Researchers consider converting invasive plants to fuel

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Invasive plants make life tougher for farmers and ranchers who live in the six headwater states of the Missouri River Basin, so why not turn the plants into fuel and make some money at the same time?

Russian olive and saltcedar alone could supply biomass far into the future, according to weed experts throughout the region.

Converting invasive plants to fuel is an intriguing idea that's being investigated by partners in a regional project headed by the Center for Invasive Plant Management (CIPM) at Montana State University and the Missouri River Watershed Coalition, said project director Liz Galli-Noble, also CIPM director.

The CIPM and MSU were recently awarded $1 million from the Natural Resources Conservation Service, Conservation Innovation Grant program, to develop innovative ideas for managing invasive plants and work with public and private partners in Montana, North Dakota, South Dakota, Wyoming Colorado and Nebraska. Out of 230 grant proposals submitted and 61 grants awarded for conservation work, MSU's tied for the largest.

Invasive plants can be ornamental plants that escaped from the garden, fast-growing non-native plants that were intentionally brought to the region to stabilize soils or river banks, or strange-looking weeds that continuously spread from other states and countries. But Galli-Noble said they all can cause very serious ecological and economic problems in

the western United States. She added that their prevention and control are crucial management issues in the Missouri River Watershed.

Dense invasive plant infestations choke river systems; restrict access for irrigation, wildlife and recreation; reduce water quality and quantity; and degrade or eliminate habitat for wildlife and livestock.

The six states in the upper Missouri watershed contain hundreds of thousands of tons of invasive plant biomass, Galli-Noble estimated. The entire river is 2,540 miles long and drains about one-sixth of the North American continent. More than a million acres in the western United States are infested with Russian olive (Elaeagnus angustifolia) and saltcedar (Tamarix spp.) alone.

"It's a huge supply of currently unwanted and untapped biomass," Galli-Noble said.

Scott Bockness of Billings, vice president of the Missouri River Watershed Coalition and weed coordinator for Yellowstone County, added that Russian olive and saltcedar -- the focus of the pilot project -- displace cottonwoods, willows and other native trees that grow along streams. Invasive plants push out native forbs and deciduous trees at alarming rates.

"There really isn't a place on the Yellowstone corridor where it's not a problem. It's massive," he said.

The Yellowstone River feeds into the Missouri River. It's a major contributor to the entire ecological system, Bockness said.

Slade Franklin, state weed coordinator for Wyoming and member of the Missouri River Watershed Coalition executive committee, said Russian olive and saltcedar, as well as Canada thistle (Cirsium arvense) and white

top (Lepidium draba), have invaded the riparian areas along several Missouri River tributaries in Wyoming. In addition to trees, invasive plants have pushed out "some pretty valuable grasses and forage for wildlife, also for agriculture communities."

Russian olive invades every county in Wyoming, Franklin said. He noted that the infestation is particularly significant in the Bighorn Basin of northern Wyoming.

The regional endeavor is a three-part project, with a major component focusing on the feasibility of turning saltcedar and Russian olive into biofuel. Organizers said it will include setting up demonstration sites and conducting workshops that show how existing technology can use Russian olive and saltcedar biomass as a feedstock for pelletization, bio-brick production, gasification and other bioenergy production.

The second focus of the project is determining the effectiveness of existing strategies used in the six-state region for controlling invasive plants and restoring desired native plant communities. The project will monitor short-term and long-term ecological changes, riparian system health and function, and natural resource enhancement on selected treatment and control sites.

"There is great potential to incorporate students and other university resources into the project over our three-year time frame," Galli-Noble said.

Bockness said many agencies and groups already use various strategies to control invasive plants, but the six-state project is unique. Little work has been done prior to implementing management to quantify the effectiveness or understand the ecological impacts of those strategies, he said.

"Converting invasive plants to fuel is also a unique concept for the Missouri River Watershed, as far as we know," he said.

Galli-Noble said companies already use crop residues as feedstock for biofuel production, so it seems logical that invasive plant biomass feedstock can be used in much the same way. Bockness added that early BTU testing indicates that fuel made from invasive weeds is a viable product.

If the idea works, Galli-Noble said it could spread across the West and the rest of the nation and benefit local, state, federal and private landowners and managers. Besides providing an income to offset the costs of controlling invasive plants, she added that this innovative technology has the potential to develop community-based jobs, produce an effective energy source, improve the quality and reduce the cost of grazing land restoration, enhance fish and wildlife habitat, reduce the threat of wildfire, and promote long-term conservation strategies on high-value riparian lands.

A third key component of the three-year project is transferring these innovative conservation technologies and riparian land management approaches to a broad range stakeholders throughout the region, including the private sector, Galli-Noble said. All project information will be disseminated through CIPM and coalition communication networks, field demonstrations and workshops, and publications.

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