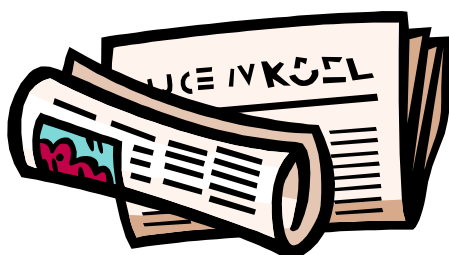


Paper: Old Newspapers

COMMODITY PROFILE

North Carolina Department of
Environment and Natural Resources
DIVISION OF POLLUTION PREVENTION
AND ENVIRONMENTAL ASSISTANCE

MARKETS ASSESSMENT 1998



OVERVIEW

Traditionally, old newspapers (ONP) have been recovered from the waste stream and used as feedstock for a variety of recycled products, including newsprint, paperboard, tissue, containerboard, molded pulp, animal bedding, insulation, and as a bulking agent for compost. The most widely traded grade of ONP is commonly called Number 8 News.¹ This grade commands the highest price because it has the least contaminants relative to the other three grades of ONP.² It is also the most sought after grade of ONP for recycled newsprint mills, the single largest end users of recovered ONP.

The Institute of Scrap Recycling Industries defines No. 8 News as "baled, sorted, fresh dry newspapers, not sunburned, free from magazines, white blank, pressroom over issues, and paper other than news." Total outthrows (i.e., contaminants) in No. 8 News should not exceed one-fourth of one percent.³

In 1997, more than 282,000 tons of newsprint were generated in North Carolina. That year, North Carolina achieved a 57 percent recovery rate for newsprint, which is slightly above the national recovery rate of 54 percent.⁴ Of the tonnage recovered, 121,000 tons, or 76 percent, were collected by local governments, while the private sector accounted for the remaining 24 percent (38,000 tons).

The American Forest and Paper Association (AF&PA) reported the amount of recovered ONP rose in 1997 due to an increase in domestic mill consumption.⁵ This increase in domestic demand can be attributed to three factors: (1) the strong economy and the consequent demand for newsprint advertisements, (2) increased recycled newsprint capacity due to mill improvements in production efficiency, and (3) the underlying effect of state governments' minimum recycled content newsprint regulations.

Figure 1: Estimated Supply of Newsprint in North Carolina

	1997	2002
Generation (tons)	282,412	299,673
Recovery (tons)	159,594	169,611

Source: AF&PA and North Carolina S.W. Management Annual Report 1996-97.

Demand for ONP remains strong in North Carolina and the Southeast region. Because of the presence of some of the largest newspaper mills in the nation, the region consumed almost 26 percent of the total domestic demand for recovered newspapers in 1997.⁶

SUPPLY OF ONP

Generation

According to EPA, the national generation of total ONP (domestic shipments plus imports) has been declining slowly from 1993 to 1996.⁷ Because of the strong economy and advertising climate, however, 1997 appears to represent the first increase in the generation of newsprint in four years. The AF&PA reported that 1997 was a record year for domestic newsprint shipments in the United States. After declining from 7.13 million tons in 1992 to 6.93 million tons in 1996, United States newsprint shipments increased to 7.25 million tons in 1997. According to the AF&PA, the increase in newsprint shipments is primarily a result of the expanding domestic demand driven by robust economic trends and the strong advertising atmosphere in 1997.⁸ Paralleling the increase in domestic shipments, imports are also expected to increase in 1997. As a result, while EPA data for 1997 are not yet available, the total generation of ONP, including imports, is expected to increase over the 12.3 million tons generated in 1996.⁹

To calculate the supply of ONP in North Carolina, the generation of ONP was estimated as the combination of post consumer newsprint, overissue newspapers, and uncoated groundwood products such as newspaper inserts and coupons. The following section outlines two primary methods of calculating the supply of ONP in North Carolina.

First, supply could be estimated using a per capita national average derived from EPA data.¹⁰ However, this aggregate methodology results in a supply figure that does not account for the differences in newspaper density and readership levels between states with extremely large metropolitan areas versus less urbanized states. As a result, the aggregate approach overestimates the supply of ONP in North Carolina. Using this approach, the supply of ONP in North Carolina in 1997 would be 344,621 tons.

In contrast, supply could be estimated using North Carolina-specific data on the following factors: 1) unprinted newsprint shipped to North Carolina, 2) out-of-state papers imported across the state line, and 3) inserts. This approach ensures that the statewide supply of ONP reflects the differences in local newspaper circulation and paper density across the nation. For instance, states with large metropolitan areas, such as New York and California, have thicker newspapers and higher per capita newsprint consumption than more rural states, such as North Carolina. The AF&PA reports that 235,343 tons of unprinted newsprint were shipped to North Carolina in 1997.¹¹

According to industry experts, in 1989, groundwood inserts comprised the equivalent of eight percent of the weight of the ONP supply. More recently, however, experts estimated that inserts have increased to roughly fifteen percent of the weight of ONP in 1997.¹² To account for the addition of groundwood inserts in the supply of ONP in North Carolina, the total figure for unprinted newsprint was increased by fifteen percent. Furthermore, to account for the net imports of out-of-state newspapers (e.g. the New York Times, the Washington Post), the supply of ONP was increased by an additional five percent. In summary, the unprinted newsprint figure was increased by 20 percent to account for inserts and imported newsprint. As illustrated in Figure 1, the total supply of ONP in NC in 1997 was 282,412 tons.

Projections for the supply of ONP in 2002 are based on population increases in North Carolina and assume that the per capita generation and recovery rates will remain constant at 1997 levels.¹³ As a result, the projections may underestimate the actual ONP supply in 2002. Because of prevailing of regional market dynamics in the newsprint industry, the generation and recovery for North Carolina's border states and for the southeast region are provided in Figures 2 and 3.¹⁴ Old newspaper generation and recovery estimates for 1997 and 2002 for the southeast region and the border states are based on national per capita averages from 1997 EPA data. As previously explained, this aggregate method of calculation may overestimate generation and recovery of ONP.

Figure 2: Estimated Supply of ONP in North Carolina and Border States

	1997	2002
Generation (tons)	1,426,123	1,514,828
Recovery (tons)	771,532	819,522

Source: Based on US EPA MSW Characterization Report, 1997 Update.

Figure 3: Estimated Supply of ONP in the Southeast Region

	1997	2002
Generation (tons)	2,697,144	2,852,883
Recovery (tons)	1,459,155	1,543,410

Source: Based on US EPA MSW Characterization Report, 1997 Update.

Figure 4. Local Government Recovery of ONP in North Carolina

	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97
Tons of ONP Recovered	85,728	97,534	109,927	104,034	110,242
Percent Change, 1992-93	Baseline	13.8%	28.2%	21.4%	28.6%

Source: NC Solid Waste Management Annual Report 1996-1997. Does not include ONP reported as mixed paper.

Recovery

North Carolina achieved a 56.5 percent recovery rate for newsprint in 1997, primarily due to the proximity to end users in the Southeast region and mandatory recycled content newsprint regulations. Currently the national recovery rate is 54 percent, and industry experts estimate that, given the existing recycling infrastructure, optimal recovery levels for ONP should be between 65 to 70 percent.¹⁵

In North Carolina, local government curbside and drop-off collection programs are the primary methods of recovery and supply to paper brokers, dealers and end users. During the past five years, local government recovery of ONP has increased more than 28 percent (Figure 4). In 1997, 121,000 tons, or 76 percent of the total ONP recovered in the state, was collected through local government programs. Private (i.e. non-local government) recovery of ONP accounted for the remaining 24 percent of the total ONP recovered (38,000 tons).

While the percentage of ONP recovered has increased in recent years, the quality of the recovered ONP supply is declining. Due to consistently low prices for No. 8 News during the past three years, local governments have not emphasized source separation and, thus, have not achieved high quality ONP. Furthermore, in the aftermath of the re-

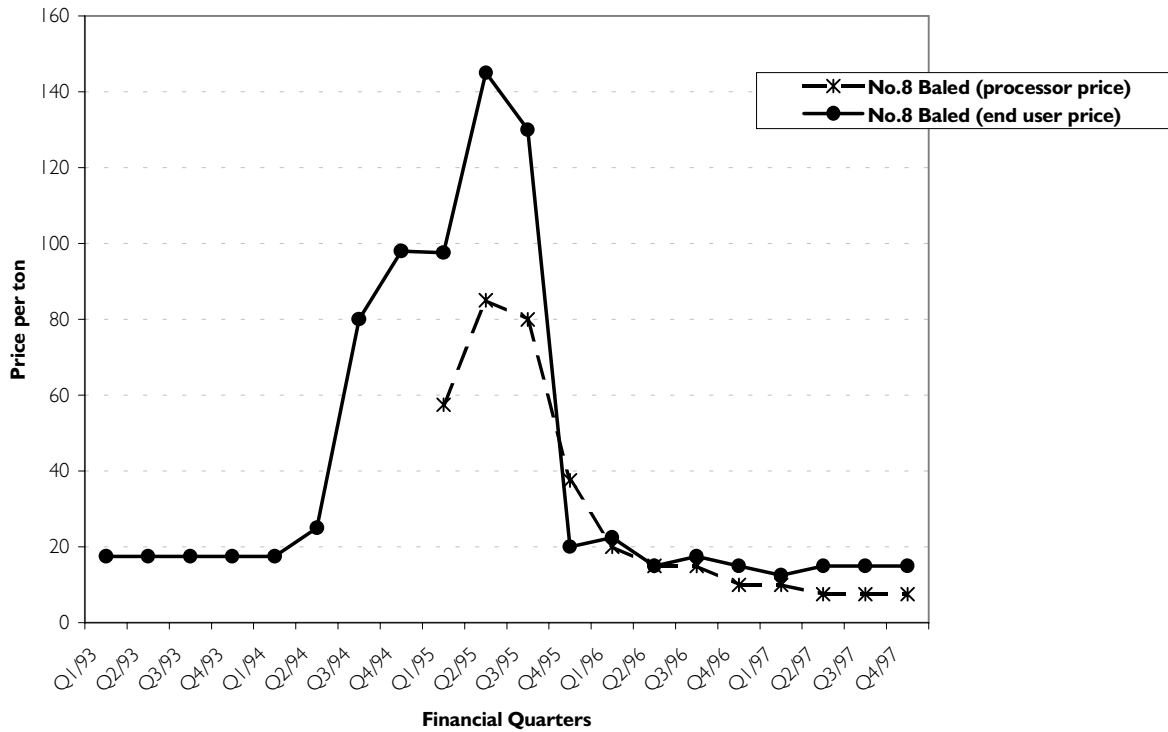
cent price decreases, some North Carolina local governments have chosen not to maintain separate ONP and residential mixed paper (RMP) systems due to the increased efficiencies of combining ONP and RMP collection. Due to the trend toward commingling ONP and RMP collections, the local government ONP recovery calculations in this report reflect an increased tonnage to include 50 percent of the tonnage reported as mixed paper by local governments in fiscal year 1996-97. As a result, nine percent of the 121,229 tons of the total ONP recovered consists of ONP reported as mixed paper.

DEMAND FOR ONP

While various technical and economic factors affect demand decisions at mills, the following section describes seven fundamental factors that have a significant impact on the demand for ONP.

- **General Demand for Paper and Paperboard Products:** In general, the demand for paper and paperboard products parallels the health of the economy. Due to the strong economy and the continued demographic shift toward the southeastern United States, the demand for advertising in newsprint remained high throughout 1997.

Figure 5: Price History of ONP (Processor and End User Prices)



Source: Recycling Times. Processor Prices not available prior to 1995.

- Recycled Content Legislation:** Since the early 1990s, minimum recycled content laws have been important mechanisms to develop the domestic demand for ONP. As of 1998, 28 states supported mandatory or voluntary recycled content levels. Thirteen states have passed mandatory newsprint laws across the country, and 15 states have established voluntary guidelines for publishers to use recycled newsprint.¹⁶ Many of the states adopting such initiatives have also established programs with increasing recycled content targets, so that the industry can gradually develop demand for ONP. In 1994, the North Carolina legislature required publishers to use 30 percent post-consumer recycled fiber by 1998 with an increase to 35 percent by 2000.¹⁷ Florida and Kentucky have also adopted mandatory recycled content legislation by 1998. Virginia is the only state in the southeast that encourages publishers to purchase recycled content newsprint through voluntary guidelines.¹⁸

These laws have provided an effective incentive for newspaper publishers to demand recycled content newsprint from paper mills. Possibly more significant than helping increase the demand for ONP, the minimum content laws have provided a

stable domestic demand for ONP and provided a critical balance to the fluctuating foreign demand for ONP.

- Capacity for Recycled Newsprint Production and Consolidation Trends:** In reaction to the increased demand for recycled newsprint from publishers, many newsprint mills invested heavily in facility expansions with deinking capabilities throughout the mid-1990s. In the Southeast region alone, five newsprint mills reported using a combined total of more than 1.2 million tons of ONP in 1997.¹⁹ Despite the lack of announced expansions of deinking capacity, the mills surveyed for this report anticipated increases in production capacity for recycled newsprint because of improvements in production efficiency. Additionally, the current industry-wide trend toward consolidation could result in the acquisitions and expansion of smaller paper mills and increased capacity for recycled newsprint production in the Southeast region.
- Export Demand:** Fluctuations in the foreign demand for ONP have caused significant price volatility in ONP in recent years. For example, when

Figure 6: Breakdown of End Uses for ONP

National Consumption of ONP by End Use	Tons (000)	Percentage of Total
Newsprint	2,676	36.2%
Recycled Paperboard	1,393	18.9%
Exports	1,048	14.2%
Tissue	496	6.7%
Containerboard	264	3.6%
Printing-Writing	176	2.4%
All Other	1,333	18.0%

Source: AF&PA Recovered Paper Statistical Highlights (1997)

foreign market demand for ONP peaked in 1995, the prices for recovered paper increased dramatically (see Figure 5). Unlike the slow but steadily increasing domestic demand for ONP, foreign paper buyers have tended to enter the market somewhat spontaneously and present large purchase orders in short time periods, thus driving prices up rapidly. Unfortunately, they tend to cut orders just as quickly and create demand voids with parallel price declines.²⁰

From 1995 to 1997, the five largest foreign importers of ONP from the United States were Canada, Mexico, Korea, China, and Indonesia.²¹ According to the AF&PA, total ONP exports achieved a record high of 2.2 million tons in 1995. However, the level of ONP exports dropped to 1.5 million tons in 1996, due to decreased foreign purchases, increased recovery efforts abroad, increased supplies of recovered paper from Europe, and the devaluation of foreign currencies. Despite the devaluation of Asian currencies in 1997, exports rebounded to 1.9 million tons.²² China is expected to lead the growing Asian demand by increasing imports of recovered paper in the short term. Industry experts anticipate that, as Mexican and Asian economies strengthen, exports of ONP will rise to 2.4 million tons by 2002.²³ In the long term, increased investments in recycled newsprint capacity in Asia along with increased recovery efforts will eventually lead to a decrease in Asian demand for ONP exports from the United States.

- **Discontinuity between Supply and Demand:** Throughout the past five years, fluctuations in ONP prices have reflected the inability of local ONP suppliers to respond to large increases in foreign demand as well as a historical disharmony

between recycling collection efforts and domestic demand. For example, because of their reliance on long-term public education campaigns, local government collection initiatives maintain constant ONP collection efforts despite fluctuating prices and subsequent demand fluctuations.

- **Virgin Pulp Capacity:** Although the process of converting virgin pulp is more energy intensive than deinking and repulping recovered newsprint, many mills continue to rely heavily on virgin inputs due to their consistent quality, reliability, and availability.²⁴ Several factors that favor the continued reliance on virgin pulp supplies include the decentralized organization of recovered paper suppliers, the price volatility of recovered paper relative to virgin pulp, and the quality problems associated with the supply of ONP.
- **Quality of Recovered Paper Supply:** The consistently low prices for No. 8 News during the past three years have not supported source separation of ONP by local governments. Since the price decline in late 1995 and the expanding opportunities to market mixed paper, many communities in North Carolina have combined ONP with mixed paper collection in an effort to increase collection efficiencies. In addition, industry analysts indicate that the lack of consistent public education concerning material preparation has also contributed to the decline in the quality of ONP supplies.²⁵ With this trend toward non-source separated collection and reliance on material recovery facilities (MRF), mill officials have noted a decline in the overall quality of recovered paper supplies. Mill officials cited non-specification materials, such as plastic and unbleached boxboard, as major contaminants limiting the potential for using ONP in the future.

End User Demand

Recycled newsprint production has traditionally been the primary end use for recovered ONP in the United States. The AF&PA reports that more than 36 percent of ONP recovered nationally was consumed by newsprint mills in 1996. Paperboard mills consumed an additional 19 percent of the nation's recovered ONP in 1996, while 14 percent of recovered ONP was exported. Figure 6 provides a more detailed breakdown of the national uses of ONP in 1996, according to the AF&PA.

Nationally, newsprint mills are the largest and fastest-growing end users of ONP. In an effort to support the rapid growth of recycling collection programs from 1989 to 1993, many states introduced recycled content newsprint laws to stimulate the demand for ONP. Partially as a result of the increased demand from recycled content laws, almost 56 percent of the growth in the consumption of ONP has been attributed to increased newsprint consumption.²⁶ Due to the prevalence of newsprint and paperboard mills in the southeastern United States, the region maintains a strong demand for ONP. The following section reviews the demands and concerns of five major newsprint mills in the Southeast, because they constitute a majority of ONP demand in the region. These descriptions do not imply endorsement by DPPEA or DENR of any company or its products.

- In 1997, **Alabama River Newsprint Co., Perdue Hill, Alabama**, produced 245,000 tons of newsprint sheet with approximately 115,500 tons of recovered paper feedstock. Ninety-one percent of the recovered feedstock consisted of No. 8 ONP with the remaining nine percent from pre-consumer coated groundwood. In 1997, only about 2.5 percent of the recovered feedstock was obtained from North Carolina. The mill does not have any plans to expand recovered paper capacity. However, the Perdue Hill mill estimates that, on average, mills in the Southeast increase their recovered paper capacity by roughly 2.5 percent per year due to improvements in process efficiency.
- In 1997, **Augusta Newsprint Company, Augusta, Georgia**, produced 35 percent recycled content newsprint with approximately 160,000 tons of Number 8 ONP. In addition, Augusta obtained 60,000 tons of old magazines for its recycled content newsprint in 1997. Approximately 15 percent of the recovered ONP was supplied by North Carolina sources. Less than one percent of the OMG was obtained from the North Caro-

lina. Augusta plans to increase recycled content to 40 percent by 2002 given the possibility that in minimum content legislation may expand or increase in the southeast states. As a result, the mill's demand for Number 8 ONP will increase to 237,600 tons per year in 2002. Due to the steady decrease in price for ONP since 1995, Augusta has experienced an increase in contaminants arising from poor collection and material separation at the local level. During the past few years, the mill has received some shipments with contaminant percentages approaching 5 percent. Augusta recycles ONP almost exclusively from offset printing operations.²⁷

- In 1997, **Bear Island Paper Co., L.L.C., Ashland, Virginia**, produced newsprint with approximately 28 percent recovered paper feedstock. Bear Island's recovered paper composition consists of a 90 percent ONP and 10 percent OMG mix. In 1997, Bear Island obtained 12 percent of its total 92,000 tons of recovered feedstock from North Carolina. Specifically, North Carolina provided 19,700 tons of ONP and OMG in 1997. Bear Island plans to expand recovered paper capacity to 34 percent by December 1998, with plans to achieve a 40 percent recovered paper feedstock percentage in the long term. The mill uses a flotation deinking process to recycle the ONP from offset newsprint.
- **Bowater, Calhoun, Tennessee**, produces newsprint using an average feedstock ratio of 80 percent virgin and 20 percent recovered paper. The mill currently produces newsprint sheets to different states varying its range of recycled content from 80 percent virgin and 20 percent recycled to 60 percent virgin and 40 percent recycled. The mill used approximately 200,000 tons of recovered paper in 1997. In 1997, the recovered paper feedstock ratios were approximately 70 percent ONP and 30 percent old magazines (OMG). The Calhoun mill obtained between 30,000 and 50,000 tons of ONP in 1997 from North Carolina mostly through round-trip pickups after dropping off unprinted newsprint shipments in the state. Currently, there are no plans for mill expansion in Calhoun, but increased mill efficiencies are expected to increase the demand for recovered paper. The mill can recycle both offset and flexographic printed newspaper.²⁸

Figure 7: Estimated Demand for ONP

	1997	2002
North Carolina	127,382	153,651
NC and Border States	523,820	557,880
Southeast Region	1,429,800	1,515,140

Sources: North Carolina Demand numbers from Survey of seven end users
North Carolina and Border States and Southeast Region demand based on 1998 Utilization data (AF&PA)

- In 1997, **Southeast Paper Manufacturing Company & Southeast Recycling Corporation, Dublin, Georgia**, produced 530,000 tons of 100 percent recycled content newspaper. Because of their absolute dependence on recovered paper feedstocks, the Southeast Paper Manufacturing Company manages the Southeast Recycling Corporation, a paper collection and sorting center. The Southeast Recycling Corporation obtained approximately 700,000 tons of ONP in 1997. The Southeast Recycling Corporation also obtained a small percentage of old magazines and inserts in their 700,000 total tonnage. In 1997, Southeast Recycling acquired 30,000 tons, or roughly four percent of its ONP supply, from North Carolina. The Dublin plant has the ability to process both flexographic and offset ONP. While there are no immediate plans to expand the Dublin mill, they expect to increase consumption of ONP by 50,000 to 75,000 tons by efficiency improvements through 2002. Furthermore, the possibility that Southeast will acquire smaller mills in the region provides the potential for increased demand capacity for ONP during the next five years.

Other End Uses

While newsprint mills consume the largest share of the demand for ONP, paperboard mills also consumed 31 percent of recovered ONP in the Southeast region in 1996. However, paperboard mills are not ideal candidates for increases in demand because they represent a relatively low-end use for recovered newspaper utilization. More specifically, because mills can substitute low quality mixed paper grades for ONP based on price differences, there appears to be a limited potential for realizing sustainable increases in ONP demand through recycled paperboard production. In addition, the potential for increased demand for recovered ONP from tissue and containerboard end users is limited by the shortness of fibers resulting from the repulping of ONP.

Two other end uses are cellulose insulation and animal bedding. Cellulose insulation is an emerging market with significant potential for future growth.²⁹ In contrast, animal bedding has been repeatedly mentioned during the past ten years as a potential market for reuse of ONP; nevertheless, end users have been reluctant to purchase and transport ONP from recovery locations to rural markets. As a result, unless prices drop further or transportation costs are subsidized, the potential for increased demand through animal bedding will be limited by the price of ONP and the proximity of the appropriate farms.

Figure 7 estimates the demand for ONP in North Carolina and its border states and the southeast region.

SUPPLY / DEMAND RELATIONSHIP

Nationally, the market for ONP can be best described as having a fairly stable demand structure with steady supply sources. Despite the strong and steady demand for ONP in the southeast, regional prices have varied significantly during the past five years due to large fluctuations in foreign demand. The lack of flexibility innate to local curbside collection efforts has resulted in a fairly stable supply of ONP despite the price fluctuations. As a result, despite the variations in the market prices, the total quantity of ONP recovered in North Carolina has increased steadily during the past five years.

In response to the consistently low prices for ONP in the region during the past three years, many local collection efforts have shifted toward commingled collection and processing of ONP in combination with residential mixed paper (RMP). Combined with a decrease in the quality of source separated ONP, the shift toward commingled collection provides an indication that supply exceeds demand for ONP in the southeast.

It can be assumed that all recovered ONP was utilized for newsprint, other paper products, cellulose insulation, or animal bedding. Actual demand for all four grades of ONP

Figure 8: Estimated ONP Supply and Demand for North Carolina

	1997	2002
Supply of ONP (Recovered in NC)	159,594	169,611
Demand for NC's ONP (Reported)	127,382	153,651

Sources: Supply numbers reflect recovery as reported by the North Carolina State Annual Report for 1997. Demand numbers from survey of five end users in North Carolina and its Border States.

Figure 9: Estimated ONP Supply and Demand in the Southeast Region

	1997	2002
Supply	1,459,155	1,543,410
Demand	1,216,772	1,430,544

Sources: Supply numbers reflect the recovery of ONP based on EPA estimates. Demand numbers from survey of five end users in North Carolina and its Border States.

is therefore roughly equivalent to supply. Figures 8 and 9, however, represent the demand from the five largest newsprint mills in the Southeast for ONP recovered from North Carolina and the Southeast region. The demand estimates reflect the general trend of increased ONP demand from newsprint mills in 1997 and 2002. These tables do not account for all the end users in the region and are not intended to provide comprehensive ONP demand estimates; it is likely that the demand provided in the tables underestimates total demand in 1997 and 2002.

Regionally, the needs of newspaper publishers and the recycled content capacity of mills directly affect the demand for ONP. While North Carolina, Kentucky, Florida, and Virginia have provided leadership in the establishment of recycled content laws in the Southeast, other states have not adopted minimum recycled content initiatives. Currently, South Carolina, Georgia, Tennessee, Alabama, and Mississippi lack state guidelines for recycled content newsprint. Several of the largest mills in the southeast have indicated the capacity to produce at least 40 percent recycled content newsprint sheet thus providing the technical capacity to increase recycled content consumption. In contrast, some states in the northeast and upper mid-west have experienced difficulty attaining sufficient recycled content due to low levels of recycled fiber from Canadian newsprint shipments. Finally, with no apparent increases in the future consumption of ONP, the demand for ONP can be further developed in the southeast through higher percentages for recycled content newsprint. Missouri has already provided such leadership by increasing its target level to 50 percent recycled content newsprint by the year 2000.³⁰

CONCLUSION

ONP represents one of the largest single sources of materials discarded in the waste stream. As such, ONP should remain one of the top priorities for reaching the state's 40 percent waste reduction goal. Given the mill capacity to increase recycled content levels and continuous improvements in production efficiency, it appears that the domestic demand for ONP should continue to grow at a slow but steady pace in the near future. In addition, while the state has little influence on foreign markets, industry experts expect the foreign economies to rebound in 1998 along with their demand for recovered paper.

RECOMMENDATIONS

The following recommendations are intended to improve the ONP recycling market through demand development and improved effectiveness of recovery efforts in North Carolina.

- As a result of the technical improvements in recycled newsprint production at mills in the Southeast region, it is recommended that the state of North Carolina reconsider its current recycled content goals. North Carolina should play a leadership role in the region by reviewing the current mandates in order to account for possible improvements in mill capacity. The telephone survey conducted for this report revealed the two largest newsprint mills in the southeast currently have the capability to produce 40-percent recycled content sheets. Two of the remaining three mills in the region stated their intention to reach a 40-percent

recycled content capacity in the near future. As a result, the state should consider working with publishers and newsprint manufacturers to establish additional recycled content targets beyond the year 2000. The state should also review exceptions granted under the current 35 percent regulations.

- In the absence of price stabilizing mechanisms such as futures markets, the state should address the discontinuity between supply and demand by encouraging contact between end users and local government suppliers. More specifically, the state could facilitate efforts to have recycled newsprint mills present their needs to local governments in North Carolina. The state should organize efforts to investigate the potential for voluntary partnerships and/or long-term contracts between end users and local governments. Because of labor and operating cost reductions, many mills have expressed a preference to receive ONP directly from municipalities rather than through processing plants.³¹

Closer ties between ONP suppliers and mills would also lead to more timely and efficient shipments of ONP. For example, during summer periods of peak energy costs, recovered paper suppliers could help offset the high energy costs associated with virgin paper processing by increasing their ONP shipments. In addition, end users may be more willing to provide higher prices and longer term contracts for higher quality, timely shipments from local collection programs. Finally, mills could use this opportunity to educate local governments about their quality standards.

- Efforts should also be made to further inform local government collectors about the dynamics of pa-

per markets. Increased awareness of previously successful marketing strategies could be one method of improving local government efficiency with regard to market sales and contracts. For instance, Duplin County's storage of mixed paper during periods of lower market prices is one example of how a collector's awareness of market dynamics can positively affect the sustainability of a local recovery program.

- Contaminants in ONP supplies impose additional costs on the use of ONP relative to virgin fiber sources. Improvements to the quality and consistency of ONP supplies could enable local governments to net higher prices and possibly encourage increased utilization of ONP. One method of improving the quality and quantity of ONP recovered would be for local governments to shift toward pay-as-you-throw waste collection system coupled with public education.

In conjunction with improved local government efforts, partnerships between end users and local governments should also be encouraged as a means to reducing ONP contaminants. Such partnerships would encourage end users to assume a more active role in setting quality standards for their ONP supplies in exchange for sharing some of the financial responsibility for public education campaigns.

- Finally, based on the decreased distance between urban and rural areas of some parts of the state, it appears that the potential for reusing old newspaper as animal bedding will increase in the future. As a result, it is recommended that additional support be provided to experimental programs documenting the effectiveness and efficiency of using ONP as a bedding substitute.

¹ Sound Resource Management Group, Inc. *The Economics of Recycling and Recycled Materials*, prepared for the Clean Washington Center. December 1993. p. 102

² There are four grades of ONP that have been traditionally recovered and utilized as feedstocks for newsprint or other paper and paperboard production at mills. The four grades of ONP are No. 6 News (containing up to 5% contaminants), No. 7 News (containing ONP and magazines), No. 8 News (containing only one-fourth of 1% contaminants) and No. 9 News (consisting of pre-consumer over-issued newspaper).

³ Institute of Scrap Recycling Industries, Inc. *Scrap Specifications Circular 1998*. p. 34-35

⁴ U.S. EPA., *Characterization of Municipal Solid Waste in the United States – 1997 Update*. May 1998.p.29

⁵ AF&PA, *Paper, Paperboard, & Wood Pulp, A Monthly Statistical Summary from the AF&PA*. January 1998.

⁶ AF&PA, *1998 Annual Statistical Summary Recovered Paper Utilization, Twelfth Edition*. June 1998 p.15

For purposes of this report, The Southeast Region is defined as North Carolina, South Carolina, Virginia, West Virginia, Tennessee, Kentucky, Tennessee, Florida, Alabama, and Mississippi.

⁷ U.S. EPA., *Characterization of Municipal Solid Waste in the United States –1994, 1995, 1996, 1997 Updates*.

⁸ American Forest and Paper Association, *Paper, Paperboard, & Wood Pulp, A Monthly Statistical Summary from the AF&PA*. January 1998.

⁹ U.S. EPA., *Characterization of Municipal Solid Waste in the United States – 1997 Update*. May 1998. p. 29

¹⁰ Ibid. p. 29.

¹¹ Personal Communication. Steven Fowler, American Forest and Paper Association. May 18, 1998.

¹² Ridgley, Heidi "ONP Market Could Be Affected By Falling Newsprint Production Rates," *Recycling Times*. Vol. 9. July 21, 1997. p. 1, 13. & Iannazzi, Fred and Clarke, Rosemary, "Recovered Paper Target Level of 50% Seen Unreachable by 2000", Andover International Associates, May 1998, p. 3

¹³ North Carolina State Planning Office Population Projections for 2002 (Source: <http://www.ospl.state.nc.us/demog/#a>)

¹⁴ North Carolina's border states consist of South Carolina, Virginia, Tennessee, and Georgia, and the southeast region includes North Carolina, South Carolina, Georgia, Virginia, West Virginia, Tennessee, Kentucky, Alabama, Florida, and Mississippi.

¹⁵ Miller Freeman, Inc., "Wastepaper markets to strengthen in 1998 despite persistent lull in offshore exports." *Paper Recycler*. Vol. 9 No. 1. January 1998.

¹⁶ Miller Freeman, Inc. "Paper Grades: Newsprint," *Pulp & Paper 1998 North American Factbook*. p.184.

¹⁷ Post-consumer recycled content includes only ONP that has entered the consumer waste stream after leaving the newsprint publishing facility.

¹⁸ Ibid. p. 184-185

¹⁹ Personal conversations with mill purchase agents for recovered paper.

²⁰ Mary Cesar. "Asian currency crisis affects U.S. recovered paper markets." *Resource Recycling*. June 1998. p. 30.

²¹ AF&PA. *1998 Annual Statistical Summary Recovered Paper Utilization*. Twelfth Edition. June 1998. p. 50 and 56.

²² Ibid. p. 50.

²³ Miller Freeman, Inc. "Wastepaper markets to strengthen in 1998 despite persistent lull in offshore exports." *Paper Recycler*. January 1998. Vol. 9, No.1. p.1-8.

²⁴ The majority of virgin material newsprint is produced through mechanical pulping processes. Newsprint is produced by shredding softwood or hardwood logs and chips using either water and stone grinders (groundwood pulping) or steam and refiner technology (thermomechanical pulping). Based on the EDF's *Recommendations for Purchasing and Using Environmentally Preferable Paper: Final Report*. 1995. p. 173-174.

²⁵ Communication with Bill Moore, Moore and Associates, September 1998

²⁶ Michael Alexander, "ONP and ONG Market Outlook to 2000", *Wastepaper IV* Conference Proceedings, Chicago, Il. May 1995

²⁷ Offset printing is the more traditional form of newspaper printing in which ink is transferred (off-set) to the newspaper from a rubber cylinder and lithographic plate. Offset printing normally uses oil-based inks and paper which is relatively impervious to water. Flotation deinking facilities are required to recycle offset printed newsprint. (Based on *Recommendations for Purchasing and Using Environmentally Preferable Paper: Final Report*, EDF, 1995 p.238).

²⁸ Flexographic printing is a relatively recent technology whereby the ink is transferred directly to the paper through flexible rubber or plastic plates. (Source: Flexoexchange website, <http://www.flexoexchange.com/glossary.html#F>). Flexographic printing uses water-based inks and has become increasingly popular because it results in decreases in number of breaks at the start up of the printing machine and lower investment costs. (Based on "De-inking of wastepaper containing water-based flexo-printed newsprint" by G. Galland and Y. Vernac, *Pulp and Paper Canada*, Vol.94:6. 1993. p. 181.

²⁹ Communication with Bill Moore, Moore and Associates. September 1998.

³⁰ State Recycling Laws Update. "California Leads Mandatory Newsprint Program States." Vol.7, No.4. April 1998.

³¹ Edwards, Rodney. "Future Trends in the Secondary Fiber Industry." *Recycled Paper Technology*. 1994. p. 12-18.