

# BIOCYCLE

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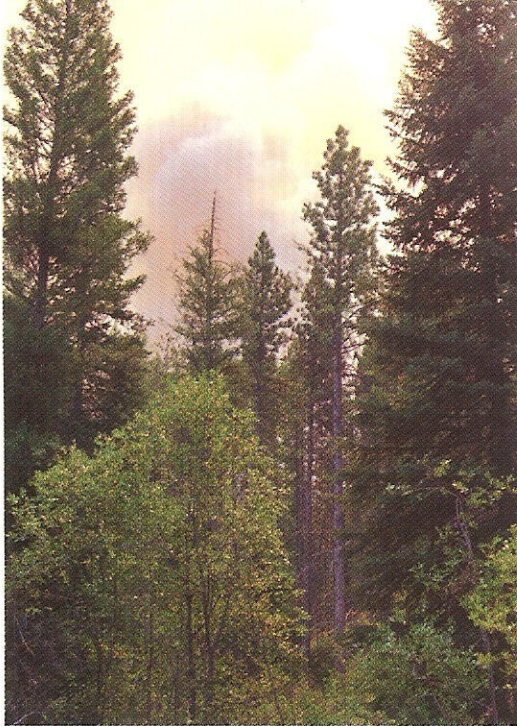
## COMPOSTING AND FOREST FIRE MANAGEMENT

National survey identifies composters who can process forest fire residuals as well as brush and limbs cleared to create defensible spaces.

**Composting  
Replaces Rendering  
For Carcasses**

**Cart-Based  
Collection Boosts  
Recycling Rates**

**States Take Steps  
To Restrict  
Clopyralid Use**



As part of a strategy to protect forests, officials are planning to remove fuel sources from fire-prone sites.

**T**HE U.S. Department of Agriculture Forest Service (USDA-FS) and the United States Department of the Interior have developed a comprehensive National Fire Plan. The plan involves various federal agencies in an effort to reduce forest fire fuel sources, as well as develop reclamation and rehabilitation options for burned forest sites. Consideration has been given to removing fire-killed trees, and thinning small live trees from forests that are prone to fires. The USDA-FS queried the U.S. Environmental Protection Agency (EPA) regarding options for the disposition of recently cut, and damaged and dead trees injured by forest fires. Because the Forest Service uses large quantities of disposable materials and food at fire camps, interest was also shown in the potential management (composting) of food residuals together with biodegradable tableware, paper and card stock generated at forest fire-camp sites. Since various wood, and wood by-products, are used and/or managed by various composters throughout the United States, the EPA suggested working with the U.S. Composting Council (USCC) to evaluate this option.

The USCC proposed a national survey to identify composting facilities, both private and public, as well as their capacities and willingness to act as disposition sites for forest fire management by-products. The purpose was to enable the USFS to evaluate the economic viability of disposing of forest fire by-products at composting sites, as well as the overall interest of the composting industry to accept these materials. Fortunately, the USCC had recently completed a project for EPA that included development of a national database of "commercial scale" composting facilities.

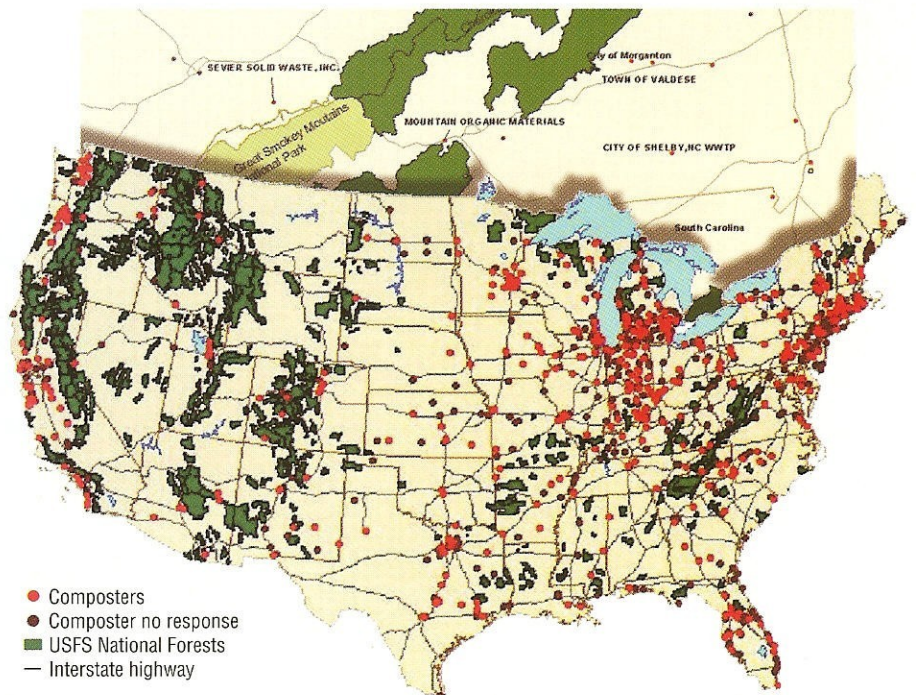
## GIS MAPPING

# ROLE OF COMPOSTING IN FOREST FIRE MANAGEMENT AND PREVENTION

*National survey conducted for the U.S. Forest Service identifies composters who could assist in managing forest fire by-products, and evaluates the economic viability of selecting the composting option.*

*Ron Alexander, Rosalie Green and John Sebelius*

**Figure 1. Location of composters in relationship to National Forest sites, with close-up view of GIS map**



## DATA SOUGHT

A variety of data collection and evaluation tasks were completed during the project, as was electronic (GIS) mapping, in order to more effectively illustrate the location of composting facilities in relation to fire prone forests, and those with the greatest potential of significant damage and postfire remediation. The project's internal management team (authors of this article) developed a survey that was mailed to over 1,100 composters.

The following information was sought: Location of composting facilities that could potentially manage fire waste, as well as other by-products; Location of composting facilities willing to actually accept USFS by-products; Volume/tonnage capacity of facilities; Determination of acceptable organic materials — identify which wastes and by-products the composting facilities were willing to accept (e.g., chipped wood, logs, charred vs. totally burned wood, wood ash, food, paper goods, OCC); Determination of disposal economics — identify which by-products (if any) composters are willing to accept for free, and/or identify the tipping fee they expect to receive to accept the forest fire by-products. Since certain composting facilities purchase wood chips and wood ash for use in their operations, it was hoped that some facilities would not charge a tipping fee for the management of certain materials.

The survey was developed by the internal

project management team then forwarded to the Millersville University (Millersville, Pennsylvania) Center for Opinion Research (COR) which upgraded the questions, then conducted the survey via mail and telephone from August 2001 to January 2002. The information in the project report was based on survey responses received from 436 composting facilities.

The survey data was evaluated and compiled to determine general trends; specific data was then tabulated and mapped (GIS, using ArcView Version 3.2) where appropriate. The USFS provided GIS maps of its National Forest sites and fire prone forests. The composting facility data could be overlaid onto these current GIS maps, illustrating the location of commercial composting facilities willing to accept USFS by-products, and their location in relation to USFS identified forest sites (Figure 1).

## SURVEY RESULTS

Of the 1,135 composters in the database, developed during a prior EPA project, only 664 had provided facility capacity data — accounting for over 31 million cubic yards of compost manufactured annually. The 436 composters responding to the USFS survey have the capacity to manage 10,158,505 tons/year of compostable materials and are permitted to process, on average, 37,698 tons/year (standard error = ± 4,739 tons).

The annual capacity of those facilities for

Compost facility data could be overlaid onto current GIS maps of National Forest sites, illustrating which could accept woody materials.



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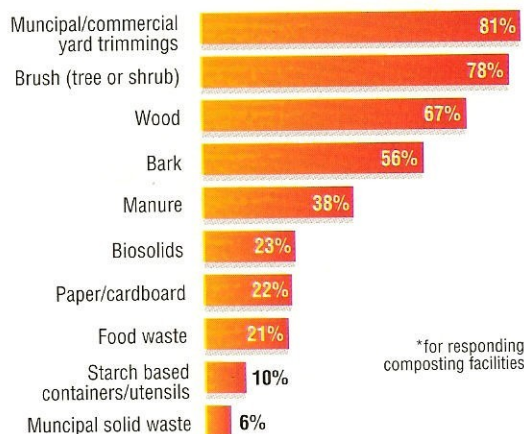
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**Figure 2. Feedstocks processed\***



which data is available is as follows: 65 percent — up to 25,000 tons; 15 percent — 25,001 to 50,000 tons; 12 percent — 50,001 to 100,000 tons; and eight percent — more than 100,000 tons. When broken down into ten basic feedstock categories, a majority of survey respondents manage municipally or commercially generated yard trimmings and green waste (81 percent), brush (78 percent), wood (67 percent), and bark (56 percent). Figure 2 illustrates the proportion of respondents that manage the ten basic feedstocks categories.

Respondents are most willing to accept ground chipped and screened ground tree limbs/logs, ground tree/shrub brush, chipped and unscreened ground tree limbs/logs, ground tree limbs/logs with bark, and ground tree limbs/logs with leaves/needles. The majority of composters are not willing to accept starch-based food service containers/utensils, solid paper/cardboard, source separated food residuals, or wood ash. (Figure 3 is a sample of maps generated around feedstocks accepted.) The willingness to accept certain compostable materi-

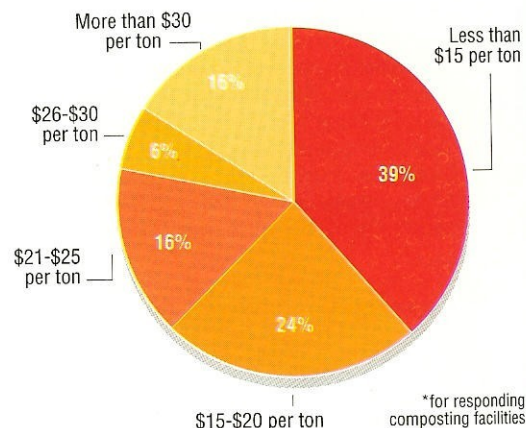
For those composters who charge a tipping fee, 63 percent charge less than \$20/ton to accept wood.

als is related to whether or not the composter is currently licensed to accept those materials. The size of the composting facility is not relative to its ability to manage these less typical feedstocks. The maximum limb, or log diameter that the respondent composters can typically process is 19 inches (standard error =  $\pm 2$  inches).

There is strong interest in managing a variety of wood or tree-based compostable forestry materials (35 to 52 percent) from the USFS, if the composters are paid a tipping fee to do so. Some composters were also willing to pay for some of these materials, while others were willing to accept some of these materials at no charge. Chipped wood and bark were the most popular products named in these scenarios.

Interestingly, only one in seven (14 percent) of the survey respondents indicated

**Figure 4. Current tipping fees for accepting/processing wood\***



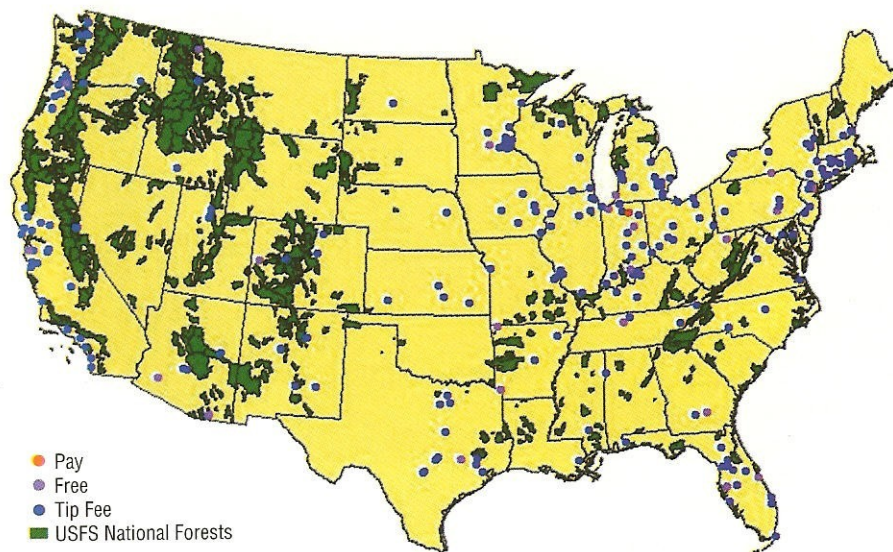
that they purchase wood for use as a bulk agent in their composting process. Of those, nearly three in four (73 percent) pay less than \$10/ton delivered, and more than three in five (61 percent) charge a tipping fee to accept, or process wood. For those who charge a tipping fee, 63 percent charge less than \$20/ton to accept wood (Figure 4).

#### ANALYZING NONRESPONSE RATE

The response rate for the composter survey was only 46 percent. The research team had some concern about this rate and wanted to explore the possible reasons for the lower response, including the lack of time on the part of nonresponders, a lack of capacity to handle additional material, or a lack of interest in the topic.

COR conducted telephone interviews with 18 composting facilities that were not interested in completing the survey. More than half (53 percent) stated they cannot handle additional volumes, one third (35 percent) can handle only materials generated by their own city/municipality, and one quarter (23 percent) do not have the permits to accept this form of feedstock (multiple responses were allowed). Nine out of ten (88 percent) also stat-

**Figure 3. Composting facilities accepting unground brush**

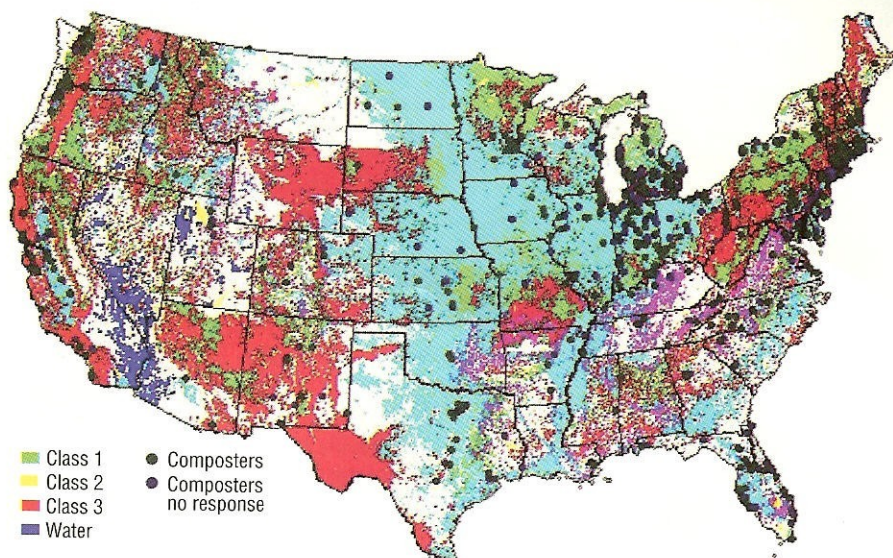


ed that they did not believe they would be able to accept USFS residuals in the future. This analysis illustrates that nonresponders are primarily those composters who believe that they are unable to manage USFS compostable materials in their current circumstances.

### GIS MAPPING

A variety of maps were developed to illustrate the location of composters in relationship to National Forest sites, and high-risk forest sites. The GIS mapping was completed by Mountain Organic Materials, LLC, in Candler, North Carolina. Separate maps were developed to show the geographic relationship between those composting facilities that responded positively to a feedstock specific question within the survey and the USFS National Forests. (Figure 3 is a sample map.) Positive responses within the survey included: "1" (willing to pay), "2" (willing to accept for free), and "3" (willing to accept for a tipping fee) — all relating to a particular feedstock of compostable material. These feedstock-specific maps are of the lower 48 states only. Another map (Figure 5) was prepared showing the relationship between USFS Fire Regime Condition Classes and the locations of composting facilities (both survey respondents and nonsurvey respondents). Under the USFS Hazardous Fuels Reduction Program, some of these higher fire priority areas (Condition Class 3) may be subject to removal of timber fuels as a fire

**Figure 5. GIS map showing the relationship between USFS Fire Regime Condition Classes and locations of composting facilities (both survey respondents and nonrespondents)**



prevention measure. The timber fuels also create a source of feedstock for composters.

A primary finding of the survey is that composters have a strong interest in managing a variety of wood or tree-based compostable forestry materials from the USFS — if they are paid a tipping fee to do so. Few are will-

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## CREATING DEFENSIBLE SPACES

**J**EFFERSON County, Colorado is one of the largest mountain counties in the state (and as of this writing, had acreage involved in the Hayman forest fire that was raging). Clearly aware of the potential fire dangers to residences, the county's Emergency Management department created a slash removal program about five years ago. Slash — lower limbs, brush and small trees — is a "fire fuel," and removing it helps create defensible space around homes. A-1 Organics — a composting and organics recycling company in Colorado with facilities in

Golden, Eaton, Platteville and Kingsburg — has been under contract with Jefferson County to process the slash. "The county sets up a dropoff site each weekend in a different area over a 12-week period, and residents can bring material to the site," says Bob Yost of A-1 Organics. "The county created the program to mitigate the cost and damage done by fires. They communicate to the community that homeowners can clear the area around a house, create a defensible space, and then take that wood to a designated



**A mobile grinder is brought to the dropoff site to process slash.**

dropoff site — typically a fire station — on a specific weekend. Then on Monday, we determine how much material is there, and on Tuesday, we bring our mobile Morbark grinder to that site, process the wood and haul it to one of our sites for composting."

This year, with the severe drought and the current fires, residents are actively creating defensible spaces. "The amount of material we are getting is almost double what we received last year at this time," he adds. Much of the ground wood is cocomposted with biosolids. A-1 Organics's Kingsburg facility opened recently. The 430-acre site is 40 miles east of Denver and manages the majority of the biosolids that A-1 processes. — N.G.

ing to pay for these materials, however some interest does exist to purchase chipped wood and tree bark. Only one in seven (14 percent) of the composters responding indicated that they purchase wood for use as a bulking agent in their composting process. The survey confirmed that yard trimmings composters are the most prevalent composters,

and are already paid a tipping fee for managing these materials. As a consequence they do not have to purchase bulking agent. This also may illustrate a shift in the composting industry, whereas many past purchasers of wood bulking agent (biosolids composters) are now set up to accept and manage wood waste themselves — for a tipping fee. They then become the manager and ultimate end user of the wood chip or shredded yard trimmings. Those facilities that purchase wood as a bulking agent do so at an inexpensive price.

A majority of the largest (75 percent) and smallest commercial composters (92.5 percent) also believe that their typical composting capacity is equal to the amount of material that they could manage if there were emergency conditions affecting the USFS. This would, of course, limit the volume of compostable materials that the USFS could direct to composting facilities in order to manage it. However, it is very feasible that in an emergency situation, political pressure would allow specific composting facilities to accept additional volumes of material. (This occurred in North Carolina after a major hurricane.) The GIS maps illustrate that there is good coverage of composters in the Northeastern and Western United States to accept USFS compostable materials from Condition 3 classified forest sites (those at high risk of losing key ecosystem components, and those needing a high level of postfire restoration). Therefore, in certain regions of the U.S., the composting industry could play an important supporting role in the USFS National Fire Plan. ■

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