

Minnesota's Publicly-Owned Timberland:

Request for Information of Acres of Timber Sold in 2001

**A REPORT FROM THE INFORMATION MANAGEMENT
COMMITTEE OF THE MINNESOTA FOREST RESOURCES
COUNCIL**

September 2004

REPORT IM-0904

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1. Executive Summary

In the state of Minnesota, forest harvest activities have historically been recorded and measured by the number of cords produced because the focus has been on the economic value of the resource. As a result, agencies and researchers have had to estimate the number of *acres* of timberland that have undergone timber harvesting. Unfortunately, past efforts to estimate acres affected by timber harvest have been intermittent and contained varying methods for estimating. The Minnesota Forest Resources Council (MFRC) decided that determining the number of acres affected by timber harvesting each year was crucial in understanding the sustainability of current and future timber harvest levels. Therefore, the MFRC conducted a project that requested information from public landowners about their timber sales in 2001. The goal was to report statewide harvest levels on public land in a geographical manner. A secondary goal was to test the efficacy of a “survey” approach for obtaining this type of information. This report describes: 1) the process of developing and refining the request for information, 2) how the information was managed and analyzed, and 3) the resulting data that shows number of acres sold for harvest, by cover type and by public landowner.

A summary of the results is presented in the following two tables.

Table 1. Acres Sold by Owner/Administrator

Agency	Sales	Acres	Percent
State	1,081	40,842	48.8%
County	1,001	30,978	37.0%
Federal	397	11,136	13.3%
Tribal	17	700	0.8%
Total	2,496	83,656	

Table 2. Acres Sold by General Cover Type

General Cover Type	Sales	Acres	Percent
Aspen-Birch	1,483	55,425	66.3%
Spruce-Fir	363	12,393	14.8%
Pine	472	11,254	13.5%
Hardwoods	170	4,372	5.2%
Unknown	8	212	0.3%
Total	2,496	83,656	

These tables show that 83,656 acres of the total 7,818,034 acres¹ owned/managed by these landowners was sold for harvest in 2001. This represents just over 1% of the land owned and managed by the responding public landowners.

¹ 2002 FIA inventory information. Total acres are composed of DNR-managed timberland (4,092,484 acres), plus National timberland (1,847,669 acres), plus

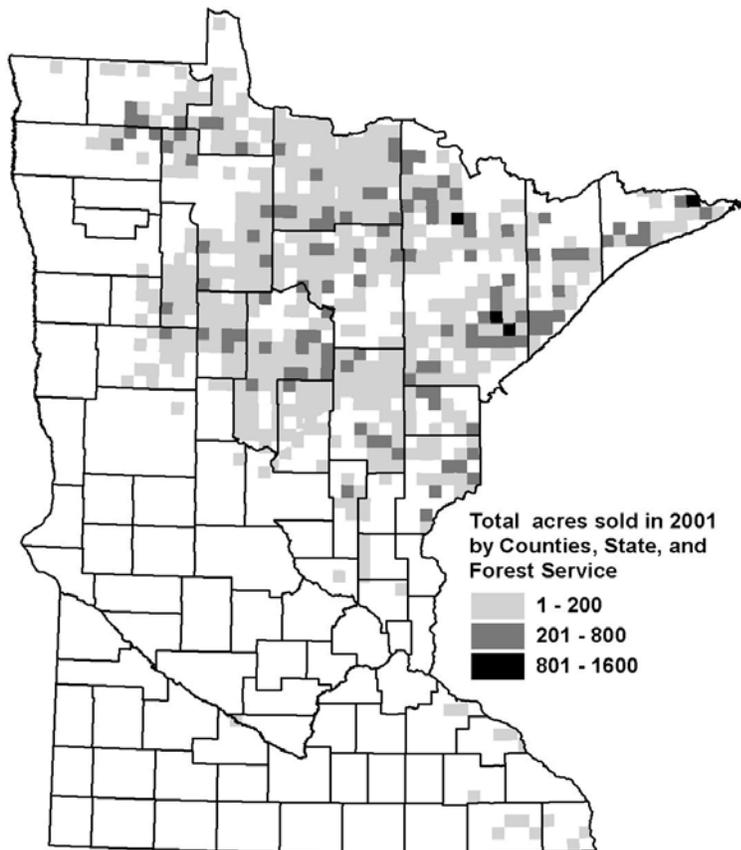
The following table shows the relative contribution by landowner/manager of the one percent of acres sold for harvest.

Table 3. Acres Sold as a Percentage of Total Owned/Managed

Agency	Acres Sold	Total Acres Owned	% Sold
State	40,842	4,092,484	1.00%
County	30,978	1,766,314	1.75%
Federal	11,136	1,847,669	0.60%
Tribal	700	111,567	0.63%
Total	83,656	7,818,034	1.07%

Map 1 below shows the area of all harvests sold in 2001.

Map 1. Acres of forestland sold for timber harvest by all owners/managers in 2001



County timberland (1,766,314), which excludes one non-responding county - Itasca; plus acreage of Indian band timberland acreage (Bois Forte 41,863, Grand Portage 47,408 and Fond du Lac 22,296).

As the forestry profession begins to better understand the spatial aspects of timber harvesting, understanding the number and location of acres of harvest are crucial. MFRC seeks to not only consolidate this important information, but also to promote consistent definitions when collecting and storing forest harvest data. Based on the success of this project and the value of the results, this request for information will be repeated by the Minnesota Forest Resources Council.

2. Introduction

In December 2001, the Information Management Committee (IMC) of the Minnesota Forest Resources Council completed a report (*Review of the Availability and Accuracy of Information About Forests*, The Irland Group) which concluded that there are significant gaps in Minnesota's forest information, and provided a long list of indicators that would enable trends in resource health, condition and sustainability to be measured. Following that, in March 2001, the IMC prioritized the information gaps listed in that report. One of the top three priority items was to "develop a survey for a yearly harvest report, using a standard format for all public agencies (and industry lands if possible) that includes volumes, acres, species cut and sold."

The IMC realized that accurately compiling this data from public agency/owners who may utilize differing definitions could pose a challenge, but hoped to facilitate movement towards shared definitions long-term. In the interim, the IMC planned to use data "crosswalks", recognizing that it takes time for organizations to change how they collect and store their information. For example, DNR is working on the next phase of a forest information management system (FORIST) in which a consistent harvest method definitions could possibly be incorporated. The IMC hoped that, through this type of information request, some commonality of definitions would emerge over time.

Activity on this priority of collecting acres data began in September 2002. The IMC began by determining the focus and scope of the request for information, the desired data, etc. The IMC decided to gather information on the number of acres *sold* by public landowners instead of collecting the number of acres *harvested* because logging activities typically span several years after the sale, which would significantly complicate the data gathering process. Also, collecting actual harvest acres is not currently completed and/or input into a standard format. However, it was recognized that acres sold also has inherent problems:

- Number of acres sold will be larger than acres harvested due to leave tree areas and buffers within the sale line.
- Number of acres sold can be determined by multiple methods such as cruising the sale or GPS, and therefore the data is not completely consistent.

In the end, the IMC determined that the benefits of gathering the acres sold instead of acres harvested outweighed the disadvantages. The IMC determined that the disadvantages of gathering acres sold information would be mitigated in future years as additional years of data are collected each year.

The IMC also debated whether species or cover type information should be collected for each harvest sale. The inconsistency of public agencies in use of species and/or cover type information has been known since 1997 when the Interagency Information Center (IIC) reported that public agencies do not gather species and cover type information in a consistent manner. The IMC decided to ask for cover type data.

After developing an initial letter requesting the information, the IMC agreed to pilot test it by sending it to Superior National Forest and Cass County in January 2003. Feedback on the request for information included the elimination of two data items due to concerns:

- Dollar value of the sale from the data sheet
- Purpose of sale

The pilot also showed that the data from the Superior National Forest included several “timber units” for each sale. Also, each sale listed several geographic sections and listed up to 9 species rather than a single cover type. To address this, we requested additional data from Superior that linked to Timber Units data that provided acres by cover type for all the timber sales.

During the pilot, it was clear that the recipients often provided species information rather than cover type. In order to address this, the IMC agreed that species information could be grouped into six categories of cover types. To consistently perform this grouping, the DNR’s *Key for Main Cover type Determination*² was used.

Based on successful pilot results, the Information Management Committee agreed to proceed with requesting the 2001 timber harvests sold information from the remaining recipients in May 2003.

3. Methods

Recipients of Information Request

The recipients of this request for information included the Superior and Chippewa National Forests, Minnesota DNR, fourteen Minnesota Association of County Land Commissioners (MACLC) counties, and six Indian bands.

Due to resource constraints, industry landowners were not asked to provide information. Industry landowners may receive the information request in future years.

Request for information materials:

The request for information materials included a cover letter and a request for information (see Appendix B). The letter suggested several methods for recipients to provide the requested information:

- Electronic form - summary spreadsheet
- Printout/report from a data management system
- Copy of requested information form for each sale
- Copies of actual timber sale sheet for each sale

² From page 20 of Minnesota DNR’s CSA User’s Manual

Response Rate:

A total of 19 organizations responded to the request for information. Data was obtained from both the Superior and Chippewa National Forests, and DNR data was obtained from the central office in St. Paul. 13 of the 14 counties responded³. Three of six Indian bands responded⁴.

Information Formats:

Only one of the respondents, the state, provided the requested information in electronic format. Of the remaining 19 respondents, 11 provided a printout/report generated from either an existing database or a new report created for this request. Eight provided copies of the survey form for each harvest sold.

National Forests: Both national forests sent a report from their timber sales management system. Each report was different.

State: The Department of Natural Resources (DNR) provided an Access database file that included all timber sales in 2001. This file from DNR's central office provided less detail than if the information was obtained from all DNR area offices. We utilized the central DNR database due to concerns that area offices would not have time and resources to respond to this request. In the future, this requested data could be retrieved from a forest management system that is currently being developed (FORIST software).

Counties: Eight counties sent reports run from their Timber Sales Management software program. The remaining five counties responded by manually filling out the paper forms.

Indian Bands: All three Indian Bands responded by manually filling out the survey form (Appendix 3).

The diversity of formats received indicates that Indian Bands' and some counties' management systems are relatively manual processes and/or are not sophisticated enough to easily generate a report that addresses this type of information request. In addition, it is clear that there is a wide disparity between data management sophistication across the four categories of public landowners.

Receipt of the data and data management:

Data was received throughout the 30-day deadline window, with a seven sets of data arriving up to 2 weeks after the deadline.

An Access database was developed to collect and manage the data. A volunteer entered data into the database and managed the database.

Maps were made utilizing the Access data, imported through Excel into ArcView.

³ Counties that responded: Cass, Cook, Beltrami, Koochiching, St. Louis, Lake, Hubbard, Carlton, Crow Wing, Aitkin, Becker, Clearwater and Pine Counties. Non-responding county was: Itasca.

⁴ Indian bands that responded: Bois Forte, Grand Portage, and Fond du Lac.

Results

Table 4. Acres Sold by Owner/Administrator

Agency	Sales	Acres	Percent
State	1,081	40,842	48.8%
County	1001	30,978	37.0%
Federal	397	11,136	13.3%
Tribal	17	700	0.8%
Total	2,496	83,656	

Analysis of results

83,656 acres was sold for harvest in 2001, representing just over 1% of the total 7,818,034 acres⁵ owned by these landowners. It should be noted that these results are missing data from Itasca County.

Table 5. Acres Sold by Cover Type – State/DNR

Cover type	Sales	Acres	Percent
Aspen	582	24,387	59.8%
Lowland black spruce	96	4,309	10.6%
Tamarack	55	2,387	5.9%
Norway pine	113	2,328	5.7%
Birch	41	1,993	4.9%
Jack pine	89	1,981	4.9%
Oak	32	841	2.1%
Balsam fir	29	828	2.0%
White spruce	19	658	1.6%
White cedar	7	439	1.1%
White pine	5	341	0.8%
Walnut	6	113	0.3%
Northern hardwoods	3	96	0.2%
Cottonwood	1	55	0.1%
Scotch pine	1	20	0.0%
Balm of Gilead	1	18	0.0%
Total	1,080	40,794	

⁵ 2002 FIA inventory information. Sum of State timberland (4,092,484 acres), plus National timberland (1,847,669 acres), plus County timberland (1,766,314 acres) but excludes one non-responding county: Itasca; plus acreage of Indian band forestland acreage (Bois Forte 41,863, Grand Portage 47,408 and Fond du Lac 22,296).

Analysis of results

The highest volumes sold for harvest was aspen, followed by lowland black spruce. This contrasts with Federal species in Table 7 because state land tends to have more lowland species.

Table 6. Acres Sold by Cover Type – Counties

Cover Type	Sales	Acres	Percent
Aspen	598	21,141	68.2%
Birch	74	2,475	8.0%
Northern hardwoods	58	1,789	5.8%
Jack pine	77	1,431	4.6%
Lowland black spruce	39	1,097	3.5%
Balsam fir	24	597	1.9%
Balm of Gilead	21	543	1.8%
Oak	29	479	1.5%
Norway pine	33	427	1.4%
Ash	13	321	1.0%
Tamarack	10	276	0.9%
White spruce	10	126	0.4%
White cedar	5	116	0.4%
White pine	3	107	0.3%
Lowland hardwoods	2	26	0.1%
Unknown	4	26	0.1%
Upland black spruce	1	1	0.0%
Total	1,001	30,978	

Analysis of results

Of the 2,709,290 acres administered by county land departments⁶, 30,978 acres were reported as sold for harvest in 2001, representing a little over 1% of the land base⁷. This can be compared to similar data obtained via a survey conducted by Minnesota Forest Industries (MFI). In early 2002, MFI requested information from the counties represented by the Minnesota Association of County Land Commissioners. That survey provided a comparable data point -- the total annual planned harvest acres in county timber sale plans was about 33,194 acres/year, which is higher than the 30,978 acres reported here. However, comparison of these data points is a bit difficult since MFI's number excludes Koochiching County, and our number excludes Itasca County.

⁶ Sum of County timberland obtained from 2002 FIA inventory.

⁷ However, Itasca County did not provide harvest sale information.

Table 7. Acres Sold by Cover Type⁸ – Federal

Cover type	Sales	Acres	Percent
Aspen	115	3,279	31.9%
Norway pine	69	2,129	20.7%
White pine	55	1,802	17.5%
White spruce	32	772	7.5%
Birch	29	589	5.7%
Balsam fir	21	534	5.2%
Central hardwoods	14	435	4.2%
Jack pine	14	197	1.9%
unknown	4	186	1.8%
Upland black spruce	12	155	1.5%
Northern hardwoods	9	141	1.4%
Oak	3	76	0.7%
Total	377	10,295	

Analysis of results

A significant portion of the sales and acres were for aspen, but norway and white pine together (38.2%) are a greater component of harvests than aspen.

Table 8. Acres Sold by Cover Type – Indian Bands

Cover type	Sales	Acres	Percent
Aspen	10	322	46.0%
Norway pine	3	253	36.1%
Lowland black spruce	2	90	12.9%
White pine	1	19	2.7%
Jack pine	1	16	2.3%
Total	17	700	

4. Learnings

By conducting this survey, the IMC obtained some important learnings about the process of surveying public landowners for this type of information.

Learnings include:

- MFRC staff and volunteer spent approximately 110 hours on this project.
- It is estimated that respondents spent varying time to fulfill the information request, from 5 minutes (to request a report) to 2-3 hours (to create a new report format, or to manually

⁸ Cover type was either provided by landowners or species information was converted to cover type using DNR's Key for Main Cover type Determination (page 20 of CSA User's Manual) based on the species with the most volume.

write out the survey form for each sale). In total, it is estimated that respondents spent a total of 18-20 hours.

- Public landowners utilize inconsistent methods for storing and managing harvest sale data. Even where counties utilize the same management software (Timber Sales Management software), the report formats are not entirely consistent.

Challenges:

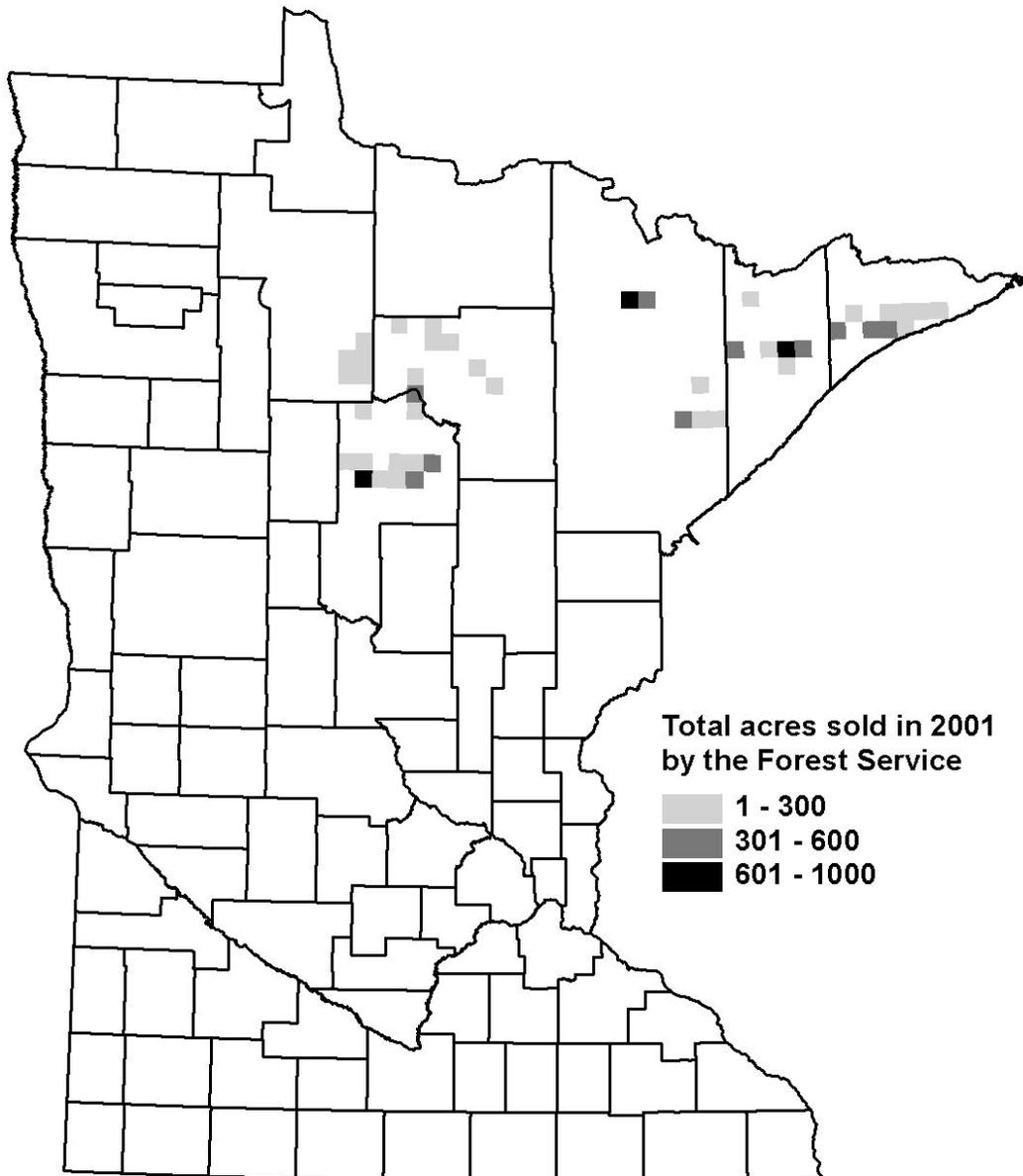
- Inconsistent definitions to insure data compatibility.
- Inconsistent cover types. The diverse reality of our resource leads to many cover types.

5. Recommendations

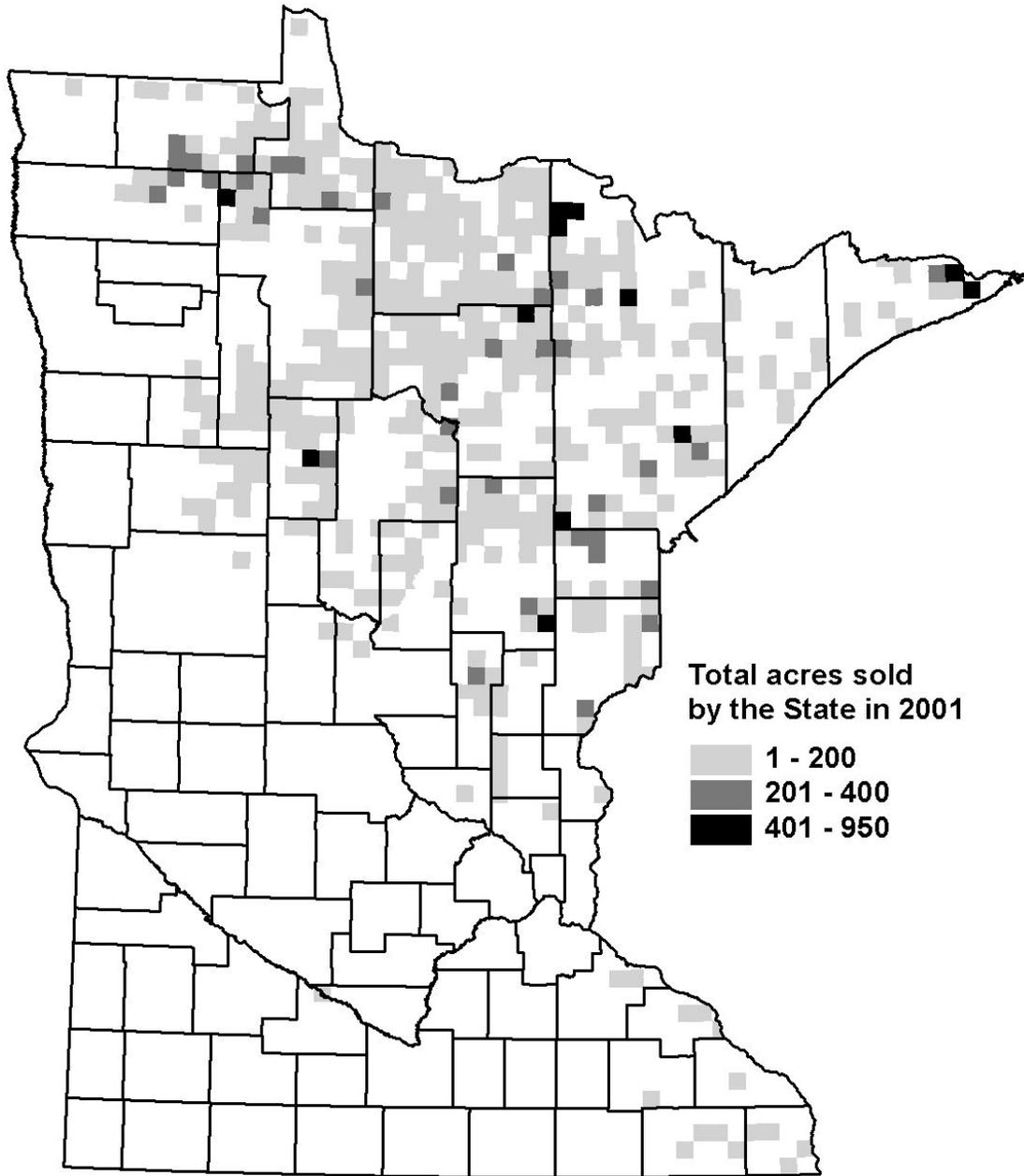
- This request for information should be repeated annually to allow for annual comparisons.
- Public landowners should be encouraged to utilize consistent methods for storing and managing harvest sale data.
- The request for information should include only the most critical data items since this increases the response rate.
- Providing options for providing the data proved to be important because of the various data management systems in use. This should be repeated, but the respondents will be encouraged to streamline their current systems.
- This report, and future year's results, should be published on the MFRC website and other forestry data-related sites.
- Consistent definitions and source to allow for comparison with MFRC reports and a better baseline.

6. Appendix A – Supplemental Maps

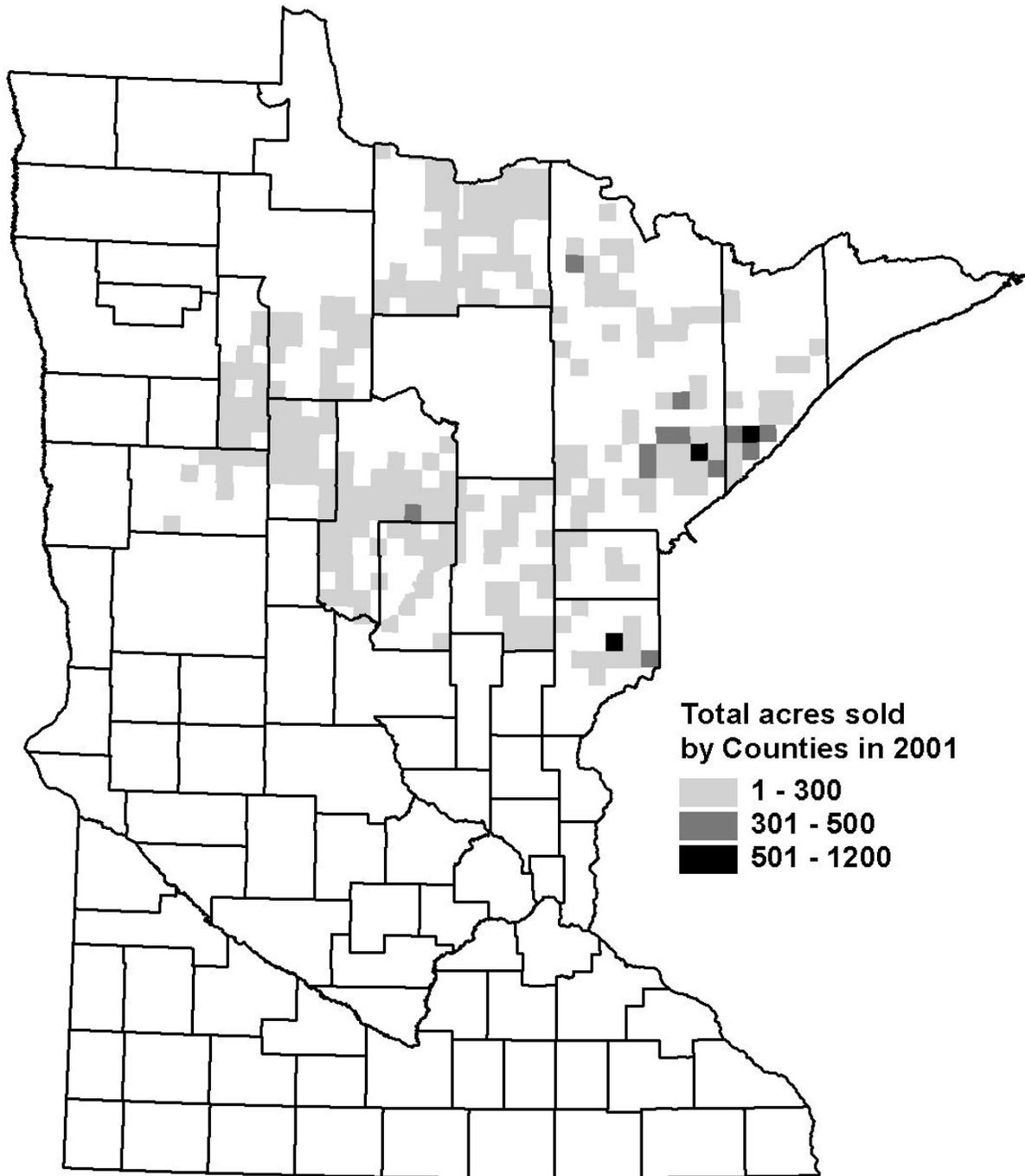
Map 2. Acres of forestland sold for timber harvest by Forest Service in 2001. Shaded squares represent townships where timber was sold and the number of acres that were sold. Dark lines are county boundaries.



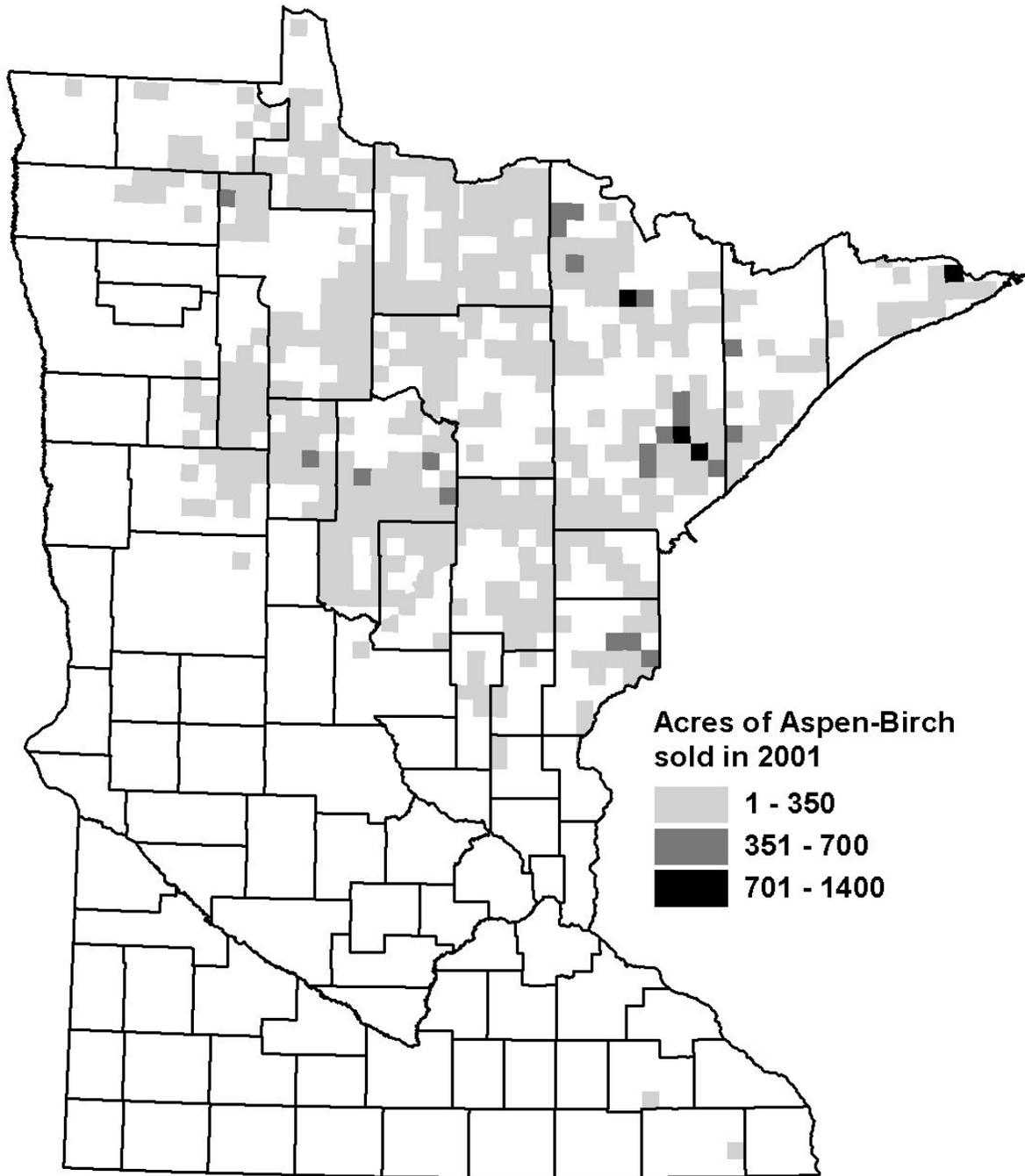
Map 3. Acres of forestland sold for timber harvest by Minnesota DNR in 2001. Shaded squares represent townships where timber was sold and the number of acres that were sold. Dark lines are county boundaries.



Map 4. Acres of forestland sold for timber harvest by Minnesota Counties in 2001. Shaded squares represent townships where timber was sold and the number of acres that were sold. Dark lines are county boundaries. Data for Itasca County are not shown.



Map 5. Acres of forestland sold for timber harvest by all owners in 2001 – Aspen/Birch.
Shaded squares represent townships where aspen-birch timber was sold and the number of acres that were sold. Dark lines are county boundaries.



APPENDIX B -- Information Request letter and survey instrument

April 17, 2003

Greetings:

The Minnesota Forest Resources Council (MFRC) is gathering information from public forest landowners to better understand the number of acres sold for harvest in Minnesota in **2001**. This information request is sponsored by the Information Management Committee of the MFRC:

Norm Moody – Committee Chair and Cass County Land Commissioner

Jim Sanders – Supervisor, Superior National Forest

Jan Green – Board member, MN Center for Environmental

Advocacy

Bob Stine – Coordinator, Cloquet Forestry Center

Dave Grigal - Professor Emeritus, University of MN Soil Science

Dave Heinzen – DNR Resource Assessment

Chad Skally – MFRC GIS Specialist/Forest Planner

Jenna Fletcher – MFRC Policy Analyst/Information Specialist

We are testing this method of collecting timber sold data. The purpose of this information is to assist the state of Minnesota, agencies and researchers to approximately measure the number of acres of forest that will be harvested. This information is important in determining sustainability of harvest levels. Past estimation efforts have been intermittent and utilized varying methods for estimating acres, usually based on volume. The MN Forest Resources Council will consolidate the data into a report that will show number of acres and volume of timber sold for harvest by cover type for public landowners.

INSTRUCTIONS for 2001 Timber Sold Information Request

Please fill out this information request for **all timber sales in 2001 by April 30th**. It is not important whether the harvest was actually completed in 2001. There are several ways to provide the information (in order of preference):

1. If your organization has a database of this information, and you can provide the requested information in the form of a summary spreadsheet:

RECORD	OWNER	LOCATION T/R/S	ACRES SOLD	COVER TYPE (code)
1	Cass county	131/26/13	16	12
2	Cass county	141/31/21	20	53
3	Cass county	137/28/05	10	12

1. OR If you have the ability to generate a computer printout/summary that provides all the required information and the optional information *for each sale*, please feel free to do so. Please ensure that you are providing every piece of data that is requested *for each sale*.
2. OR Make several copies of the next page (one for each timber sale in 2001) and fill in relevant information for each sale.
3. OR Mail in photocopies of timber appraisal reports, timber sales sheets or other data sheets for each sale.

Please call Jenna Fletcher 651-603-0109 if you have questions.

Please send your information by April 30th to:

Jenna Fletcher
MN Forest Resources Council
2003 Upper Buford Circle
St. Paul, MN 55108

Minnesota Forest Resources Council
 REQUEST FOR INFORMATION – 2001 Timber Sold

REQUIRED Landowner: _____

REQUIRED Location of the harvest sold:
 Township: _____
 Range: _____
 Section: _____

REQUIRED Number of acres sold: _____

REQUIRED Specify the **cover type** of the harvest sold using the codes from the list below:

01	Ash	51	White pine
06	Willow	52	Norway pine
09	Lowland hardwoods	53	Jack pine
12	Aspen	54	Scotch pine
13	Birch	55	Ponderosa pine
14	Balm of Gilead	61	White spruce
15	Cottonwood	62	Balsam fir
17	Hybrid Poplar	71	Lowland black spruce
20	Northern hardwoods	72	Tamarack
25	Walnut	73	White cedar
30	Oak	74	Upland black spruce
40	Central hardwoods	81	Red cedar

Estimated volume of the sale in cords: _____

Harvest method:

- a) Clearcut (0-20% residual area/volume)
- b) Clearcut with residuals (40-60% residual area/volume)

Management objective - if known (choose one):

- Even aged management
- Un-even aged management

What is/was the method of regeneration (choose one):

- Natural regeneration
- Artificial regeneration

APPENDIX C – Metadata for 2001 Harvest Survey

- Geographic regions: Superior and Chippewa National Forests, state lands administered by the DNR, county-administered land in Cass, Cook, Beltrami, Koochiching, St. Louis, Lake, Hubbard, Carlton, Crow Wing, Aitkin, Becker, Clearwater and Pine Counties, Bois Forte reservation, Grand Portage reservation, and Fond du Lac reservation.
- Geographic mapping unit is township.
- Data was gathered for the period from January 1, 2001 to December 31, 2001.
- 45% of county/national forest/Indian band sales do not list harvest method (Superior, Chippewa and St. Louis County provided it).
- Most respondents did not list regeneration method.
- Cover type definitions and methods varied among landowners.
- Some cover types are likely to be overstated and others understated in cases where cover type was determined using the greatest volume. Aspen will most likely be overstated. For example: permit # 201100 for Beltrami - 18 acres harvested were aspen and 11 acres harvested were Norway Pine cover type. When using the *DNR key for Cover Type Determination*⁹, all 29 acres were categorized under aspen.
- DNR acreage is overstated since numbers can include “drain acres” which include 5% reserve.
- Codes used for harvest method are codes assigned by Superior National Forest in their record-keeping format.
- In some instances harvest sale data was received in a format that sub-divided volume and cover type by the various section locations.
- Some records or sales have multiple cover types. We used the DNR key for main cover type determination, which chooses the type with the greatest volume.
- Volume information provided in thousand board feet (Mbf) was converted using the formula of 1Mbf = 2 cords (also indicated cords/acre in remarks column).
- Sales were not entered if the resource sold was maple syrup, gravel/sand, balsam boughs or salvagewood/fuelwood because the sales are very small and do not provide cover type or acreage information.
- Under harvest method, we separated clearcut into having residuals of 0-39% residual area/volume, or 40-60% residual area/volume. Aitkin County classified clearcut as having less than 10% residuals, and clearcut with residuals as 10-40% residual area/volume, and partial cut is classified as having 40-60%.
- Two counties submitted data using a new Timber Sales Management (TSM) report format (Koochiching and Beltrami) that contained duplicated entries. Duplicates were weeded out and crosschecked with the corresponding dollar values so that they amounted to the correct total sales value.
- Contact information: Minnesota Forest Resources Council, Jenna Fletcher, 651-603-0109, flet0042@umn.edu

⁹ This key is on page 20 of Minnesota DNR’s CSA User’s Manual.