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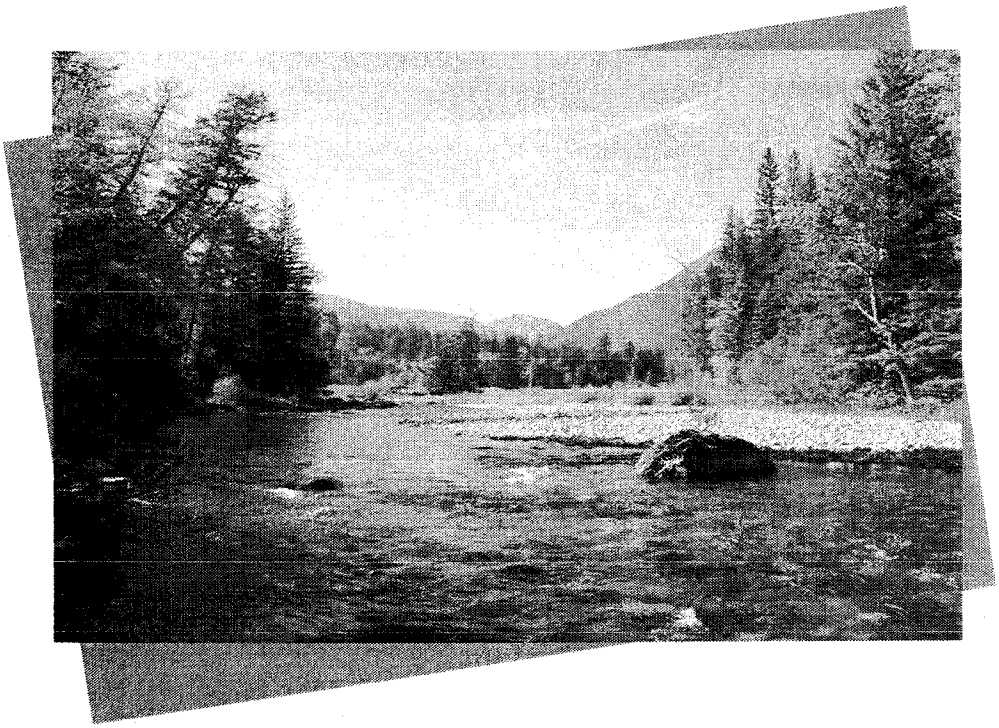
The Economic *and* Ecological Impacts *of* Recycling in Montana



July 2004

Montana Department of Environmental Quality

Air, Energy, and Pollution Prevention Bureau
Business & Community Assistance Program
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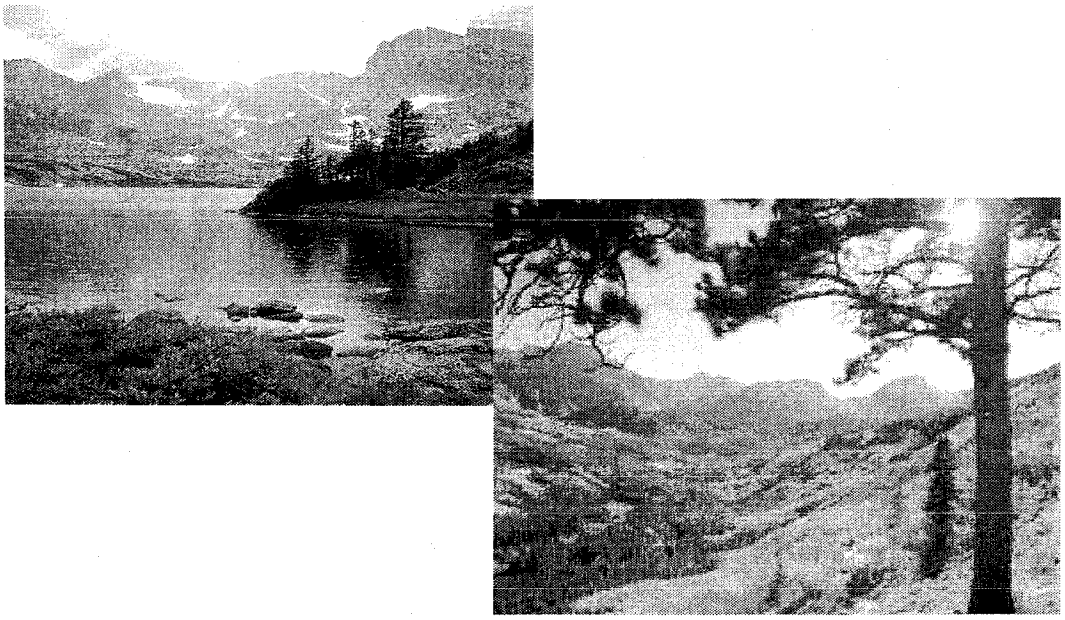
The Economic *and* Ecological Impacts *of* Recycling in Montana

Throughout the United States, recycling has resulted in economic growth, income growth, net job increases, long-term investment, energy savings, waste reduction, lower production costs for many industries, and an extension of the life of landfills. According to the California Environmental Protection Agency, waste *diversion* of any type, including recycling, tends to create twice the economic activity per ton of conventional waste *disposal*[1]. Recycling also reduces pollution and conserves natural resources, which leads to cleaner air and water, and it increases open space and reduces greenhouse gases. This paper will look at the impact of recycling on Montana's economy.



[1] Found in the pamphlet, *Is Recycling good for California's Economy?*.

The Impact of Recycling on the U.S. and Other States

Before discussing the impact of recycling on Montana's economy, it is informative to look at the impact of recycling on other states and on the U.S. as a whole. The National Recycling Coalition recently conducted a comprehensive national survey of the impact of recycling on the U.S. economy. This survey was titled *U.S. Recycling Economic Information Study* (REI Study) and was conducted by R.W. Beck Inc. for the National Recycling Coalition Inc. (July 2001). According to the study, there are three main types of businesses in the U.S. recycling sector. These are collection, processing, and manufacturing/sales. There is also a fourth type of business sometimes mentioned which is the reuse and remanufacturing of goods. According to the *U.S. Recycling Economic Information Study-Executive Summary*, "The Recycling sector includes long-established sectors like paper and steel making, as well as new entrepreneurial ventures such as composting and plastic and rubber product manufacturers" (page ES-4). Examples of specific establishments in the U.S. recycling sector include government and private curbside collection programs, compost and miscellaneous organics products producers, materials recovery facilities, and recyclable material wholesalers.

In the U.S., using 1997 Census data, the Recycling and Reuse Industry as defined by Census NAICS codes employed just over 1 million people at 56,000 establishments generating an annual payroll of approximately $37 billion and grossing over $236 billion annually in revenues including direct and indirect economic impacts (*U.S. Recycling Economic Information Study)*. The average annual wage in that industry was about $32,700 nationwide in 1997, which was about $3,000 per year more than the national average wage at that time. The Recycling and Reuse Industry in the U.S. produced over $200 billion in total wages and sales, which was comparable to both the Machinery Manufacturing and Mining industries.

The average annual wage in the Recycling and Reuse Industry was about $32,700 nationwide in 1997, which was about $3,000 per year more than the national average wage at that time.

Two studies done in California found that reuse and recycling activities actually create more total sales, income and jobs in California than solid waste disposal activities. These two studies are a University of California, Berkeley study entitled *The Economic Impact of Waste Disposal and Diversion in California (UCB study)* and a R.W. Beck Inc. and the National Recycling Coalition study entitled *The California Recycling Economic Information (REI) Study*. The UCB study estimated total economic output from recycling in California in 1999 of about $10 billion in revenues, $4 billion in income created, $5 billion in value-added impact, and 85,000 jobs. About $100 million in annual sales tax revenue was created from recycling in California.

Ohio is a U.S leader in recycling, due in part to the large amount of material-intensive industry found there. In Ohio, the total economic impact of the recycling industry (both direct and indirect impacts) in 2001 was approximately 169,000 jobs, $6 billion in annual wages and $30 billion in annual sales. The recycling industry supported directly or indirectly 4.3 percent of the jobs and 3.7 percent of gross state product in Ohio in 2001. The average annual wage paid by

The Impact of Recycling on the U.S. and Other States - *continued from page 3*

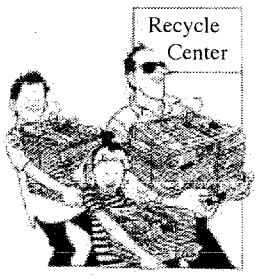
Ohio's recycling industry was $36,000 or $8,000 more than the state average in 2001. On an annual basis, Ohio's recycling industry contributes about $650 million in tax revenue to state and local government. Ohio boasts a very large aluminum recycling program and in-state manufacturers use the bulk of that material. It is estimated that Ohio saves about 1.6 billion tons of greenhouse gases annually from paper recycling alone. The Ohio recycling industry annually processes 30 million tons of materials including 16 million tons imported into Ohio for processing and manufacturing into new products. (*Recycling Means Business*, pamphlet issued by the Ohio Department of Natural Resources).

The Economic Impacts of Recycling in Montana

Like other states, Montana's recycling sector is diverse and significant. The types of companies in Montana that are involved in recycling are:

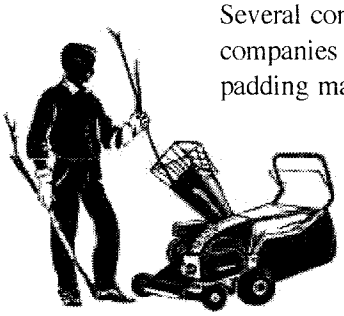
- City/County transfer stations
- Recycling haulers and collectors
- Retailers of recycled materials and products made of recycled materials
- Manufacturers of recycled materials
- Recycling processors
- Producers and sellers of organic compost

There are a significant number of recycling collection centers in Montana, and often more than one in the larger towns. Headwaters Recycling Co-op operates the largest number of collection centers in the state. The Headwaters Recycling Co-op is an interlocking government agreement between 13 counties. Their centers are located mostly in central, southern and southwestern Montana. Pacific Steel and Recycling also operates several large recycling facilities in the state. Materials recycled at the various collection centers throughout Montana include newspaper, office paper, magazines, aluminum cans, steel cans, metals, glass, plastic, motor oil, clothing and cardboard. Not every center recycles all of these materials (Recycle Montana website, http://recyclemontana.org/where.htm)



Establishments that currently sell recycled and re-used goods in Montana are diverse. Montana companies sell clothing made from recovered cotton, used car parts restored from previous vehicles, insulation made out of post-consumer products, re-tread truck tires, and reused building materials from flooring to roofing. Three Montana companies sell Plum Creek Lumber Company's medium density fiberboard made from the sawdust and shavings produced in lumber and plywood operations. Also, the Montana Chamber of Commerce and Montana State University Extension Service sponsor the Montana Material Exchange, which helps businesses find buyers for surplus materials and helps individuals or businesses locate these materials.

The Economic Impacts of Recycling in Montana - *continued from page 4*



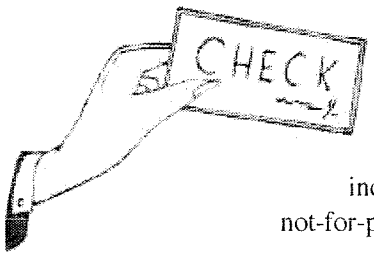
Several companies in Montana sell compost, which is made from yard and wood wastes. Other companies in Montana offer flooring tiles made from 100 percent recycled material, carpet and padding made from recycled materials, salvaged wood flooring, recycled paper at food stores, and cardboard with recycled content. Numerous companies sell plastic lumber and plastic/wood composite lumber. Other Montana companies sell toner cartridges that can be remanufactured after use, recycled office supplies, duffel bags, CD cases, binders, photo albums, toothbrushes, and trash bags. (*2003-2004 Montana Guide for Buying Recycled Products*, Montana Department of Environmental Quality).

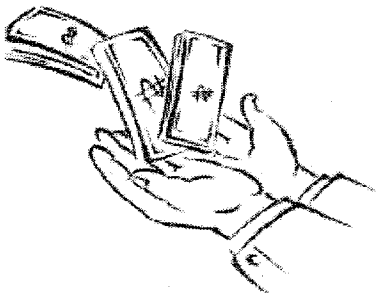
The state government of Montana purchases and uses recycled products. All of state government letterhead paper contains 25% post-consumer content. About 89% of Montana state government agencies use copy paper with some recycled content. About 1/3 of the envelopes used by state agencies contain 30% post-consumer content. All coarse paper products sold through the Department of Administration Central Stores contain from 10 to 40 percent post-consumer content. The Montana Department of Transportation purchased 1.5 million pounds of reflective beads for pavement striping in Fiscal Year 1999 which were manufactured from plate glass cuttings. Remanufactured toner cartridges and trash bags with 50% post-consumer content material were also sold by the Montana Department of Administration to state agencies.

The state program "3R's in State Government" (which involves state agencies) recycled 2,080 tons of paper from 1996-2003. More than half of that, over 1,300 tons, was office paper. Other types of paper recycled by state government include newspaper, cardboard and computer paper. In 2003 alone, 3R's recycled about 340 tons of paper. (*2003 Montana Department of Administration Recycling Report).*

Overall Economic Numbers

The Recycling Industry in Montana is significant. In 2003, the industry paid over nine million dollars in wages and benefits to approximately 300 full-time and 40 part-time employees. Total gross revenues for the industry in 2003 were almost 90 million dollars and the average wage per full-time job (including benefits) was about $29,000 a year, which is several thousand dollars greater than the average wage in Montana (about $25,800 in 2002 according to the U.S. Bureau of Economic Analysis). These totals include recycling activity at all levels including processing, collection, remanufacturing, and sales. The totals include the private sector, public sector and not-for-profit entities.





The largest component of recycling in Montana is the for-profit private sector, which is the traditional backbone

Overall Economic Numbers - *continued from page 5*

for recycling in Montana. Manufacturing was the largest recycling activity in Montana and the processing of recycled materials was the second largest activity. The total economic numbers below were largely concentrated within several individual businesses. The approximate numbers for 2003 are as follows:[2]

Full Time Jobs:	300
Part Time Jobs:	40
Wages (+ benefits)*:	$ 9,330,000
Revenues:	$89,120,000

* Assuming benefits to be $.15 per $1.00 wage for survey respondents who did not give benefit amounts.

The average wage (including benefits) in Montana's recycling industry was calculated to be about $29,000 (9,332,580/321.5 = $29,028). Total avoided landfill costs in 2002 as a result of recycling were estimated to be $4,615,776—128,216 tons recycled which avoided landfill at a fee of $36.00 per ton. (*Brian Spangler, Montana Department of Environmental Quality*). There are also indirect positive economic effects from recycling and tax revenues collected from the recycling industry in Montana. Estimating these numbers is beyond the scope of this paper.

Environmental Impacts of Recycling in Montana

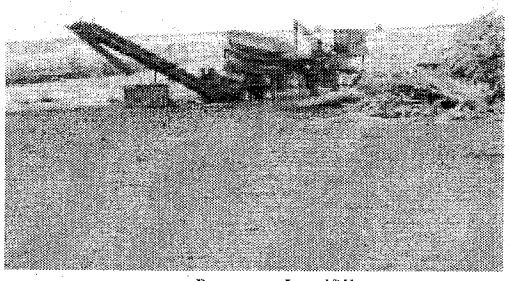
The amount of total waste generated in Montana in 2002 was 1,194,243 tons. The amount of waste landfilled was 1,004,635 tons or about 84% of total waste and the amount incinerated was 13,037 tons or about 1% of total waste. The total amount of waste that was recycled was 128,216 tons or 11% of the total generated. Four percent or 48,355 tons were composted. So, about 15% of Montana's total waste was either recycled or composted. The 128,216 tons recycled was reported from 12 different companies/public facilities in Montana with Pacific Steel being the largest recycler overall. Eight companies comprised the 48,355 tons of composted material (Montana Department of Environmental Quality, Air, Energy, and Pollution Prevention Bureau).

In 2002, numbers were estimated for total tonnage of recycled materials in Montana. The tonnage numbers were collected from landfills and transfer reports submitted to the Solid Waste Department at DEQ. These numbers were obtained from landfills, transfer facilities and

[2] These results were produced by a survey conducted by the Air, Energy and Pollution Prevention Bureau of the Montana Department of Environmental Quality in the Spring of 2004. Matt Elsaesser was the principle investigator of the survey. The results do not include the small number of contacts that did not respond to the survey, nor the activity of sole proprietors who are not listed or advertised as a public business or recycling operation. Emerging companies and recycling components of large institutions are for the most part not included in this survey. Recycling activity for this project included the collection, transport, processing, remanufacturing and sale of post consumer products. It includes composting as recycling activity, but does not include wrecking yards. The list of participants to meet these criteria was constructed using the State Database, Recycle Montana Recycling Guide, a D.E.Q. mailing list, telephone directories and staff knowledge. The survey was conducted primarily by phone, with letters sent for some respondents by their request.

Environmental Impacts of Recycling in Montana - *continued from page 6*

recyclers through an annual survey. Montana DEQ went through the reports to gather and summarize the information. Individual names and towns are not reported due to confidentiality concerns.



Bozeman Landfill

In 2002, there was a total of 128,216 tons of total recycled material in Montana. The estimated numbers for the tonnage recycled of specific major materials are:

Cardboard -	77,642
Paper-	27,167
Aluminum-	21,977
Steel-	1,428
Plastic	172
Total	128,216

The recycling of each of these materials results in not only economic benefits but also in ecological benefits for Montana. Using the National Recycling Coalition (NRC) Calculator, the Net Greenhouse Gas Emissions from Recycling in Montana compared to disposal is 178,722 Metric Tons Carbon Equivalent (MTCE/year) lower, which is equal to taking approximately 136,523 cars off the road per year. The net energy from recycling compared to disposal is estimated at 7,082,247 million BTU, which is equivalent to what is used by just over 70,000 households per year. An estimated reduction of 159,656 tons of air emissions results from Montana recycling, including a 149,599 ton reduction in carbon dioxide. About 592 tons of waterborne wastes are avoided as well. About 2,870 total tons of natural resources are saved annually.

Un-quantified Benefits from Recycling

As demonstrated above, the economical, environmental and social benefits of reducing pollution from recycling are diverse and significant for Montana. Although we cannot quantify some of these benefits monetarily in this study, we can certainly list them. For example, reducing air pollution from recycling leads to the following benefits in Montana:

- Health benefits (reduced human morbidity and mortality)
- Recreation benefits (especially to Class I areas like Glacier National Park)
- Increased visibility
- Lower levels of materials damage such as office buildings
- Agricultural benefits
- Ecosystem benefits (local and worldwide) including lower levels of greenhouse gas emitted and healthier forests