

A Working Ranch with an Effective Medusahead Management Program

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As any smart beef producer knows, their livelihood depends as much on healthy rangeland as it does on healthy cattle. When Oregon rancher Ben McGough realized he was in danger of losing his ranch to medusahead without an aggressive plan, he took action.

Ben and Barbara McGough had been searching for some time before they purchased the Circle Bar Ranch in Mitchell, Oregon in 2003. It's a traditional ranch of about 5,000 acres and they run

Medusahead (Taeniatherum caput-medusae)

Ben and Barbara McGough soon learned that medusahead germinates early with fall rains and grows roots during the cold winter months, which sets it up in the spring to have a head start over more desirable perennial plants. That head start allows it to reduce available soil moisture and other resources. Its high silica content makes it unpalatable to livestock and slow to decompose. This, and its prolific seed production, lead to monoculture areas with heavy loads of fine, dry fuel. These monocultures alter the fire regimes and



Medusahead:

- Germinates early - often in the fall
- Winter root growth
- Prolific seed production
- Virtually unpalatable to livestock
- Decomposes slowly
- Increases fire frequency & intensity

about 150 cow/calf pairs. They employ a full-time ranch manager and one ranch hand. What they didn't realize when they bought the ranch was that medusahead was in the process of taking ownership as well. In fact, medusahead was already taking control of almost 600 acres, ranging from light infestations to complete monocultures of this invasive annual grass.

This bulletin follows the management plan developed on a central Oregon ranch over the last five years. The main purpose is to give ranchers a perspective on the actual

facilitate the conversion of valuable rangeland to an annual-dominated system that essentially diminishes the land's value.

Medusahead currently infests millions of acres of western rangeland and the risk of ever-increasing infestations places us at a crossroads: protect and restore diverse landscape or give way to a monoculture of invasive grasses. On a ranch level,

The Circle Bar Ranch

Once Ben and Barbara discovered they had purchased a medusahead patch, they started trying to figure out what to do with it. Ben began consulting with ARS Ecologist Roger Sheley in Burns, Oregon to begin coming up with a plan to start managing the medusahead. One of the first things was to sit down and set some goals for the ranch:

1. They wanted to continue a cow/calf operation and decrease hay purchases.
2. Ben likes to hunt so they wanted to enhance the big game habitat for the ranch.
3. They considered protecting and maintaining a healthy ecosystem fundamental to good management.

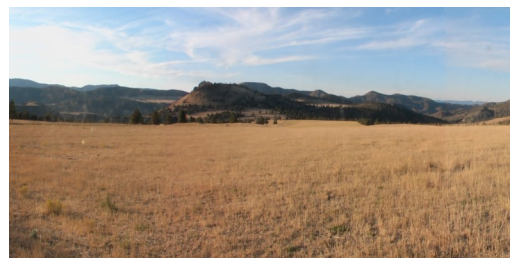
treatments and level of commitment needed in restoring medusahead-infested land. It is a cautionary tale to those whose lands don't have medusahead: *Do all you can to **prevent** it from establishing on your lands.* However, it is also a tale of success in that ranchers don't have to throw their hands up if medusahead is already infesting their rangelands. Restoration, though expensive, is possible.



The Circle Bar Ranch Near Mitchell, Oregon is a traditional ranch of about 5,000 acres, running about 150 cow/calf pairs.

medusahead spreads quickly, robs producers of usable rangeland and increases the risk and frequency of wildfire.

Establishing a diverse landscape with species filling multiple niches would bring the McGoughs closer to achieving these goals. In fact, few landscape goals would not be served by working toward a landscape that is diverse with various species filling multiple niches.



One of the top priorities the McGoughs needed to act on was to sit down, set some goals for the ranch and write out how to accomplish each of those goals.

Ecological Site Descriptions & Historic Uses

The McGoughs love the ranch for its scenic mountainous region with elevations between 3000 – 4000 feet. Western Juniper is the main tree species, though a small portion of the ranch is timbered property consisting of Ponderosa pine (very little medusahead exists in the pine forest area). The juniper is encroaching on the acreage on the ranch and, in conjunction with NRCS, they have been clearing much of it out. The ranch is in a 12-inch precipitation zone, most of the precipitation occurring in the winter as snow, with hot dry summers.

The soils tend toward higher percentages

of clay so, in general, they are heavier. Medusahead favors clay soil sites, however it is adaptable. Adaptability is a distinct characteristic of invasive species. Native grass species growing on the ranch include bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, and Thurber needlegrass. Shrub species growing include Wyoming and mountain big sagebrush, and antelope bitterbrush.

Historically, several homesteaders attempted dryland farming in the early 1900's but were unsuccessful, leaving large tracts of disturbed land. The imprint of that tillage is still visible. Intermediate



wheatgrass has been sown in fields on the ranch and there are a number of fields with a high percentage of this grass. There really are no accounts of when medusahead started appearing at the ranch. It has likely been on the ranch for a number of years since it's located in an area of Oregon with extensive medusahead infestations.

Implementing Ecologically-based Invasive Plant Management

Working with Roger Sheley, the McGough's decided to make medusahead management a priority. They wanted to use ecologically-based invasive plant management (EBIPM), a decision framework, to come up with a plan.

EBIPM is a stepwise decision framework to help managers increase successful management of invasive plants. The model

uses ecological processes as the basis for decision making and setting up integrated treatments, in this case for medusahead. EBIPM challenges land managers to find the true cause of the infestations, because the invasive plants are only a symptom of a deeper ecological problem. EBIPM also helps managers embrace the idea that our lands are complex ecosystems and that one treatment is not going to solve the

problem. By using the EBIPM approach managers can tailor a plan that works for their land and the resources they have available.

This story of the Circle Bar is to give land managers an example of one ranch's approach; it is not necessarily a recipe to recreate on land you might manage.

EBIPM Addresses Ecological Processes in Disrepair in Medusahead-dominated Fields

EBIPM focuses on the three causes of plant community change: 1. Site Availability— if there are sites available for a plant to establish, 2. Species Availability - if there are species available to occupy the site that is available and 3. Species Performance - if there are the resources available for the plant to perform – grow and reproduce.

From that perspective, the McGoughs



One of the strengths of EBIPM is its adaptability which allows managers to tailor a plan to work for their land and the resources they have available.

began to look at three keys in restoring their land, 1- how they could reduce the opportunities for medusahead to establish, 2- how to reduce the seed production of medusahead and increase desired species through seedings and stressing the medusahead to give the desired plants the competitive advantages, and 3- setting up treatments to address these processes instead of just focusing on eliminating the medusahead.

In demonstrating their commitment to this project, the McGoughs decided to hire an intern each summer to work solely

First Priority - Preventing the invasion of uninfested areas

On the Circle Bar, they started taking assessment of where the medusahead was on the ranch and how much they were dealing with. It was important to survey perimeters and also mark any small satellite infestations. With mapping started,

on the medusahead management. This is a dedicated effort to restoring this landscape. It may be possible to restore lands without this level of resources, however, successful management of medusahead will take considerable commitment of time and attention. During the last five years, many treatments have been tried; some haven't worked well. From these treatments it is also important to learn from what hasn't worked and try something else.

they started treating roadsides and trails since they are the corridors for spread. When they found a patch of medusahead, they sprayed and then broadcast seeded over the patch. They retreated the roadsides and trails each year for 5 years.

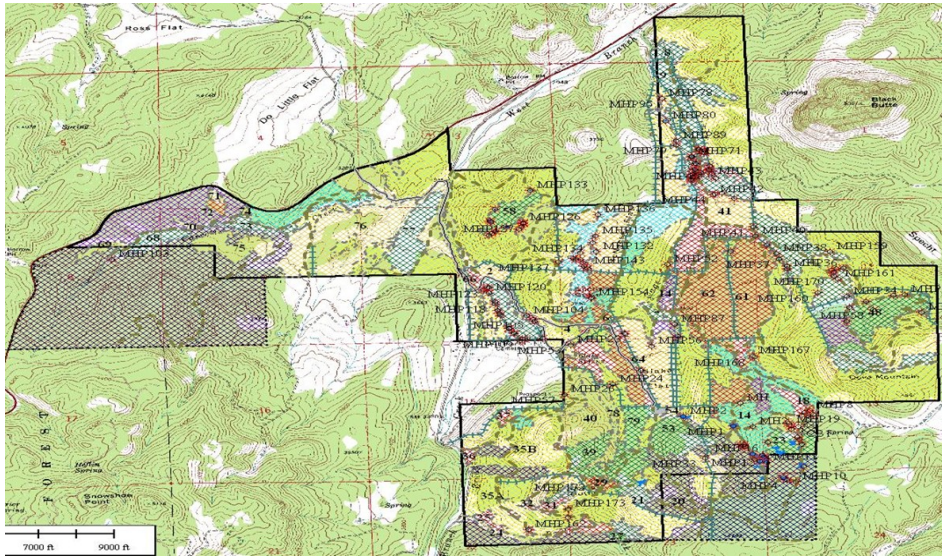
Usually the intern has treated and mapped at the same time using an ATV and a GPS unit. Mapping consists of making swaths across areas that can be traversed with the vehicle and by foot in less-accessible areas. The mapping has continued each year and the map is keyed by color.

For example, (see map below) dark green areas are sites that do not have medusahead or areas that need to

be watched carefully as the medusahead is sparse. Areas in orange are areas that contain medusahead, should be treated but

a seeding is not needed because there are enough residual desired species they may recover by reducing the competition from

medusahead. Sites marked in red are essentially medusahead monocultures and will require seeding after treatment. Purple areas are sites mostly at higher elevation that are dominated by pine/ Douglas fir and medusahead is only found in disturbed areas such as along roadside cuts. From the mapping it is estimated that 500-600 acres or about 15% of the ranch had medusahead infestations.



Ecological Principles and the Tools and Strategies Being Used

One of the tools the McGoughs used on the ranch has been herbicide treatments. The herbicide typically create fewer disturbances than other forms of mechanical weed removal. Imazapic can be effective on medusahead while most perennial grasses show tolerance to this herbicide. In many cases, areas were sprayed and/or seeded two and even three times to reach desired results. The **‘Prevention’** and **‘Restoration’** tables at right outline the herbicide treatments that address the process of disturbance for site availability, seed production for species availability and stress for species performance.

The **‘Seeding Treatments’** table below outlines the seedings that address process of dispersal for species availability, and address the processes of life strategies, interference and response to environment for species performance.

Prevention		
Application Method:	Spot Spray	Helicopter
Timing:	June - September	September 2009
Herbicide:	Plateau® or Panoramic® (imazapic) and surfactant	Plateau® (imazapic)
Rate:	6 oz/acre	6 oz/acre
GPA:	12	5
Area Treated:	spot spray while mapping; roadsides and traveled areas	100 acres inaccessible medusahead patches
Cost:	\$12/acre material only	\$600/hr (100 acres

Seeding Treatments	
Seeding Method:	One Pass Application in year 1; No-till drill in subsequent years
Timing:	October
Rate:	Increased each year from 12 lbs/acre in 2005 to 30 lbs/acre in 2009
Seed Mix:	Hycrest wheatgrass at 20%, bluebunch wheatgrass at 20%, intermediate wheatgrass at 20%, Ladac Alfalfa at 20%, and Sherman big bluegrass at 20%
Area Seeded:	25 acres in years 1-3; 50-60 acres in years 4-5
Cost:	\$1.94/lb at 15 to 30 lbs/acre = \$29 to \$58/acre

Restoration		
Application Method:	Year 1: One Pass Application	Years 1-5: with ATV sprayer
Timing:	October	June - September
Herbicide:	Plateau® or Panoramic®	Plateau® or Panoramic®
Rate:	6 oz/acre herbicide 12 lbs/acre seed	6 oz/acre
GPA:	12	11-12
Area Treated:	25 acres	500 acres
Cost:	\$23/acre seed \$12/acre materials \$35/acre labor & equipment	\$12/acre materials \$25/acre labor & equipment

The McGoughs also adapted their grazing practices to focus less stress on the desired species and to stress the medusahead more. Cattle don't preferentially graze medusahead but will graze it in heavily-infested areas in the spring when the plant is 2 to 4 inches. The

Along with the herbicide, seeding and grazing treatments, the McGoughs always



Concentrating efforts and resources on restoring medusahead-infested land is an expensive process. Some of the costs of treatments and the continuing efforts should put you on high alert – keep your land free of medusahead! Prevention is

Keys to the Successful Medusahead Management at the Circle Bar Ranch

The McGoughs appear to be winning the fight. Approximately 350 acres have been treated and 100 acres have been reseeded. The overall acreage of medusahead has been reduced by at least 60-70%. Fields that were monocultures of medusahead are now established with a variety of desired species and only isolated patches of the annual grass. Trails and roadsides are no longer corridors of medusahead.

Ben McGough is excited by the progress, “[We had] monoculture areas, you know, where there was nothing but medusahead. I am just really enthusiastic about this because we can go to some of those fields now and see pretty good grass growing.”

Primarily, the success the McGoughs have had in managing medusahead at the Circle Bar Ranch has come because:

amount of time areas can be grazed depends on the year. One season they had 6 weeks of grazing, but just 2-3 weeks of grazing the next year. The cows were not supplemented and maintained their body condition. This added stress of intensive grazing pressure on the medusahead can

Applying Adaptive Management

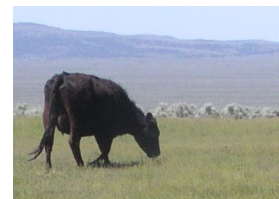
include a small control plot where they apply no treatments. This allows for data to be taken to compare and determine if treatments applied are effective beyond control of medusahead to include directing the plant community.

Adjustments are made to treatments and priority areas from what they learn each

Costs

inexpensive so protect un-infested land by using good land management practices and make mapping and monitoring key areas a high priority. If you are faced with infestations of medusahead or other invasive species, use EBIPM to look at how the system can be altered with lower

reduce its seed bank, thus crippling one of its competitive advantages. Also, in seeded fields, the cattle are usually kept from grazing until the desired species establish and have good growth.



year. As an example, the treatments have changed from using the one-pass system, which may work in other situations, but has been too erratic in establishing desired seedings as well as in managing medusahead. The main priority continues to be preventing the spread of medusahead into previously uninfested areas.

cost alternatives. Sometimes relatively low-cost land management practices can be implemented to give the desired species a competitive advantage over the invasive species. Also, an integrated effort will help keep costs to a minimum.



But fight is not over for the McGoughs and it may be just beginning for you. Save yourself from the time, effort and expenses of restoration; take action now by focusing on prevention first. If you're faced with an infestation of medusahead or other invasive species, use EBIPM to consider how you can treat the true underlying causes of the invasion and fix the actual problem.

1. They recognized the severity of the medusahead problem and realized that ignoring it would not make it go away.
2. They committed to the task and understood the persistence and resources required to successfully control the medusahead and restore their land.
3. They have used EBIPM to focus on and treat the actual causes of the infestations.
4. With help, they developed treatments to integrate strategies and tools to fully address the management of the medusahead.
5. They made it a top priority to prevent the further spread of medusahead into uninfested areas by thorough mapping and monitoring.

For more details on the Circle Bar Ranch or to learn more about EBIPM and how we can help you with your invasive species infestations, go to www.ebipm.org or contact Brenda Smith at Brenda.smith@ars.usda.gov or 541-573-4084.