud of uncertainty surrounds the most recent Ainsworth shuts combined with slowdowns in paper demand with respect to potential negative impacts on DNR harvest levels.

### Key Changes Since the October 2008 Forecast

- Forecast sales volumes were reduced to reflect slower than expected selling rates through second quarter FY09 with an expectation to carryover into FY10.
- School/University Trust cost reimbursement estimates were shifted from a "revenue basis" to a "cost basis" in order to account for relatively fixed costs with declining per-unit revenues.
- Permit default risk adjustments were refined to focus on aspen cordwood only with a >=\$60 per cord book value being considered high-risk.
- ITC investment income was added to the watch list as the 18J FMIA account balance and interest rates declined for an estimated revenue reduction of \$200,000 - \$250,000.
- Market related emergency timber permit extensions effective December 1, 2008 will most likely postpone forfeit of economically inoperable timber permits due to expire during CY2009.

### Forecast Methods

The timber sales revenue forecast is a combination of four distinct forecast variables. An additional step is then required to estimate the portion of timber revenue allocated to the Division of Forestry budget. Approximately 50% of timber sales revenue is eventually available for Division budgeting while the other 50% is distributed to various accounts and entities including the School / University Trust accounts, the General Fund, and Minnesota counties. Each component of the revenue forecast has its own unique set of metrics, range of variation, drivers, constraints, and inherent uncertainties. The four forecast variables and metrics are:

## GENERAL DISTRIBUTION - 1/23/09

1. sales volume (volume offer "target" minus an estimate of no-bid sales),
2. sales average per-unit price (regression model utilizing historic price data),
3. removals volume (most recent 5-year adjusted for forecast sales and operational constraints), and
4. removals average per-unit price, (value of timber under contract adjusted for forecast sales values and permit default risk).

The basic revenue forecast calculations:

$$\begin{aligned} \text{Forecast Timber Revenue (TR)} = & \\ & ((\text{FY Forecast Sales Volume} * \text{FY Forecast Per-Unit Price}) * 0.15 \text{ down payment}) \\ & + ((\text{FY Forecast Removals Volume} * \text{FY Forecast Per-Unit Price}) * 0.85 \text{ balance due}) \\ & + \text{Other Timber Revenues} \\ & \pm \text{Net Change in Scaled Unbilled Balance} \end{aligned}$$

The estimate of the portion of timber sales revenue eventually allocated to Forest Management Investment Account (FMIA):

$$\begin{aligned} \text{Funds Allocation and Portions to FMIA} = & \\ \text{18J FMIA Direct Deposit} = & \text{TR} * (100\% * \% \text{ Historical Acquired Forestry Revenue}) \\ \text{200-022 Con-Con Transfer} = & \text{TR} * (50\% * \% \text{ Historical Con-Con Revenue}) \\ \text{Forest Suspense Account (FMIA transfer lags 1 fiscal year)} = & (\text{Historical Average Certified Cost}) \end{aligned}$$

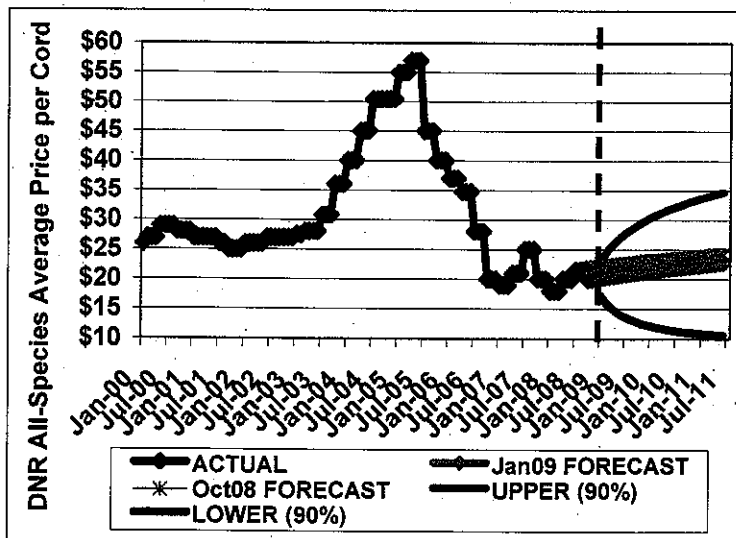
### 1. Forecast Sales Volume

The timber offer target from Division of Forestry and Section of Wildlife administered lands was increased from 800,000 cords in FY08 to 950,000 cords for the current fiscal year. Based on the increased FY09 timber target, the October 2008 forecast sales volume was 932,000 cords annually (including sawtimber) or 98% of the offer target. Through FY09Q2, DNR sold 396,345 cords plus 1,971 MBF of sawtimber (preliminary totals) with an 80% sell rate of volume offered. This represented a significant reduction from "normal" conditions as purchasers held on to cash in order to prop up their quarterly and year-end financial statements. The sell rate is expected to increase over the next two quarters as purchasers replace relatively expensive volume harvested with relatively cheap inventory. For January 2009, forecast sales volumes were adjusted as follows: FY09, 886,000 cords (92% sell rate), FY10, 914,000 cords (95% sell rate), and FY11, 932,000 cords (97% sell rate) including sawtimber.

### 2. Forecast Sales Average Per-Unit Price

Through FY09Q2 the Division of Forestry sold ~400,000 cords at an all-species average \$21.14 per cord plus 1,971 MBF of sawtimber at an all-species average \$183 per MBF. The forecast average per-cord selling price was developed with a regression model utilizing historic stumpage prices and primary product data. The model was fit to monthly time-series data from January 2000 through December 2008. For January 2009, modeling results suggested the average all-species cordwood sell price would increase from the current \$21.14 per cord to the \$23.50 per cord range by FY2011 as compared to the October 2008 forecast average price at \$21.60 increasing to the \$25 per cord range. By fiscal year, the October 2008 forecast was: FY09 at \$22,

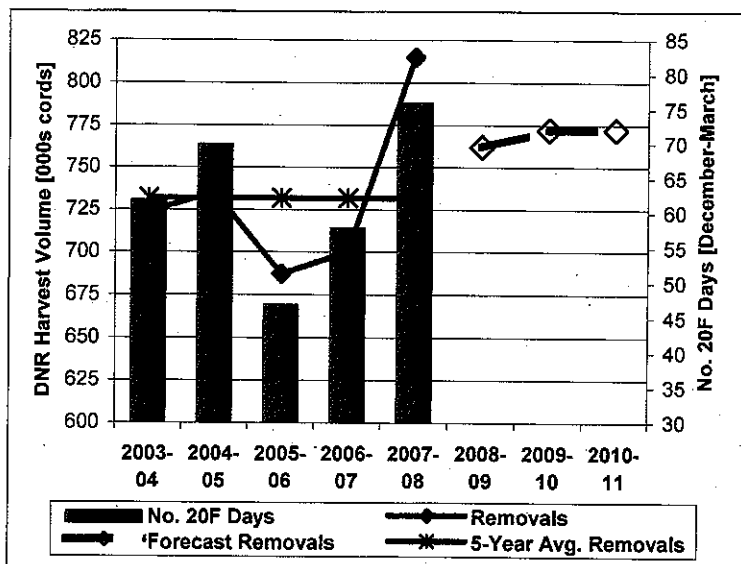
FY10 at \$24, and FY11 at \$25 per cord. Due to a significant market downturn in FY09 second quarter, the January 2009 forecast selling prices were adjusted as follows: FY09= \$21.50 per cord, FY10= \$22.50 per cord, and FY11= \$23.50 per cord. Although not included in the sell price forecast model, the all-species average sawtimber price was expected to remain in the \$200 per MBF range.



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### 3. Forecast Removals Volume

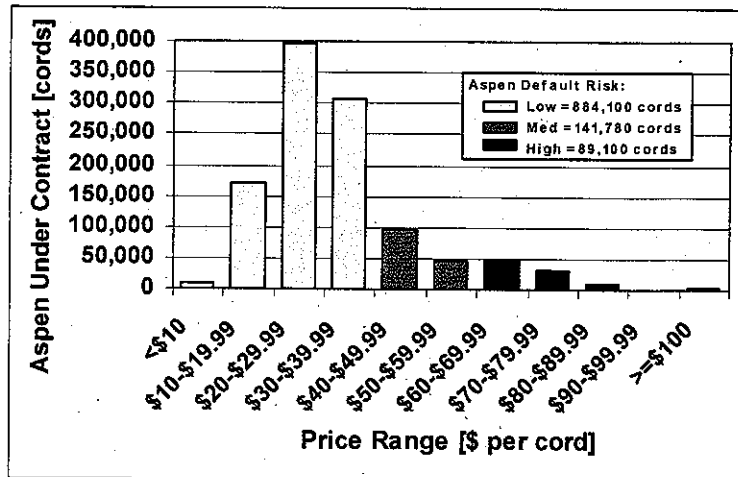
In FY08, DNR set a modern era timber removals volume record of 815,000 cords. Under a scenario of relatively low private timber availability, U.S. Canadian dollar parity, and emerging biomass markets, DNR timber removals volume would be expected to be in the 800,000-1,000,000 million cord range over the forecast horizon. However, DNR timber removals volume seems to be more dependent on the length of the winter logging season than on existing timber inventory and increasing timber sales volume targets. An estimated 70-75% of all DNR stumpage volume sold is designated as winter only operable. For the most recent 5-year period, removals ranged from low 687,000 cords in FY06 with a 47-day winter logging season to a high 815,000



cords in FY08 with a 76-day winter logging season. Weather forecasting was beyond the capability of this analyst. Hence, the forecast for timber removals relied on the 5-year average adjusted for the FY09 timber offer target increase. If the percentage of winter only timber remains constant, the offer target increase would add an estimated 30,000 cords of summer operable wood to the mix. Under this scenario, forecast average removals would be 762,000 cords including sawtimber, 4.0% above the 5-year average. For FY10-11, forecast removals volume was increased to 772,000 cords to reflect increased focus on summer harvest.

### 4. Forecast Removals Average Per-Unit Price

The forecast timber removals per-unit value was based on the per-unit value of timber inventory by fiscal year permit expiration adjusted for aspen default risk and for forecast per-unit sale values of new volume. As of January 1, 2009, DNR had 2.3 million cords timber inventory valued at \$53.9 million or an average \$23.56 per cord plus 13.6 MBF valued at \$2.9 million or an average \$213 per MBF. The volume of cord products by fiscal year expiration included: FY09, 390,000 cords, FY10 438,000 cords, and FY11, 918,000 cords.



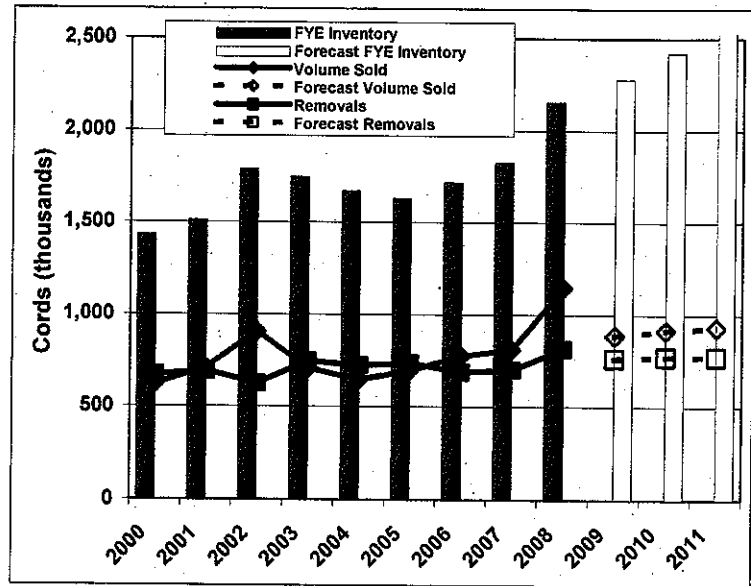
A default risk adjustment was made by removing all aspen cord products with a book value  $\geq$  \$60 per cord. This process identified and removed ~89,100 cords or 8% of the aspen cordwood inventory from consideration. By fiscal year expiration, the risk adjusted average inventory values were: FY09= \$23.60 per cord, FY10= \$22.24 per cord, and FY11= \$22.64 per cord. January 2009 forecast average per unit removal values by fiscal year were \$24.25 per cord, \$23.50 per cord, and \$23.50 per cord respectively as compared to the October 2008 forecast removal values of \$24.75, \$24, and \$24 per cord respectively. Of note, an additional 142,000 cords of aspen in the \$40-\$60 per cord book value range are in moderate risk of default. Unsecured permit defaults do not generate new revenue for DNR because the forfeited down payment amount is accounted for at the time of purchase. Fiscal effects are to increase program costs through sale re-offers and to reduce revenue projections as the per-unit value of volume to be harvested decreases.

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**Timber Inventory**

Volume under contract remains a concern as it plays an important role in the revenue forecasting process and provides insights for the future policy direction of the DNR timber program. At the close of FY08, uncut timber inventory was ~2.16 million cords. This was equivalent to a 2.9-year supply at an annual removals volume of 762,000 cords. Using the current forecast sale and removals volumes, timber inventory is expected to reach 2.6 million cords by the end of FY11.

Through FY2008, industrial capacity was not a limiting factor in DNR timber removals. For FY09-11, this may not be the case as the State has absorbed over 1.1 million cords of industrial wood capacity in the past 2 years.



Perpetually increasing timber inventory is not a normal expectation and is not sustainable. The phenomenon seems to be tied to the large volume of winter only operable volume, and for FY09-10 to industrial wood consumption. This topic requires further analysis to better understand long-run timber removals and revenue implications.

**Funds Allocation**

Acquired Forestry and Con-Con dollars are allocated on a revenue basis while School/University Trust dollars are allocated on a cost basis. The current land class distribution of timber inventory by book value is similar to historical averages.

Example Jan09 MED Revenue Forecast (\$21,510,500), Funds Allocation.

Account	Allocation Factor <sup>a</sup>	Allocation	FMIA Portion	FMIA Receipts and Transfers
Acquired Forestry	0.20	\$4,302,000	100%	\$4,302,000
Con-Con	0.255	\$5,485,000	50%	\$2,743,000
School / Univ. Trust <sup>b</sup>	---	---	---	\$4,500,000

<sup>a</sup>Allocation factors based on book value of current timber inventory and historic averages by land classification.

<sup>b</sup>FY09 School / Univ. Trust certified costs transferred to the FY10 FMIA account balance; based on previous 4-year average cost certification.

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**FY2009-2011 Timber Sales Revenue Forecast Summary.**

FY2009 FORECAST TIMBER SALES REVENUE						Jan09
	VOL CDS	TR	PORTION TR			Forecast
SOLD CORDS*	874000	\$18,791,000	\$2,818,650			
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000			
SOLD OTHER		\$575,000	\$86,250			ITC INV INC
REMOVALS CORDS	752000	\$18,236,000	\$15,500,600			+ TS I&P =
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000			\$150,000
REMOVALS OTHER		\$500,000	\$425,000	<b>FY2009</b>	<b>REVENUE</b>	<b>w/INT INC</b>
BILLING GAIN*		\$1,500,000	\$1,500,000	LOW (-10%)	\$19,224,450	\$19,374,450
SUM			\$21,360,500	<b>MED</b>	\$21,360,500	<b>\$21,510,500</b>
				HIGH (+10%)	\$23,496,550	\$23,646,550

\*950,000 cord offer target with a 92% sell rate

FY2010 FORECAST TIMBER SALES REVENUE						Jan09
	VOL CDS	TR	PORTION TR			Forecast
SOLD CORDS*	902000	\$20,295,000	\$3,044,250			
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000			ITC INV INC
SOLD OTHER		\$500,000	\$75,000			+ TS I&P =
REMOVALS CORDS	762000	\$17,907,000	\$15,220,950			\$200,000
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000	<b>FY2010</b>	<b>REVENUE</b>	<b>w/INT INC</b>
REMOVALS OTHER		\$500,000	\$425,000	LOW (-10%)	\$17,815,680	\$18,015,680
SUM			\$19,795,200	<b>MED</b>	\$19,795,200	<b>\$19,995,200</b>
				HIGH (+10%)	\$21,774,720	\$21,974,720

\*950,000 cord offer target with a 95% sell rate

FY2011 FORECAST TIMBER SALES REVENUE						Jan09
	VOL CDS	TR	PORTION TR			Forecast
SOLD CORDS*	920000	\$21,620,000	\$3,243,000			
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000			ITC INV INC
SOLD OTHER		\$500,000	\$75,000			+ TS I&P =
REMOVALS CORDS	762000	\$17,907,000	\$15,220,950			\$250,000
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000	<b>FY2011</b>	<b>REVENUE</b>	<b>w/INT INC</b>
REMOVALS OTHER		\$500,000	\$425,000	LOW (-10%)	\$17,994,555	\$18,244,555
SUM			\$19,993,950	<b>MED</b>	\$19,993,950	<b>\$20,243,950</b>
				HIGH (+10%)	\$21,993,345	\$22,243,345

\*950,000 cord offer target with a 97% sell rate

**FORECAST PARAMETERS and ASSUMPTIONS**

\*FY09 revenue includes a one-time gain on unbilled balance.

Sawtimber converted to cords @ 2 cords per MBF.

FY09 forecast SOLD cords wavg price = \$21.50/cd and REMOVALS cords wavg price = \$24.25/cd.

FY10 forecast SOLD cords wavg price = \$22.50/cd and REMOVALS cords wavg price = \$23.50/cd.

FY11 forecast SOLD cords wavg price = \$23.50/cd and REMOVALS cords wavg price = \$23.50/cd.

Timber sold \* 0.15 = sold portion TR.

Timber removals \* 0.85 = removals portion of TR.

SOLD / REMOVALS OTHER includes products sold by: #1000 lb, ton, piece, and per acre.

January 2009

**Timber Sales Revenue Forecast**

For lands administered by the Division of Forestry and Section of Wildlife  
*Fiscal Year 2009 - Second Quarter*

Prepared by  
Don Deckard  
State Forest Economist  
DNR – Division of Forestry



## **PREFACE**

As recently established in State law, [see 2008 Laws, Chapter 368 (SF 2651), Article 1, Section 19], the Commissioner of the Department of Natural Resources, is required to deliver quarterly revenue reports to the House Ways and Means and the Senate Finance committees and the H/S Environment and Natural Resources Finance committees or divisions. The report to the respective committees will provide forest management investment account (FMIA) fund statements with unallotment information and is to include the methodology used in calculating the revenue forecasts.

Forecasting accuracy is heavily influenced by risk and uncertainty. "Risks" are similar to statistical probabilities in that they are somewhat measurable based on information about range of variation and likely outcomes. Unlike risk, uncertainty is a situation lacking in data and information. Uncertainty currently surrounds certain macro-economic variables that have ripple effects on DNR timber harvest volumes and stumpage prices. For the forecast horizon, considerable uncertainty exists with respect to the potential impacts of mortgage related financial markets and escalating energy prices on Minnesota's primary forest industries. This forecast does not directly consider the impacts of potential mill/plant shutdowns or starts/restarts.

## **ACKNOWLEDGEMENTS**

This forecast was a collaborative effort. A number of DNR staff provided data and information and made significant contributions. Special thanks to Gaylord Paulson, Karl Olmstead, and Kari Geurtz for their technical support.

### **Reviewer Distribution List:**

Keith Wendt, Resource Mgmt. Program Mgr. - Science Policy Section, DNR - OMBS

Forestry Division Management Team (DMT)

Dave Epperly, Director, Division of Forestry

Bob Tomlinson, Assistant Director, Division of Forestry

Olin Phillips, Manager, Forest Management & Protection Section, Division of Forestry

Janet Cherney, Director of Accounting, Division of Forestry

Dave Thomas, NW Region Forest Manager, Division of Forestry

Jim Rupert, NE Region Forest Manager, Division of Forestry

Wayne Damerow, Central Region Forest Manager, Division of Forestry

Lillian Baker, Timber Sales Program Supervisor, DNR - Division of Forestry

Calder Hibbard, Forest Policy Analyst, Minnesota Forest Resources Council

Keith Jacobson, Marketing & Utilization Program Supervisor, DNR - Division of Forestry

Jon Nelson, SFRMP Program Supervisor, DNR - Division of Forestry

Tim O'Hara, V.P. Forest Policy, Minnesota Forest Industries

Gaylord Paulson, Timber Sales Program Coordinator, DNR - Division of Forestry



## EXECUTIVE SUMMARY

### Background

The quarterly timber sales revenue forecast provides critical budget planning information for the Division of Forestry. As required by State law, [see 2008 Laws, Chapter 368, Article 1, Section 19], forecast updates are completed to provide current revenue estimates based on new information and changing expectations. We strive to produce the most accurate and objective forecast possible within the limitations of available information and resources. However, actual timber revenues are determined by a combination of external market forces, physical site conditions, and DNR timber sale policies.

The Division of Forestry manages 4.2 million acres of State owned forestland, provides forest management assistance to family forest owners and protects 45.5 million acres from wildfire. Confronted with declining timber revenue prospects, the Division implemented a fiscal strategy in early FY08 that successfully managed down \$5.4 million in FMIA expenditures to date. Cost cutting was accomplished by holding positions vacant and reduced efforts in: forest improvement, forest roads, ecological classification, forest re-inventory, private land management, and other programs.

**January 2009 Forecast Timber Sales Revenue Summary Table**

Scenario	FY09	FY10	FY11
Feb09 MED	\$21,510,500	\$19,995,200	\$20,243,950
Nov08 MED	\$22,886,200	\$21,182,800	\$21,320,800
Change (%)	(6.0%)	(5.6%)	(5.1%)

### Trends

- Year-to-date timber DNR sell rate = 80% of volume offered, down 13% from last year; significant downside risk to forecast sales volume.
- FY09 second quarter economic meltdown; GDP dropped 5.5% driven by a decline in consumer spending. No expectation of positive GDP until first quarter FY10 with slow recovery.
- Pulp & paper started to feel the economic pain in the form of reduced demand and falling prices. Boise, International Falls and VERSO, Sartell took market related downtime.
- Ainsworth Lumber LTD Bemidji and Cook, MN oriented strand board (OSB) plants remain shut. Combined wood consumption capacity for the two plants estimated at 540,000 cords. At this point in time, a cloud of uncertainty surrounds the most recent Ainsworth shuts combined with slowdowns in paper demand with respect to potential negative impacts on DNR harvest levels.

### Key Changes Since the October 2008 Forecast

- Forecast sales volumes were reduced to reflect slower than expected selling rates through second quarter FY09 with an expectation to carryover into FY10.
- School/University Trust cost reimbursement estimates were shifted from a "revenue basis" to a "cost basis" in order to account for relatively fixed costs with declining per-unit revenues.
- Permit default risk adjustments were refined to focus on aspen cordwood only with a >=\$60 per cord book value being considered high-risk.
- ITC investment income was added to the watch list as the 18J FMIA account balance and interest rates declined for an estimated revenue reduction of \$200,000 - \$250,000.
- Market related emergency timber permit extensions effective December 1, 2008 will most likely postpone forfeit of economically inoperable timber permits due to expire during CY2009.

### Forecast Methods

The timber sales revenue forecast is a combination of four distinct forecast variables. An additional step is then required to estimate the portion of timber revenue allocated to the Division of Forestry budget. Approximately 50% of timber sales revenue is eventually available for Division budgeting while the other 50% is distributed to various accounts and entities including the School / University Trust accounts, the General Fund, and Minnesota counties. Each component of the revenue forecast has its own unique set of metrics, range of variation, drivers, constraints, and inherent uncertainties. The four forecast variables and metrics were:

GENERAL DISTRIBUTION - 1/23/09

1. sales volume (volume offer "target" minus an estimate of no-bid sales),
2. sales average per-unit price (regression model utilizing historic price data),
3. removals volume (most recent 5-year adjusted for forecast sales and operational constraints), and
4. removals average per-unit price, (value of timber under contract adjusted for forecast sales values and permit default risk).

The basic revenue forecast calculations:

$$\begin{aligned} \text{Forecast Timber Revenue (TR)} = & \\ & ((\text{FY Forecast Sales Volume} * \text{FY Forecast Per-Unit Price}) * 0.15 \text{ down payment}) \\ & + ((\text{FY Forecast Removals Volume} * \text{FY Forecast Per-Unit Price}) * 0.85 \text{ balance due}) \\ & + \text{Other Timber Revenues} \\ & \pm \text{Net Change in Scaled Unbilled Balance} \end{aligned}$$

The estimate of the portion of timber sales revenue eventually allocated to Forest Management Investment Account (FMIA):

$$\begin{aligned} \text{Funds Allocation and Portions to FMIA} = & \\ 18\text{J FMIA Direct Deposit} = & \text{TR} * (100\% * \% \text{ Historical Acquired Forestry Revenue}) \\ 200-022 \text{ Con-Con Transfer} = & \text{TR} * (50\% * \% \text{ Historical Con-Con Revenue}) \\ \text{Forest Suspense Account (FMIA transfer lags 1 fiscal year)} = & (\text{Historical Average Certified Cost}) \end{aligned}$$

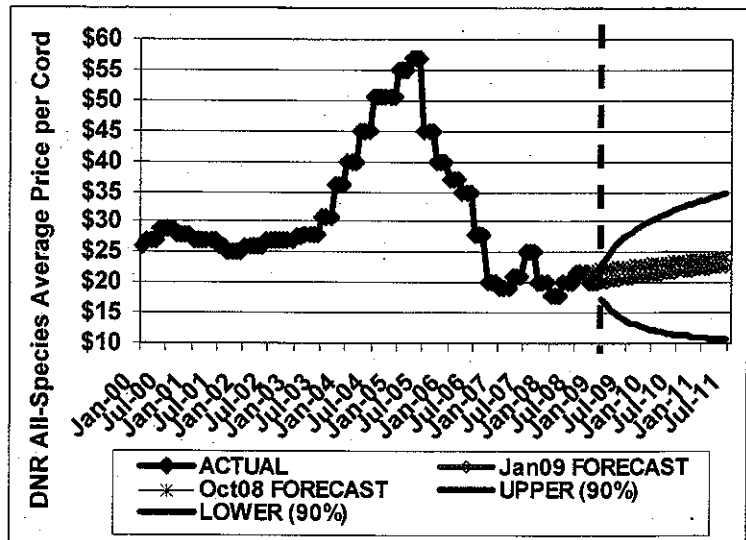
**1. Forecast Sales Volume**

The timber offer target from Division of Forestry and Section of Wildlife administered lands was increased from 800,000 cords in FY08 to 950,000 cords for the current fiscal year. Based on the increased FY09 timber target, the October 2008, forecast sales volume was 932,000 cords annually (including sawtimber) or 98% of the offer target. Through FY09Q2, DNR sold 396,345 cords plus 1,971 MBF of sawtimber (preliminary totals) with an 80% sell rate of volume offered. This represented a significant reduction from "normal" conditions as purchasers held on to cash in order to prop up their quarterly and year-end financial statements. The sell rate is expected to increase over the next two quarters as purchasers replace relatively expensive volume harvested with relatively cheap inventory. For January 2009, forecast sales volumes were adjusted as follows: FY09, 886,000 cords (92% sell rate), FY10, 914,000 cords (95% sell rate), and FY11, 932,000 cords (97% sell rate) including sawtimber.

**2. Forecast Sales Per-Unit Price**

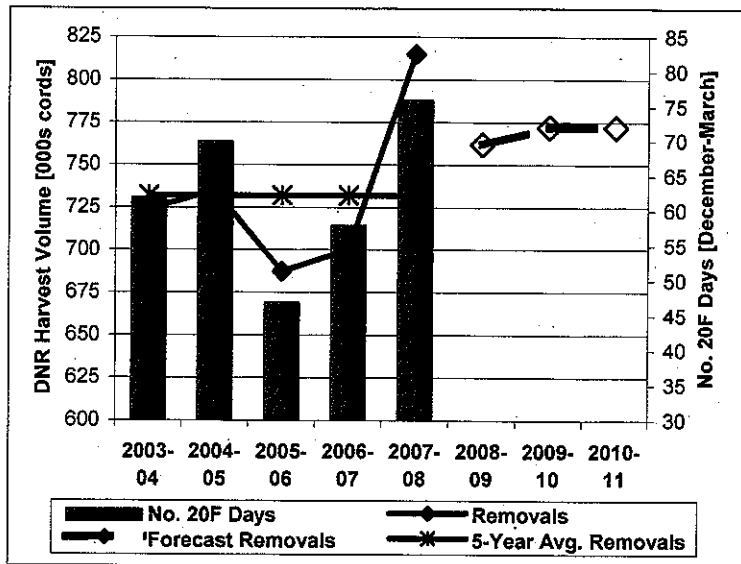
Through FY09Q2 the Division of Forestry sold ~400,000 cords at an all-species average \$21.14 per cord plus 1,971 MBF of sawtimber at an all-species average \$183 per MBF. The forecast average per-cord selling price was developed with a regression model utilizing historic stumpage prices and primary product data. The model was fit to monthly time-series data from January 2000 through December 2008. For January 2009, modeling results suggested the average all-species cordwood sell price would increase from the current \$21.14 per cord to the \$23.50 per cord range by FY2011 as compared to the October 2008 forecast average price at \$21.60 increasing to the \$25 per cord range. By fiscal year, the October 2008 forecast was: FY09 at \$22,

FY10 at \$24, and FY11 at \$25 per cord. Due to a significant market downturn in FY09 second quarter, the January 2009 forecast selling prices were adjusted as follows: FY09= \$21.50 per cord, FY10= \$22.50 per cord, and FY11= \$23.50 per cord. Although not included in the sell price forecast model, the all-species average sawtimber price was expected to remain in the \$200 per MBF range.



**3. Forecast Removals Volume**

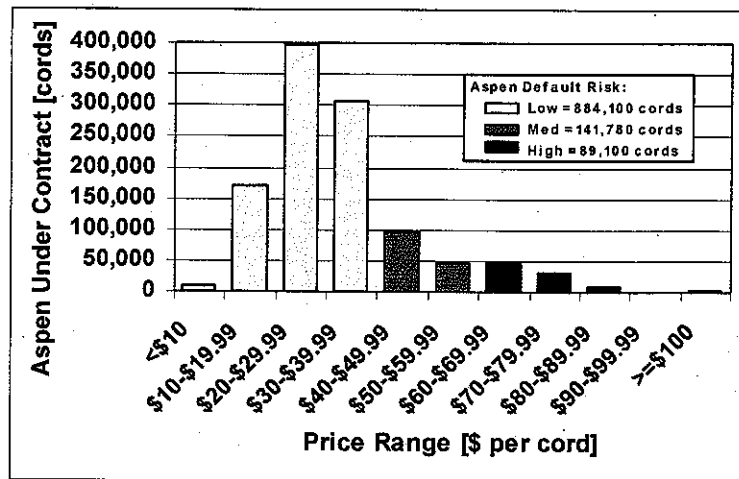
In FY08, DNR set a modern era timber removals volume record of 815,000 cords. Under a scenario of relatively low private timber availability, U.S. Canadian dollar parity, and emerging biomass markets, DNR timber removals volume would be expected to be in the 800,000-1,000,000 million cord range over the forecast horizon. However, DNR timber removals volume seems to be more dependent on the length of the winter logging season than on existing timber inventory and increasing timber sales volume targets. An estimated 70-75% of all DNR stumpage volume sold is designated as winter only operable. For the most recent 5-year period, removals ranged from low 687,000 cords in FY06 with a 47-day winter logging season to a high 815,000



cords in FY08 with a 76-day winter logging season. Weather forecasting was beyond the capability of this analyst. Hence, the forecast for timber removals relied on the 5-year average adjusted for the FY09 timber offer target increase. If the percentage of winter only timber remains constant, the offer target increase would add an estimated 30,000 cords of summer operable wood to the mix. Under this scenario, forecast average removals would be 762,000 cords including sawtimber, 4.0% above the 5-year average. For FY10-11, forecast removals volume was increased to 772,000 cords to reflect increased focus on summer harvest.

**4. Forecast Removals Per-Unit Price**

The forecast timber removals per-unit value was based on the per-unit value of timber inventory by fiscal year permit expiration adjusted for aspen default risk and for forecast per-unit sale values of new volume. As of January 1, 2009, DNR had 2.3 million cords timber inventory valued at \$53.9 million or an average \$23.56 per cord plus 13.6 MBF valued at \$2.9 million or an average \$213 per MBF. The volume of cord products by fiscal year expiration included: FY09, 390,000 cords, FY10 438,000 cords, and FY11, 918,000 cords.

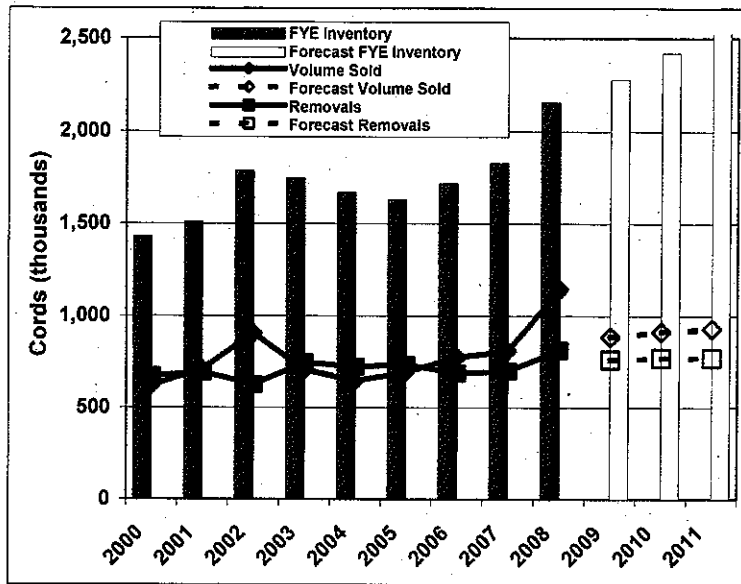


A default risk adjustment was made by removing all aspen cord products with a book value  $\geq$  \$60 per cord. This process identified and removed ~89,100 cords or 8% of the aspen cordwood inventory from consideration. By fiscal year expiration, the risk adjusted average inventory values were: FY09= \$23.60 per cord, FY10= \$22.24 per cord, and FY11= \$22.64 per cord. January 2009 forecast average per unit removal values by fiscal year were \$24.25 per cord, \$23.50 per cord, and \$23.50 per cord respectively as compared to the October 2008 forecast removal values of \$24.75, \$24, and \$24 per cord respectively. Of note, an additional 142,000 cords of aspen in the \$40-\$60 per cord book value range are at moderate risk of default. Unsecured permit defaults do not generate new revenue for DNR because the forfeited down payment amount is accounted for at the time of purchase. Fiscal effects are to increase program costs through sale re-offers and to reduce revenue projections as the per-unit value of volume to be harvested decreases.

**Timber Inventory**

Volume under contract remains a concern as it plays an important role in the revenue forecasting process and provides insights for the future policy direction of the DNR timber program. At the close of FY08, uncut timber inventory was ~2.16 million cords. This was equivalent to a 2.9-year supply at an annual removals volume of 762,000 cords. Using current forecast sales and removals volumes, timber inventory is expected to reach 2.6 million cords by the end of FY11.

Through FY2008, industrial capacity was not a limiting factor in DNR timber removals. For FY09-11, this may not be the case as the State has absorbed over 1.1 million cords of industrial wood capacity in the past 2 years.



Perpetually increasing timber inventory is not a normal expectation and is not sustainable. The phenomenon seems to be tied to the large volume of winter only operable volume, and for FY09-10 to industrial wood consumption. This topic requires further analysis to better understand long-run timber removals and revenue implications.

**Funds Allocation**

Acquired Forestry and Con-Con dollars are allocated on a revenue basis while School/University Trust dollars are allocated on a cost basis. The current land class distribution of timber inventory by book value is similar to historical averages.

Example Jan09 MED Revenue Forecast (\$21,510,500), Funds Allocation.

Account	Allocation Factor <sup>a</sup>	Allocation	FMIA Portion	FMIA Receipts and Transfers
Acquired Forestry	0.20	\$4,302,000	100%	\$4,302,000
Con-Con	0.255	\$5,485,000	50%	\$2,743,000
School / Univ. Trust <sup>b</sup>	---	---	---	\$4,500,000

<sup>a</sup>Allocation factors based on book value of current timber inventory and historic averages by land classification.

<sup>b</sup>FY09 School / Univ. Trust certified costs transferred to the FY10 FMIA account balance; based on previous 4-year average cost certification.

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## II. Forest Industry Factors

### Timber Supply - DNR Stumpage Sold Market Share

From CY1998 to 2007, all-public agency stumpage sold volume increased from 39% market share to an estimated 57% market share. Components of DNR stumpage sold market share increased from 15% to 26%, county share increased from 16% to 20%, and federal share increased from 8% to 11% (Figure 1). This shift in relative market share occurred when stumpage prices plummeted and supply from non-industrial private timberland decreased.

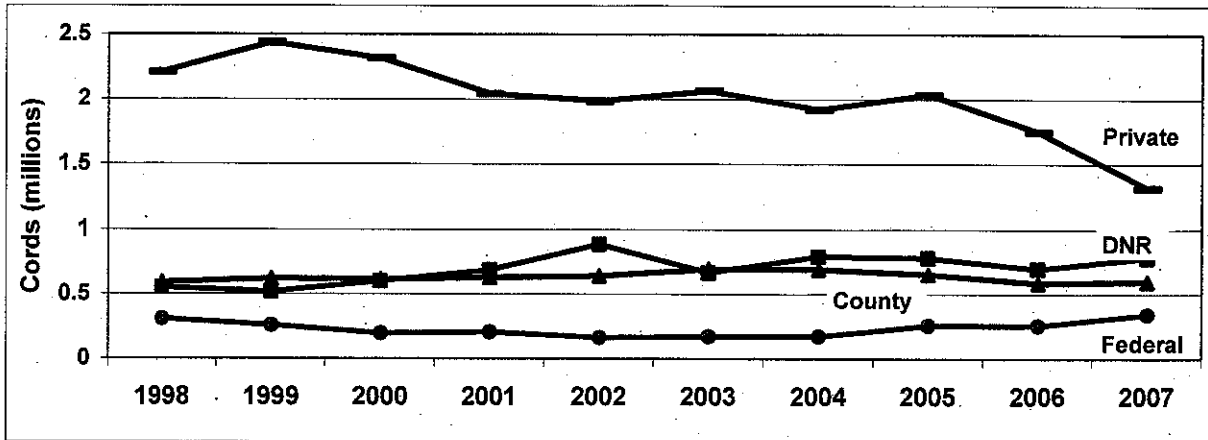


Figure 1. Stumpage Volumes Sold in Minnesota by Ownership, CY1998-2007.  
 Note: CY2008 totals by ownership class not available as of January 2009.

### Timber Demand – Mill Consumption and In-State Harvest Levels

In CY2008, an estimated 2.9 million cords of roundwood were harvested in Minnesota from all ownerships, down 22% from a peak 3.7 million cords in 2005 (Figure 2). In addition to the reduction in forest management opportunities, of major concern is the potential long-term loss of logging capacity and infrastructure.

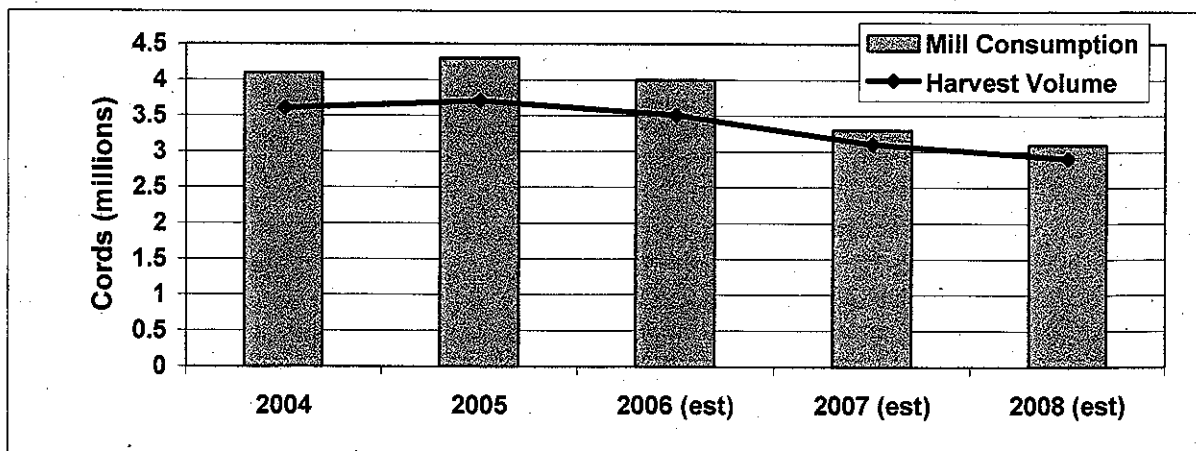


Figure 2. Minnesota Mill Consumption and Harvest Levels, CY2004-08.

Even though Minnesota has accumulated over 1.1 million cords of idle forest products manufacturing capacity due to weak housing demand, no significant impact on DNR harvest levels had occurred through December 2008. The majority of idle mill capacity was absorbed through shifts in stumpage supply sources. In fact, DNR FY08 timber removals set a modern era record high at 815,000 cords as industry concentrated on harvesting public agency timber while reducing private sourced timber and out-of-state imports.

In second quarter FY09, pulp & paper started to feel the economic pain in the form of reduced demand and falling prices. Boise, International Falls and VERSO, Sartell took market related downtime and Ainsworth Lumber LTD shut its Bemidji, MN oriented strand board (OSB) plant. At this point in time, a cloud of uncertainty surrounds the most recent Ainsworth shut combined with slowdowns in paper demand with respect to potential negative impacts on DNR harvest levels.

### Housing & Mortgage Markets

In terms of new single-family and multi-family starts, the consensus expectation is to bottom out this year at ~800,000 starts with a slow rebound anticipated (Figure 3).

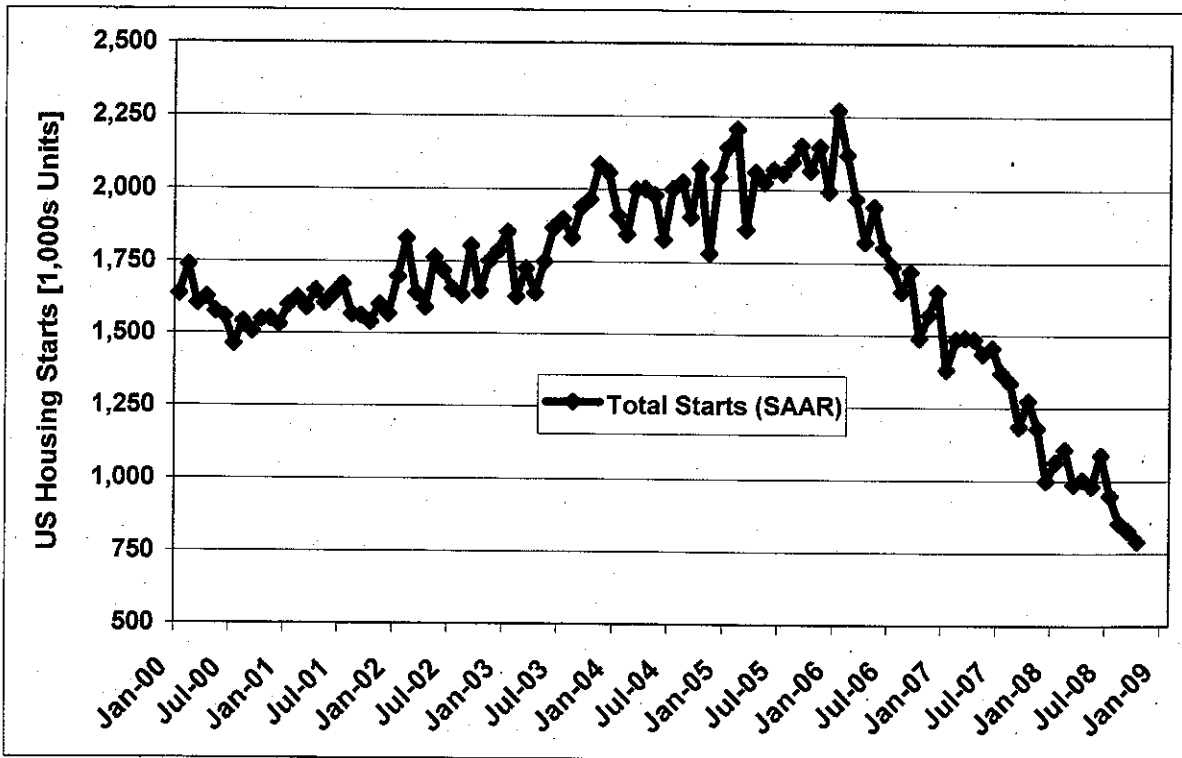


Figure 3. U.S. Housing Starts, January 2000 to December 2008.

Existing homes-for-sale inventory reached a new peak 4.5 million in April or 11.2 months supply as compared to the recent 4.4 million peak in October 2007 or 10.2 months supply (Figure 4). The unsold backlog for both new and existing units remains near record highs. What all this adds up to is an extremely weak demand outlook for housing related wood products in CY2009.

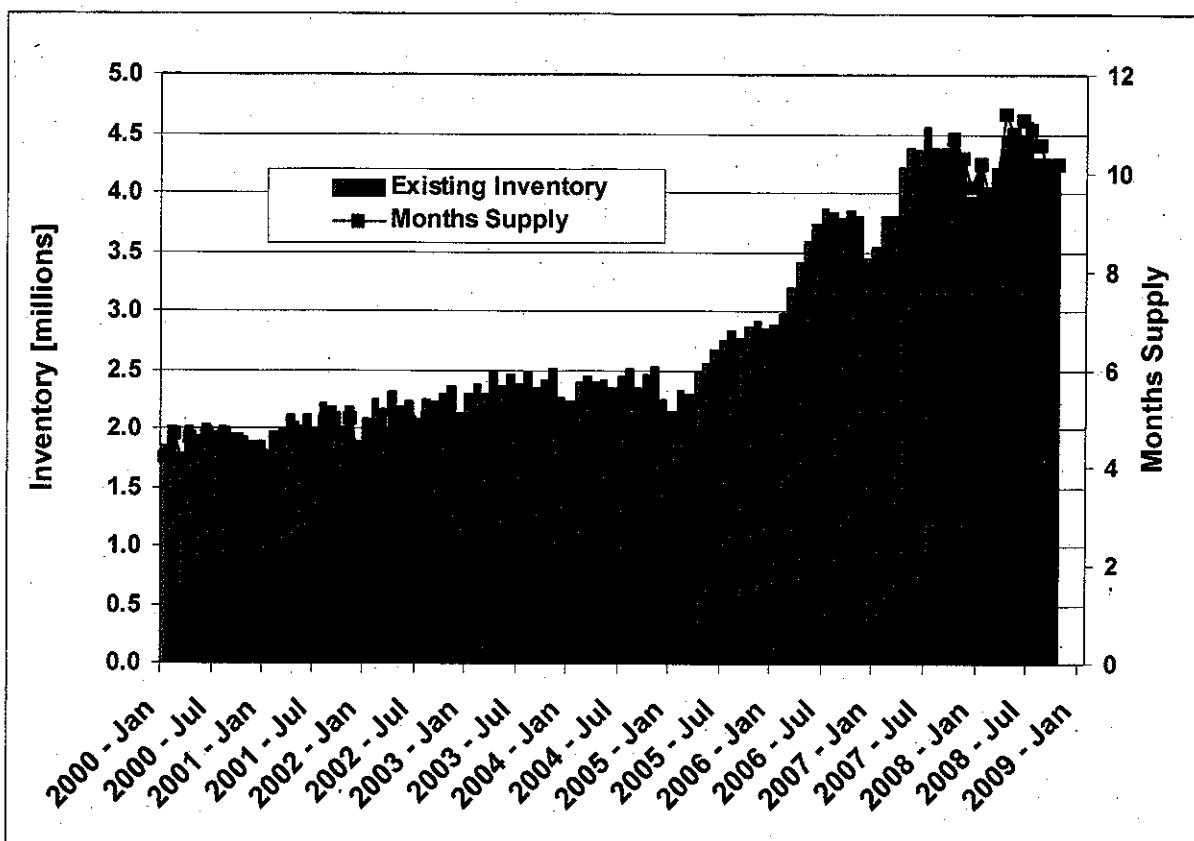


Figure 4. Existing Home Inventory and Months Supply, January 2000 to December 2008.

### DNR Stumpage Prices

Negative product demand effects of the ongoing housing crisis and recent declines in paper demand continue to depress stumpage prices. The DNR all-species volume weighted average cordwood price peaked in 2005 at \$57 per cord. As a direct result of the housing crisis and ensuing economic recession, the all-species average cordwood stumpage price has hovered around \$20 per cord since October 2007 or the past 16 months (Figure 5). Even comparing nominal dollars to nominal dollars, the last time DNR stumpage prices were at this level was in FY 1997.



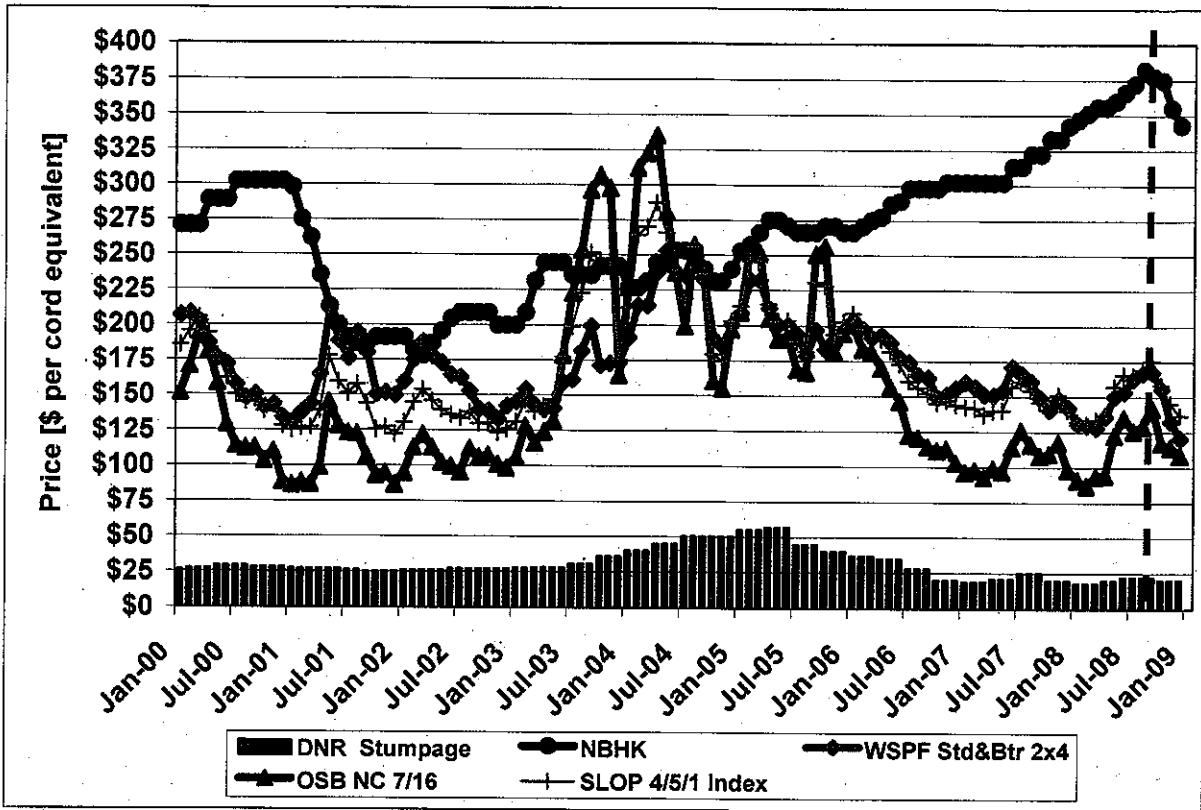


Figure 5. Benchmark Market Pulp, Softwood Lumber, OSB, and DNR Stumpage Prices, Nominal Dollars, January 2000 to December 2008.

Price Series:

NBHK = Resource Information Systems Inc. (RISI) - Northern Bleached Hardwood Kraft, cord equivalent yield basis from North American sources.  
 KD WSPF Std.&Btr. 2x4 = Random Length Kiln Dried Western Spruce-Pine-Fir Std.&Btr. 2x4s delivered to Minneapolis, MN, cord equivalent yield basis.  
 OSB-NC7/16 = Oriented Strandboard – North Central, 7/16 inch cord equivalent yield basis.  
 SLOP Index = composite 4/5/1 product weighted cord equivalent price index derived from the benchmark prices of: softwood lumber (SL), OSB (O), and northern bleached mixed hardwood market pulp (P).  
 DNR All-Species Stumpage = Minnesota Department of Natural Resources all-species average cordwood stumpage price.

The Softwood Lumber (SL) Oriented Strandboard (O), market pulp (P) (SLOP) Composite Index is being developed for use as a forecasting tool with respect to the DNR all-species cordwood price. Using a simple ordinary least squares (OLS) regression model, the dependent variable, DNR all-species average cordwood stumpage price, was regressed on the SLOP Index lagged by 3 months. In its present form, the Index has an Adjusted R Square = 0.58 (Figure 6). While, the predictive value of the SLOP Index is somewhat limited by the current disparities between housing related lumber and OSB markets relative to pulp & paper markets, it is one of few viable options for use as an explanatory variable.

### III. Forecast Methods

#### Timber Sales Revenue Forecast Components

The Minnesota DNR timber sales revenue forecast is the culmination of four distinct forecast variables followed by a set of funds allocation estimates:

1. volume sold,
2. average per unit price sold,
3. volume of removals, and
4. average per unit price of removals.

Each component of the revenue forecast has its own unique set of metrics, range of variation, drivers, constraints, and inherent uncertainties.

#### Variables, Metrics, and Indicators

##### *Variable 1: Forecast Timber Sales Volume*

*Metric:* timber program volume offer "target" average minus an estimate of no-bid sales, subdivided into cord products and sawtimber. A 15% down payment of bid value is required to secure a stumpage permit, payable within 60 days of the initial sale.

*Drivers/Constraints:* housing markets (starts and remodeling) and general economic conditions heavily influence in-state industrial wood consumption and DNR sell rates.

##### *Variable 2: Forecast Timber Sales Average Per-Unit Price*

*Metric:* factored (SLOP Lag 3) autoregressive econometric model form AR(1) used to forecast average selling price of all-species cord products. The volume weighted average price of all-species sawtimber per thousand board feet is estimated separately.

*Drivers/Constraints:* for primary forest industries in Minnesota, structural panel and lumber production are driven by relative production costs, domestic housing starts, and North American capacity utilization. Local pulp & paper markets are driven by relative production costs and global capacity utilization in comparable paper grades.

##### *Variable 3: Forecast Timber Removals Volume*

*Metric:* most recent 5-year average harvest volume adjusted for changes in timber offer targets by the percentage of summer operable wood with consideration given to industry conditions.

*Drivers/Constraints:* length of winter logging season, inventory capacity of consuming mills, and in-state logging capacity.

##### *Variable 4: Forecast Timber Removals Average Per-Unit Price*

*Metric:* volume weighted average of the value of wood under contract inventory at the time of the forecast with an adjustment for the forecast value of wood that is expected to be purchased and harvested over the forecast horizon. In addition, a permit default risk adjustment is made by removing inventory volume above a predetermined price threshold from the forecast value.

*Driver:* A complicating factor is the 2.3 million cords under contract balance with the expectation of continuing increases in the volume under contract inventory. Since 2000, DNR has consistently sold more volume than removals.

## Funds Allocation Background

DNR timber sale receipts are, as defined in state statute, deposited in various accounts based on land classification. The majority of these receipts are generated on lands in the following three lands classes: acquired forestry lands, consolidated conservation (Con-Con) lands, and School/University Trust lands. On average, approximately 50% [45%-55%] of timber sales receipts eventually end off in the Forest Management Investment Account (FMIA).

Gross timber sale receipts from acquired forestry lands are direct deposited in the Forest Management Investment Account (FMIA, see M.S. §89.035), gross timber receipts from Con-Con lands are deposited in the Consolidated Conservation Areas Account (see M.S. § 84A.51), and gross timber receipts from school trust lands are deposited in the Forest Suspense Account (holding account for School/University Trust timber receipts) (see M.S. § 16A.125). The portions of each source of revenue eventually deposited into FMIA are as follows: Acquired Forestry (100%), Con-Con (50%), and School/University Trust<sup>1</sup>. Acquired Forestry and Con-Con revenues are deposited in the fiscal year received. School/University Trust certified cost transfers lag one fiscal year.

## Funds Allocation Estimates

*Metrics:* historical average value of timber sales revenue by land classification: Acquired Forestry, Con-Con, School/University Trust Lands.

*Drivers:* distribution of acreage, timber sold, and removals value by land classification.

## Summary Calculations

*Forecast Timber Revenue (TR) =*

((FY Forecast Volume Sold \* FY Forecast per Unit Value) \* 0.15 down payment))

+ ((FY Forecast Removals Volume \* FY Forecast per Unit Value) \* 0.85 balance due))

+ Other Timber Revenues (e.g. interest and penalty income)

± Forecast net gain / loss in scaled unbilled value

*Allocation to Funds and Portions to FMIA:*

18J FMIA Direct Deposit = TR \* (100% \* % Historical Acquired Forestry Revenue)

200-022 Con-Con Transfer = TR \* (50% \* % Historical Con-Con Revenue)

Forest Suspense Account (FMIA transfer lags 1 fiscal year) = (Historical Average Cost)

Note: year-to-year revenues by land classification may vary as much as ±5% as choices as to which permits are harvested are made by the individual purchasers.

<sup>1</sup> No statistical average or range available. Trust cost reimbursement rate to FMIA based on historical average certified costs applied herein for forecasting purposes only when official certified costs are not available.

## IV. Forecast Timber Revenue

### Forecast Timber Sales Volume

The most recent 5-year average annual sold volume through FY2008 was 814,000 cords. For FY09, the timber target was increased to the 850,000 - 950,000 cord range. Management chose to set the offer target at 950,000 cords, the upper limit of the range. Based on the increased FY09 timber target, volume projections to be offered for sale from FY2009 through FY2011 were forecast to be 136,000 cords higher than the most recent 5-year average, an annualized increase of 17%. For January 2009, the sales volume forecasts were adjusted as follows: FY09, 886,000 cords, FY10, 914,000 cords, and FY11, 932,000 cords including sawtimber with a 92%, 95%, and 97% sell rate of volume offered respectively (Figure 6). Through FY09Q2, DNR sold 396,345 cords plus 1,971 MBF of sawtimber at an average \$183 per MBF (preliminary totals).

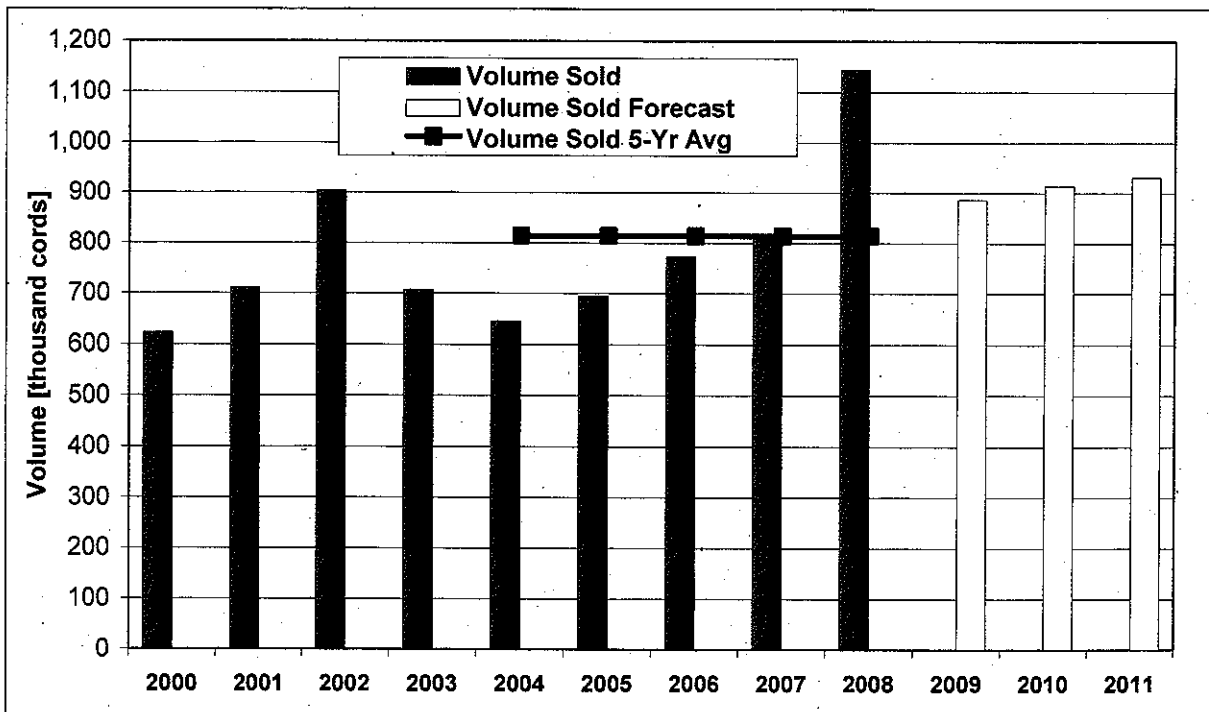


Figure 6. Timber Volume Sold from DNR Administered Lands, FY2000-08 with forecast values through FY2011.

### Forecast Timber Sales Average Per-Unit Price

Many econometric modeling options were available for price forecasting. However, parsimonious representations of price processes often prove more useful for forecasting purposes than structural econometric models. The per-unit selling price forecast was developed using a factored autoregressive (AR) econometric model in the form AR(Lag 1) with the 4/5/1 SLOP Index (Lag 3) used as a dynamic regression variable (factor). The model was fit to monthly data

from January 1995 through December 2008. All parameters were significant at  $\geq 2\%$ . The model root mean squared error (RMSE) = 1.78 with an  $R^2 = 0.965$  (Table 1).

Table 1. Factored AR(1) Model Parameter Estimates.

Parameter	Estimate	Std. Error	t Value	Prob >  t
Intercept	21.48	5.5829	3.8482	0.0002
Autoregressive (Lag 1)	0.9803	0.0138	70.7935	<0.0001
4/5/1 SLOP (Lag 3)	0.0198	0.0084	2.3734	0.0188

For January 2009, modeling results suggested the average all-species cordwood sell price would increase from the current \$21.14 per cord to the \$23.50 per cord range by FY2011, as compared to the October 2008 forecast of \$21.60 to the \$25 per cord range with FY09 at \$22, FY10 at \$24, and FY11 at \$25 per cord (Figure 7). While prices seem to have stabilized, the forecast Upper 90% and Lower 90% confidence limits were exceptionally wide because of the recent period of extreme price volatility. January 2009 forecast selling prices were adjusted as follows: FY09= \$21.50 per cord, FY10= \$22.50 per cord, and FY11= \$23.50 per cord. Although not included in the sell price forecast model, the all-species average sawtimber price was expected to remain in the \$200 per MBF range.

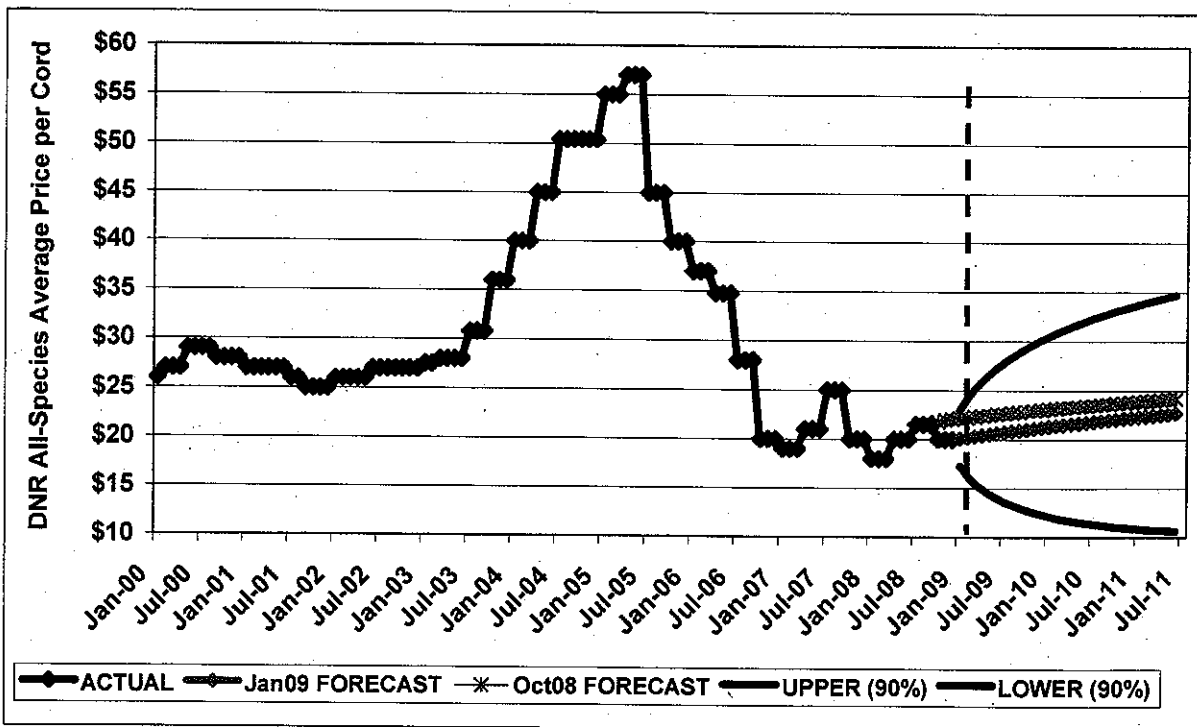


Figure 7. All-Species per-cord Price Forecast, January 2009 through June 2011.

**Forecast Timber Removals Volume**

Factors that influence DNR timber removals include: total market demand, private timber availability, Canadian dollar exchange rates, and the length of the winter logging season. Under a scenario of an existing 2.16 million cord timber inventory, emerging biomass markets, relatively low private timber availability, and U.S. Canadian dollar parity, DNR timber removals would be expected to increase over the forecast horizon. However, DNR timber removals volume seems to be more dependent on the length of the winter logging season than on existing timber inventory and timber sales volume targets. An estimated 70% of all DNR stumpage volume sold is designated as winter only operable.

Using a simple ordinary least squares (OLS) regression model, the dependent variable DNR harvest volume was regressed on the number of winter logging days defined as days when the average temperature was  $\leq 20$  degrees Fahrenheit during the period December 1 - March 31 in Duluth, MN, the model produced an adjusted  $R^2 = 0.72$  for the most recent 5-years. For the period, DNR removals ranged from low 687,000 cords in FY06 with a 47-day winter logging season to a high 815,000 cords in FY08 with a 76-day winter logging season as compared to the 5-year average annual timber removal rate of 732,000 cords (Figure 8).

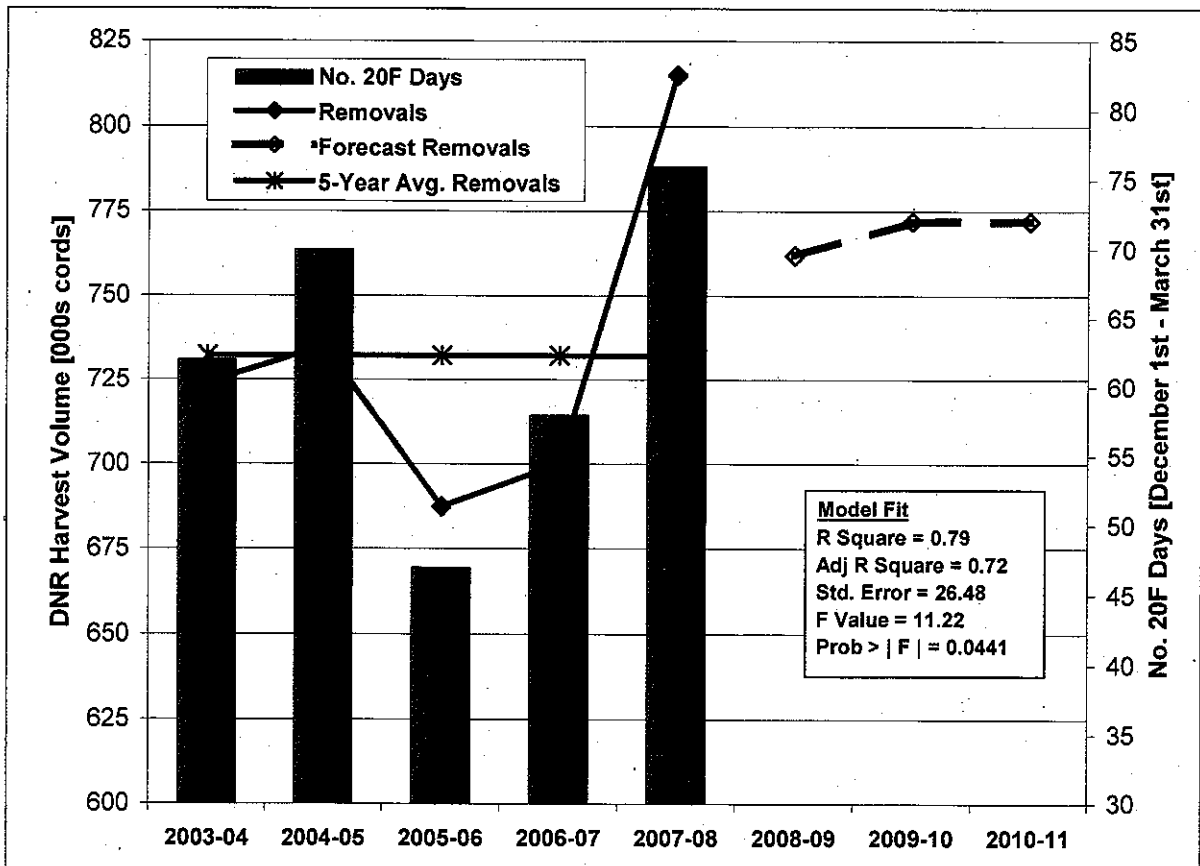


Figure 8. DNR Timber Removals as a Function of Winter Logging Days, FY04-FY08 with Forecast Values through FY11.

Weather forecasting was beyond the capability of this analyst. Hence, the forecast for timber removals volume relied on the most recent 5-year average adjusted to compensate for the FY09 timber offer target increase. If the percentage of summer operable timber and pine beetle harvesting restrictions remain unchanged, the offer target increase would add an estimated 30,000 cords to the mix. Under this scenario, forecast removals would be 762,000 cords including sawtimber, ~4% above the most recent 5-year average removals volume. Forecast removals were increased to 772,000 cords for FY10 and FY11 assuming increased emphasis on all-season harvesting.

**Forecast Timber Removals Average Per-Unit Price**

The forecast timber removals per-unit price was based on the per-unit value of timber inventory by fiscal year permit expiration adjusted for default risk and for forecast per-unit sale values of new volume. As of January 1, 2009, DNR had 2.3 million cords timber inventory valued at \$53.9 million or an average \$23.56 per cord plus 13.6 MBF valued at \$2.9 million or an average \$213 per MBF. The volume of cord products by fiscal year expiration included: FY09, 390,000 cords, FY10 438,000 cords, and FY11, 918,000 cords (Figure 9).

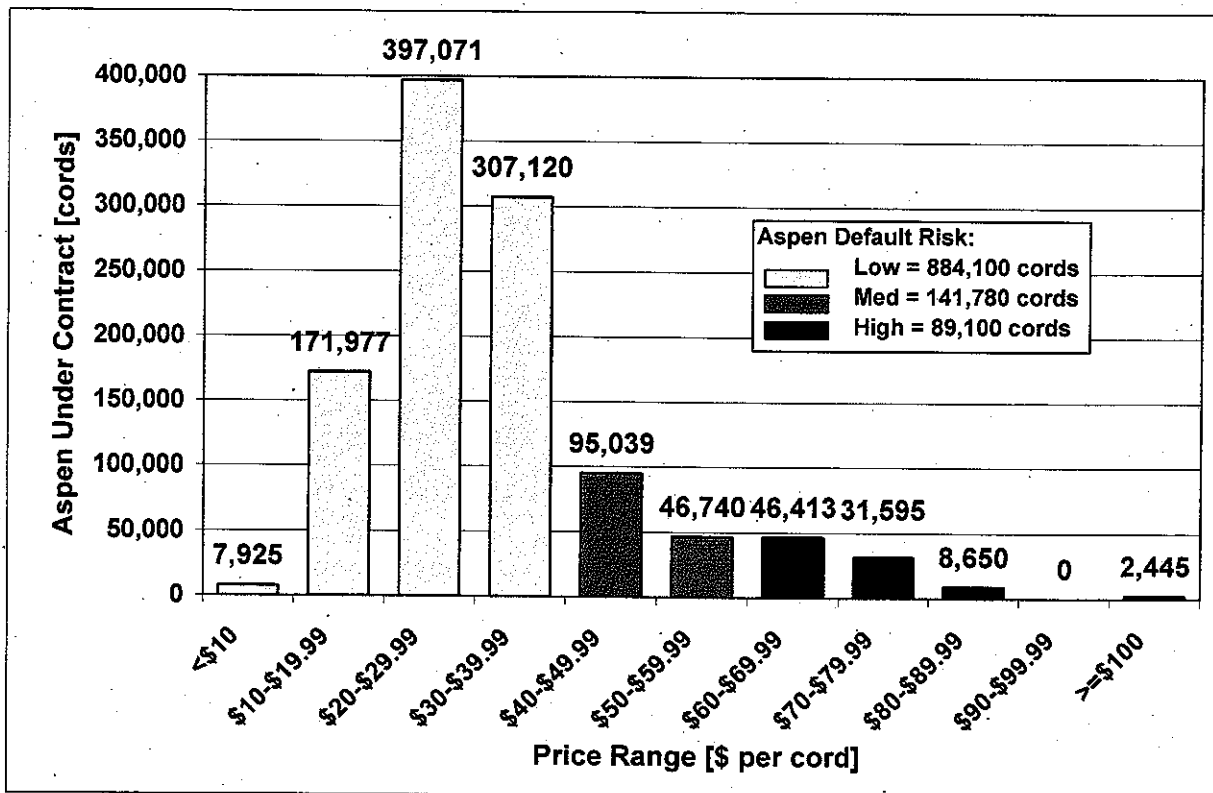


Figure 9. DNR Aspen Cordwood Inventory, Volume and Value.

A default risk adjustment was made by writing off all aspen cord products with a book value >=\$60 per cord due to economic inoperability. This process identified and removed ~89,100 cords or 8% of the aspen cordwood inventory from consideration. By fiscal year expiration, the

risk adjusted average inventory values were: FY09= \$23.60 per cord, FY10= \$22.24 per cord, and FY11=\$22.64 per cord. January 2009 forecast average per unit removal prices by fiscal year were \$24.25 per cord, \$23.50 per cord, and \$23.50 per cord respectively as compared to the October 2008 forecast average removal prices of \$24.75, \$24, and \$24 per cord respectively. Of note, an additional 142,000 cords of aspen in the \$40-\$60 per cord book value range are in moderate risk of default.

**Timber Inventory (Volume Under Contract)**

While timber permit inventory is not a forecast variable, it plays an important role in the revenue forecasting process and provides insights to the current status and future policy direction of the DNR timber program. At the close of FY08, volume under contract (inventory) was 2.16 million cords including sawtimber. This was equivalent to a 2.9-year supply at the forecast annual harvest level of 762,000 cords (Figure 10).

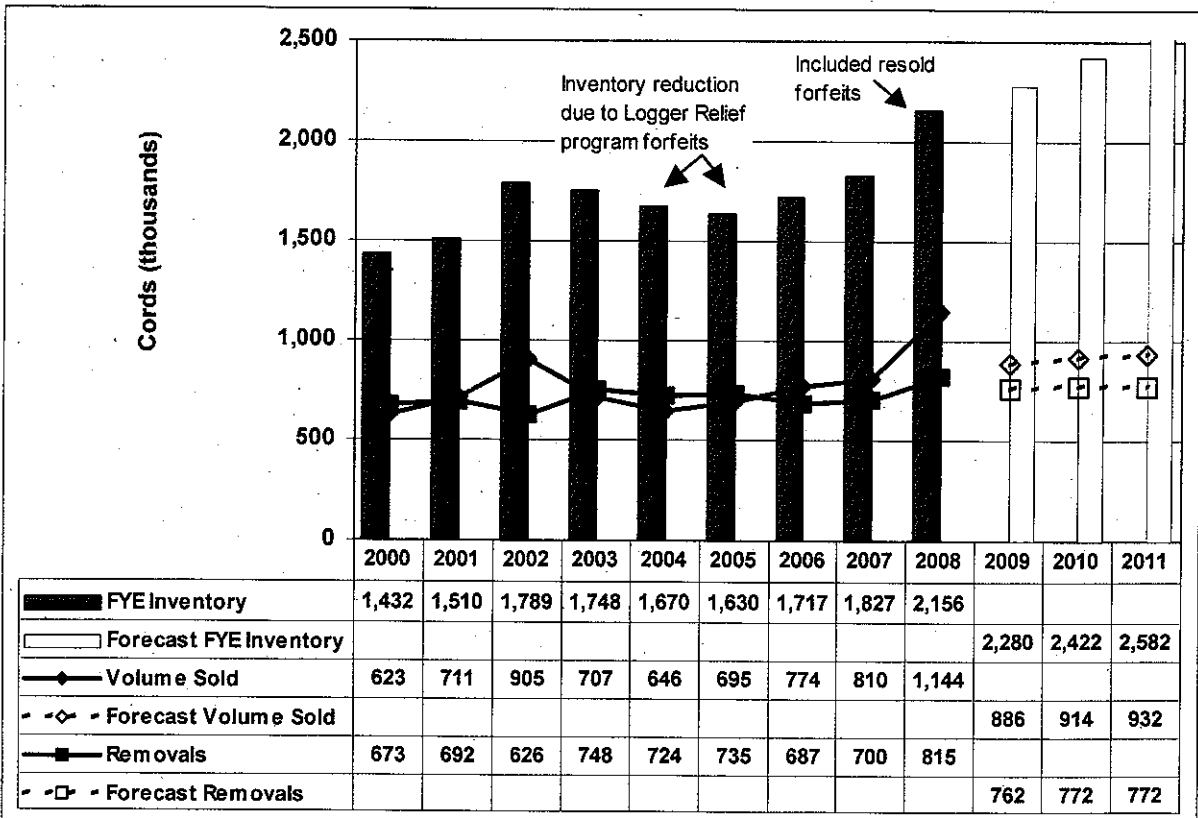


Figure 10. DNR Timber Sold, Removals, and Inventory, FY2000-08 with forecast values through FY2011.

A significant change in volume under contract dynamics occurred when DNR started to increase stumpage volume offered for sale in 2002. Since then, volume under contract steadily increased with no indication of a forthcoming trend reversal. This trend is not a normal expectation given the relatively high demand for stumpage over the same time period. As presented in the previous section, a major factor limiting annual removals seems to be the high proportion of DNR



managed timberland acres requiring frozen ground conditions for equipment access and harvesting operations. A secondary factor limiting harvest volume are seasonal restrictions that limit or prohibit pine species harvest during the spring of the year in an attempt to minimize the spread of pine beetles. In addition, when timber is sold on 5-year contracts, purchasers tend to postpone harvest in order to concentrate on shorter duration contracts held with other landowners. The subject of timber inventory requires further analysis in order to better understand what implications there may be for timber revenues. Irrespective of increased volume offer targets for FY09-FY11, the winter only operational constraint may represent an upper limit for timber removals.

### **Unbilled Balance Carryover**

The DNR Timber Program implemented a new monthly invoicing policy effective July 1, 2008. As part of the implementation strategy, an abnormally large invoice volume, approximately \$1.8 million, was mailed in June 2008, payable in FY09. An estimated \$1.5 million of the total invoiced in June would be considered a one-time gain in timber revenue. Under the new quarterly invoicing policy, the expected carryover balance of unbilled timber is a fairly constant \$1 million.

## V. Forecast Summary Table

Table 2. Forecast Timber Receipts Summary, FY2009-FY2011.

FY2009 FORECAST TIMBER SALES REVENUE				Jan09	
	VOL CDS	TR	PORTION TR	Forecast	
SOLD CORDS*	874000	\$18,791,000	\$2,818,650		
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000		
SOLD OTHER		\$575,000	\$86,250		ITC INV INC
REMOVALS CORDS	752000	\$18,236,000	\$15,500,600		+ TS I&P =
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000		\$150,000
REMOVALS OTHER		\$500,000	\$425,000	<b>FY2009</b>	<b>REVENUE</b>
BILLING GAIN*		\$1,500,000	\$1,500,000	LOW (-10%)	\$19,224,450
SUM			\$21,360,500	<b>MED</b>	\$19,374,450
				HIGH (+10%)	\$23,496,550
					\$23,646,550

\*950,000 cord offer target with a 92% sell rate

FY2010 FORECAST TIMBER SALES REVENUE				Jan09	
	VOL CDS	TR	PORTION TR	Forecast	
SOLD CORDS*	902000	\$20,295,000	\$3,044,250		
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000		ITC INV INC
SOLD OTHER		\$500,000	\$75,000		+ TS I&P =
REMOVALS CORDS	762000	\$17,907,000	\$15,220,950		\$200,000
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000	<b>FY2010</b>	<b>REVENUE</b>
REMOVALS OTHER		\$500,000	\$425,000	LOW (-10%)	\$17,815,680
SUM			\$19,795,200	<b>MED</b>	\$18,015,680
				HIGH (+10%)	\$19,795,200
					\$21,995,200
					\$21,974,720

\*950,000 cord offer target with a 95% sell rate

FY2011 FORECAST TIMBER SALES REVENUE				Jan09	
	VOL CDS	TR	PORTION TR	Forecast	
SOLD CORDS*	920000	\$21,620,000	\$3,243,000		
SOLD SAWTIMBER	12000	\$1,200,000	\$180,000		ITC INV INC
SOLD OTHER		\$500,000	\$75,000		+ TS I&P =
REMOVALS CORDS	762000	\$17,907,000	\$15,220,950		\$250,000
REMOVALS SAWTIMBER	10000	\$1,000,000	\$850,000	<b>FY2011</b>	<b>REVENUE</b>
REMOVALS OTHER		\$500,000	\$425,000	LOW (-10%)	\$17,994,555
SUM			\$19,993,950	<b>MED</b>	\$18,244,555
				HIGH (+10%)	\$19,993,950
					\$20,243,950
					\$22,243,345

\*950,000 cord offer target with a 97% sell rate

### FORECAST PARAMETERS and ASSUMPTIONS

\*FY09 revenue includes a one-time gain on unbilled balance.

Sawtimber converted to cords @ 2 cords per MBF.

FY09 forecast SOLD cords wavg price = \$21.50/cd and REMOVALS cords wavg price = \$24.25/cd.

FY10 forecast SOLD cords wavg price = \$22.50/cd and REMOVALS cords wavg price = \$23.50/cd.

FY11 forecast SOLD cords wavg price = \$23.50/cd and REMOVALS cords wavg price = \$23.50/cd.

Timber sold \* 0.15 = sold portion TR.

Timber removals \* 0.85 = removals portion of TR.

SOLD / REMOVALS OTHER includes products sold by: #1000 lb, ton, piece, and per acre.

**Forecast Comparison to Historic Receipts**

DNR timber receipts last peaked in FY 2006 at \$25.5 million primarily driven by the U.S. housing market bubble as demand for and prices of framing lumber and OSB peaked. As the housing bubble burst, stumpage selling prices and timber receipts started an abrupt downhill slide. However, FY2008 timber receipts were propped up by cyclic highs in pulp & paper markets and a DNR record 815,000-cord timber harvest. FY2008 timber receipts were \$23.5 million. The primary difference between FY06 receipts and FY08 receipts were: FY06 harvest = 687,000 cords at an average \$32 per cord as compared to the FY08 harvest = 815,000 cords at an average \$25.60 per cord. The most recent 5-year average timber receipts, FY 2004 - FY 2008, was \$22.6 million. In light of the abrupt FY09Q2 economic collapse, Jan09 forecast median timber receipts were downgraded to: FY09 \$21.5 million, FY10 \$20.0 million, and FY11 \$20.2 million (Figure 11).

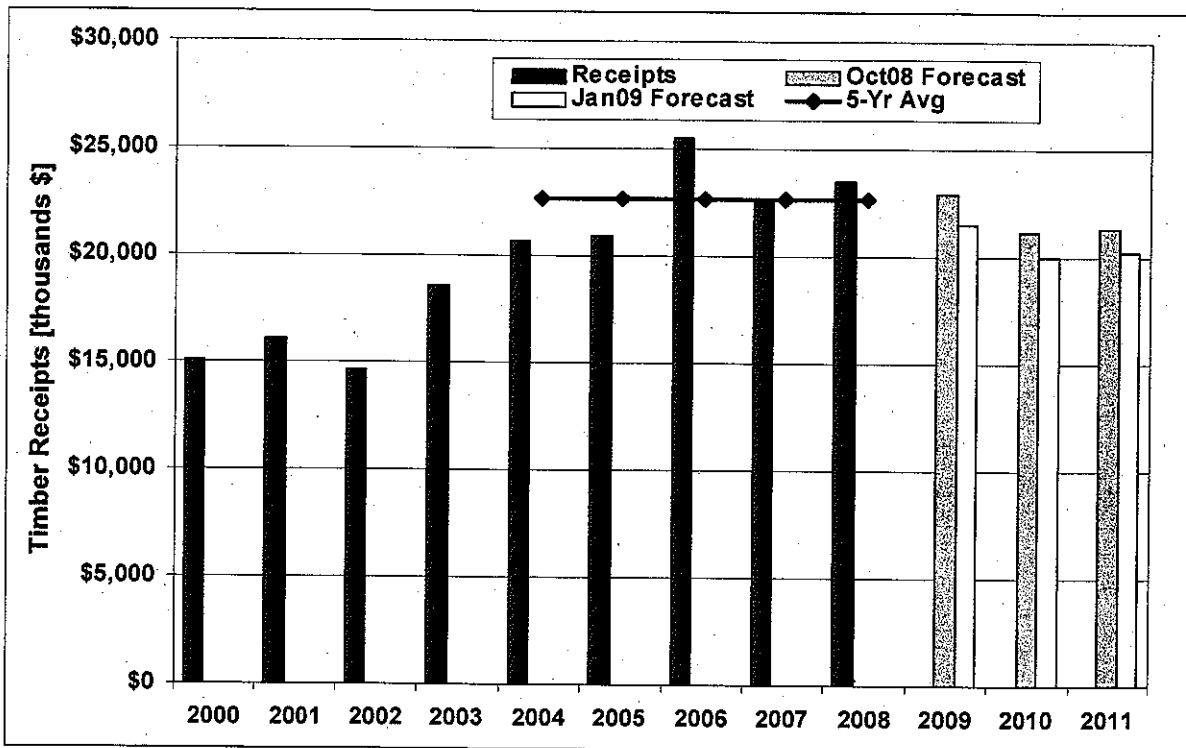


Figure 11. DNR Timber Sales Receipts, FY2000-08 with forecast values through 2011.  
 Note: timber sales receipts include all DNR administered sources.

## VI. Funds Allocation

DNR timber receipts are, as defined in state statute, directly deposited in various accounts based on land classification. The majority of these receipts are generated on lands in the following three lands classes: acquired lands, consolidated conservation (Con-Con) lands, and school trust lands. Gross timber sale receipts from acquired lands are deposited in the Forest Management Investment Account (FMIA, see M.S. §89.035), gross timber receipts from Con-Con lands are deposited in the Consolidated Conservation Areas Account (see M.S. § 84A.51), and gross timber receipts from school trust lands are deposited in the Forest Suspense Account (see M.S. § 16A.125).

FMIA account revenues include direct deposited timber sales receipts from Acquired Forestry lands and transfers in from Con-Con, University Trust, and School Trust funds. Over the course of the fiscal year, 100% of timber receipts from Acquired Forestry land are deposited into the FMIA account. Immediately following the close of a fiscal year, approximately 50% of the timber sale revenue initially deposited in the Con-Con Areas Account is transferred to the FMIA and included as revenue for the fiscal year in which it was received. Con-Con transfers into the FMIA are completed by the end of July based on the June 30th close values. The remaining 50% is distributed to the counties (Figure 12).

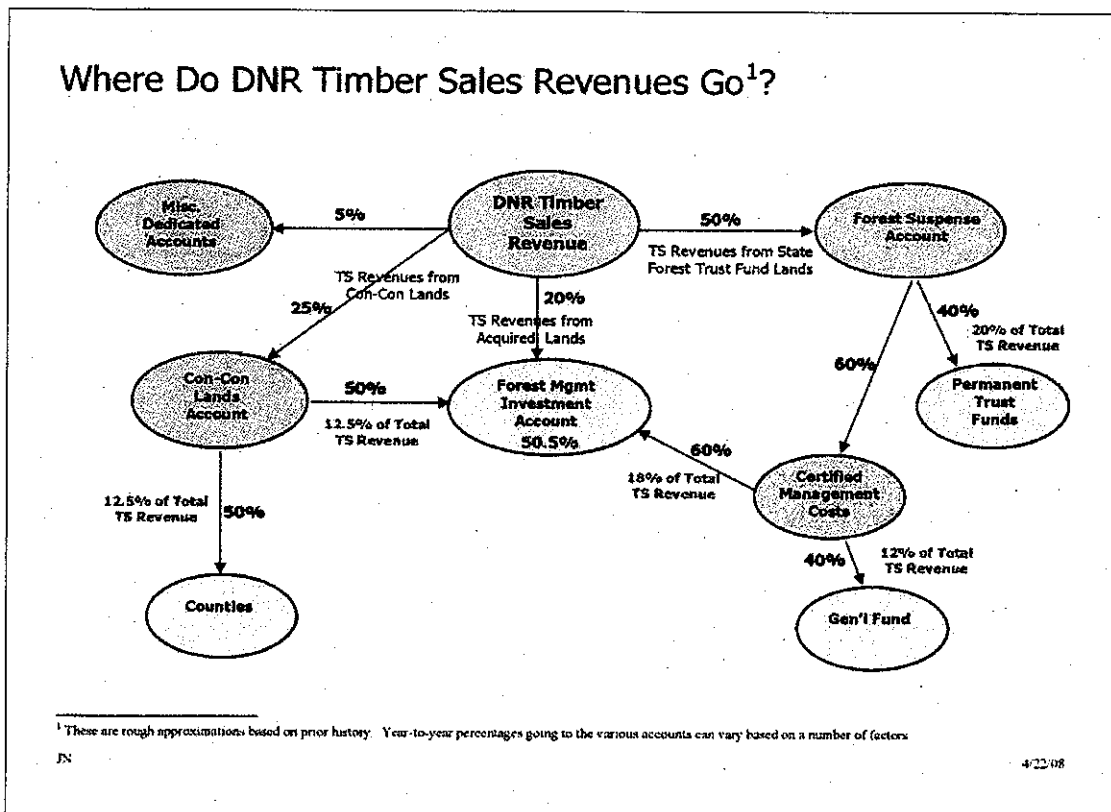


Figure 12. Distribution of DNR Timber Receipts.<sup>2</sup>

<sup>2</sup>Source: Jon Nelson, SFRMP Program Supervisor, DNR Division of Forestry.

GENERAL DISTRIBUTION - 1/23/09

Well after the close of the fiscal year, certain costs related to the management of trust lands are certified and transferred from the Forest Suspense Account (University Trust and School Trust Accounts) to the FMIA (i.e., approximately 36% of the timber revenues deposited in the Forest Suspense Account). The remaining balance of deposits in the Forest Suspense Account is transferred to the general fund (i.e., remainder of the certified trust land management costs) and the net to the permanent trust funds (Figure 12). Trust land cost certification is usually finalized by the end of the second quarter (December 31st) of the following fiscal year. In other words, the transfer of trust dollars to the FMIA always lags one fiscal year.

The current land class distribution of timber inventory by value is comparable to historical averages. As of January 1, 2009, the land class distribution of timber inventory value was: Acquired Forestry (17.9%), Con-Con (24.6%), and Trust Lands (50.4%) (Table 3).

Table 3. Value of DNR Timber Inventory by Land Classification.

Account	Account Name	Inventory Value	Inventory % by Value	FY96-06 Avg. % by Acres
100-000	General Fund - Non-Dedicated	\$254,021	0.41%	0.62%
200-022	Consolidated Conservation	\$15,441,396	24.64%	25.51%
860-012	School	\$31,081,667	49.61%	49.13%
610-010	University	\$468,416	0.75%	0.91%
18J-000	Acquired Forestry	\$11,212,212	17.89%	17.81%
multiple	Dedicated Accounts	\$15,410,992	6.70%	6.02%
SUM		\$62,656,492	100.00%	100.00%

Sources: Karl Olmstead, DNR FORIST Project Mgr. current value TSM database query and Gaylord Paulson, DNR Timber Sales Program Coordinator, FY96-06 acreage averages.

For example, using the inventory distributions from Table 3, the components of timber sales revenue deposited and eventually transferred into FMIA are as follows: [Acquired Forestry ( $20^3 \times 1.0$ ) + Con-Con ( $25.5 \times 0.5$ )]. Annual adjustments within  $\pm 5\%$  are required due to constantly changing harvest volumes and revenues by land classification. In addition to the revenue based estimates for Acquired Forestry and Con-Con lands, school/university trust lands contribution to the FMIA is estimated using historical certified costs, currently the 4-year average. Using the Jan09 MED revenue forecast (\$21,510,500), the Acquired Forestry funds direct deposit to FMIA would be \$4.3 million, Con-Con \$2.7 million, and School/University Trust \$4.5 million (cost basis) with FMIA transfer in FY10 (Table 4).

Table 4. Example Jan09 MED Revenue Forecast (\$21,510,500), Funds Allocation.

Account	Allocation Factor <sup>a</sup>	Allocation	FMIA Portion	FMIA Receipts and Transfers
Acquired Forestry	0.20	\$4,302,000	100%	\$4,302,000
Con-Con	0.255	\$5,485,000	50%	\$2,743,000
School / Univ. Trust <sup>b</sup>	---	---	---	\$4,500,000

<sup>a</sup>Allocation factors based on book value of current timber inventory and historic averages by land classification.

<sup>b</sup>FY09 School / Univ. Trust certified costs transferred to the FY10 FMIA account balance; based on previous 4-year average cost certification.

<sup>3</sup> Adjusted upward by 2% to account for expected direct deposit interest and penalty income.

