Western Range & Wildlands Edition
SPRING 2013

TechLine INVASIVE PLANT NEWS

INNOVATIVE RESEARCH, SUCCESS STORIES, AND TIPS FOR INVASIVE PLANT MANAGERS

IN THIS ISSUE

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TechLine Readers Review Their Backpack Sprayers

New Resources for Spring

Prairie & Grasslands Edition, SPRING 2013

ABOUT TECHLINE

TechLine Invasive Plant News aims to provide an objective communication tool for on-the-ground natural resource managers who face common management challenges so they may share the successes of their programs and learn from one another.

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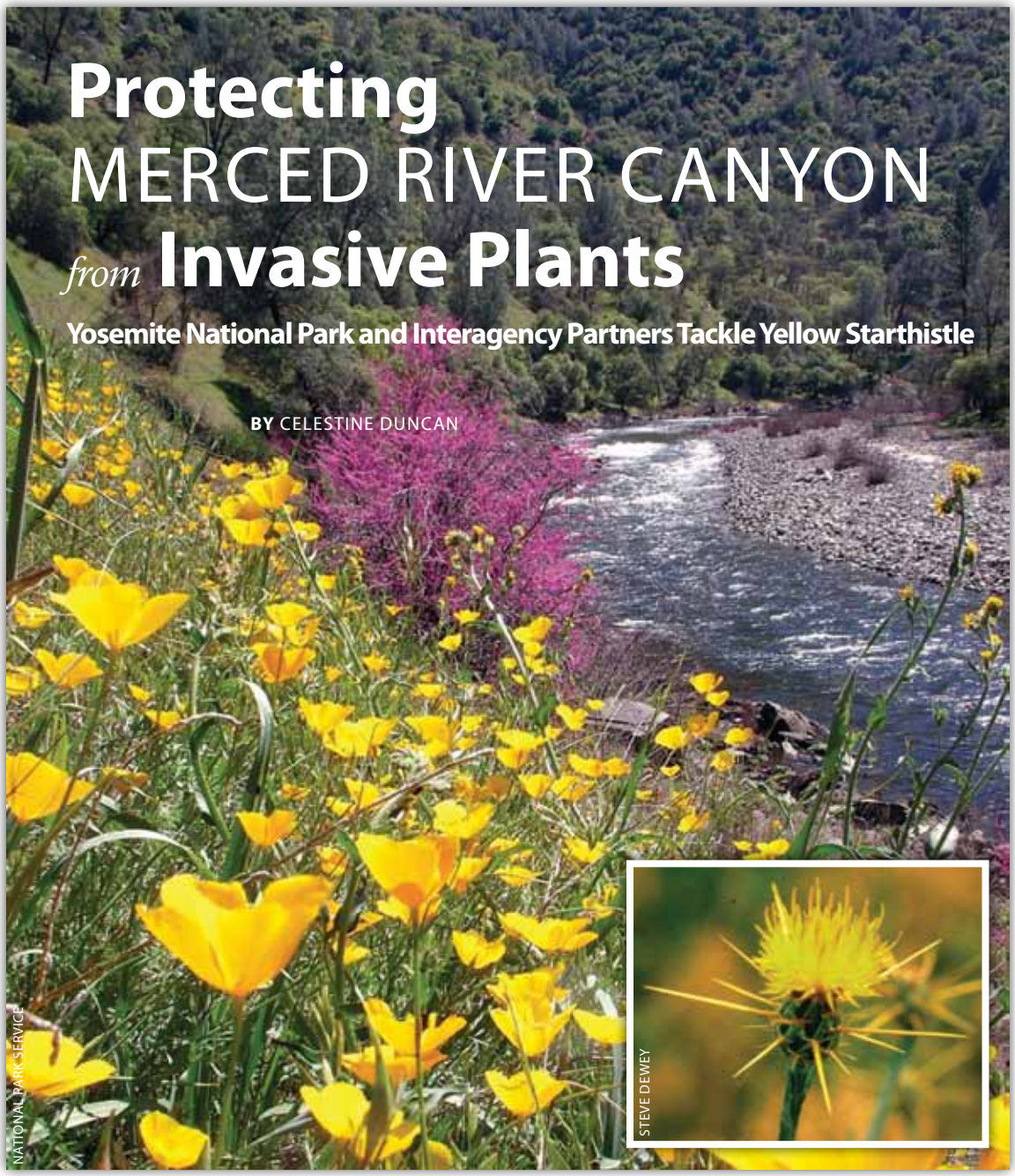
Protecting MERCED RIVER CANYON *from* Invasive Plants

Yosemite National Park and Interagency Partners Tackle Yellow Starthistle

BY CELESTINE DUNCAN



THE MERCED RIVER begins in the high country of Yosemite National Park and flows through rugged mountains and foothills forming a canyon renowned for its **spring wildflower displays**, wildlife and recreation opportunities. • **Yellow starthistle** in bloom (inset).

YELLOW STARTHISTLE (*CENTAUREA SOLSTITIALIS*) IS A "WANTED" WEED in the Merced River Canyon of Yosemite National Park and lower watershed. The plant is well known for its ability to dominate vegetation in the Sierra Nevada foothills and mountains, infesting an estimated 10 to 14 million acres in California.

["YOSEMITE" continued on page 2]

["YOSEMITE" continued from page 1]

"The largest infestation of yellow starthistle in Yosemite National Park is near the western border adjoining Sierra National Forest land," explains Garrett Dickman, Invasive Plant Manager with Yosemite National Park. "We are fortunate that yellow starthistle infests only about 18 net acres in Yosemite, but these infestations are scattered over about 250 acres of steep canyon terrain, making control very difficult." Downstream from the Park boundary additional acreage is infested with yellow starthistle on lands managed by the Bureau of Land Management (BLM) and Forest Service (USFS).

Various federal agencies and groups have worked to control yellow starthistle in the Merced River Canyon since 1998; however, control efforts accelerated in 2011 to include 18 contiguous miles of the canyon. Three federal agencies—National Park Service (NPS), Forest Service, and BLM—partnered to share expertise and resources to control non-native invasive plants that threaten the Merced River Canyon's renowned wildflowers, wildlife and recreation areas.

MANAGEMENT EFFORTS

YELLOW STARTHISTLE MANAGEMENT INCLUDES hand pulling, mowing, and herbicide treatments depending on site location and conditions. Yosemite National Park has two five-person crews—led by Heather Smith and Aaron Peters — that control yellow starthistle-infested sites within the Park and also contract herbicide applications to control yellow starthistle and other invasive plants on adjoining Forest Service and BLM land.

Milestone® at 5 to 7 fluid ounces per acre (fl oz/A) is applied within the Park, and Transline® or Roundup* is used on other federal partner lands. "In El Portal on the west side of Yosemite National Park, infestations of yellow starthistle have been controlled with Milestone or Roundup depending on location and plant phenology since 2009," explains Dickman.

This area is the leading edge of yellow starthistle in the Merced River Canyon, and infestations are found on slopes ranging from 30 to 60 degrees. Crews use ropes for fall protection on the steepest slopes or drag hose-lines up to 400 feet to treat infestations on upper canyon slopes and hilltops. Smaller bluffs and rock outcrops along the highway have successfully been treated from a cherry picker type lift.

"We found these herbicide application methods to be a safe and efficient option on the steep slopes of the Merced River Canyon," says David Greenwood, River Ranger for the BLM Merced River Recreation Area. "This approach allows us to

"THIS APPROACH ALLOWS US TO MAXIMIZE OUR SUCCESS IN CONTROLLING YELLOW STARTHISTLE WHILE MINIMIZING NEGATIVE IMPACTS, SUCH AS SOIL EROSION AND DANGER TO WORKERS ON NEARLY VERTICAL SLOPES."

DAVID GREENWOOD, RIVER RANGER FOR BLM MERCED RIVER RECREATION AREA


NATIONAL PARK SERVICE


NATIONAL PARK SERVICE

FALL PROTECTION-CERTIFIED NPS invasive plant management crews use ropes to secure themselves on steep slopes as they apply herbicide to yellow starthistle infestations (left). • Herbicides are applied by NPS crews from "cherry-picker" lift equipment on steep cut slopes, ridges and rock outcrops adjacent to highways. This application method minimizes soil erosion and reduces exposure of workers to hazardous slopes.


NATIONAL PARK SERVICE

PARTNERS HELP PROTECT MERCED RIVER CANYON FROM INVASIVE PLANTS. *Project partners are shown below in bold type.* **Volunteer "Weed Warriors"** and other partners work together to physically remove invasive plants in areas where herbicide treatments are not used. • The **Upper Merced River Watershed Council** and the **Sierra National Forest** partnered with **American Conservation Experience Crew** youth (top left) to hand pull yellow starthistle near the river; a project funded by a **Sierra Nevada Conservancy** Grant. • **Mount Bullion California Department of Corrections** crew (right) hand pulls yellow starthistle and Italian thistle from steep slopes near the Merced River under the guidance of **Bureau of Land Management** personnel. • **Yosemite National Park** Invasive Plant Manager Garrett Dickman and crew leader Heather Smith (bottom left) pose in front of the steep hillside treatment area.

PARTNERS UNDERSTAND THAT THEIR SUCCESS IN MANAGING INVASIVE PLANTS IS BASED ON THEIR COMMITMENT AND FUNDING TO SUPPORT FUTURE PROJECTS.

maximize our success in controlling yellow starthistle while minimizing negative impacts, such as soil erosion and danger to workers on nearly vertical slopes. When treatments are effective, fewer re-treatments are needed, and larger infestations can be controlled."

The BLM also believes that spending less time on re-treatment frees up resources and allows crews time to detect and remove newly invading plants before infestations become established. Botanists monitoring herbicide-treated yellow starthistle sites have seen an increase in native plant cover on sites where native seed is present.

Both BLM and Forest Service use hand pulling and mowing to control yellow starthistle and other invasive plants near waterways and high public use areas. Greenwood explains, "The BLM and Forest Service didn't want to use herbicides along the Merced River within high public use sites, so we focus on hand pulling and timed mowing to control yellow starthistle on these areas. Our control work on BLM land concentrates along an eight-mile section of the river, including a few hundred feet upslope, and we've effectively contained the infestation along this section of the canyon."

BLM and Forest Service field crews, California Department of Corrections crews, and volunteers physically remove weeds from some sites. Consistent hand pulling and mowing has significantly reduced yellow starthistle within designated areas of the Merced River Canyon including along the Wild and Scenic Trail. In the wild section of the Wild and Scenic River corridor where hand pulling crews have removed yellow starthistle for six years, it takes only one day to pull plants compared to five days when the project first started.

Monitoring data shows a 34 and 42 percent decline in Italian thistle (*Carduus pycnocephalus*) and yellow starthistle respectively, after three consecutive years of hand pulling. Timed mowing when plants are at about three percent bloom has also reduced seed production on roadsides and trailheads.

Partners found that herbicide treatments were the most reasonable option for successfully controlling the largest infestations of yellow starthistle and could be combined with other methods such as hand removal once plant density was reduced.

["YOSEMITE" continued on page 4]

["YOSEMITE" continued from page 3]

And, their hard work is paying dividends. Within Yosemite National Park, yellow starthistle acres treated with herbicide declined 41 percent from 2010 to 2011. Although yellow starthistle seed remains viable in the soil for at least six years, treatment of new infestations and monitoring and control of re-invading plants is resulting in a significant decline in infestations (Table 1). On Forest Service lands, the increase in acres treated between 2010 and 2012 was due to crews expanding treatment to previously non-treated infestations. Partners plan to continue interagency (USFS-BLM-NPS) cooperation in the future.

TABLE 1. THE NUMBER OF CANOPY ACRES TREATED within the yellow starthistle project area with herbicide on National Park Service, Bureau of Land Management, and US Forest Service lands since 2009.

Year	National Park Service	Bureau of Land Management	US Forest Service
2009	12.2	1	0.19
2010	27.33	0.2	9.22
2011	16.13	0.1	19.13
2012	7.0	4.7	21.7

PARTNERS UNDERSTAND THAT THEIR SUCCESS IN managing invasive plants is based on their commitment and funding to support future projects. Although staff and funding for invasive plant management remains limited, pooling resources has expanded management effort within the project area.

"In California it seems weeds are everywhere," says Greenwood. "Most of the other rivers canyons we manage are full of yellow starthistle and other invasive plants. The Merced River Canyon is one of our success stories."

NOTE:
This article contains material written by Yosemite National Park: http://1.usa.gov/ZGvGeg and the Upper Merced Watershed Council: http://bit.ly/11hzwss

Herbicide Selectivity in Invasive Plant Management

Choosing the right herbicide to fit your vegetation management objectives is an important decision. Herbicides are classified in a number of ways based on how they are used and their selectivity on different plant families.

NONSELECTIVE HERBICIDES are not selective about the plants they control. Glyphosate (Roundup*, Accord® XRT II, Rodeo®, and other trade names) is a non-selective herbicide that will cause significant injury to both broadleaf and grass plants. Often undesirable weedy plants will re-establish in bare ground created by nonselective herbicide treatments.

SELECTIVE HERBICIDES are those formulated to control specific plant families. Milestone® and Transline® are selective herbicides that control invasive broadleaf plants, allowing grasses and some desirable broadleaf plants to thrive. Applying selective herbicides to target plants reduces the potential for erosion by maintaining vegetative cover and minimizes damage to desirable non-target plants.


VANELLE PETERSON

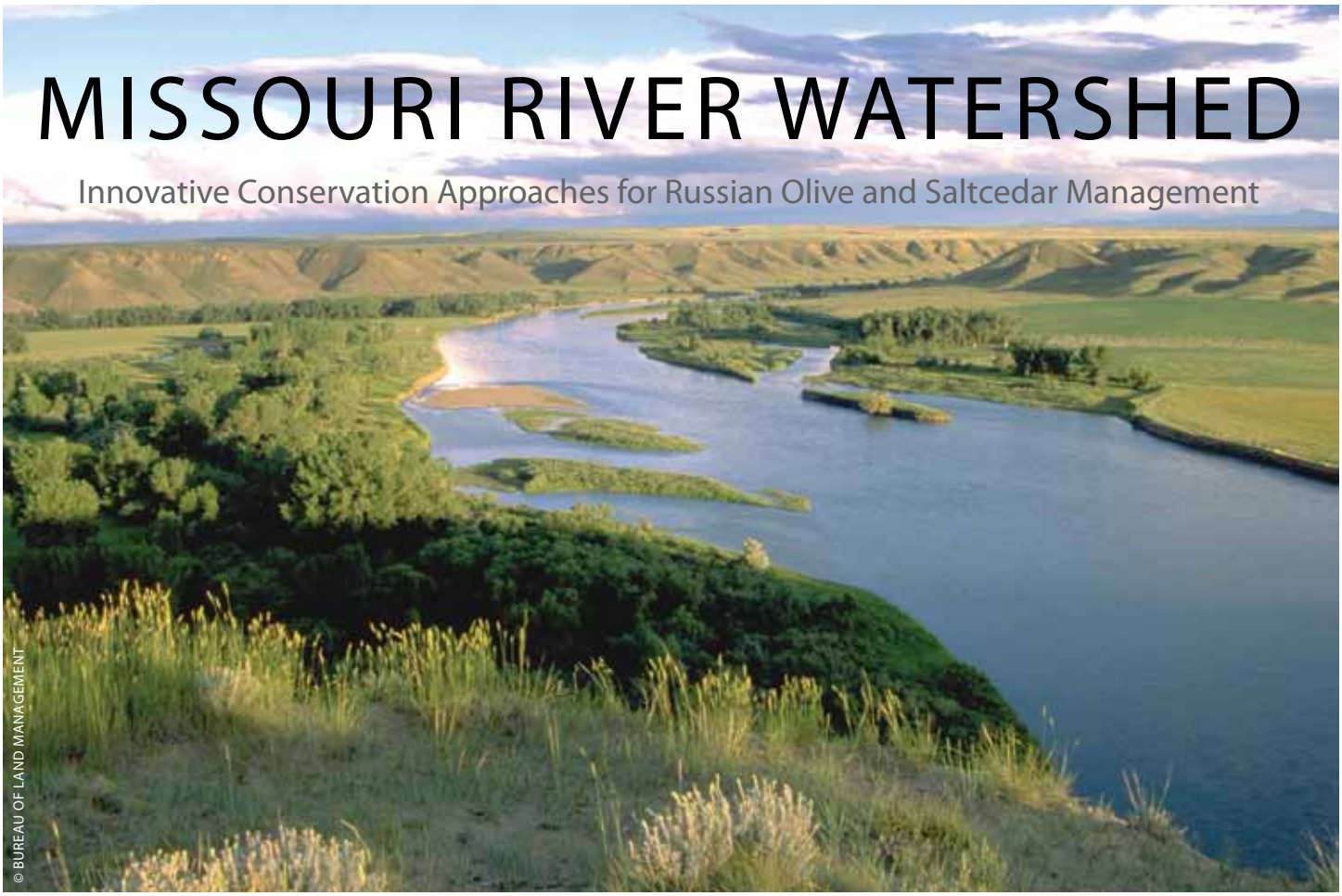

VANELLE PETERSON

NONSELECTIVE HERBICIDE (glyphosate) applied to Scotch broom (*Cytisus scoparius*) resulted in injury to desirable grasses (top) shown 45 days following application. Removal of grass competition by glyphosate allowed for invasion of oxeye daisy (*Leucanthemum vulgare*), another invasive plant, 416 days after application (bottom).

Active ingredients for herbicide products mentioned in this article: Milestone (aminopyralid); Transline (clopyralid); Roundup, Accord XRT II, Rodeo (glyphosate).

MISSOURI RIVER WATERSHED

Innovative Conservation Approaches for Russian Olive and Saltcedar Management



© BUREAU OF LAND MANAGEMENT

BY CELESTINE DUNCAN

THE MISSOURI RIVER FLOWS 2,540 MILES FROM ITS HEADWATERS IN SOUTHWESTERN MONTANA to its confluence with the Mississippi River north of St. Louis. The watershed covers more than 529,000 square miles in portions of ten states, supporting a multitude of uses including agriculture, wildlife habitat, drinking water, industry, and power generation.

In 2005, the Missouri River Watershed Coalition (MRWC) was organized to help protect the watershed from invasive plants including saltcedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*). The mission of the Coalition is to maintain productive, biologically diverse riparian habitat to meet the economic and ecological needs of the Missouri River Watershed region.

© US ARMY CORPS OF ENGINEERS

MISSOURI RIVER WATERSHED COALITION includes Colorado, Montana, Nebraska, North Dakota, South Dakota, Kansas, and Wyoming.

The MRWC teamed up with the Center for Invasive Species Management (CISM) in 2010 and received a $1 million Conservation Innovation Grant (CIG) from the USDA Natural Resource Conservation Service, and additional state matches of $750,000 from Montana and $250,000 from Wyoming.

Scott Bockness, CIG Project Field Leader for the Coalition is tasked with

["WATERSHED" continued on page 6]

["WATERSHED" continued from page 5]

developing solutions to regional invasive plant issues within the watershed through this riparian investigation. "The objective of this project is to investigate methods to help mitigate the impacts of Russian olive and saltcedar and explore their potential use as bioenergy products," Bockness explains. "We believe our results will help producers and land managers with Russian olive and saltcedar management projects and serve as a model for other large-scale invasive plant projects in the West."

MANAGEMENT STUDY AREAS

RUSSIAN OLIVE- AND SALTCEDAR-INFESTED SITES were selected in six locations within three of the Missouri River Watershed Coalition states (Table 1). Sites include both regulated (dammed) and unregulated (free flowing) river watersheds with different saltcedar and Russian olive invasion patterns in terms of age, infestation size and density. Land use on the study areas range from livestock production to conservation areas.

"Our objective for the field studies is to determine which management methods provide the most effective control of saltcedar and Russian olive, in addition to evaluating the plant community response to herbicide treatments," explains Bockness.

Herbicide treatments on Russian olive and saltcedar included Garlon® 4 Ultra as a foliar application to young trees, and as a basal cut stump or basal bark treatment depending on the size of the target tree. Herbicides were applied in fall and early winter of 2012 at all sites except Lovell, Wyoming, which was treated spring 2013 (Table 1). Data collected at the Wyoming site will compare basal cut stump herbicide treatments to mastication and herbicide treatment that is part of an on-going Coordinated Resource Management Project.

Long-term monitoring data collected pre- and post-treatment from the study includes cover and relative abundance of Russian olive and saltcedar, desirable native and non-native species, and other invasive species that may colonize the site after treatment. Bockness explains, "These data will allow us to measure plant community changes over time for each treatment method under different land uses and hydrologic conditions. We will

"WE BELIEVE OUR RESULTS WILL HELP PRODUCERS AND LAND MANAGERS WITH RUSSIAN OLIVE AND SALTCEDAR MANAGEMENT PROJECTS AND SERVE AS A MODEL FOR OTHER LARGE-SCALE INVASIVE PLANT PROJECTS IN THE WEST."

SCOTT BOCKNESS, MISSOURI RIVER WATERSHED COALITION

TABLE 1. Herbicide rate, application method, acres treated and location of treatment sites within the Missouri River Watershed Coalition states.

Site Number and Location		Target	Acres Treated	Treatment Date	Herbicide Rate and Application Method
1	Miles City, MT	Russian olive	14	10/30 to 12/30/2012	Garlon 4 Ultra 33%/67% basal oil (v/v) mixture – basal cut stump
		Saltcedar	3	9/1 to 9/30/2012	Garlon 4 Ultra 27%/73% basal oil (v/v) mixture – basal bark
2		Russian olive	15	10/30 to 12/30/2012	Garlon 4 Ultra 33%/67% basal oil (v/v) mixture – basal cut stump
		Saltcedar	3	9/1 to 9/30/2012	Garlon 4 Ultra 27%/73% basal oil (v/v) mixture – basal bark
3	Lovell, WY	Russian olive	14	2/28 to 3/5/2013	Garlon® 4 Ultra 33%/67% basal oil (v/v) mixture – basal cut stump
		Saltcedar	7	2012	Mastication of trees followed by herbicide application
4	Sturgis, SD	Russian olive	7	9/1 to 12/30/2012	Garlon 4 Ultra 33%/67% basal oil (v/v) mixture – basal cut stump
5	Hardin, MT	Russian olive	14	10 to 12/2012	Garlon 4 Ultra 27%/73% basal oil (v/v) mixture – basal bark
		Saltcedar	11	9/1 to 9/30/2012	
6	Big Horn County, MT	Russian olive	14	9/1 to 12/30/2012	Garlon 4 Ultra 33% /67% basal oil (v/v) mixture – basal cut stump

SCENES FROM THE FIELD. **Russian olive** (bottom left) and **saltcedar** (top left) infest more than one million acres in the Missouri River Watershed. • Garlon 4 Ultra was applied to Russian olive and saltcedar trees as a **basal cut stump treatment** (top center) or basal bark treatment. • **Vegetation surveys** were conducted at all project sites prior to treatment (top right). • **Big Horn County study area** (site 6) pre-treatment, September 2012 (bottom left) and post-treatment, March 2013 (bottom right) for Russian olive and saltcedar.

also be able to evaluate the efficacy of basal bark and basal cut stump treatments for controlling saltcedar and Russian olive."

Local, state, and federal agencies including the NRCS have committed resources to mitigating the impacts of saltcedar and Russian olive throughout the region. Work conducted in the watershed prior to 2012 show excellent efficacy with Garlon® 4 Ultra on both Russian olive and saltcedar, and results from the current study will help land managers adapt conservation practices to improve long-term control of these invasive plants and improve ecosystem function.

BIOENERGY PRODUCTION

EXPLORING THE FEASIBILITY OF CONVERTING invasive Russian olive and saltcedar to fuel is a key component of the project. Bockness explains, "We have at least one million acres infested with these invasive trees in the Missouri River Basin, and each acre produces from 5 to 10 tons of wood biomass that could be a great source of bioenergy. Current management includes cutting, stockpiling and burning the trees since other economical alternatives haven't been explored."

Russian olive and saltcedar samples were collected in July and August 2011 from five sites in Montana and Wyoming. Tests were conducted on the samples to determine British Thermal Unit (BTU) levels generated per pound of material, as well as ash content, volatile matter content, and moisture content. Test results were compared to data from forestry species traditionally used in bioenergy applications (Table 2).

Comparisons of the data indicate that while the BTU levels of both Russian olive and saltcedar are relatively close to those of forest materials, the ash content level of saltcedar is considerably higher than the desired levels for use in commercial wood pellet markets. Unlike other forest residues, these shrub-like invasive species require special (and more expensive) treatments to harvest, making them an expensive fuel source compared with natural gas, coal or forest fuels.

["WATERSHED" continued on page 8]

["WATERSHED" continued from page 7]

TABLE 2. Wood from invasive tree species could compete with fuel oil or propane (based on delivered cost of fuel).

Fuel (Unit)	Net Heating Value BTU/unit	Cost/unit	Cost/Million Metric BTU
Natural Gas (Therm)	82,000	$0.20	$2.44
Bituminous coal (Ton)	26,000,000	$125.00	$4.81
Wyoming coal (Ton)	22,000,000	$125.00	$5.68
Forest fuels (Oven dry ton)	13,800,000	$60.00	$4.35
Invasive trees (Oven dry ton)	13,800,000	$300.00	$21.74
Fuel Oil #2 (Gallon)	115,000	$4.00	$34.78
Propane (Gallon)	71,000	$2.50	$35.21


SCOTT BOCKNESS


SCOTT BOCKNESS

BIOFUELS. The project is looking at the feasibility of invasive Russian olive and saltcedar as a source of biofuel. **Invasive trees** are cut, stockpiled and burned on site (top). • **Wood pellets** generated from Russian olive (left).

"ONE OF OUR BIGGEST PROBLEMS IS THE COST OF TRANSPORTING BIOMASS; WE NEED A FACILITY WITHIN ABOUT 100 MILES OF OUR REMOVAL SITE TO BE ECONOMICALLY FEASIBLE."

SCOTT BOCKNESS, MISSOURI RIVER WATERSHED COALITION

LEARN MORE

Missouri River Watershed Coalition

PROJECT OBJECTIVES include measuring short- and long-term ecological changes, riparian system health and function, and natural resource protection on Russian olive and saltcedar infested sites treated with manual removal alone and in combination with herbicides; investigating and demonstrating the use of innovative bioenergy technologies that promote the utilization of invasive plant biomass as a fuel source; and transferring project findings, products, and technologies to a broad range of regional stakeholders.

OTHER PROJECT COMPONENTS include: project-specific website and webinars, on-site demonstration on Russian olive and saltcedar removal, regional presentations, publications, and a Wild Dakota television production on invasive plants.

PROJECT PARTNERS represent private landowners and producers; private sector and industry; and local, state and federal governments. MRWC is led by Andrew Canham (President) from **South Dakota** and Karie Decker (Vice President) from **University of Nebraska**; and comprised of reprentatives from **Montana** (Dave Burch), **Nebraska** (Mitch Coffin), **Wyoming** (Slade Franklin), **Kansas** (Scott Marsh), **South Dakota** (Ron Moehring), **Colorado** (Steve Ryder), and **North Dakota** (Rachel Seifert-Spilde) **Departments of Agriculture**, as well as with the **Center for Invasive Species Management–Montana State University** (Liz Galli-Noble–Director, CIG Principal Investigator and Scott Bockness –CIG Project Field Leader).

LEARN MORE about MRWC from: Scott Bockness at scott.bockness@montana.edu, or visit the MRWC website at weedcenter.org/mrwc/cig/

Natural Resource Conservation Service – Conservation Initiative Grant (CIG) Program

THE PURPOSE of the NRCS–CIG program is to stimulate the development and adoption of innovative conservation approaches and technologies, while leveraging federal investment in environmental enhancement and protection of riparian areas in conjunction with agricultural production. CIG projects are expected to lead to the transfer of conservation technologies, management systems, and innovative approaches (such as market-based systems) into NRCS policy, technical manuals, guides and references, or to the private sector.

READ MORE about the CIG grant program: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/

["WATERSHED" continued from page 8]

"The ash content is too high for making a high value residential wood pellet, but there may be a potential to supply facility-scale heating boilers with biomass," says Bockness. "One of our biggest problems is the cost of transporting biomass; we need a facility within about 100 miles of our removal site to be economically feasible."

The University of Nebraska-Lincoln and the Center for Invasive Species Management at Montana State University are working together to pursue funding for assessing the feasibility of installing biomass facilities in local schools or hospitals and integrating Russian olive and saltcedar removal with other fuel reduction projects on forest lands.

THE MRWC PROJECT HAS UNITED university, county, state, and federal agencies in a collaborative effort to manage invasive plants over a wide geographic area encompassing seven of the ten watershed states. "We believe that results from this project will help develop science-based conservation approaches for managing Russian olive and saltcedar in the Missouri River Watershed," says Bockness. "Increased knowledge related to the removal of invasive species and the vegetative response to the treatments will be critical to understanding secondary weed invasion and to facilitate ecosystem recovery methods. In addition, determining the feasibility of biomass generated from invasive species could be an innovative catalyst in supporting regional woody biomass alternative energy program developments."

Proper Application Timing

Maximizes Invasive Plant Control with Milestone® Herbicide

CANADA THISTLE
(Cirsium arvense)

Late spring and early summer applications of Milestone® on Canada thistle should be made after all plants have emerged and basal leaves are expanded. It is better to wait until some of the plants are at the bud growth stage to be sure that all plants are emerged before applying Milestone at 5 to 7 fluid ounces per acre (fl oz/A). Use the 7 fl oz/A rate at later growth stages.
http://bit.ly/canadathistle

RUSSIAN KNAPWEED
(Acroptilon repens)

Applications of Milestone at 5 to 7 fluid ounces per acre (fl oz/A) should be delayed until Russian knapweed has bolted and is in the early bud to flower growth stage through the fall. It is important to remember that herbicide efficacy symptoms do not always show on Russian knapweed the season the treatment is made.
http://bit.ly/russianknapweed

BIENNIAL THISTLES:
BULL THISTLE *(Cirsium vulgare)*
MUSK THISTLE *(Carduus nutans)*
PLUMELESS THISTLE *(Carduus acanthoides)*

Milestone at 3 to 5 fluid ounces product per acre (fl oz/A) can be applied in spring and early summer from rosette to early flower growth stage. Use the 5 fluid ounce rate at the late bolt to early flower growth stage.
http://bit.ly/biennialthistle

SPOTTED AND DIFFUSE KNAPWEED
(Centaurea stoebe and C. diffusa)

Milestone at 5 to 7 fl oz product per acre may be applied any time during the growing season when plants are actively growing. Applications made during the late bud to bloom stage will not stop seed production the year of treatment.
http://bit.ly/spottedknapweed

BLM and partners 'Restore New Mexico' on a landscape scale

BY JOHN WALLACE, J. WALLACE COMMUNICATIONS

By the Numbers
Restore New Mexico -

2 million acres
Restored to date – an area bigger than Delaware and Rhode Island combined

3 million acres
Targeted for restoration – about the size of Connecticut

$10 million
Investment by BLM

$10 million
Investment by Natural Resources Conservation Service

$3 million
Investment by oil and gas companies

$3 million
Investment by private individuals and groups

For more information about the Restore New Mexico Initiative, visit www.nmacd.org/restore-new-mexico

AMID THE BARREN FOOTHILLS of the West Potrillo Mountains southwest of Las Cruces, New Mexico, a group that included sportsmen, ranchers, biologists and conservationists gather to witness the early stages of an effort to restore this vast swath of Chihuahuan Desert, a wilderness study area.

Ray Lister, a natural resource specialist with the U.S. Bureau of Land Management (BLM) and others in this diverse group share concern for the health of the West Potrillos, and came together to restore an area they all value.

"When you're out here, there's nothing but creosotebush as far as the eye can see," explained Lister. But it wasn't always this way. Historically, this was grassland.

"This will be a grassland again, restored to a healthy ecological state," he predicts.

THE GOAL: HEALTHY LANDS

The 26,000-acre West Portrillos project is just one of many partnerships BLM has worked through in its Restore New Mexico initiative. The goal is to recover the state's native grasslands, woodlands and riparian areas to pre-1900 ecological states. Since then, unintended consequences of human activity have degraded those resources.

Now, diverse interests are cooperating to recover those lands. Since 2005, BLM and its partners in Restore New Mexico have pooled resources to recover more than 2 million acres of federal, state and private land. More than 300 partners have participated, including ranchers, other landowners, industry, conservation and sportsmen's groups, and federal and state agencies.

Bringing back historic grasslands now invaded by creosotebush and mesquite has been a priority in Restore New Mexico.

In the West Portrillos, planes applied pelleted Spike® 20P herbicide to significantly reduce the creosote and allow native grasses to return. This, in turn, reduces runoff and erosion and significantly improves habitat for wildlife.

"Ranchers, sportsmen, and wilderness advocates all care deeply about the West Potrillos," Lister says. "And even though everyone's approaching this effort with their own perspective, we've been able to come together and find a lot of common ground to develop a strategy to improve the health of the watershed and return the vegetative community to its natural potential."

Dow AgroSciences LLC has worked with BLM and other partners to ensure the most favorable outcomes for the investment and for the land. "Dow worked with our aerial applicators, on improving the processes, methodology and science of application," says Bill Merhege, BLM-New Mexico deputy state director, resources. "And any information we needed, Dow made available at the drop of a hat."

BEFORE AND AFTER. BLM used herbicide to treat sites infested with creosotebush and/or mesquite. Following brush removal with herbicide, grasses came back from long-lived seed in the soil; in some cases, grass production increased from 100 pounds to nearly 1,000 pounds per acre in three to five years.

GRASSES RECOVER

Lister led a field trip to a previously-treated site for the group to see firsthand the benefits of these recovery treatments.

"Once a brush species like creosotebush or mesquite overtakes a landscape and drives out the native grasses, it won't revert back to a healthy, balanced state on its own," explains Lister.

Other methods, like prescribed fire or mechanical removal are ineffective or just not practical on a landscape-scale basis. There's not enough fine fuel to carry a fire. Once brush is no longer dominant, Lister foresees using fire as a maintenance tool.

Following brush removal, grasses come back from long-lived seed in the soil. "Depending on site characteristics and if Mother Nature cooperates," Lister says, "we can see grass production increase from 100 pounds to nearly 1,000 pounds per acre in three to five years."

Many of the lands treated as part of the Restore New Mexico program, including the West Potrillos, allow cattle grazing. To speed recovery, ranchers agree to defer grazing for at least two growing seasons after treatment. Even with more grass, more cattle are not permitted. Still, ranchers typically support the effort because healthier rangelands benefit their ranching operations in other ways.

Results don't happen overnight, but the partners in the West Portrillos project – like those in many other projects – know their work can restore a healthy balance that benefits the land, wildlife, and many stakeholders who value this special place.

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Lessons from the Islands: Online Exclusives

From the tropical rainforests of the East Maui Watershed to Eastern Island at Midway Atoll National Wildlife Refuge, three articles from the Pacific Islands tell stories of innovative strategies to control incipient invasive plant populations, successful restoration of nesting seabird habitat through invasive plant control, and studies to improve individual plant herbicide application techniques.

Read online about how the National Park Service, US Fish and Wildlife Service, and University of Hawai'i Cooperative Extension Service Invasive Weed Management Program are using innovative approaches to address unique challenges of tropical ecosystems.

Protecting Paradise Through Partnerships– Surveillance, Detection, and a New Application Technology Benefit Miconia Control Effort

http://bit.ly/miconia


CELESTINE DUNCAN

Successful Habitat Restoration at Eastern Island, Midway Atoll National Wildlife Refuge

http://bit.ly/easternisland


KITTIPONG // PAPAHANAUMOKUAKEA.GOV


COURTESY OF JAMES LEARY

Herbicide Incision Point Injection for Woody Plant Control Saves Time and Resources

http://bit.ly/pointinjection

R12000120 010-58256 (WMS, 4/2013)