SW 2151

Bulky Materials Handling

FIBER REUSE

WOOD DIVERSION STRATEGIES

MORE than eight million tons of wood packaging residuals are generated annually nationwide, according to the U.S. Environmental Protection Agency. Additionally, significant tonnages of tree limbs, stumps and woody construction and demolition debris are discarded and/or recycled.

A growing number of solid waste managers, trying to meet diversion goals, have been implementing and/or expanding wood recovery programs throughout the 1990s. Markets for recycled wood include lumber reuse, mulch, fibers for manufacturing, animal bedding and biomass. The following case studies show how wood fits into public and privately owned recycling operations.

The Marine Corps Air Station at Cherry Point, North Carolina opened a construction and demolition debris landfill in 1982. The largest quantity of materials going into that facility consists of scrap wood, pallets and shipping containers. To minimize what was being landfilled, the station began diverting wood and stockpiling it, according to Dave Cooke, pollution prevention manager with the Environmental Affairs Department.

In 1993, the base started allowing people to haul wood away for $5/pickup truck load. Most is used for home heating fuel, but some goes back into construction. "We had one guy that built his house from Cherry Point wood," says Cooke. "There's some fine lumber out there, and that is one of the things that I thought of when I initiated this diversion program." Most of the wood continued to pile up, however, and the station used a bulldozer to compact it. In 1994, a contractor was hired to shred the material with a tub grinder. "Because of the compaction, he misjudged the size of the pile," says Cooke. "A job that was supposed to take him four days took a month."

Since then, mulch is given away for use on the base, and sold to those who wish to haul it themselves. It has been utilized around homes, administrative offices, nature trails, and running paths. Most has been used to replace sand on the explosive ordinance range. More than 3,000 tons have been diverted from the landfill annually, yielding a savings of nearly $250,000 in avoided disposal costs over two years, says Cooke. Fees for firewood and mulch have generated $5,345 in income. With a better idea of the task at hand, the grinding contractor is scheduled to come back in the summer of 1996. An effort has been made to reduce contamination in the wood scrap pile, which should simplify shredding and produce a better product. "We had some people hiding metal scrap in a wooden crate," says Cooke. "We've gotten better at policing the operation."

Wood from construction projects is shredded into mulch at the Marine Corps Air Station at Cherry Point, North Carolina.

Government agencies and private companies have found alternatives to stockpiling or landfilling wood waste.

Robert Steuteville

CARROLL COUNTY, IOWA

The Carroll County (Iowa) Solid Waste Management Commission runs an extensive recycling program to meet the state's 25 percent waste reduction goal, including curbside collection service in 52 communities and yard trimmings composting. After a "controlled" wood fire got out of hand on a windy day and nearly burned the materials recovery facility (MRF), the county decided to begin recycling wood. For three years, the county contracted with private grinders to process its material — but this proved too unreliable, according to Jim Ulveling, director of the Carroll County commission. "That's why we asked for the grant from the Iowa Department of Natural Resources (DNR) for the equipment to do our own grinding."

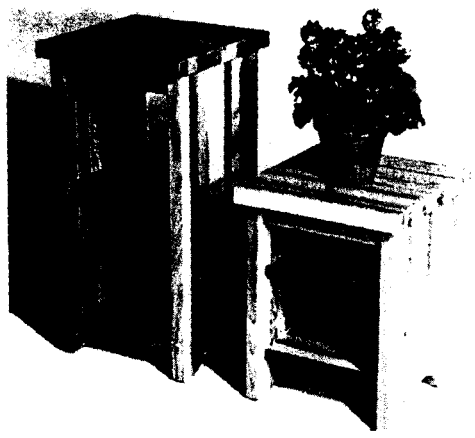
The state provided $83,700, which funded most of the $100,000 grinder. The commission put up the remainder and purchased a front-end loader and truck. The wood residuals recycling operation is located adjacent to the MRF on a 7,200 sq.ft. concrete pad. The commission charges $20/ton for clean, separated loads of wood (as opposed to a $34.75 tipping fee at the landfill down the road).

In the first 10 months of 1995, 200 tons of wood residuals were diverted. "We're not doing the tonnage we anticipated," Ulveling adds, "but it is growing. We had a setback because we were taking too much material

RECLAIMING WOOD FOR MAXIMUM VALUE

WOOD recycling programs, by and large, focus on grinding as the primary means of recovering fiber. Big City Forest, a for profit spinoff of the nonprofit Bronx 2000 in New York City, focuses on reuse of lumber for furniture, fixtures, flooring and refurbished pallets. A grinder is utilized only for wood that cannot be recovered through reuse.

The enterprise had its origins six years ago, when Bronx 2000 accumulated a stockpile of pallets used in its multimaterial buyback center. The group explored the idea of exporting the lumber overseas to wood deficient countries, like the Sudan. "The reaction we got was 'send us virgin lumber, not New York City garbage,'" says Resa Dimino of Big City Forest. "We said, 'we don't think it's garbage, but if we have to prove it, we'll prove it.'"



Butcher block style tables are manufactured by Big City Forest out of used pallets.

Big City Forest began as an incubator project in 1991 with the help of equipment grants and foundation funding for job training. In 1994, the pallet dismantling and remanufacturing portion of the project was spun off by Bronx 2000. Recently, the furniture and flooring manufacturing was rolled into the for profit business as well. Big City Forest is not operating in the black yet, but the future looks bright, Dimino says. "The jury is still out on when we will be profitable, but the furniture and flooring will change the financial structure dramatically, because it is the high end part of the business."

In December, Big City Forest's 20 employees were building butcher block counters for Ben & Jerry's ice cream shops, a table for a resort lodge in Maine, furniture to be sold at two environmental stores in New York, and flooring for affordable housing rehabilitation projects. Dimino sees significant local benefits for the affordable housing work. "It uses public money to create jobs and reduce waste in the city, as opposed to supporting the cutting of virgin forests," she says.

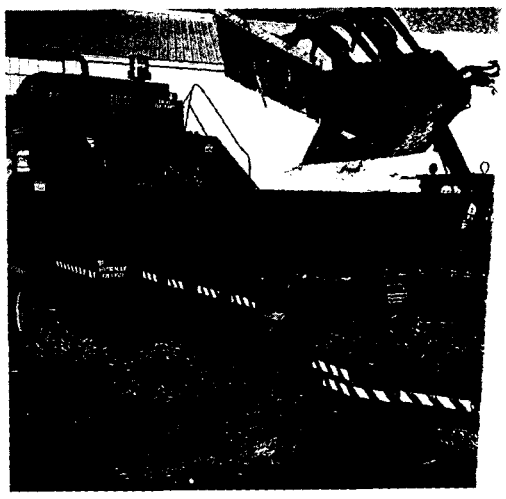
Big City Forest recycled 3,600 tons of used pallets in the 12 month period ending September, 1995. Currently, about 75 percent of the recovered lumber is used in refurbished pallets and 25 percent in furniture and flooring. "We're shifting that ratio as much as possible to furniture and flooring, because that's where the biggest job creation potential is," Dimino explains. Wood not suitable for pallets and furniture/flooring is ground up for sale to a medium density fiberboard manufacturer. Any remaining fibers are burned to heat the building. "We're a no waste operation," she says. "If you look in the dumpster, all you basically see is lunch waste."

There has been a lot of interest in replicating Big City Forest's operation elsewhere. If U.S. Environmental Protection Agency funding is approved, two more enterprises may be created elsewhere in New York State. "We've also been contacted by a number of people across the country interested in replicating what we are doing," Dimino says. "We are in the process of figuring out what someone would have to bring to the table to license such an operation."

with too many contaminants. At first, we accepted all wood waste, which included everything from furniture and pool table corners to wood with iron bolts and braces and painted lumber. So, we had to become more selective to protect the machine and produce a good end product."

Two kinds of mulch are produced from feedstocks separated into two piles. Tree residuals, which must be no bigger than eight inches in diameter and 10 feet long, are put in one pile; pallets and dimensional lumber go in another. The shredded trees, with bits of leaves, branches and bark, produce more of a "compostable mix," Ulveling notes. This mulch breaks down somewhat during storage, although it is not turned. The lumber based mulch is more stable.

No screening is needed, he adds. Both products sell for $20/ton, bulk. "During the tree planting time of year we can't make it fast enough," says Ulveling. In addition to landscapers, the commission has found a new market in cattle feeders. "They like to put the mulch in the feed lots," he explains. "It dries them up and provides a good base for the cattle." The county would like to process more wood and increase utilization of the grinder. Currently, it only operates about one day every two weeks. A neighboring county also borrows the equipment fro time to time.



A pallet is released into a grinder at the wood recycling facility in Carroll County, Iowa.

CATAWBA COUNTY, NORTH CAROLINA

Catawba County is the center of the fu niture industry in North Carolina. Un about five years ago, 500 to 600 tons/mon of scrap wood were going directly into t landfill. At that point, the county start recycling the wood into mulch. "Duri

the first year, we couldn't find customers, so we had to give it away," says Dick Wyatt, county engineer. "But the program has grown in popularity." Now, the county charges $4/cubic yard. About half is sold to individuals, and the other half to professional landscapers. Some garden centers resell the mulch.

To promote recycling, the county does not charge a tipping fee for clean, separated wood. That compares to a $12.50/ton fee at the construction and demolition debris landfill (the municipal solid waste landfill charges $30/ton). Processing is kept simple, with a grinder and no screening. The program pays for itself in reduced disposal, says Wyatt. "It costs more to process than we can get from sale of material, but the program has been very successful in terms of saving landfill space."

Since the county's wood program began, a private processor has emerged, offering an even better alternative from Wyatt's point of view. Conwed, of Conover, North Carolina, processes wood scrap into fibers used for seeding highways. "I have been referring some of the generators to that company," says Wyatt. "They grind it and use it. I never see the stuff."

OSKALOOSA, IOWA

B&B Bedding of Oskaloosa, Iowa, receives about 50,000 tons/year of wood waste from kitchen cabinet and window manufacturers, used pallet processors and other sources. That material is processed and/or sold directly as animal bedding and biomass. The company receives an additional 25,000 to 30,000 tons/year of sawmill residuals, which are transformed into mulch and shipped to garden centers in the region, according to Cornie Brouwer, president of B&B Bedding.

The company continues to expand due to growing markets and entrepreneurial initiative. "We might get someone who will offer us 100 percent of their material, and we have to take it all even though we may only have a market for 40 percent," Brouwer says. "So we have to go out and find new markets. In the course of getting aggressive with marketing, we might find two new customers and then have a shortage. So it's a never ending cycle." Operating for 12 years, the firm received a $92,000 grant in 1994 from the Iowa DNR to expand its processing and bagging operations.

B&B Bedding is located 60 miles from Des Moines and 120 miles from the Quad Cities (Davenport and Bettendorf, Iowa, and Rock Island and Moline, Illinois), significant markets for mulch. Wood residuals are sourced from as far as 800 miles away, Brouwer says. The company, with 22 employees, hauls all its own materials with a system of 56 trailers and 10 trucks. Trailers are left at generators' sites, and hauled away when full. The same trucks bring finished product to customers.

Although B&B owns three grinders, it also purchases grinders for large generators. "We finance the equipment, and they pay us back in material," says Brouwer. The product is shipped directly from the generators to B&B's customers, reducing hauling expenses. The company didn't always do its own hauling, but Brouwer found it beneficial to have control of all aspects of the business. "The drivers and the equipment are mine," he says. "I know the trucks will be where I want them to be, and nobody is telling me what I can or can't do with the equipment."

Additional sources of feedstock for B&B are three used pallet processors. Some of this material is shipped directly to market, and some is taken back to B&B Bedding for further processing, depending on the needs of clients. "Every customer is different in terms of the criteria of the product they prefer," Brouwer explains. "We are constantly matching the waste product with what the customer wants — it's a puzzle we put together." ■