

Utah Forest News

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Introducing the Utah Biomass Resources Group

The Utah Biomass Resources Group (UBRG) was formally created in the fall of 2010 to promote biomass utilization and forest health objectives in Utah. The group is co-chaired by USU Extension's Dallas Hanks and Darren McAvoy, and includes members from the Bureau of Land Management, the USDA Forest Service, the Rural Life Stewardship Center, the Utah Department of Agriculture and Food, the Utah Division of Forestry, Fire and State Lands, the Governor's Office Energy Advisor, and others.

Members of the group have been meeting and working toward a formalized structure for about three years, leading to the signing of a charter in November 2010 that officially created the UBRG. Its creation was motivated by the need for woody biomass markets to help provide a means to accomplish forest management activities for Utah landowners, a desire to see a sustainable biomass industry in Utah, and a federal directive to pursue alternative energy sources. This fall the UBRG helped conduct the Southern

Utah Woody Biomass Field Day which had 200 people viewing state-of-the-art equipment processing woody biomass material. The day was the brainchild of BLM contractor Lance Lindbloom, of Bloomin' Ranch Services, a contractor working out of Beaver, who arranged for the equipment demonstrations. In January the UBRG winter meeting in Salt Lake City had 50 attendees, indicating the high interest in this topic.



Currently, many piles are burned each year in Utah. Perhaps they could be used to create energy.

The UBRG is partnering with the Idaho National Laboratory (INL) in Idaho Falls for the technical know-how to convert biomass to energy. The INL is a federal facility that is best known for its development of nuclear reactors, with around 50 reactors on their reservation east of Idaho Falls. But recent UBRG visits to the INL have revealed that they are also

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experts in the field of handling biomass from the stump to the bioreactor. This includes the processing, handling, transportation, and storage of biomass.

As it turns out, this is a much more complex set of challenges than simply loading wood chips into a truck and dumping them into a bioreactor, and the INL has spent the last two decades experimenting with and refining these industrial processes. It is fortunate that INL is charged with assisting regional partnerships such as the UBRG.

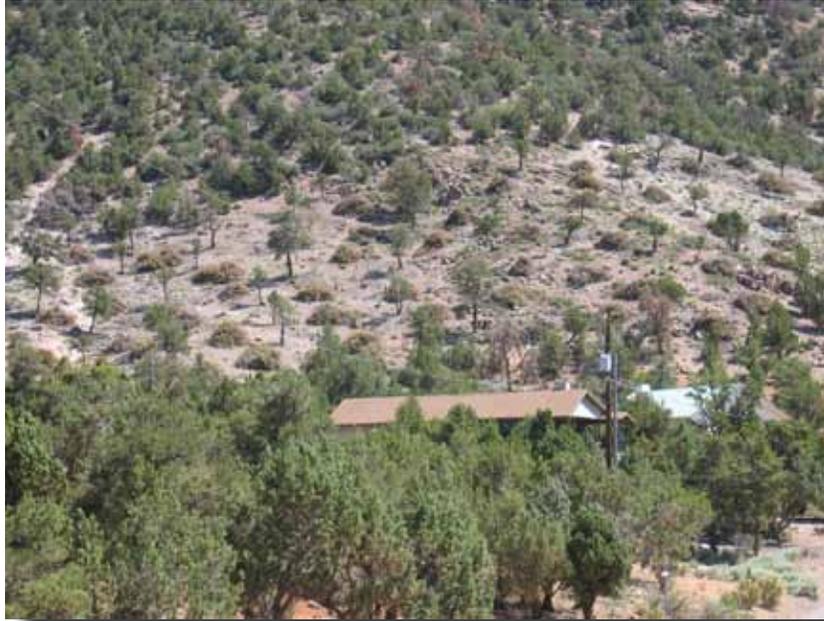
Although wind and solar power are the first things that come to most peoples' minds when they think about

alternative energy, the vast majority of our alternative energy already comes from biomass. Biomass can be thought of as stored solar energy. Biomass is any organic material, and the focus of the UBRG is woody biomass utilization. Woody biomass can include logging slash, branches and logs from urban tree maintenance and waste construction wood.

Perhaps the biggest potential source of woody biomass in Utah is from pinyon-juniper (PJ) restoration projects and wildland fire hazard reduction projects. Many scientists believe that PJ has encroached upon many acres that were historically vegetated with sagebrush, grasses and forbs, which offer greater diversity and better wildlife habitat than a landscape thickly wooded with PJ. Also many acres are treated annually to reduce fire hazard around communities (see UFN Fall 2004). PJ woodlands are

increasingly being thinned to reduce their water use, with many examples of thinning leading to springs and seeps suddenly returning after years of absence.

Currently, large swaths of PJ woodlands are reduced



Fuel breaks for fire protection in pinyon-juniper woodlands are a source of biomass that could be used for energy production.

to chips left on the ground (see UFN Spring 2003) to reduce fire hazard. Also in many cases house-sized logging slash piles go up in smoke rather than being used. This has led many foresters to wonder why we are using food crops like corn for energy when so much potential wood energy goes to waste. As we pursue domestic energy production as a national

priority, woody biomass is a natural place to turn.

The technologies required to release energy from wood are not new; what is new is the current price of fuel that makes this an appropriate time to redevelop and use these old technologies. Surprisingly, the fuel shortages following World War II led to creation of hundreds of cars and trucks in Europe that were powered by wood. But to use wood energy for such purposes you can't just burn it as you do in a woodstove or campfire. You need to use closed combustion techniques such as pyrolysis, gasification and torrefaction.

Pyrolysis and gasification are somewhat similar, involving applying heat to wood and capturing and utilizing the various gasses that come off in a controlled manner. Very little smoke or vapor leaves

the system. Torrefaction is a process that involves cooking the wood, again with little but water vapor leaving the system, to create a more carbon rich product that might be mixed with coal in power plants or used for other purposes.

Wood is a renewable resource. There are estimated to be 15 million tons of woody biomass available annually in Utah. According to Ted Wilson, the Governor's Senior Energy Advisor, coal's time in Utah is limited to perhaps 10 or 15 years; beyond that it is just too deep and too dangerous to mine safely. It makes sense then to start to develop alternative sources of energy now so we are prepared for the day when gasoline hits four dollars per gallon and our coal reserves dwindle.

The UBRG plans to put together a demonstration project in Utah during 2011 to show individuals and businesses how this can be done in an economic fashion so that they can create similar facilities themselves. Steering committee members are

following a variety of leads in an effort to get something going on the ground very soon that demonstrates how to efficiently turn wood into energy as heat, electricity, or ideally, a combination of these forms.

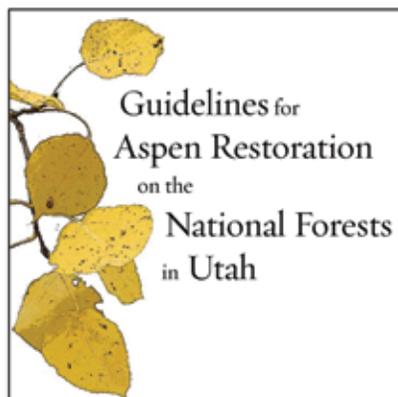


The hope is that by showing enterprising individuals how it can be done, those individuals can run with the technology, improving it, creating jobs and domestic energy, turning a profit, and helping to improve forest health. Making value out of trash is a lot to shoot for, but the time might be right

to finally begin to utilize the vast amount of woody biomass that is available in Utah.

by Darren McAvoy

For more information on the UBRG, or to become involved, contact Dallas Hanks or Darren McAvoy.



UTAH FOREST RESTORATION WORKING GROUP

The Utah Forest Restoration Working Group (UFRWG) - Ecology Committee has recently put out some aspen management guidelines to assist Utah forest managers in making difficult land use decisions which positively affect aspen communities.

These guidelines can be accessed online at: <http://www.western-aspen-alliance.org/pdf/AspenRestoration.pdf>.

UFRWG is a collaborative, multi-party group which is working towards reaching consensus on management issues affecting Utah's National Forest lands.

Wood Pellets: A Growing Industry

A Salt Lake manufacturing company creatively manipulates and recycles woody biomass into wood pellets, which can be used as fuel for heating homes and other buildings, as fuel for producing electricity, and also as animal bedding. ArborPellet LLC is part of the growing international wood pellet industry which is concerned about decreasing pollution and emission of greenhouse gases and also about promoting an alternative, renewable energy source.

While working for 24 years in urban forestry, the founder of ArborPellet, Brian Getzelman, saw the decisions society had been making regarding the use of its residual tree products or urban wood waste. Wood waste was either buried wastefully in landfills or ground into compost or mulch. In 2007 he built a wood pellet manufacturing plant to help provide society with a better option. The wood pellet industry began in the 1930s, expanded in the 1970s following the energy crisis, and spurted in the last decade as fossil fuel costs have risen. Wood pellet production capacity in North America increased from 1.1 million metric tonnes in 2003 to 4.2 million in 2008, according to the U.S. Forest Service's Forest Products Laboratory.

Small mountains of wood pallets and scrap wood can be seen at Getzelman's plant. ArborPellet largely makes its wood pellets out of fiber from urban wood

waste, mostly wood pallets used for shipping, though it currently does not utilize green tree waste. Green tree waste has relatively high moisture content which often makes it unusable without first undergoing an expensive drying process. Getzelman said that wood

pallets are made from a large variety of wood types and that "the number one use of wood in the country is for wood pallets." He collects both non-reusable pallets which are designed to ship a specific product and also broken boards from grocery pallets. He also obtains some fiber and scrap cutoffs, from secondary manufacturing facilities like cabinet and furniture makers. ArborPellet



ArborPellet of Salt Lake City produces wood pellets, which can be used as an alternative fuel or as animal bedding.

grinds up this wood waste and makes wood pellets in a three-step process. The wood goes through a 125 HP rotochopper, then a 200 HP hammer mill, and finally a 400 HP pellet mill where pellets are formed under intense heat and pressure.

The Forest Products Laboratory identified at least 111 operating or nascent wood pellet producers in North America in 2009. Getzelman knows of five wood pellet manufacturers in Utah and one in Evanston, Wyoming. ArborPellet is rather unique in its exclusive use of urban wood waste and cutoff scraps from secondary manufacturing facilities instead of sawmill residues or green material.

The Forest Products Laboratory found that only about

1% of the fiber used to produce wood pellets in North America in 2008 came from urban or salvage wood and only about 14% came from secondary manufacturing facilities. Moreover, 69% of North America's wood pellet fiber was sawmill residues and 16% was green material from pulpwood or logging residues.

Most wood pellet plants depend on fiber from sawmill residues and, consequently, are located near mills. Getzelman sees some potential for utilizing some of these wetter materials (e.g., sawdust or urban tree waste) in summer pellet production by mixing them with his drier scrap wood which is too dry in the summer to be properly used for making wood pellets without the addition of supplementary moisture to the fiber.

Because wood pellets are derived from raw wood, which is carbon neutral and renewable, using wood pellets as a fuel is an attractive alternative to using fossil fuels such as coal, natural gas, propane, and heating oil. Moreover, heating with wood pellets is sometimes less expensive than heating with fossil fuels, relative to the heat output. For example, in smaller communities where natural gas is unavailable and propane is commonly used for heating, burning wood pellets can be a less expensive option.

Although wood pellets should probably be classified as just a partially renewable energy source because their production can require large amounts of electricity, heating with wood pellets has a number of advantages over heating with raw firewood. First, burning wood pellets tends to be cleaner than burning

firewood, creating less ash and emitting fewer harmful particulates – an appealing option in regions prone to inversions like Cache Valley and the Wasatch Front. Second, burning wood pellets is more effective or efficient than burning firewood because pelletization densifies the wood, making the energy content

per unit volume higher. Also, the higher bulk density of wood pellets makes hauling them more economical than firewood. Finally, their consistent, small size allows for more user convenience because the fuel feed in pellet burning stoves can be automated.

About 1 million U.S. homes are being heated by wood pellets, according to the Pellet Fuels Institute (PFI), a North American trade association promot-

ing the wood pellet industry. Wood pellets are being used in freestanding stoves and fireplace inserts or in furnaces and boilers. They also have the potential to be used in larger public and commercial buildings. There is a market for wood pellets in the U.S., but the largest market for wood pellets is in Europe. Nations within the European Union are ambitiously attempting to meet 20% of their energy needs through renewable sources by the year 2020. Although Getzelman has found that shipping wood pellets beyond the neighboring states is not economical, Europeans regularly show interest in purchasing his wood pellets.

by Ryan Allred

For more information on the wood pellet industry, visit the PFI website at <http://pelletheat.org/>



Brian Getzelman of ArborPellet stands beside stacks of wood pellets with piles of scrap wood and a rotochopper in the background.

Urban Tree Inventories in Utah

Editor's Note: This story is part of an ongoing series contributed by the staff of the Utah Division of Forestry, Fire & State Lands. The Division works in cooperation with USU Forestry Extension to help to educate landowners about forestry practices in Utah. Generous contributions of funds from the Division pay for the printing and distribution of this issue of the Utah Forest News.



Technicians perform a community tree inventory by taking measurements and collecting data at Hill Air Force Base.

Communities nationwide have recognized the myriad of economic, social, and environmental benefits trees in urban areas provide including increasing property values, improving air and water quality, and providing energy cost savings. However, trees in public areas need long-term care, which requires planning, funding and support. That is why the Utah Division of Forestry, Fire & State Lands actively promotes community tree inventories and forestry management plans. Thanks to a partnership between the Wildland Urban Interface and Urban & Community Forestry Programs, the Division teamed up with five pilot cities (Santa Clara, Farmington, Hurricane, LaVerkin, Monticello) to launch a new tree inventory program.

Utilizing a tablet computer and free software, Quantum GIS, with a custom tree inventory “plug-in”, cities mapped their community forest by simply

clicking each tree location on an aerial photo and entering data including species, diameter, condition, and maintenance needs. Once trees on the streets, in the parks and around public buildings are recorded, the data reveals a picture of the entire urban forest. The information was then uploaded to free urban forest analysis software developed by the USDA Forest Service, iTree, that calculates the tangible benefits the trees provide. Using scientific, peer reviewed

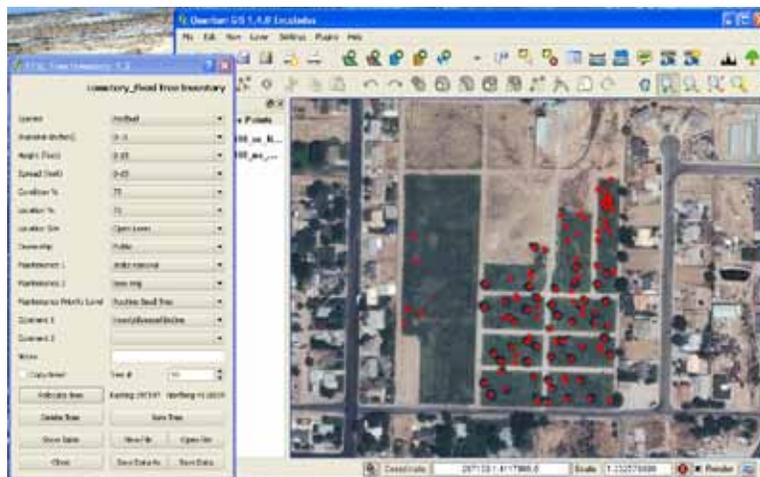
methods, iTree can estimate ecosystem services including total energy savings, carbon sequestration, aesthetic value and more. With this information communities can begin to make educated decisions about the future of the forests they manage.

A main focus of these pilot inventories was to keep the data relevant and encourage communities to incorporate the information into planning. In response to the tree inventory, the City of Santa Clara adopted a comprehensive Community Forestry Management Plan which provides detailed direction for the conservation, future development and care of Santa Clara's community forest resource to ensure its health, resilience and to maximize the services it provides. In Farmington City both the GIS Department and the Parks and Recreation Department have embraced the

tree inventory. The city boasts new three-dimensional tree maps and has developed innovative ways to keep tree maintenance proactive.

Strategic planning is necessary for urban forestry programs to maximize success and cost-effectiveness. Communities are often forced to ask whether trees are worth the price to plant and care for over the long-term. Tree inventories are the first step to justify-

ing a forestry program and showing that although urban forests need budget dollars, they pay us back. Trees are the answer!



Screenshot of Quantum GIS computer program displays tree inventory and GIS data.

*by Kelly Washburn and
Meridith Perkins*

If you would like more information about urban tree inventories contact Meridith Perkins at meridithperkins@utah.gov or 801.538.5505.

For more information regarding any of the information presented in this newsletter, please call Darren McAvoy at Utah State University, 435-797-0560, write to him at 5230 Old Main Hill, Logan, UT 84322-5230, or email darren.mcavoy@usu.edu.

To get on our list for email delivery of this newsletter go to <http://extension.usu.edu/forestry/subscribe.html>. For back issues visit <http://extension.usu.edu/forestry/reading/ufnindex.htm>

The Utah State University Forestry Extension website, found at <http://extension.usu.edu/forestry>, is an excellent source of technical forestry information for woodland owners. Check the “What’s New” section periodically for new postings.

State of Utah Division of Forestry, Fire and State Lands (DFF&SL) service foresters for your area can be contacted by calling 801-538-5555.

Ideas and written contributions to this newsletter are encouraged. Send your contributions or comments to the return address above or call 435-797-0560, or email darren.mcavoy@usu.edu.



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Utah State University is an affirmative action/equal opportunity institution.
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COMING EVENTS

Selkirk Society of American Foresters Chapter meeting: Calculating Carbon Credits for a Stand or Parcel, April 14, 2011, Worely, ID

IMSAF 2011 Section Meeting, Hosted by USU Student Chapter: How Climate Change Might Be Incorporated Into Forest Management, Logan, UT, April 29 & 30, 2011
 See usu.edu/saf/ for details

Second Annual Southern Utah Woody Biomass Field Day, Beaver, UT, June 3 & 4, 2011
 See utahbiomass.com for details



SnowSnag: This woodpecker hole is a reminder of the wildlife value in standing dead trees, also called snags.