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*Western North Carolina's
Wood Waste Biomass Supply
Survey Results: 2007*

Report Prepared by:
Waste Reduction Partners
Land-of-Sky Regional Council

In Partnership with:
NC Division of Pollution Prevention & USDA Rural Utility Services

Acknowledgement to our Partners

Waste Reduction Partners is a program of the Land-of-Sky Regional Council (LOSRC), a governmental nonprofit organization that assists local governments with planning and decision-making. The Waste Reduction Partners program works in a special partnership with the N.C. Division of Pollution Prevention, the US Department of Agriculture and NC State Energy Office.



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WNC Wood Waste Biomass Supply Survey: 2007
by
Waste Reduction Partners, Land-of-Sky Regional Council

Executive Summary:

A Wood Waste Supply Survey for Western NC was conducted by Waste Reduction Partners of the Land-of-Sky Regional Council. The survey was conducted in North Carolina counties falling within a 100-mile radius around Buncombe County, NC. No other states were included. A one-page survey was mailed to 405 wood waste processors, large wood component manufacturers (including pallet manufacturers), sawmills, lumber producers, logging, chip mills, and land-clearing businesses. Separate data was also collected for local government solid waste management operations. The 51 responding private sector businesses reported a total of 298,780 tons of wood waste generated annually from their operations, of which they report that 255,823 tons could be available annually for a new local market. Twenty-five WNC county and municipal governments reported 87,506 tons of separated wood waste that is collected and managed. Attachment 2 is a wood waste density map showing all reported generating locations and tonnage ranges.

WNC Available Wood Waste Survey Results

| Survey Response by Sector | Total Tonnage of Wood Waste Potentially Available | Average Tonnage Reported Available | Median Tonnage Reported Available |
|--|--|---|--|
| Private Sector Businesses (51 Responses)* | 255,823 | 5,221 | 1,250 |
| Local Governments (25 reporting) | 87,506** | 3,365 | 1,704 |
| Total Reporting | 343,329 | 4,578 | 1,500 |

* Private Sector survey response rate: 12.7 percent. **Assumes all local government wood waste available for market.

One fourth of the potentially available (private sector) wood waste was reported by two wood waste processors. Forty-five percent of the remaining wood waste was reported as generated by a number of wood product manufacturers. Nearly half of the available material was described as “coarse wood” material, some of which is chipped. Another quarter was described as “fine wood” sawdust. Sixty-two percent of the available material is currently utilized as boiler fuel. About half of the available tonnage is currently transported to markets that are between 41 to 100 miles away from the source of generation.

Further comments on additional wood waste sources and small waste collection strategies are discussed within this report. No attempt was made by the authors to project total potential WNC wood waste supplies.

WNC Wood Waste Biomass Supply Survey

1.0 Background:

Better utilization of wood waste and wood by-products are goals of both the NC Division of Pollution Prevention and Environmental Assistance (NCDPPEA) and the State Energy Office. The State Energy office is interested in better utilizing biomass waste for energy related business development projects. The NCDPPEA is interested in growing markets for clean wood waste to divert more material from landfilling and to prepare for the October 2009 statewide landfill ban on wood pallets.

Waste Reduction Partners, a technical assistance program of the Land-of-Sky Regional Council that works in partnership with the NCDPPEA and the State Energy Office, has been working on wood waste recycling projects for several years. WRP has interests in quantifying wood waste throughout the WNC region for use as a business development tool and for other opportunities to better utilize renewable, locally generated by-products for productive uses.

2.0 Survey Development

WRP embarked upon the WNC Wood Waste Survey in October 2006. A WRP work team consisting of Dave Lowles, Tom McCullough, Richard Burke, Michelle Barber and Terry Albrecht held various meetings to develop a one-page written survey tool and to assemble various databases. The survey was mailed and followed-up with phone calls for non-responders. A second mailing of the survey also was conducted to contact the remaining 100 largest potential wood waste generators.

2.1 Written Questionnaire Development

The WRP wood survey team developed a simple one-page written survey to be used with all wood generating sectors. The survey included questions on annual wood waste generation, description of the by-products, present markets, distance to markets, disposal cost/revenues, stability of end markets, estimated amount of wood waste that could be supplied to a new market, and minimal desired price per ton (see Attachment 1). The survey tool was reviewed by the WRP team and several wood waste stakeholders, including end-users, brokers, and generators.

2.2 Survey Databases and Business Identification

The development of the survey database was a time-consuming and challenging task. The WRP team set the geographic region of the survey to be approximately a 100-(driving) mile radius around Buncombe County, specifically Asheville. The NC counties included in the survey are as follows: Avery, Alexander, Buncombe, Burke, Caldwell, Catawba, Cherokee, Clay, Cleveland, Graham, Gaston, Haywood, Henderson, Iredell, Jackson, Lenoir, Lincoln, McDowell, Macon, Madison, Mitchell, Polk, Rutherford, Swain, Transylvania, Watauga, and Yancey. Only North Carolina counties were included in the survey. It is notable that over half of the 100-mile radius area falls outside NC boundaries, which was not part of this survey.

The WRP team utilized the following data sources information for contacts:

| Data Source | Filter Criteria |
|---|--|
| Western North Carolina Industrial Directory (2005) | SIC codes – 25, 24, 26, and 08 NAICS codes 113-113310, 115-115310, 23891&238910, 321-322211 |
| Harris Directory 2006 | SIC codes – 25, 24, 26, and 08 NAICS codes 113-113310, 115-115310, 23891&238910, 321-322211 |
| NCDENR - NCDPPEA Markets for Recyclable Materials (www.p2pays.org/DMRM) | Wood/Biomass Categories recyclers in Westernmost 23 NC Counties |
| NCDENR – Solid Waste Management Annual Report FY2004 and FY2005 | Westernmost 23 NC Counties |
| Timber Buyers in WNC | Timber buyers in 21 WNC Counties |
| Asheville Metro Business and Industry Directory – 2006 | SIC codes – 25, 24, 26, and 08 NAICS codes 113-113310, 115-115310, 23891&238910, 321-322211 |
| McCrae’s Bluebook.com | Wood products and timer industries in WNC |

A combined database was created containing 2266 records, which was then filtered to identify the largest potential wood waste generators and to reduce the number of records (businesses) to survey. For example, industrial wood product manufacturers (SIC codes 24-26) were eliminated if gross sales were less than \$1.2 million per year.) The survey database was consolidated to approximately 405 wood waste generators with the potential for the highest volume of generation. These generators did not include local government units, which were examined separately.

A survey was mailed out to 405 wood waste generators on December 13, 2006 with responses due by December 31, 2006. By early January 2007, approximately 30 survey responses had been received. The WRP team divided up the non-responding organizations and followed-up with a small subset of these by phone. Phone follow-up proved equally difficult to gather data. The team decided to make a second mailing of the survey with a revised, simplified cover letter in mid-January 2007. Several additional surveys had been received from this second mailing at the time of writing this report.

2.2.1 Local Government – Solid Waste Management Operations

Regarding local government data (county and municipality solid waste management), the team relied upon the Solid Waste Management Annual Report provided by the NCDENR, Division of Pollution Prevention and Environmental Assistance. Richard Burke and Dave Lowles followed-up with several of these local governments to verify reported information.

3.0 WNC Wood Waste Survey – Primary Findings

3.1 Total Wood Waste Generated and Available:

The 51 private sector respondents reported a total of 298,782 tons of wood waste generated annually from their operations. Attachment 2 shows a wood waste density map of all reporting generating locations and tonnage ranges. This total tonnage generated compares to 255,823 tons per year that were reported available for a new local market. The majority noted that their entire generation was available for a new market. The difference between amount “generated” versus “available” were for businesses like Henson’s that is producing a mulch product for retail sale. Others reporting less available tonnage than generated appeared to have very stable or committed markets for fuel, mulch and pulp.

Twenty-five WNC local government solid waste operations reported 87,506 tons per year of separated wood waste that are collected and managed, mostly brush (based on FY 2004 and FY2005 state reports). Authors of this report made the assumption that all of this reported wood waste would be available for a new market. This assumption would need to be verified, as well as confirming that any of the reported wood waste from construction and demolition (C&D) related activities is already source separated and would not require additional sorting labor.

| Survey Response by Sector | Total Tonnage of Wood Waste Potentially Available | Average Tonnage Reported Available | Median Tonnage Reported Available |
|---|---|------------------------------------|-----------------------------------|
| Private Sector Businesses (51 Responses)* | 255,823 | 5,221 | 1,250 |
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* Private Sector survey response rate: 12.7 percent. **Assumes all local government wood waste available for market.

3.1.1 Business Sectors Reporting

The following graph below shows the types of business sectors reporting available wood waste materials. No local government data is included in this pie chart. Percentages are based on tonnage reported. The largest volumes are reported by the wood products manufacturing sector, which could also include pallet manufacturing, but was significant enough to break out and report separately. Interestingly, the second largest generating sector, wood waste processing, includes only two reporting surveys from the Riverside Stump Dump and Hensons’. This number of businesses compares to 17 reporting wood product manufacturers.



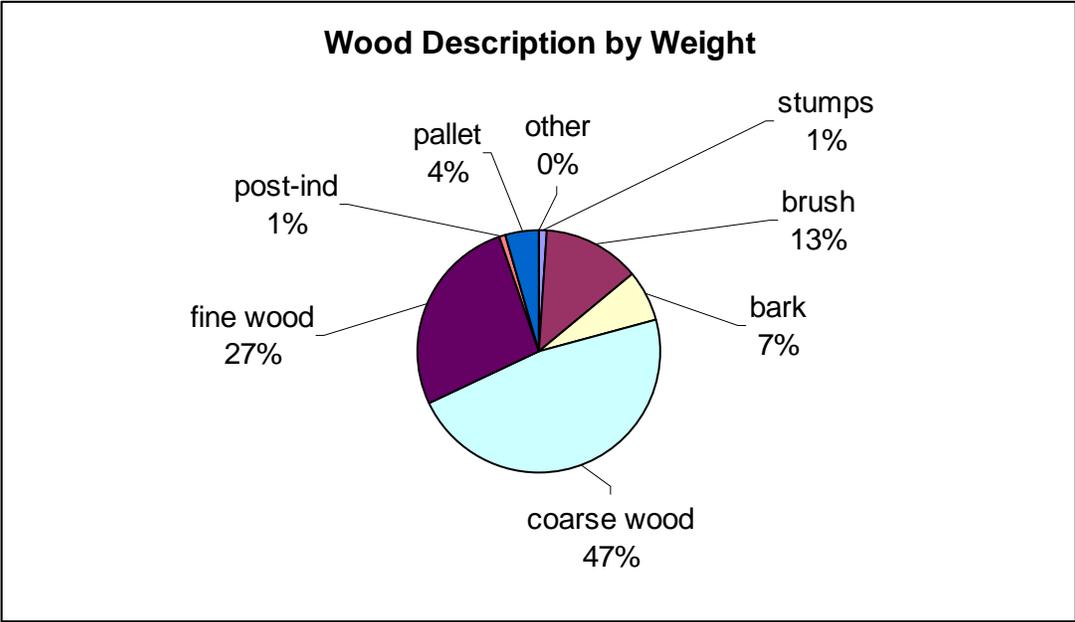
3.1.2 WNC Market Wood Market Projections

With only 12.7 percent of the businesses completing the survey, further total market projection could not be made. An important sector to extend market projections from would be timber product data sources from the U.S. Forest Service. Projections for the wood component manufacturers sector would be very speculative. Authors assume that many land-clearing companies were missed in these surveys and could represent significantly large volumes of material. Some timber and land-clearing businesses have noted that quantities of wood are left on-site. The U.S. Forest Service estimates that 122,223 tons of logging residuals waste were generated in 20 WNC counties based on the 2002 Timber Products Output Mapmaker 1.0. The USFS defines logging residual as the unused portions of trees cut, or killed by logging, and left in the woods. This survey did not attempt to further quantify wood slash left on-site. The State’s Air Quality Division prohibits the burning of materials over 6 inches in diameter, which could be another factor driving wood material to markets.

All other projections of total WNC wood supply derived from this study should be conducted by the report users with additional knowledge of these wood waste generating sectors.

3.2 Description of Word Waste (Private Sector reporting)

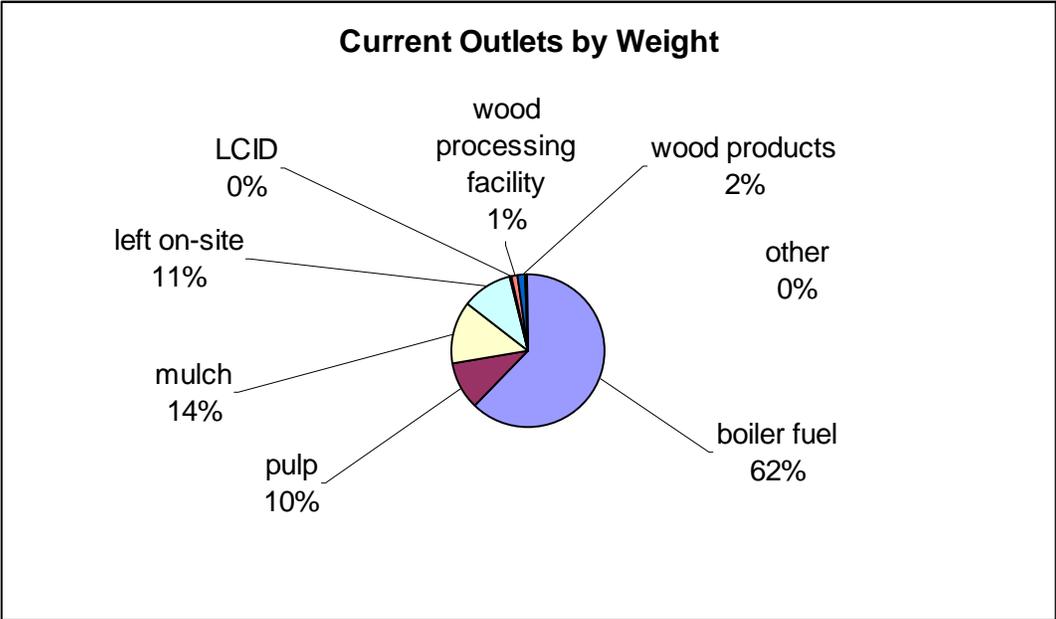
Forty-seven percent of the private sector wood waste reported available was described as ‘coarse’ wood, much of which is assumed to be chipped. See chart below.



The local government sector wood waste (not shown above) was mostly reported as brush with some coarse wood, post-industrial wood and pallets. Some Construction and Demolition (C&D) waste also was reported, but numbers reported in this report should not include wood in mixed C&D waste streams.

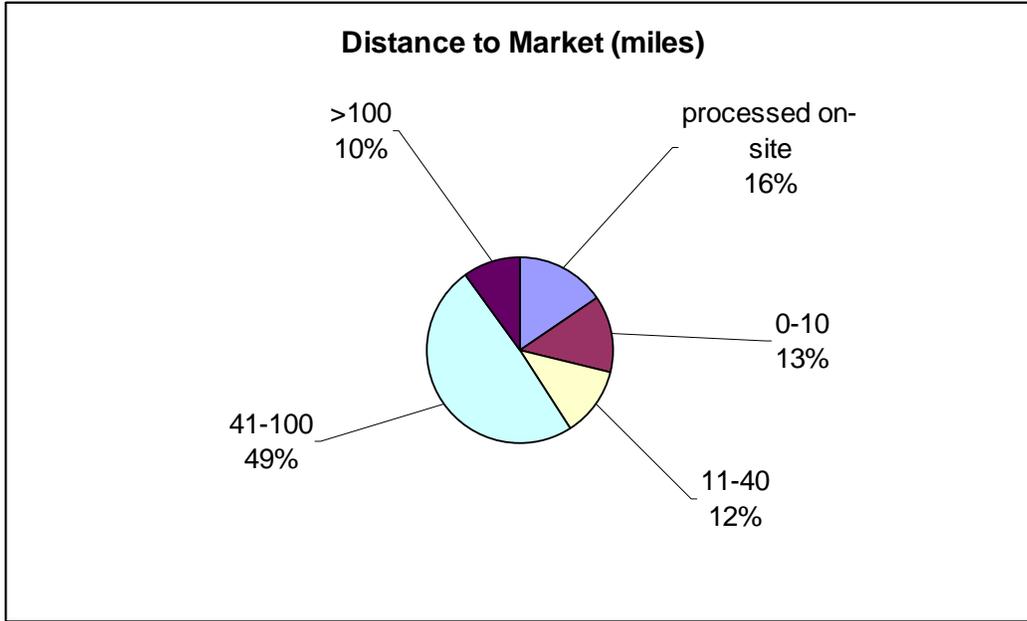
3.3 Report Market or Disposal Outlets

The largest current market for survey responders was boiler fuel, followed by mulch, left on-site, and pulp wood. See “Current Outlets by Weight” chart below.



3.4 Distance to Market

Survey responders noted that the largest tonnage of wood waste in this study is transported 41 to 100 miles to market. See “Distance to Market” chart below.



3.5 Report Market Stability

Responses about the stability of markets ranged greatly. The majority of the responders, seventeen, said markets were “very stable.” Thirteen responders noted that markets “varied with season” and eight said the market “varied with production.” Four responders noted that their markets were “highly variable.” Of the total 51 responses, many did not answer this question. Some of the “very stable” responses applied to disposal management options. There were no obvious trends in the reporting of wood market stability.

3.6 Costs and Market Pricing report

Twelve of 51 survey responders reported paying for wood to be managed. Tipping fees of \$30, \$40, and \$45 per ton are noted, as well as truckload costs of \$200 per tractor trailer load.

Eighteen of 51 survey responders report being paid for their wood by-products. Price per ton ranged from \$6.00 to \$33.00. Values were requested to be reported as “\$/ton FOB at the generator’s site.” There were not enough responses to present a weighted pie chart.

4.0 Business Sectors Not Quantified

While the timber products, logging and land-clearing sectors were well identified and surveyed under this study, other business sectors such as private tree trimming, right-of-way

maintenance, and arborists were not well identified nor surveyed. Some amount of the wood waste generated by these sectors is likely captured by private sawmills, pulp mills, wood processors and local government waste management facilities. But, this assumption has not been verified or documented.

5.0 Wood By-product Brokers

Wood waste brokers operating in the greater WNC region will be key partners for any wood waste utilization business in the region. Wood waste brokers participating in this survey are list below. A comprehensive listing of wood waste recyclers can be found in the North Carolina Recycling Market Directory: www.p2pays.org/DMRM:

Joe Pryor
Oaks Unlimited Fiber Fuels
3530 Jonathan Creek Rd
Waynesville, NC 28785
Phone 828-926-1621
mail@oaksunlimited.com

Ben Long / Max Doggett
Lobo Products
2905 Old Whigham Rd
Bainbridge, GA 39817
Phone 229-246-5046
Fax 229-243-8575
loboproducts@bellsouth.net

Don Arrington
Environmental Resource Group, LLC
527 Allens Branch Rd
Sylva, NC 28779
Phone 828-506-3365
Fax 828-631-9340
donarrington@verison.net

6.0 Small Wood Source Collection Strategies

About half of the survey respondents generated less than 1,500 tons per year. If a new business development initiative is seeking to improve collection of wood from wood-product industrial manufacturers or the C&D waste stream, the authors of this report suggest that partnerships be created with local waste haulers, especially those with roll-off services. While the collection of wood from this sector will prove challenging, there would appear to be opportunities if market conditions and pricing can drive the collection of source separated materials. In 2002, eleven WNC county C&D landfills were collecting 115,292 tons of mixed

C&D waste. The estimated C&D waste generation in 17 WNC counties was 252,624 tons in 2002 (based on per capita generation estimated). The C&D sector presents opportunities for significant material recycling. The following waste and C&D haulers currently serve the greater

Asheville area:

Asheville Area Waste and C&D Haulers

- Consolidated Waste Services – phone (828) 645-0660
- Griffin Waste Services – phone (828) 281-4549
- Waste Management – phone (828) 253-5364
- Wyatt Waste Container – phone (828) 250-0996
- GDS – phone (828) 253-3929

In North Carolina:

The NC Division of Pollution Prevention and Environmental Assistance has developed a comprehensive on-line listing of wood waste recyclers, which can be found in the North Carolina Recycling Market Directory: www.p2pays.org/DMRM

**Western North Carolina
Wood By-Products - Supply Survey**

Company Name _____ **Site Location (City)** _____

1. What is your estimated annual generation of wood waste or by-products?

_____ tons/year or _____ cubic yards/year

2. Describe these wood by-products & estimate percentages.

_____ stumps _____ brush _____ bark _____ coarse wood (chipped) _____ fine wood (sawdust, etc)
_____ post-industrial mfg _____ pallets _____ other, please describe _____

3. What are your present markets or disposal outlets for these wood by-products?

_____ boiler fuel _____ pulp _____ mulch _____ left on-site _____ landfill (LCID)
_____ landfill (municipal/C&D) _____ wood processing facilities _____ wood products (MDF, etc)
_____ other? _____ (Assumes wood is clean and unadulterated unless otherwise noted)

4. How far are your wood by-products transported to markets/outlets?

_____ processed on-site _____ 0-10 mile(s) _____ 11-40 miles _____ 41-100 miles _____ > 100 miles

5. Average price you pay for disposal or are paid for your wood-by products (delivered)?

_____ I pay a tip fee of \$_____ per ton (other unit _____) _____ I am paid \$_____ per ton

6. How stable is this end-market/outlet?

_____ very stable _____ varies by season _____ varies by production _____ highly variable

7. Estimate amount of wood by-product that you could supply to a new local market, within 50 miles (annual tons or cubic yards)?

_____ tons /year or _____ cubic yards/year

8. What is the minimal price per ton you would accept for your wood by-products?

\$_____ / tons FOB at Your Site

Contact Name _____ **Phone** _____

E-mail: _____ **Business Type** _____

Please mail or fax this survey to Waste Reduction Partners, Land-of-Sky Regional Council, Fax (828) 251-6353.

Attachment 2 (Map)

WNC Wood Waste Supply Survey

May 2007

 100 Mile Radius of Asheville

Tons of Wood Waste Available

- 0 - 150
- 151 - 500
- 501 - 1500
- 1501 - 3000
- 3001 - 6500
- 6501 - 12000
- 12001 - 25000
- 25001 - 50000

