Gallatin/Big Sky Weed Committee

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Gallatin/Big Sky Weed Committee

2014 Annual Report

By Jennifer Mohler, Coordinator

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Introduction

Project Area

The project area encompasses the portion of the Gallatin River Watershed south from Four Corners to the border of Yellowstone Park. Elevation ranges from 5000 feet near Four Corners to over 11,000 feet in the highest peaks. Annual precipitation ranges from 12-15 inches near Four Corners to 45 inches in the higher elevations. Most precipitation falls as snow, particularly above 6000 feet. Average temperatures range from 6^{o} F in winter to 78^{o} F in summer but can vary from over 100^{o} F in summer to -40^{o} F in winter. Soils are medium to moderately coarse with abundant rock fragments and are shallow in mountainous terrain and deeper in valley bottoms.

Valley floors are drier and are primarily shrub steppe/grassland. Lodgepole Pine with an understory of grouse whortleberry, pine grass, heartleaf arnica, or Oregon grape is the most common cover type found in the mid-elevations (5500-9500 feet). Douglas fir and Engelmann Spruce are common as well. Alpine vegetation includes whitebark pine, subalpine fir, sheep fescue, and alpine bluegrass.

The majority of property within the project area is National Forest System lands managed by the U.S. Forest Service. Private lands are concentrated in the Big Sky area and along the Gallatin River corridor. Montana Fish, Wildlife, and Parks maintain the Gallatin Game Range, which has parcels in the Buffalo Horn Creek and Taylor Fork Drainages as well as parcels adjacent to Big Sky. Yellowstone National Park is not included in the Project area.

Land Use

The U.S. Forest Service is the largest land owner in the project area, which is managed for multiple uses including: timber production, recreation, wildlife habitat, and watershed protection. Land from Four Corners south to the mouth of the canyon is mostly privately owned and land use is a mixture of agriculture, residential subdivisions, and businesses. Highway 191, which runs through Gallatin Canyon, is also a major transportation route connecting southwestern Montana and eastern Idaho.

The Gallatin Canyon and Big Sky area are known for world class outdoor recreation such as skiing, fishing, hunting, whitewater rafting, rock climbing, horseback riding, and backpacking. The natural amenities and proximity to the city of Bozeman and Yellowstone National Park draw a wide variety of outdoor enthusiasts from around the world.

Increased recreational use of the area has led to a high degree of residential and commercial development in the Big Sky area. Development of the area includes many subdivisions, homes, condominiums, businesses, and 3 major ski resorts. These pressures on the area have led to the inevitable introduction of noxious weed seeds from a variety of sources, and major development projects have provided ideal habitat for noxious weeds to thrive.

Gallatin / Big Sky Noxious Weed Committee

In 2004, the citizen-led Gallatin/Big Sky Weed Committee (formerly known as the Gallatin/Big Sky Noxious Weed Committee) organized under the auspice of the Northern Rocky Mountain RC&D to combat invasive plants in the Big Sky community and along the Gallatin River corridor, in Gallatin and Madison County, Montana. With the closing of the NRM RC&D, the Committee (comprised of the same volunteer board) applied for and received 501c3 designation. The Gallatin/Big Sky Weed Committee

(hereafter known as the Committee) celebrated its 10 year anniversary by re-evaluating its mission and goals. This opportunity provided the board clarity of purpose for the years to come.

Gallatin / Big Sky Weed Project

The presence of noxious weeds in the Gallatin Canyon and Big Sky area is directly attributed to human activity, such as construction, recreation, and travel (i.e. roads, trails, and water ways). Continued spread of noxious weeds negatively impacts wildlife, fisheries, water quality, downstream agricultural water users, scenic beauty, and property values. In essence, our love of wilderness and wildlife unfortunately can have a direct impact on their health, and working to address the negative effects of our actions is a reflection of our core community values. Protecting native ecosystems and natural resources is a tangible way to reduce our impact on the land.

Purpose

The purpose of the Gallatin/Big Sky Weed Committee is to protect and conserve native ecosystems from invasive exotic plant species in the Big Sky community and the Gallatin River watershed. These invasive plants affect all Montanans directly or indirectly through impacts on agricultural and forest economies and on other resources such as fish, wildlife habitat, recreation, and overall watershed health. Working collaboratively with federal, state, county, and local partners, the Committee promotes the management of invading noxious weeds by focusing on education, prevention, early detection, and rapid and timely response.

Mission

The mission of the Gallatin/Big Sky Weed Committee is to protect natural resources in the Gallatin River Watershed, including the Big Sky area, by promoting the management of invasive exotic plant species (noxious weeds) through integrated pest management.

Goals

The Big Sky Weed Committee has four primary goals:
1) Educate the local community about noxious weeds and their impacts;
2) Provide technical assistance to private landowners;
3) Assist and coordinate noxious weed management activities; and
4) Advocate for native plant and wildlife species to maintain ecological and economic health.

2014 Programs Report

This report details the activities and accomplishments of the Gallatin/Big Sky Weed Committee for 2014. During the transition from NRM RC&D to its own non-profit organizational status, the Committee continued pursing its goals, which were established in previous years, under the following programs: Landowner Assistance, Education/PR, Community Involvement, Mapping & Monitoring, and Habitat Improvement. Future efforts to develop a Membership / Partner Program are on the radar, but have yet to be developed. During this time of change and learning, it is likely that further examination and refinement

of these programs will occur. The Committee is now its own administrator and is working with an accounting firm to ensure all activities, records, and reporting are consistence and in line with standard operating procedures for a non-profit organization.

Landowner Assistance Program

Goal: Provide direct assistance to landowners in the form of weed identification, appropriate management strategies, and support through cost-share.

While the majority of property within the project area is part of the National Forest System, private lands concentrated in the Big Sky area and in Gallatin Canyon are the primary target for the Committee's efforts. National forest lands are managed by the U.S. Forest Service, with resource and expertise in land management, whereas private landowners rarely have such knowledge. This lack of resource management knowledge combined with the nature of a resort community (high turnover rates of property ownership, non-resident ownership, and development of vacant land) creates an environment conducive to noxious weed invasion and spread.

To address this, the Committee provides free one-on-site landowner education and technical assistance. The Committee's coordinator meets landowners or property managers on site to identify noxious weeds, provide information and materials regarding noxious weed management, and assist landowners with land management questions. This effort includes a cost share program to provide a financial incentive for landowners to treat noxious weeds.

Easy and timely access to noxious weed management information, along with follow-up support, is the primary way to ensure major economic and environmental impacts of noxious weeds are most effectively mitigated.

Site Visits

A total of 61 site visits, up from 37 in 2013, covering 2085 acres were conducted in 2014, with the first site visit being on May 28, and the last on November 5. The property inspection statistics for the 2014 field season and prior years are presented in Tables 1 and 2.

Table 1. Property Inspection Summary 2008-2014

Year	# Properties Inspected	Total Acres Inspected
2008	120	2026
2009	84	691
2010	98	369
2011	170	957
2012	49	617
2013	37	868
2014	61	2255
Total	**619**	**7783**

The dip in properties inspected in 2012 and 2013 could be attributed to the absence of a post card mailer being sent to property owners within the project area, which directly contacts landowners and explains the assistance the Committee offers. In 2014, the Committee again did not send out a post card mailer and reduced the number of newspaper advertisements due to budget restraints, thus overall outreach to landowners was reduced compared to previous years. The increase in the number of properties inspected may be due to general increased awareness of the Committee's services and or word of mouth by friends or neighbors.

Table 2. Number of Property Inspections by Month

	2008	2009	2010	2011	2012	2013	2014
May	27	2	0	3	2	2	1
June	30	23	1	6	4	7	3
July	28	31	10	14	3	15	19
August	19	23	10	79	25	9	27
September	14	5	55	46	12	4	10
October	0	0	22	22	3	1	0
November	2	0	0	0	0	0	1
Total	**120**	**84**	**98**	**170**	**49**	**38**	**61**

Table 3 shows the percentage of properties on which different noxious weeds were identified. Canada thistle, hoary alyssum, houndstongue, musk thistle, oxeye daisy, and spotted knapweed continue to be the main weeds identified.

Table 3. Percentage of Properties Inspected with Noxious Weed Species Present 2008-2014

	2008	2009	2010	2011	2012	2013	2014
bull thistle		5		5	4		
canada thistle	60	58	78	76	73	82	77
common tansy	9	5	35	5	2	16	3
curly dock				4	31	37	21
dalmation toadflax			1	1			2
field bindweed		1			2		
hoary alyssum	25	39	75	51	80	66	44
houndstongue	48	41	45	27	39	53	36
leafy spurge				1			
musk thistle	8	43	27	35	47	55	49
orange hawkweed					2	3	
oxeye daisy	17	27	48	48	43	39	44

	2008	2009	2010	2011	2012	2013	2014
poison hemlock				1	16	11	6
scentless chamomile							2
scotch thistle					6	5	5
spotted knapweed	53	49	51	30	43	29	28
sulfur cinquefoil		7		3	4	5	13
tall buttercup				1	2		
tansy ragwort				1			
yellow toadflax	9	7	3	11	14	24	13

Table 4. Inspections by Area

Area	2008	2009	2010	2011	2012	2013	2014
Big Sky	89	51	46	122	36	33	50
Canyon / 191	23	12	38	10	9	2	11
Four Corners	0	14	3	0	0	0	0
Gallatin Gateway	8	7	11	38	4	3	0
Total	**120**	**84**	**98**	**170**	**49**	**38**	**61**

As illustrated in Table 4, the majority of inspections occur in the Big Sky area.

Cost Share Program

In 2010, the Committee initiated a cost share program to provide monetary incentive for landowners in the project area to work together in stopping the spread of invasive weeds. Through strengthening on-the-ground management, the major economic and environmental impacts of weeds can be more effectively mitigated.

Multiple reasons exist for the focused assistance to property owners in the Project area:

- a large number of undeveloped/vacant lots
- many property owners are not full time residents
- high volume of traffic in the Gallatin Canyon due to tourism and recreation
- many subdivisions in the Gallatin Canyon do not have a homeowners association

The Committee obtained cost share funds from the Big Sky Resort Tax grant and advertised the program aggressively, both in newspapers ads and by informing landowners during site visits. The cost share program was intended to assist landowners, subdivisions and cooperating landowner groups located along the Gallatin River Corridor beginning at the north end of the Gallatin Canyon (where Gateway South Road meets Highway 191) and extending to the Yellowstone Park boundary, and the greater Big Sky area. In order to be eligible, interested landowners were required to have the Committee's Coordinator visit the property to ensure the presence of noxious weeds and provide pertinent and appropriate information on management of the species present.

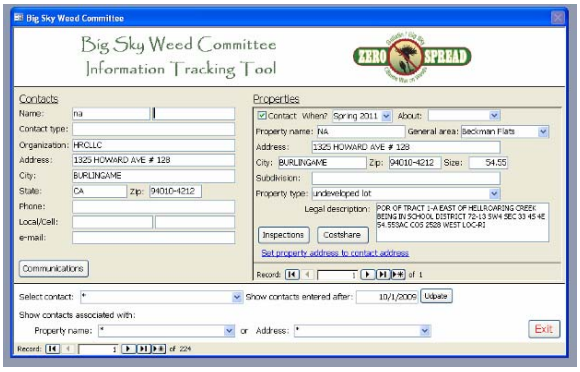
Applications were available on the website, and the annual maximum payment limit of $250.00 per applicant, up to 50 % of the cost of treatment (herbicide or herbicide and applicator fee). Four landowners submitted cost share applications by the October 15, 2014 deadline (Table 5).

Table 5. Cost Share: funds distributed to landowners

2010	2011	2012	2013	2014	Total
Total funds available: $5,500	Total funds available: $8,075	NA	Total funds available: $1,750	Total funds available: $2,000	
Coverage: ½ up to $500	Coverage: ½ up to $500	NA	Coverage: ½ up to $150	Coverage: ½ up to $250	
Total distributed = $2,123.21	Total distributed = $4,682.42	NA	Total distributed = $256.63	Total distributed = $736.00	Total distributed = $7,798.26
10 landowners	33 landowners	NA	5 landowners	4 landowners	52 landowners
122 acres	225 acres	NA	29 acres	115.5 acres	491.5 acres
5 miles of roadsides	29 miles of roadsides	NA	0 miles of roadsides	0 miles of roadsides	34 miles of roadsides

Database

In 2008, a database with landowner information was created by the Coordinator with assistance from Justin Mohler of Bridger Scientific, Inc, who donates his time and expertise. From that time to now, continued database refinement has occurred on a routine basis.



All landowner visits and communications in 2014 were entered into the database, furthering the Committee's efforts to maintain a comprehensive database. Table 6 illustrates the extent of communication and interaction in which the Committee engages. Many of the tables within the annual report are generated directly from the database. With most data management systems, it is likely that the database will routinely be improved upon to better facilitate the management of data collected by the Committee.

Table 6. Committee Database Statistics

Database Contents
7,783 acres represented
619 landowners
512 individual properties

Education/PR Program

Goal: Raise awareness and educate the public about noxious weeds and their impact on the ecosystem thorough various public relations outlets.

The composition of residents and visitors in the Committee's project area requires a constant and consistent message in order to increase awareness and initiate active management of noxious weeds. The nature of a resort community is marked by a high turnover of property owners, many of whom may lack knowledge and familiarity with local natural resource issues. The draw of such a pristine and wild area is the primary reason people visit and reside in Big Sky. The Committee's education/PR program promotes a healthy and balanced ecosystem, and strives to educate individuals, organizations, businesses, and others about the actions they can take to mitigate our impacts upon the natural landscape.

The Committee's education and public relations efforts benefit the entire community:

- Residents benefit from one-on-one on site assistance and the cost share program.
- Businesses benefit from a community invested in preserving the environment. Recreation, tourism, and real estate drive the economy, which benefits directly from a healthy and sustainable ecosystem.
- Large landowners benefit from the Committee's resources, connections, and engagement.
- Visitors and tourists become educated about the threat of invasive species and are inspired by the community's commitment to stewardship.
- Finally, the native flora and fauna of the region are the most direct beneficiaries of the Committee's efforts to protect and conserve native ecosystems from invasive exotic plant species.

Increasing development, high turnover rates of land ownership, and the increasing rates of visitors and recreationalists in the area require a sustained and visible campaign about noxious weeds, their impacts, and best management practices.

Logo

The Committee continued to utilize the logo (Gallatin/Big Sky Noxious Weed Committee) designed in 2013 due to budget restraints. Updating the logo with the current/correct name of Gallatin/Big Sky Weed Committee will be a priority for 2015.

Newspaper Outreach Campaign

Due to budget uncertainties and limitations, the 2014 advertising campaign was greatly reduced compared to previous years.

Lone Peak Lookout: No advertisements were placed in Lone Peak Lookout during 2014, whereas 16 ads ran throughout the season in 2013.

Big Sky Weekly: A series of 6 ads were placed and ran from June through August. Due to an error by Big Sky Weekly, the Committee received an additional ad for free, totaling 7 in all. The Committee received a 50% discount on ads placed due to being a non-profit.

Each advertisement was updated with current event information, contained information about a specific noxious weed species, and promoted the Committee's services, website, cost share program, and presence at the Big Sky Farmer's Market. Each ad focused on different educational information.

Gallatin River Weed Pull: Ads were placed in the Bozeman Chronicle for the event. The Committee applied for and was awarded "buy one, get one free" by the Chronicle, thus four total ads were placed. The template of "Volunteers Wanted" was used again to reduce costs. Fliers were created and distributed in many locations throughout the community: Bozeman, Four Corners, Gallatin Canyon and Big Sky.

Big Sky Weed Pull: Big Sky Owners Association paid for advertisements in both the Lone Peak Lookout and the Big Sky Weekly. Fliers were made and printed by BSOA, and distributed around the community by both BSOA staff and the coordinator.

Press Releases

The Committee's Coordinator sent press releases to multiple news outlets and organizations for the Gallatin River Weed Pull and the Big Sky Community Weed Pull. Press releases were sent to: Belgrade News, Bozeman Chronicle, Big Sky Weekly, Lone Peak Lookout, KBZK news, Three Forks Herald, KTVM news, Ryan Hamilton / Town Center news, Clear Channel Communications, KBOZ news, and Town Square Media.

E-Newsletters

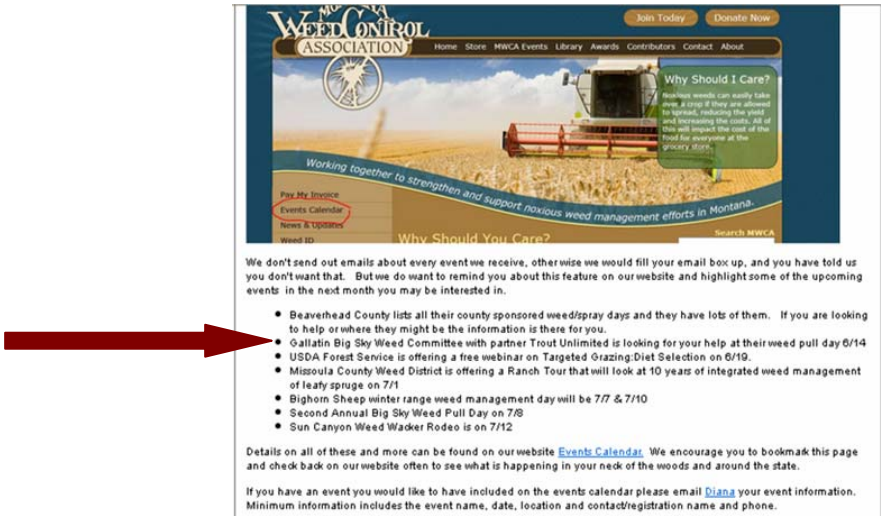
The Committee's Coordinator initiated an e-newsletter campaign to communicate Committee news, educational information, and event information. Emails from landowners collected over the years from site visits comprised the majority of the distribution list. Organizations, such as HOAs and other local non-profits, were also included in the list. Over the season, additional emails were added. For those not interested in receiving the newsletter, an unsubscribe button was included in the e-newsletter. Mailchimp was utilized due to familiarity and ease of use. Below are details and examples of the e-newsletters that were distributed.

Campaign	Date	Data
Gallatin River Weed Pull	Sent Tuesday, June 03, 2014	197 Subscribers 89 Individuals Opened
Big Sky Weed Pull	Sent Thursday, June 19, 2014	181 Subscribers 75 Individuals Opened
July Update	Sent Thursday, July 17, 2014	189 Subscribers 95 Individuals Opened

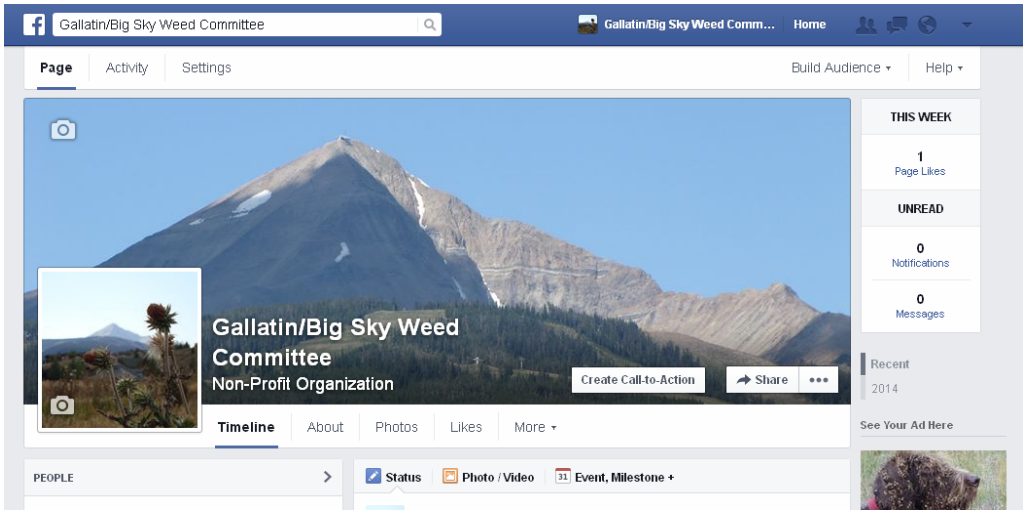
Managing Noxious Weeds Is A Community Effort: HOA Newsletter to Big Sky Owners Association, Moonlight HOA and Ramshorn HOA.

Sent Tuesday, July 29, 2014 3 Subscribers 3 Opens

The Committee received an e-newsletter from the Montana Weed Control Association in early June that contained information about the Gallatin River Weed Pull. This is proof that e-newsletters are making a mark and are a viable and productive way to get the word out.



Social Media



The Committee's Coordinator developed a Facebook page on April 25, 2014. As social media becomes more prevalent and is used by an increasing number of people, it is clear the Committee needs to have a presence. Various local organizations, non-profits, and HOA's have been "followed". The following is a selection of posts made during 2014. It does not include all posts, likes of other posts, nor comments of posts made.

Date	**Topic**
June 11	Gallatin River Weed Pull
June 17	Gallatin River Weed Pull event summary and thank you to partners were posted to their Facebook pages.
June 18	Now's the perfect time to pull weeds!
June 19	Houndstounge is another noxious weed that can easily be pulled when soils are wet.
June 26	Planting and fostering a weed-resistant plant community is one of the BEST way to prevent weed invasion.
July 2	Not all thistles are bad! Elk or Everts thistle is a native and in bloom around the community park.
July 14	Big Sky Community Weed Pull summary and thank you to partners.
Aug 12	A huge thank you to Madison County Weed Board and Gallatin County Weed District for their help during the cooperative management day last week.
Aug 12	Yes, it's Canada Thistle. While most flowers are rose-purple, flower color can vary from white to pale blue to purple. The best time to treat this noxious weed is in the fall, right after the first frost.
Aug 14	In contrast to exotics, native thistles are rarely reported as invasive and play an important role in the ecosystem.

Aug 18 Even moose are curious to learn about noxious weeds! This girl followed us around for an hour while we inspected a property. Do your part to keep native vegetation healthy for wildlife!

Posting activity declined with the end of the field season. Promotion and invitations to "like us on Facebook" were included on the e-newsletters, posters, and newspaper advertisements. Because people can see and review posts, comments, etc at any time through Facebook, public relations can be ever present and ongoing.

Website

From 2009-2013, the Committee's website was created and managed by the Center for Invasive Plant Management at Montana State University. In October of 2013, Kitty Weiss, the E-Communications Coordinator who managed the website updates, informed Jennifer via email that the funding situation has changed at the Center and she will no longer be able to continue making edits to the website.

The Committee's Coordinator began building a comprehensive new website via "WIX," which would enable the Coordinator to regularly update and refresh the website. It went online at the end of March. Updates occurred regularly throughout the year, including a link to Facebook, to ensure accurate and timely information was presented. Below is a screen shot of the home page of www.bigskyweeds.org.

Newspaper Coverage

Printed in the June 10, 2014 edition of the Big Sky Weekly, the following was submitted and printed as a letter to the editor.

LOCAL May 16-29, 2014 5

Letter: A decade of fighting noxious weeds

For the last 10 years, the Gallatin/Big Sky Weed Committee has worked to protect natural resources in Gallatin Canyon and the Big Sky community by promoting management of noxious weeds via education, prevention, early detection and rapid response.

Since its inception, the committee has worked with federal, state, county and local partners, bringing experts and resources to the community. In that spirit, we hosted the first ever Big Sky Weed Summit at the Huntley Lodge on April 14. Various agencies and local landowners were invited to attend a two-hour working session designed to stimulate a dialogue about invasive species management on the larger landscape level.

The agenda covered Montana noxious weed law, management plans, treatment including new herbicides, and biological control. The roundtable discussion proved informative and productive, and the committee hopes to continue this on an annual basis. We also planned for the second annual Big Sky treatment day with both the Madison and Gallatin Weed Control Districts, which is set for Aug. 6.

The presence of noxious weeds is directly connected to human activity, such as construction, recreation and travel. Continued spread of noxious weeds negatively impacts wildlife, fisheries, water quality, scenic beauty and property values. Working to address the negative effects of our actions is a tangible way to reduce our impact on the land.

Finally, we are proud to announce that the committee will be operating as a 501(c)(3) organization soon. Information about free landowner assistance, cost share, opportunities to volunteer at the two community weeds pulls, and weed identification and management is available at our new website, bigskyweeds.org.

-Jennifer Mohler, Gallatin/Big Sky Weed Committee

Gallatin Canyon Billboards

Roadside signs continue to educate those traveling Highway 191. The two signs were erected in 2005 by the Committee and remain along the heavily traveled corridor. One is located at the canyon entrance and the other near Storm Castle. These signs are within view of everyone who drives the canyon, helping deliver the "Zero Spread" word.

According to Montana Department of Transportation studies, there were 4,397 cars that travelled the Gallatin Canyon on an "average" day in 2013.

Community Program

Goal: Raise awareness and educate the public about noxious weeds and their impact on the ecosystem through community events, partnerships, and programs.

From educating kids at summer camps or Ophir School, to reaching residents and visitors at the Big Sky Farmers Market, the community program aims to raise awareness and educate the public about noxious weeds and their impact on the local ecosystem.

Prevention, early detection, and rapid response are core tenants of effective noxious weed management and this message needs to be conveyed to the parties most closely associated with the development process, including Developers, Realtors, Property Management Companies, and Homeowners Associations. It is critical that all those involved in the process be reached, educated, and encouraged to take action to mitigate noxious weed spread.

Greater Gallatin Watershed Council Annual Meeting

January 16

The Committee's Coordinator was invited to be a speaker on their panel discussion about local restoration projects. Five panelists shared their accomplishments in watershed restoration. The following is from GGWC's 2-12-14 e-newsletter: "We heard from Jennifer Mohler, a resource conservationist and coordinator of the Gallatin/Big Sky Noxious Weed Committee, about sustainable management practices on her small horse-focused property. Mark Story, GGWC board member and a retired hydrologist with the US Forest Service, discussed road closures and rehab work in the Gallatin National Forest and the benefits to the watershed. Next Tom Coleman, a water resources engineer, shared examples of stream restoration. Finally, Kyle Mehrens, GIS Technician, and Herb Bartle, Water Reclamation Facility superintendent, both with the City of Bozeman, shared the latest about the city's stormwater infrastructure and wastewater treatment."

The meeting was well attended and it was a wonderful opportunity for the GBSWC to publicly thank GGWC for all their hard work in protecting water resources.

Big Sky Weed Summit

April 14

Since its inception, the Committee has working collaboratively with federal, state, county, and local partners, bringing experts and resources to the benefit of the Big Sky community. In that spirit, the Gallatin/Big Sky Weed Committee hosted the first ever Big Sky Weed Summit at the Huntley Lodge on April 14. Various agencies and local large landowners were invited to attend a two hour working session designed to stimulate a dialogue about invasive species management on the larger landscape level.

The attendees included Yellowstone Club, Big Sky Resort, Moonlight Basin, Spanish Peaks Mountain Club, Jack Creek Preserve, Big Sky Owners Association, Big Sky Community Corporation, Gallatin County Weed District, Madison County Weed District, MSU Extension, Gallatin National Forest, and Montana Department of Transportation. Never before had so many land managers and agency personnel come together to discuss noxious weed management. The agenda covered Montana noxious weed law, weed management plans, specific weed treatment (including new herbicides and biological controls), and the second annual Big Sky treatment day with both the Madison and Gallatin Weed Control Districts. The roundtable discussion proved informative and productive, and the Committee hopes to continue this on an annual basis.

The Committee appreciated the efforts and support of both Dax Schieffer, of Big Sky Resort, and Susan Scott, of Big Sky Owners Association, for their assistance with the event.

Interagency Weed Managers Meeting

April 17

Hosted by the Gallatin County Weed District, the meeting facilitated communication between agencies charged with the responsibility of noxious weed management in Gallatin County, and provided an opportunity to coordinate cooperative interagency weed projects for more effective weed control in

Gallatin County. The Committee's Coordinator and five board members attended the meeting, and dates were set for cooperative spray days and bighorn sheep treatment days.

Gallatin County Farm Fair

May 6-8

Led by the Gallatin Valley Agriculture Committee, the Farm Fair is a day of fun for fourth grade school kids in the Bozeman area. Students come to learn about ranching, farming, and the importance of agriculture to our community and valley. Kids participate in workshops, activities, viewing & petting animals, and learning about farming.

In its tenth year, the Farm Fair has grown to three days and provides over 1,000 fourth graders from 20 schools in Gallatin County, including Big Sky's Ophir School, a hands-on experience at 16 booths dedicated to farm life. The goal is to introduce kids to all the agri-sciences and where our food comes from and how it gets to their tables. Teachers appreciate the opportunity to get the kids out of the classroom and learn about all the careers and possibilities in the agriculture world. The fair helps students to foster an appreciation for Montana farmers and ranchers, demonstrating to the kids the importance of agriculture and how it relates to them in our community and in the world. The fair is being held on a working ranch, owned by Ed and Punky Brainard, north of Belgrade. The Bozeman Chamber of Commerce and the Belgrade Chamber of Commerce sponsored the event, along with Carrie Taylor, and the Gallatin Valley Agriculture Committee organized the fair. Those adding to the success of this experience are the valley businesses that financially supported the Farm Fair and over 75 volunteers and presenters who made sure the kids had a great time.

The fair consists of 16 different agriculture stations. Some of the stations include dairy cows, goats, pigs, beef cattle, draft horses, pleasure horses, bees and pollination, forestry, noxious weeds, irrigation, farm safety, crops, wheat, potatoes, weeds, 4-H, and, the ever popular, "homemade ice cream."

Jennifer Mohler joined Mike Jones and John Ansley from the Gallatin County Weed District to host a Noxious Weed booth. A new class of students visited the booth every 15 minutes, so presentation time was short. After covering basic noxious weed education points (what is a noxious weed, how did they get here, where did they come from, why are they bad, how do you work to control/manage them, etc.), students were challenged to see if they could spit sunflowers seeds as far as leafy spurge explosively dehisces its seed. The student that "spit" the farthest received a prize of a weed ID booklet, plastic noxious weed plant, or a temporary tattoo. The activity was a hit, as students, teachers, and volunteers seemed to enjoy the seed spreading challenge.

Pasture Management Class for Small Acreage Landowners

Cooperative Project with MSU Extension
April 14 – May 19


2014 Small Acreage Management Course

Location: MSU Campus—Animal BioSciences Building Room 138
Date: Mondays April 14-May 19 and one on site tour TBA
Time: 6:30 p.m. to 8:30 p.m.
Price: $75

Teachers for the program are:
Jennifer Mohler, Gallatin Big Sky Noxious Weed Committee
Brad Bauer, , Gallatin County MSU Extension, Natural Resource Agent
Emily Lockard, Gallatin County MSU Extension, Agriculture Agent

Course Overview

Each 2-hour class session is devoted to a specific topic and provides landowners the basic knowledge and skills needed to understand the soil, water, and plant resources on their property.

Participants will receive:
- Aerial photos
- Soil survey maps
- Soil reports which will help landowners learn how their soil relates to pasture production capabilities

Participants will learn about:
- Weed ecology
- Basics of plant growth
- Common pasture plants
- Forest plants
- Weed identification
- Plant response to grazing/mowing
- How to manage and improve their grass production
- Guidance about grazing principals and management
- Methods for weed control

By the end of this course each participant will have the basis for creating a grazing management plan suitable for their property. All of this resource information will help the landowner formulate achievable goals for their property designed to result in a sustainable grazing system for their animals.

Registration due to the Gallatin County MSU Extension office by Monday March 31st
Cost for the Small Acre Management Course is $75.00 for two participants and is limited to 30 total participants with a minimum of 10. Each pair of enrollees get space for two attendees and one set of classroom materials. Single registrants get one spot and one set of classroom materials.

To register or for more information please contact the Gallatin County MSU Extension office by calling 388-3213 or emailing gallatin@montana.edu
Bring or mail registration with your name, phone number, address and email address to:
Gallatin County MSU Extension
201 W. Madison Ave. Ste 300 Belgrade, MT 59714
Space is limited. Parking passing are not needed on campus after 6 p.m.
www.gallatinextension.com

MONTANA STATE UNIVERSITY EXTENSION

The growing number of smaller acreage landowners, many of which are horse owners, mirrors the rapidly growing population in the Gallatin Valley. The increased number of "ranchettes" is resulting in many small-acreage landowners who lack the background in land stewardship needed to properly manage their land. Conserving natural resources can best be accomplished when landowners are provided with the knowledge and tools to enable them to make wise decisions about land management.

Participants receive aerial photos, soil survey maps, and a variety of soil reports designed to educate the landowner about the capabilities and limitations of their soils from a pasture production perspective. Participants learn about weed ecology, weed identification, and methods for weed control. They gain knowledge of the basics of plant growth, plant response to grazing/mowing, common pasture plant species, and how to improve their grass production. Participants also receive guidance about grazing principals and management, which will form the basis for creating a grazing management plan suitable for their property. All of this resource information will help the landowner formulate achievable goals for their property designed to result in a sustainable grazing system for their animals.

The cooperative project with Emily Lockard and Brad Bauer of Gallatin County Extension ensures the continuation of a successful educational program and an opportunity for landowners to get in-depth, comprehensive assistance in management of natural resources. The six week class was held in room 138 of the new Animal Bioscience Building at Montana State University in Bozeman and included a field trip to a small acreage horse property following the class.

Gallatin Gateway Youth Group Weed Pull

May 24

Jennifer Mohler joined Mike Jones and John Ansley from the Gallatin County Weed District in providing a Noxious Weed Education Event and Weed Pull for the Gallatin Gateway Youth Program. After a 20 minute educational talk about noxious weeds, the group proceeded to pull weeds around the Gallatin Gateway Community Center for an hour and a half. Spotted knapweed and hoary alyssum were the most abundant weeds pulled. After pulling, the bagged weeds were taken to the landfill.

6th Annual Gallatin Weed Pull and River Clean Up

June 14

Under the threat of heavy rain, nineteen volunteers made a difference in the fight against noxious weeds along the much recreated Gallatin River. On Saturday, June 14, the Gallatin/Big Sky Noxious Weed Committee in partnership with Madison-Gallatin Trout Unlimited held the sixth annual weed pull and river clean up day. Volunteers came from various groups to collect 680 pounds of noxious weeds and trash (Table 7).

Weather likely played a part in deterring volunteers. While the overall amount collected is down from last year, the amount each volunteer collected was up! The Weed Committee is observing fewer noxious weeds at the selected sites, indicating the yearly effort is having a positive impact in the reduction of noxious weeds.

Volunteers met in the parking lot of Murdoch's for coffee and muffins, and were treated to a volunteer prize drawing of donated items from Simms, Greater Gallatin Watershed Council, Sola Cafe, Bridger Brewing CO, Gallatin Valley Land Trust, Uswirl, and the River's Edge West. Because of the generosity of these donors, every volunteer walked away with a prize.

After distributing the prizes, thanking donors and sponsors, including the Bozeman Daily Chronicle and Big Sky Weekly for donating partial advertising for the event, volunteers split into 3 teams and headed to predetermined locations along the Gallatin River to collect noxious weeds and trash. Each team had a leader who helped with plant identification, so only noxious weeds were pulled.

The cleanup sites chosen were heavily used recreation sites on public land: Portal Creek Flats, 30 acres of forest service property located just north of Rock Haven Camp, unnamed flats at the mouth of the Canyon where FWP does game checks, and William Bridge. Portal Creek Flats has been a pull site for the past five years, and while returning volunteers noticed fewer weeds due to their efforts, the presence and density of hoary alyssum has dramatically increased, highlighting a well known issue about noxious weeds: it takes multiple years of aggressive treatment to eliminate established noxious weed patches.

Thank you's were posted on Facebook following the event for helping the Gallatin/Big Sky Weed Committee make a difference in our efforts of zero spread along the beloved Gallatin River. Posts were made to: Madison-Gallatin Trout Unlimited; Greater Gallatin Watershed Council; Simms; Montana Fish, Wildlife and Parks; Gallatin County Weed District; Gallatin National Forest Service; Big Sky Resort Area District; Simms; Sola Café: Bridger Brewing CO; The River's Edge West; Gallatin Valley Land Trust; Uswirl; Mojava Coffee; and Murdoch's.

Table 7. Gallatin River Weed Pull Data 2009-2014

	2009	2010	2011	2012	2013	2014	Total
# Volunteers	55	38	28	22	30	19	192
Pounds collected	---	850 lbs	1060 lbs	1120 lbs	720 lbs	680 lbs	4,430 lbs

2nd Annual Big Sky Community Weed Pull

July 8

Community noxious weed pulls present a unique opportunity to combine education about natural resources with service in protecting those beloved and highly used resources. Volunteers met at the pavilion at 4:30pm and were briefed with a tutorial about noxious weeds (why they are bad, how to ID, how to pull). Volunteers dispersed to pre-identified sites with abundant noxious weeds. Led by a weed ID expert, they collected weeds for 1.5 hours, and returned to the pavilion to be treated to a barbeque. The social hour provided a unique opportunity to "de-brief," answer questions, and revel in weed pulling success. Twenty-eight people volunteered and pulled 440 lbs of noxious weeds (Table 8). That's nearly 16 pounds per person! Event partners included Big Sky Owners Association, Yellowstone Club, Big Sky Community Corporation, and Gallatin County Weed District.

Table 8. Big Sky Community Weed Pull Data 2013-2014

	2013	2014	Total
# Volunteers	27	28	55
Pounds collected	680 lbs	440 lbs	1,120 lbs

Blue Water Task Force Landscape Workshop

July 22

Blue Water Task Force invited the Committee to be a presenter at their Trout Friendly Landscaping Workshop held on July 22 at the Lone Peak Brewery from 11am to 2 pm. The goal of this workshop was to help improve water quality by reducing nitrogen inputs and associated nuisance algal blooms in the West Fork and Upper Gallatin River. This workshop was primarily for landscapers and lawn maintenance leaders, but other organizations and individuals are invited to attend. The following were fellow presenters:

Christine Miller, Groundwater and surface water
Travis Horton, Fish Biology and ecology
Clain Jones, Soil Fertility/Fertilizer
Jennifer Mohler, Noxious Weeds and Herbicides
Randy Pierce, Irrigation

Big Sky Fly Fishing Festival: Blue Water Task Force

July 27

On the afternoon of Sunday July 27, Blue Water Task Force hosted a family friendly outdoor event in Town Center. Activities included product demonstrations, casting clinics and competitions, fly tying, kids activities, scavenger hunt, wader and rod-rigging races, guided nature trips to the river, and river and trout conservation educational booths.

Due to budget restrictions, the Committee did not host an education noxious weed booth this year, but provided BWTF with the following educational materials: A Guide to Montana's Freshwater Aquatic Plants, Help Stop Aquatic Hitchhikers, Montana Noxious Weed Alert: Eurasian Watermilfoil.

Big Sky Landscaping Presentation

July 29

The Coordinator was contacted by Megan Gorder with Big Sky Landscaping and asked to give a noxious weed talk to the public and BSL employees. Roughly 15 people attended the talk that included noxious weed basics, weed ID, and ecology. Farmer's Market handouts and educational materials were utilized, and all walked away with a weed ID booklet. Three landowner site visits resulted from the event.

Gallatin Canyon Women's Club - Dirt Diggers's Native Plant Tour

July 28

Founded in 1927, the mission of Gallatin Canyon Women's Club is to meet as a social, educational and philanthropic club that offers fellowship, scholarship and community outreach programs to the Gallatin Canyon communities. The Coordinator was contacted by one of the members and asked to give a talk and tour of her native gardens. Approximately 12 people traveled from Big Sky to Belgrade to tour the Coordinator's gardens and learn about using native plants in landscapes, noxious weeds, and low maintenance gardening.

2nd Annual Cooperative Treatment Day in Big Sky

August 6

On Wednesday, August 6, Madison and Gallatin County Weed Districts participated in treating noxious weeds in the Big Sky area for the second year in a row. Both the mountain and meadow areas were targeted. Gallatin County Weed District provided 4 people, four wheelers, and a spray truck. Madison Country Weed District provided 10 people, four 4-wheelers, a spray truck, and two 6-wheelers.

Individuals from Montana Department of Transportation and Big Sky Resort also assisted, resulting in 19 people working that day.

All crews rendezvoused at the large parking lots at Big Sky resort. After forming a plan, the crews dispersed to selected sites. Madison crews focused on the upper mountain: Highway 64 around Andesite road, Jack Creek Road from the fire station to Moonlight, parking areas at Big Sky Resort, and many others. The Gallatin County crews treated Reflector Trail open space, along Ouzel Falls Road, leafy spurge patches near the pond (treated yearly since its initial discovery in 2011) and along the pedestrian trail near the intersection of Highway 191 and Lone Mountain Trail.

Of specific note was the request by Big Sky Owners Association in seeking help in treating the open space land off Little Coyote Road, which is bisected by the Reflector Trail. Both BSOA and the Committee have received multiple complaints about noxious weeds on the property. The Coordinator arranged for that property to be treated during the cooperative spray day.

All who participated agreed it was another successful event and looked forward to a third annual cooperative day in 2015.

Photo: Parking lot for Big Sky Resort

Photo: Crews planning for the day

Photo: Crews treating Reflector Trail open space.

Photo: Crews treating leafy spurge by pond.

Jack Creek Preserve Camp

August 7

The Coordinator was contacted by Matthew Piper, Big Sky Watershed Corps Member with the Jack Creek Preserve Foundation, and asked to again educate young campers (age 12-18) about noxious weeds on August 7. Jack Creek Youth Camp is a multi-day overnight camp to learn about wildlife and habitat conservation. Activities include archery, elk bugling, wilderness safety, weed identification, outdoor photography, fishing, and much more. Camp is staffed by volunteers from the community and partner organizations.

Jennifer spoke in three sessions for approximately 1.5 hours each. The presentation included general noxious weed information and identification (using weed mounts), after which the campers played weed jeopardy. Jennifer gave the camp 60 weed identification pocket guides for distribution to counselors and campers. A noxious weed poster Jennifer provided the camp in 2013 was observed hanging on the cabin wall for all to see.

Big Sky Farmers Market

Wednesday Evenings, July 9- September 3

The Big Sky Farmers Market was held every Wednesday Big Sky from July 9-September 3 (excluding July 30) from 5-8 pm at Fire Pit Park in the Town Center. There were between 30 and 90 vendors, featuring fresh produce, herbs, plants and flowers, baked goods, woodworking, log furniture, antler art, photography and fine art, jewelry, clothing, and food items.

It marked the third year the Committee hosted a table with weed mounts, educational handouts, business cards, posters, and the GBSWC banner.

The booth proved very popular, as many were drawn by the "pretty framed flowers" only to learn they were noxious weeds.

Both locals and visitors visited the booth, engaged in conversation, and many walked away with weed ID booklets, along with more insight into how noxious weeds affect the greater Yellowstone ecosystem. Many visitors expressed their

appreciation that outreach and education about noxious weeds was a priority for the community.

Many wonderful connections were made and multiple property inspections resulted from it. The Farmers Market continues to be a great opportunity to engage with locals and visitors about noxious weeds.

Big Sky Owners Association Annual Meeting

August 29

The BSOA is Big Sky's oldest and largest home owner's association comprising over 8,000 acres, 29 condominium associations, 14 subdivisions, multiple certificates-of-survey, and other land tracts. BSOA's membership consists of 2,350 property owners - 85% of which are not full-time Big Sky residents. Suzan Phillips Scott, Executive Director of BSOA, worked closely with the Committee's Coordinator all year to assist property owners and tackle invasive plant species within BSOA's territory.

The Coordinator attended the Big Sky Owners Association Meeting and reception on August 29. Upon adjournment of the meeting, BSOA members and guests moved over to the reception, where the Coordinator had a table with weed information, handouts, brochures, weed identification mounts, and contact cards. Many landowners asked questions, took handouts, and site visits were discussed.

Ophir School Weed Education Event and Pull

October 6

Since 2008, the Gallatin/Big Sky Weed Committee has worked with Brittany Ellis of Ophir School to educate second graders about noxious weeds and their impact on natural recourses.

The kids arrived with the "What's In Your World?" field kit, (previously procured for the class by the Committee and now out of production), which contains resources and tools for kids to explore the natural resources on site. These kits now remain with the teacher to be used year after year.

This year's field trip was held on Monday, October 6. Thirty-one Ophir School second grade students, along with eight teachers and parents and seven Weed Committee volunteers, participated in a field trip to Big Sky Community Park. The objectives of the field trip were to educate the students about noxious weed identification, the impacts of noxious weeds, weed mapping using GPS technology, and noxious weed management options.

Both kids and adults learned to identify several species of noxious weeds, use the GPS units to map noxious weeds, and utilize

the “What’s in Your World?” field kits. After mapping weeds, kids spread out across the park pulling noxious weeds. Thirteen very large garbage bags were collected, with an estimated weight of 550 pounds (Table 9).

Upon returning to the pavilion, Shantell-Frame Martin presented the Fight Five Weed Kits that the Committee obtained from the Montana Weed Control Association for the kids. The kits were funded by a Montana Noxious Weed Trust Fund Grant and were distributed around the state with the goals of educating the youth about noxious weeds. Each kit contains:

- lightweight Fight 5 backpack
- t-shirt to draw on (each kid’s five noxious weeds)
- markers
- stickers
- “Why Should I Care” booklet
- “Watch out for Weeds” coloring book
- “noxious weed warrior” bracelet
- noxious weed refrigerator magnets
- postcard to send into the MWCA that explains what five weeds each kid chose to put on his or her t-shirt.

The kit is engaging, interactive, and proved a wonderful exercise to do after the event.

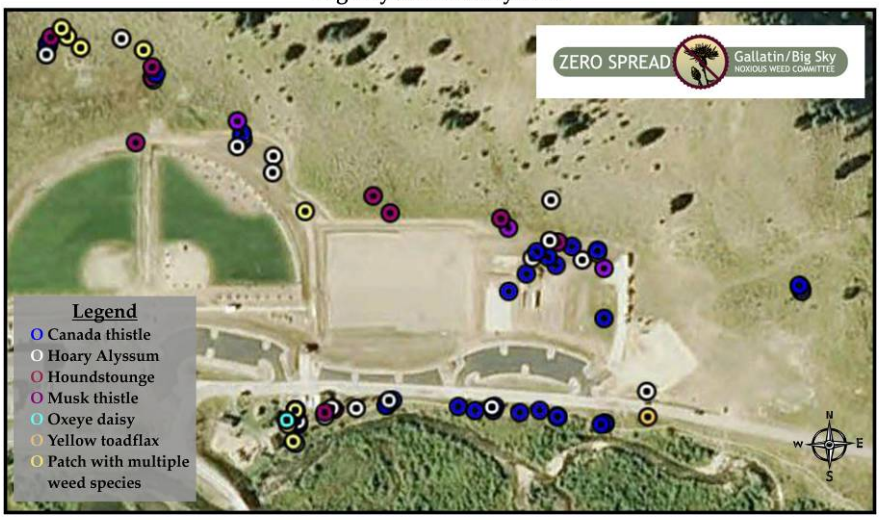
After the event, the Coordinator downloaded the GPS data and created a color map of the noxious weeds to provide to the class.

Table 9. Ophir School Weed Pull Data 2008-2014

	2008	2009	2010	2011	2012	2013	2014	Total
# Participants	--	50	40	30	31	39	46	236
Location	Moose Creek Campground	Moose Creek Campground	Portal Creek Flats	Big Sky Community Park	Big Sky Community Park	Big Sky Community Park	Big Sky Community Park	
Pounds collected *estimated lbs	*480 lbs	*300 lbs	*425 lbs	275 lbs	405 lbs	500 lbs	550 lbs	2935 lbs

Ophir School Noxious Weed GPS Map 2014

Big Sky Community Park



Pesticide Recycling Program

The Montana Department of Agriculture's Pesticide Container Recycling Program was created to keep pesticide container plastic out of Montana's landfills. Emptied and cleaned plastic containers are stored at sites throughout Montana, where a truck equipped with shredding equipment and poly transport bags visits the storage sites several times each summer to prepare the plastic for recycling. The program, established with help from the federal Environmental Protection Agency, collected approximately 288,000 pounds of pesticide container since the beginning of the program in October 2009. Shredded plastic from pesticide containers is recycled to create non-consumer items such as drain tile, roadway speed bumps, pallets, and landscape edging.

In a cooperative effort with partners that comprise the Big Sky Natural Resource Council, the Committee worked with the Montana Department of Agriculture to establish a pesticide container recycling program in Big Sky. The four golf courses alone produce a significant quantity of pesticide containers, and establishing a local recycling site would reduce time and cost of disposal and ensure containers were recycled instead of ending up in the landfill.

Carli Lofing from the Montana Department of Agriculture was contacted to get the Big Sky recycling location on the schedule. Dax Scheiffer and Sam Woodger worked to identify and build a central storage location for used pesticide containers at the Big Sky Golf Course maintenance facility. For the initial year, the program was limited to a few private weed spray programs along with containers from the four golf courses in order to ensure the site was being used as intended and not for miscellaneous dumping.

There was one pick up in early November, which enabled golf course contributions. There were enough containers to fill a 15 yd vessel. Some containers were either too big or were not prepared accordingly (triple rinsed, labels removed, etc.) and therefore not collected. To ensure better compliance with requirements for recycling, partners will aim to improve outreach/education and signage at the site.

Photo: Recycling site

Map: Recycling Location

Ramshorn HOA Presentation

November 5

The Coordinator was invited to speak to the Ramshorn Homeowners Association at their annual meeting on the evening of November 5. The Coordinator gave a brief power point presentation about noxious weeds, their impacts on the ecosystem, weed ID, what landowners can do, and services offered by the Committee. The Coordinator distributed "Why Should I Care" booklets, weed identification booklets, and scheduled one site visit with a landowner after the presentation. Due to snow, that site visit was canceled and will be conducted in the spring of 2015.

Big Sky Homeowners Associations

Year Round

Throughout the years, the Committee's Coordinator has assisted various HOAs within the project area, from presentations to providing educational materials to site visits. In an effort to begin building a comprehensive, consistent, and all inclusive HOA program, the Coordinator distributed an e-newsletter to several HOAs: Big Sky Owners Association, MoonDance Homeowners Association, Aspen Groves Homeowners Association, Towering Pines, and Ramshorn Homeowners Associations. The first e-newsletter was emailed to each HOA contact and then forwarded onto the association membership. Further development and implementation will be a goal of 2015.

Habitat Improvement Program

Goal: Work to protect and enhance vital and/or compromised habitat for plants, fisheries, and wildlife within the Committee's project area in partnership with pertinent organizations, groups, or agencies.

The Committee's project area encompasses some of the most ecologically and economically important resources in the state, which provide vital habitat and water for plants, wildlife, and the people who live and recreate in the area. Yellowstone National Park identified the spread of noxious weeds as the #1 threat to the Park's health, and the U.S. Forest Service recognizes invasive species as one of the top threats to landscape integrity and function. Noxious weeds can impact every facet of the ecosystem – water, soils, plants, wildlife, etc. Habitat improvement projects are tangible ways to directly mitigate our impacts upon the natural landscape and provide an invaluable avenue to educate the public of the importance of healthy ecosystems.

4th Annual Bighorn Sheep Winter Range Noxious Weed Treatment

July 7 & 10

Bighorn sheep are high-country ungulates that thrive on steep mountainsides and require a combination of four habitat elements: ample wild grasses and forbs, reliable water sources, wide visibility so they can see predators, and steep, bare slopes nearby for escaping danger. Such habitat exists northwest of US Highway 191 and Lone Mountain Trail. As many locals know, it is common to see bighorn sheep along these roads during winter, proving this area to be critical winter range.

Unfortunately, noxious weeds have also found a niche here, and are spreading rapidly. Spotted knapweed, hoary alyssum, houndstongue, oxeye daisy, canada thistle, and musk thistle are among the noxious weeds that are thriving on this steep hillside, crowding out native plants needed by the bighorn.

For the fourth year in a row, the Committee, Montana Department of Transportation, Gallatin National Forest Service, and Gallatin County Weed District worked together to treat noxious weeds on the winter range.

For two days, crews climbed steep slopes with backpack sprayers and used 300 foot long hoses to reduce the amount of noxious weeds that dominate the winter range.

The sheer size of the area, steep slopes, rugged terrain and high level of infestation requires a sustained and repeated effort to gain ground. While crews are seeing a marked reduction in patch sizes and densities, this area will require treatment for consecutive years in order to ensure bighorn sheep can rely on healthy winter range.

To the right, outlined by red, is the primary area of focused treatment. The terrain is incredibly difficult to navigate and access, with steep slopes and unstable footing. Spray trucks with long hoses were used for the slopes adjacent to the roads, but for the remainder of the area, backpack sprayers were used. Treatment of the area is very physically demanding and difficult, a likely reason why this area has not received the attention it needs.

In addition to the primary area, crews traveled to Portal Creek Flats (for the third consecutive year), which is also a site of the Gallatin River Weed pull since 2011. The fact that the area undergoes multiple weed management events a year is testament to the abilities of noxious weeds to persist in a heavily recreated site.

Deer creek (treatment area outlined to the right) was treated by Jeremy Rose of the Gallatin National Forest in 2011, and again with the Committee and partners in 2013. The area is a part of the Bighorn winter range, as evident by multiple trails throughout the area and was inundated with spotted knapweed. While Jeremy reported an overall improvement, returning to treat was beneficial as many young plants were managed at an ideal stage of growth. The partners will monitor the site and return again as needed.

In 2013, the Committee earmarked and distributed $450 for cost share funds to assist a local property owner in treating over 20 acres of a dense spotted knapweed infestation on an extremely steep hillside. The total cost of noxious weed treatment came to $1729.39. This particular patch has been identified by GBSNWC, Forest Service, and wildlife biologists as a high priority for treatment due to its location and proximity to the West Fork of the Gallatin. During the 2014 treatment, partners inspected the area and found the infestation greatly reduced and required only spot treatments. The Coordinator contacted the property owner to gain permission (permission was granted for the previous three years) and learned it would soon be changing ownership. The Coordinator will work to connect with the new owners to ensure continued monitoring and treatment occurs, as considerable improvement has been made.

Bighorn Revegetation Effort

During the April 17 Interagency Weed Meeting, the Coordinator updated those present about the Bighorn treatment efforts and expressed interest in re-establishing vegetation on these sites. Maureen Meagher, Bozeman District Conservationist with Natural Resource Conservation Service, was intrigued by the project and began to investigate the potential of such a project. She contacted Jim Jacobs, Natural Resource Conservation Service Plant Materials Program Manager about assistance in re-establishing vegetation with conservation planting. With expressed interest, the next step was to arrange a site visit with the various partners to assess project viability.

The following is a list of partners that are involved with the project:

Jennifer Mohler, Coordinator, Gallatin/Big Sky Weed Committee
Maureen Meagher, Bozeman District Conservationist with Natural Resource Conservation Service
Mike Jones, Assistant Coordinator/Foreman, Gallatin County Weed District & GBSWC Chair
Susan Lamont, West Zone Vegetation Management, Gallatin National Forest
Jeremy Rose, Gallatin National Forest
Matt Ricketts, Area Rangeland Management Specialist, Natural Resources Conservation Service
Jim Jacobs, Montana & Wyoming Plant Materials Specialist, Natural Resources Conservation Service
Justin Meissner, Townsend Area District Conservationist, Natural Resources Conservation Service
Larry Holzworth, Adjunct Instructor at Montana State University & GBSWC Director
Julie Cunningham, Bozeman Area Wildlife Biologist, Montana Fish, Wildlife and Parks
Bev Dixon, Wildlife Biologist, Bozeman Ranger District, Gallatin National Forest
Kevin Hughes, Wildlife Area Manager, Montana Fish, Wildife and Parks

The NRCS Plant Materials Program provides application-oriented technology including technical publications, fact sheets, conservation planting, conservation plant identification tools for conducting plant materials work and land restoration, and other plant information. The expertise or NRCS personnel and access to materials is critical for implementation of a revegetation project. Also critical is involvement of Gallatin National Forest, as that is where the bighorn sheep winter range lies.

Most of the above partners met at the site on May 28 to assess range conditions and determine the need and feasibility of re-vegetation plots. Current range conditions indicate a downward trend, unfavorable to the needs of bighorn sheep during winter months. The increase in Conifer and juniper species results in less resources and space for critical grass production. Utilization of existing desirable grass species is high, as almost no litter from previous years' growth is present. This rate is unsustainable. Great basin wildrye, sandberg bluegrass, bluebunch wheatgrass, western wheatgrass, bearded wheatgrass, slender wheatgrass, and mountain brome were grasses identified on site.

Bluebunch is likely the most preferred grass type, as evident by small individual bunch size, with few tillers per bunch. Seed bank of desirable grasses is likely non-existent due to repeated grazing (no or few seeds produced) and seeds only survive for 2-3 years. It is reasonable to expect the seed bank of desirable species is not adequate to maintain a sustainable native vegetation population.

Cheatgrass was present in high densities in areas that should be occupied by desirable grass species, further indicating a downward trend. The low utilization of this species means seed production will be high, furthering the species shift from desirable native grasses to low value invasive grass species.

Suggested grasses to seed test plots include: 4 species of bluebunch wheatgrass, sandberg bluegrass, slender wheatgrass, and basin wildrye. Additionally, experts recommended the construction of wire enclosures to prevent utilization of test plot entries, facilitate establishment and stand monitoring.

On December 2, Matt Ricketts, Jim Jacobs, Bev Dixon, Julie Cunningham and the Coordinator met to discuss the next step required to implement re-vegetation test plots. Both NRCS and Gallatin National Forest will require certain procedural steps be taken, and Jim and Bev will initiate that. Due to the nature of large governmental agencies and subsequent procedural steps, this project will require a high level of cooperation among partners. The ease and pace of the progression suggests a high level of interest and commitment to the project. With such strong support by all involved, the Committee will continue to improve and expand the effort on the Bighorn Sheep Winter Range in the next year.

Mapping & Monitoring Program

Goal: Assist and coordinate partner agencies responsible for noxious weed management in early detection and rapid response of noxious weeds populations in the Committee's project area in order to maintain ecological health and diversity.

The presence of noxious weeds in the Gallatin Canyon and Big Sky area is directly attributed to human activity, such as construction, recreation, and travel. The primary route to Big Sky, Highway 191 in the Gallatin Canyon, is heavily traveled (4,397 cars / day in 2013) and road improvements and construction occur on a regular basis. Big Sky is again seeing a rapid increase in development, setting the stage for an increase in noxious weed establishment and spread.

In 2014, Highway 191 underwent major construction (road construction, power line upgrade, underground cable installation in the right of way) creating a prime opportunity for noxious weeds to take hold and spread. Of specific concern is the use of out of state construction equipment, as that is a known vector for spreading new species of noxious weeds that do not currently exist in the area.

Focused efforts to mitigate noxious weeds immediately after disturbance is the most cost effective way to manage weeds, and key to that is knowing where and what they are. Mapping noxious weeds helps pinpoint infestations (including new species) and provides a framework for prioritizing our limited resources. Implementing a mapping/monitoring project as soon as possible following any disturbance in the canyon is the best approach for identifying and eliminating noxious weeds before they take hold. Monitoring existing populations aids managers in knowing if treatments were effective.

2014 Mapping & Monitoring

Due to budgetary restrictions, limited mapping and monitoring efforts were conducted in 2014. The only focused effort was that of monitoring and treating a leafy spurge patch first identified in 2011.

The leafy spurge patch was reported to the Committee's Coordinator by a concerned employee of Montana Department of Transportation. This again highlights the importance and value of the Committee's partners. The patch is located next to the fishing pond in the Meadow Village.

After the Coordinator confirmed the presence of leafy spurge on July 25, 2011, the property owner, Big Sky Owners Association, was immediately notified. They took quick action and notified their applicator to treat the patches.

Initially, there were four to five large patches of leafy spurge observed in the area. The area has been repeatedly treated by both the BSOA applicator and Committee partners during cooperative treatment days. The Coordinator continues to monitor the area, as leafy spurge is an extremely difficult plant to eradicate.

Leafy spurge has been described as the nearly perfect weed because it rapidly invades new areas and it has an arsenal of defenses that make control and management difficult. A native of Europe and Asia, leafy spurge emerges early in the spring and gets a head start on other vegetation in a race for space, sunlight, nutrients, and water.

The aggressive nature of leafy spurge is due to its phenomenal ability to reproduce both by seed and by adventitious shoot buds located on the crowns and roots. Effective seed dispersal mechanisms, high seed viability, and rapid seedling development enable new infestations to become established easily and quickly. Leafy spurge is a prolific seed producer, with each flowering stem capable of producing as many as 250 seeds. Once seeds are dispersed, they can remain viable for eight years. As the drying capsules shrink and split, there can be sufficient force o throw the seeds as far as 15 feet. Also, seeds of leafy spurge can float on water and germinate while floating. This increases leafy spurge establishment in sub-irrigated meadows and along streams and rivers.

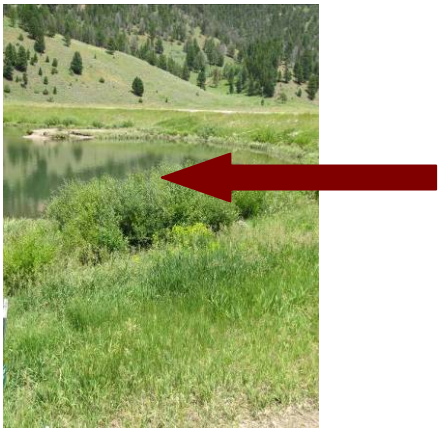
The root system contains a large nutrient reserve that can sustain the plant for years, allowing it to survive long periods of drought and most methods used to manage and control the weed. Regeneration of stems from buds on crowns and roots and limited translocation of herbicides to these plant parts contribute to this weed's resistance to control. Although the upper portion of the plant can be killed by herbicides or tillage, buds below the treated zone can continue to produce new shoots.

Leafy spurge will invade a wide variety of terrain including flood plains, river banks, grasslands, ridges, and mountain slopes and grows in diverse environments from dry to subhumid and from subtropic to subarctic. Leafy spurge will displace native vegetation even in otherwise non-disturbed habitats.

Leafy spurge is very difficult to control, as its extensive root system has vast nutrient stores that let it recover from almost any control attempts. The key to control leafy spurge, or any creeping perennial, is to exhaust the root nutrient stores, causing it to collapse. Continued monitoring of infestations for recurrence is critical as persistence is imperative to gain control.

July 25, 2011

Below are the first photos of leafy spurge by the pond. There were two patches: hillside and adjacent to willows along the edge of the pond. The close proximity of the patches were exceedingly concerning due to the difficulty of treating adjacent to water and the extraordinary ability of leafy spurge to spread by both roots and seeds. Furthermore, the pond is part of the west fork of the Gallatin River. Allowing leafy spurge to become established along this river corridor is not an option.



May 28, 2012

Areas devoid of vegetation mark the treated area.

August 1, 2012

The photo show evidence of treatment of leafy spurge. Note the dying vegetation surrounding the single stem of leafy spurge. This is proof of its extensive root system, which has vast nutrient stores that let it recover from control attempts.

September 5, 2012

The photos below show dead leafy spurge plants (red) that were treated.

August 27, 2013

The photos below show healthy leafy spurge stems. While the original patches (first identified in 2011) are no longer occupied by leafy spurge, the plant has migrated to other nearby areas. Leafy spurge is highly mobile due to the method of seed dispersal (explosive dihissence) and its creeping root system. Thus, it is no surprise that while initial patches appear to be devoid of the plant, new patches are emerging and require continued monitoring and treatment.

September 4, 2013

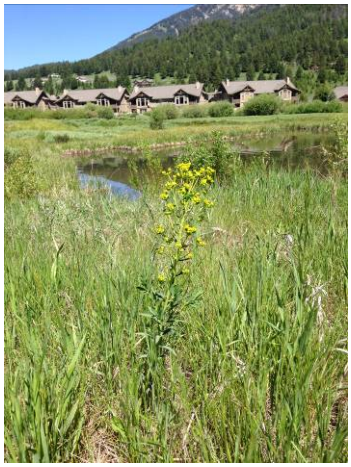
Observations indicate the patches were treated in 2013, but the plant continues to persist in various locations, including existing patches that have repeatedly been treated. Of particular concern are the smaller stems located near and within the willows adjacent to the pond. It is very difficult to see small stems among the dense willows and riparian vegetation.

May 11, 2014

The site was visited early in the year, prior to any treatment. Again, small patches of single or few stems were identified. While only May, the plant was beginning to flower. Any time the Coordinator observed flowers on any leafy spurge plant, the flowers were removed by hand to prevent seed production and dispersal, while vegetative parts were left intact to facilitate treatment via herbicides.

July 2, 2014

Upon visiting the site, there was no indication of treatment during the 2014 season. Flowers were present on more mature stems, which were again removed to prevent seed production and dispersal. The Coordinator contacted BSOA and provided information and photos.



August 6, 2014

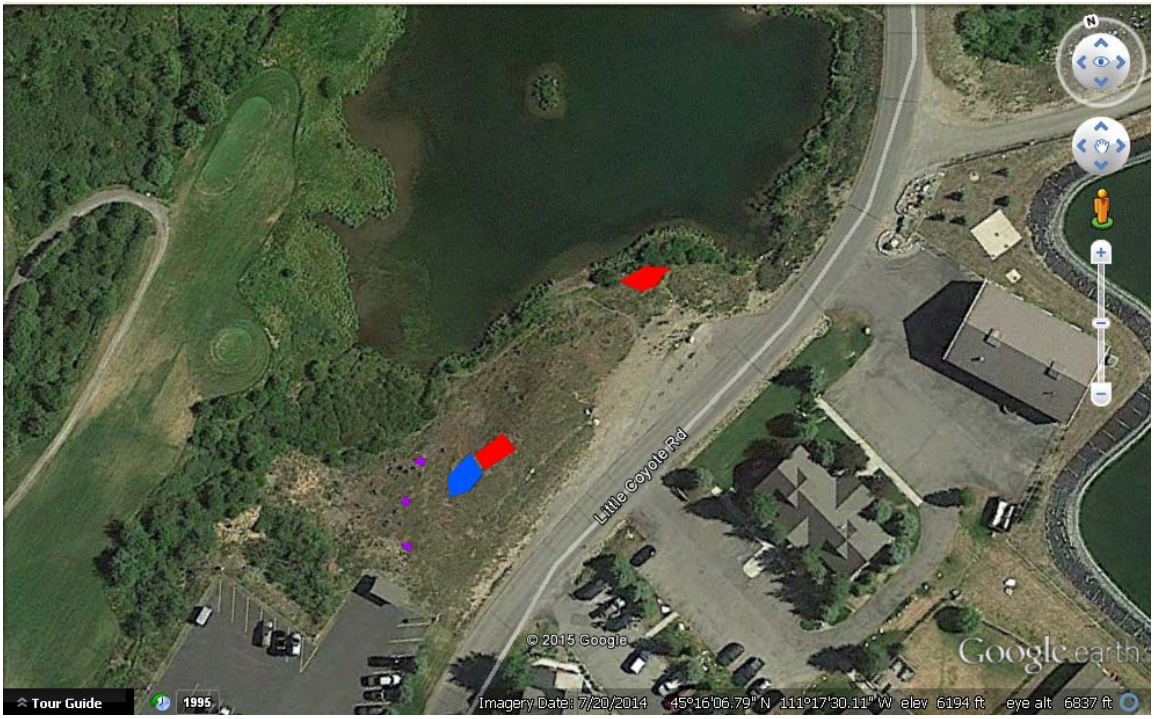
Treating leafy spurge by committee partners during Big Sky Cooperative Treatment Day

Google Earth Map of Leafy Spurge Patch Locations

Below is a map that shows observed patch locations, not GPS mapped patches. Fully mapping the area with GPS is a goal for 2015. This will be fairly easy to do, as past patch locations are easily visible

due to decimation of vegetation in the area (as seen in pictures above). Of note is the spreading nature of leafy spurge (spreading by both seeds and roots).

Red = 2011 patch locations
Blue = 2012 patch location
Purple = 2013 and 2014 patch locations



Since 2011, the Coordinator has visited the site several times a year, keeping in communication with BSOA. Frequent observations indicate multiple treatments by BSOA's contractor, with an additional treatment during the Big Sky Cooperative Treatment Days in 2013 and 2014. While there has been consistent control on the patch, the continued presence and migrating locations of leafy spurge require diligence. The importance of continued management cannot be stressed enough, as if this patch migrates further into the riparian vegetation, it could result in a permanent infestation that could have a tremendous impact on the ecology of the west fork of the Gallatin River.

Committee Partners

The Gallatin Big Sky Noxious Weed Committee spends significant time and effort toward its goal of coordinating efforts and working cooperatively with various federal, state, and local agencies in noxious weed education and control within in the project area. Personnel from these organizations assisted with community events, education and outreach, noxious weed treatments, logistical support, and funding. Their commitment and willingness to participate are major components to the successes the Committee

has achieved over the past ten years, and with sincere appreciation and gratitude, the Committee would like to thank those partners:

Aspen Groves Homeowners Association
Big Sky Landscaping
Big Sky Natural Resource Council
Big Sky Owners Association
Big Sky Publishing
Big Sky Resort
Big Sky Resort Area District
Blue Water Task Force
Bridger Brewing Company
Jack Creek Preserve
Gallatin County Extension
Gallatin County GIS Department
Gallatin County MSU Extension
Gallatin County Weed District
Gallatin Valley Land Trust
Greater Gallatin Watershed Council
Greater Yellowstone Coordinating Committee
Madison County Weed District
Mojava Coffee
MoonDance Homeowners Association
Moonlight Basin
Montana Department of Agriculture
Montana Department of Transportation
Montana Fish Wildlife and Parks
Montana Noxious Weed Control Association
Montana State University
Montana Statewide Noxious Weed Campaign
Montana State University Extension
Murdochs
Natural Resources Conservation Service
Ophir School
Outlaw Publishing
Ramshorn Homeowners Associations Simms
Spanish Peaks Mountain Club
Sola Café
The River's Edge
Tout Unlimited
Towering Pines Homeowners Association
U.S. Forest Service, Gallatin National Forest
Volunteers
Yellowstone Club

Gallatin/Big Sky Weed Committee

Helping protect wildlife habitat, water resources, and native plants through noxious weed management.