

National Bison Range National Wildlife Refuge

Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Survey Acres Infested ²	Acres Treated ³
Leafy spurge	107.36	0.04	0.04
Meadow hawkweed	150.02	0.33	0.33
Oxeye daisy	65.31	7.05	3.54
Yellow toadflax	11.70	0.18	0.18
Project Site Total	334.39	7.6	4.09

¹ Area covered during the course of weed management activities regardless of presence or absence of target weed species as measured by perimeter in GIS.
² Area occupied by weed species within the survey area that does not contain the space between individuals or populations (i.e. net infestation size) as measured by GPS feature for monitoring and treatment combined, but areas in common not additive.
³ The area or subset of infested area that has received some form of treatment as measured by GPS feature.
* Target surveys were not conducted for all species and only a portion of infestations may have been mapped and/or treated based on refuge request. Further explanation is included below.

Highlights

Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
10-June-2013 to 11-June-2013	EDRR Mechanical Treatment	Leafy spurge	4	Alexander Basin
11-June-2013 to 13-June-2013	Refuge Project Chemical Treatment	Oxeye daisy	3	Mission Creek Pasture
24-June-2013 to 27-June-2013	EDRR Chemical Treatment	Meadow hawkweed	4	Sheep Pasture
23-Sept-2013	EDRR Chemical Treatment	Leafy spurge	3	Alexander Basin
	EDRR Inventory & Monitoring t	Yellow toadflax	2	Along north refuge fence line and in Amphitheater area
26-Sept-2013	EDRR Chemical Treatment			

Coordination and Cooperation

- In early June, ISST Crew Leader Jessica Zarate coordinated with Biologist Amy Lisk via email prior to arriving at the site using the “Strike Team Expectation and Accomplishment Checklist” (Appendix A). The team set to work upon arrival and later coordinated with biological technicians Kelsey Guffey and Shay Piedalue throughout the week as needed.
- Jessica coordinated with Amy again late June for the Sheep Pasture, meadow hawkweed work. This was done via the checklist (Appendix B) and in person upon arrival.

- The September visit was also coordinated with Amy via email and using a checklist (Appendix C). For yellow toadflax monitoring and treatment the team worked with refuge staff member Dan Sharps and further coordinated with him as inclement weather altered the teams scheduled priorities.
 - All changes made in September were also coordinated with Amy, and ISST supervisors Lindy Garner and Bill Sparklin, via telephone and email.
- The refuge requested additional funding from ISST for herbicide and mapping equipment for invasive plant management. As a result, ISST provided \$2,000 for the purchase of herbicide and \$4,000 for purchase of a GPS *Spray Logger*.
- ISST leveraged \$8,000 for early detection and rapid response management throughout the watershed contributing to a cooperative agreement developed by USFWS Partners for Fish and Wildlife Service and Lake County.
 - This cooperative agreement is for invasive species management work through the cooperative weed management group and Partnership for Regional Invasive Species Management (PRISM) that includes, partners from National Bison Range, Lake County Weed District, Confederated Salish and Kootenai Tribes and private landowners.
- ISST funded a \$6,000 contract for Dalmatian toadflax treatment. Four discrete areas were selected by refuge staff for extensive invasive plant management and a statement of work was produced and put out to bid for fall 2013 treatment (Appendix D).
 - Due to government shutdown the project launch was delayed until November 6th. Rain and windy weather resulted in additional delays and reduced coverage. The project was completed on November 13th with only one of the identified areas (the west loop) treated within the time and financial framework of the project. The contractor provide a report and map of work completed each day (Appendix E).
 - A total of 124 acres were treated within the 240 acre West Loop surveyed. Areas not covered included steeper slopes and an area across a main irrigation canal and were excluded due to access limitations for ATVs.
 - The contractors notes, with ocular not direct measurements, that an estimated 60% of the surveyed area was inhabited with Dalmatian toadflax, that these areas were moderately dense, that the litter was consistent and minimal throughout the project area and that the plants were all in a young growing stage of phenology ranging from just an inch up to 6 inches (with some having flowers).
 - All areas were treated using ATV spray equipment mixed with *Plateau* herbicide at a rate of 12oz/acre combined with Methylated Seed Oil at rate of 1½ pints/acre.

Prevention and Education

- Preventing the spread and reducing infestations of new invaders on the refuge is a top priority.

Early Detection and Rapid Response

Leafy spurge

- On the Bison Range leafy spurge is only known to occur within Alexander Basin.
- The first day of inventory for this species, the background file used by ISST to located and treat the spurge was incorrect, resulting in an additional drainage located adjacent to the known population to be surveyed. No new infestations were found in this area.
- The crew surveyed 200 meters around known populations and did locate a few new patches of leafy spurge in this area.

Sheep Pasture - Meadow hawkweed & Oxeye daisy

This species is a new invader to the refuge and was mapped in 2012 an area known as Sheep Pasture.

- In 2012, the pasture was divided into five areas for survey of all uncommon weeds. This was a cursory survey consisting of wide, meandering



transects and meadow hawkweed was found in Areas 4 and 5.

- In an effort to inventory and treat all current patches of meadow hawkweed, Areas 4 and 5 were covered using systematic transects.
- Plants were found in the rosette, and early bud-bloom stages. This combined with the thick vegetation made these plants difficult to detect, so the team used tight transects (5-10 meters apart) to help reduce the chance of missing plants.
- ISST mapped and treated a few new patches of meadow hawkweed (0.24 acres more than in 2012) and found a single patch of oxeye daisy which was also treated.



Invasive yellow hawkweed, leaf, bud and flower stages. Photos by Gina Mazza.

- Oxeye daisy had not been detected in this area during the 2012 survey.
- In areas where roses were present, following herbicide application, roses were clipped back to help reduce non-target impacts to this species.

Yellow toadflax

- This species is only known to be present on the refuge along the north boundary fence line and in the amphitheater area.
- Some of the yellow toadflax in the areas mapped looked different than the typical identification characteristics of this species.
 - Many plants phenologically looked to have both characteristics of yellow toadflax and Dalmatian toadflax.
 - Since it is unclear if plants treated area hybrids Jessica Zarate emailed a description and photographs to Amy Lisk, Dan Sharps, and ISST supervisors. In addition, plant samples were collected and left for Amy further review.
- All yellow toadflax plants found were inventoried and treated (even those that appeared to display unusual characteristics).
 - The week of treatment was very wet, with rain prior to and following application, which could affect the effectiveness of control efforts this season.

Inventory and Monitoring

- ISST conducted inventory and monitoring in every area worked this season. In some cases this was done because plants could not be treated.
 - Plants were not sprayed during rain and/or if located under shrubs or trees that could be harmed by herbicides uses.

Management

Oxeye daisy

- The extent of oxeye daisy in Mission Pasture is not clear and therefore ISST was asked to map and treat this species starting from the northeast corner moving west.
- The team found the infestation to be extensive and abundant within the grassland and snowberries.
 - ISST was asked not to spray plants growing under trees and within shrubs and therefore these plants were mapped only in an effort to capture the extent of this infestation.
- The data above are difficult to interpret for several reasons:
 - Some plants were mapped during rainy weather and were later revisited for treatment. However, not all areas could be treated due to shrubs. So in some cases you may have a patch that was mapped and entirely treated, but it appears to have gaps in treatment which are resulting from differences in how the patch was mapped. But in other cases, the patch that was mapped initially was not entirely treated because of treatment constraints.

- Given the extent and abundance of this species in this pasture and satellite infestations were observed along the north tour road, ISST recommends a complete inventory to help guide future treatment efforts.

Herbicide Applied

- 9.96oz of *Milestone* was used for treatment meadow hawkweed and oxeye daisy
- 0.2oz of *Plateau* was used for treatment of leafy spurge
- 0.02oz of *Telar* was used for treatment of yellow toadflax

Recommendations

- Meadow hawkweed should remain a priority for treatment in 2014. If conditions are similar to 2013, treatment is recommended between the last two weeks of June and be completed by the first week of July.
- Clipping leafy spurge should be done mid to late June and herbicide treatment should follow the first hard frost in fall which is typically in September and yellow toadflax could also be treated at this time given the small infestations present onsite.



Beautiful sunset view from the Bison Range. Photograph by Jessica Zarate.

Appendix A

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: National Bison Range Complex
06/13/13

Date of Visit: 06/10/13-

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Leafy spurge	NBR Refuge	Alexander Basin	Systematic transecting (extent of area to be covered to be outlined by the refuge)	Clip seed heads & map	N/A
Leafy spurge	Anderson WPA	Known locations	Systematic transecting	Clip seed heads & map	N/A
Oxeye daisy	NBR Refuge	NE ¼ of Mission Creek Pasture	Systematic transecting (extent of area to be covered to be outlined by the refuge)	Spray & map	Refuge to decide what herbicide to use: Escort – ISST Milestone or Platoon – Refuge
Poison hemlock	NBR Refuge	Along Mission Creek Drainage	Systematic transecting	Spray & map	Metcel – refuge or Escort – ISST*

Notes:

Per discussion with Amy Lisk on 6/5/13 they would like to push back the meadow hawkweed project to late June when plant phenology is more optimal for detection and more time will be available for systematic transecting.

* The refuge may also look into using Transline or Milestone for poison hemlock treatment if they are effective on this species. In the past they have used glyphosate but prefer to use Escort to help reduce off target damage. They are seeing damage to the brush from Escort also and would like to further avoid that if another herbicide will work well that is not as hard on brush.

ATV Use: (define whether allowed, if partial allowance any restricted areas or travel directions, including only along fence line or not, only along two-track or if can systematically traverse project site, or if point-to-point treatment)

All use of ATVs will be discussed with refuge staff before going in the field to determine restrictions. Based on prior years, ATVs have been used for leafy spurge work both at NBR and Anderson. Sheep Pasture work will all be completed on foot. It is unknown if ATVs are permitted in area where oxeye work is to be completed.

Per discussion with Amy Lisk, ATV use is permitted in Alexander Basin however since this area supports the only known patch of leafy spurge use will be restricted. This area will be covered on foot to reduce the potential for spreading seeds. ATV should be used for transecting Anderson, but avoid riding through the patches of leafy spurge to the extent possible. ATVs are also ok to use for the oxeye daisy transecting and treatment in the Mission Creek pasture. Poison hemlock work will primarily be done on foot but quads may be used in the upland areas surrounding the riparian vegetation.

Other access issues, conflicts, etc...:

On Anderson WPA, one infestation of leafy spurge is on private property and per refuge proposal permission has been granted to treat this patch. Refuge staff will coordinate with the landowner.

It is the nesting seasons, so we will be on the lookout for ground nesting birds and do try to avoid riding over nests. Cattle are grazing at Anderson so gates should be kept closed and ISST will notify Dan Sharps if any concerns arise with regard to the livestock on site.

Station or Site Manager (or
Acting): _____ Date: _____

(back has Exit Interview)

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Completed (yes or no with explanation)
Leafy spurge	NBR Refuge	Alexander Basin	Systematic transecting (extent of area to be covered to be outlined by the refuge)	Clip seed heads & map	Yes
Leafy spurge	Anderson WPA	Known locations	Systematic transecting	Clip seed heads & map	Yes
Meadow hawkweed		Near south boundary	Yes	No	Yes, Kelsey alerted us to this species flowering on DuckHaven south of Anderson at the start of our survey, so the crew also searched for this species.
Oxeye daisy	NBR Refuge	NE ¼ of Mission Creek Pasture	Systematic transecting (extent of area to be covered to be outlined by the refuge)	Spray & map	No, extensive infestation and area to cover.
Poison hemlock	NBR Refuge	Along Mission Creek Drainage	Systematic transecting	Spray & map	No, not started yet.

Notes:

Leafy spurge in Alexander Basin – A data error was made in the background file used (which show historic points of leafy spurge) resulting in some additional areas being surveyed for spurge but none was found. Extensive patches of Dame’s rocket were seen in this area (John’s Creek). The known leafy spurge patches were found and clipped. We searched an area that extended approximately 200 meters around these patches but did not find any additional infestations. All areas were transect

Leafy spurge at Anderson WPA – This site was grazed prior to our arrival and most everything had been browsed to the ground. No cows were present on site when we arrived. We

systematically transected the entire site using quads, paying special attention to areas known to support spurge patches. These patches were found and flowering plants were clipped. The majority of the spurge found was not flowering yet or had been browsed. A couple of new infestations of spurge were mapped as well as patch of meadow hawkweed. The meadow hawkweed on Duck Haven were in full flower but on Anderson only rosettes were found. Plants had been browsed and were difficult to see.

Oxeye daisy – We worked starting from the NE corner systematically transecting using quads N to S (for the most part depending on terrain) moving West. We had some minor delays due to sprayer issues and troubleshooting GPS problems. Patches and single plants were found scattered throughout the area, many of which were growing in and around brush. Patches found within the brush were not treated and were monitored only. Progress was slow going due to the abundance of patches and mapping in both monitoring and management databases.

Concerns with Project:

Leafy spurge – Plants clipped and those not flowering yet may still flower prior to treatment in fall. If possible, additional seed head clipping should be done before fall herbicide application to help ensure the prevention of seed production.

Oxeye daisy – The patches of oxeye within the brush is extensive. Leaving oxeye patches in the brush while spraying around the brush opens up these areas for re-seeding and possible invasion of other noxious weeds. Several areas within the grassland habitat may be effectively controlled but ongoing treatment is expected since source patches are in close proximity.

Station or Site Manager (or
Acting): _____ Date: _____

Appendix B

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: National Bison Range Complex

Date of Visit: 06/24/13-06/27/13

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Meadow hawkweed	NBR Refuge	Sheep Pasture	Systematic transecting* (extent of area to cover to be determined by refuge)	Retreat patches treated in 2012 if necessary	Escort – ISST Also will need a brush cutter & clippers from refuge for removal of shrubs after herbicide application
Oxeye daisy	NBR Refuge	NE ¼ of Mission Creek Pasture	Systematic transecting continued from previous visit	Spray & map	Refuge to decide what herbicide to use: Escort – ISST Milestone or Platoon – Refuge
Poison hemlock	NBR Refuge	Mission Creek	Systematic transecting	Spray & map	Escort – ISST

Notes:

Meadow hawkweed - *If you look at ISST report Map 4, we mapped meadow hawkweed in the sheep pasture in Areas 3 & 5. This inventory was done using wide (20-50M) transects in 2012 and there was a bison near the patch found in Area 3. It would be good to do some additional systematic transecting within the woodland areas where plants were detected. Vegetation in these areas is thick and visibility is difficult, so tight transects (maybe $\leq 10M$ apart) would be recommended.

ATV Use: (define whether allowed, if partial allowance any restricted areas or travel directions, including only along fence line or not, only along two-track or if can systematically traverse project site, or if point-to-point treatment)

All use of ATVs will be discussed with refuge staff before going in the field to determine restrictions. Based on prior years, ATVs have been used for leafy spurge work both at NBR and Anderson. Sheep Pasture work will all be completed on foot. It is unknown if ATVs are permitted in area where oxeye work is to be completed.

Other access issues, conflicts, etc...:

On Anderson WPA, one infestation of leafy spurge is on private property and per refuge proposal permission has been granted to treat this patch. Refuge staff will coordinate with the landowner.

Station or Site Manager (or Acting): _____ Date: _____
(back has Exit Interview)

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Completed (yes or no with explanation)
Meadow hawkweed	NBR Refuge	Sheep Pasture	Systematic transecting the southern half of sheep pasture (part of Area 3 & 5, and all of Area 4 – see map)	Backpack sprayed	Yes – see below
Oxeye daisy	NBR Refuge	Sheep Pasture	Yes, found incidentally	Spray & map	Yes, only one small patch found and was monitored and later treated while spraying hawkweed

Notes:

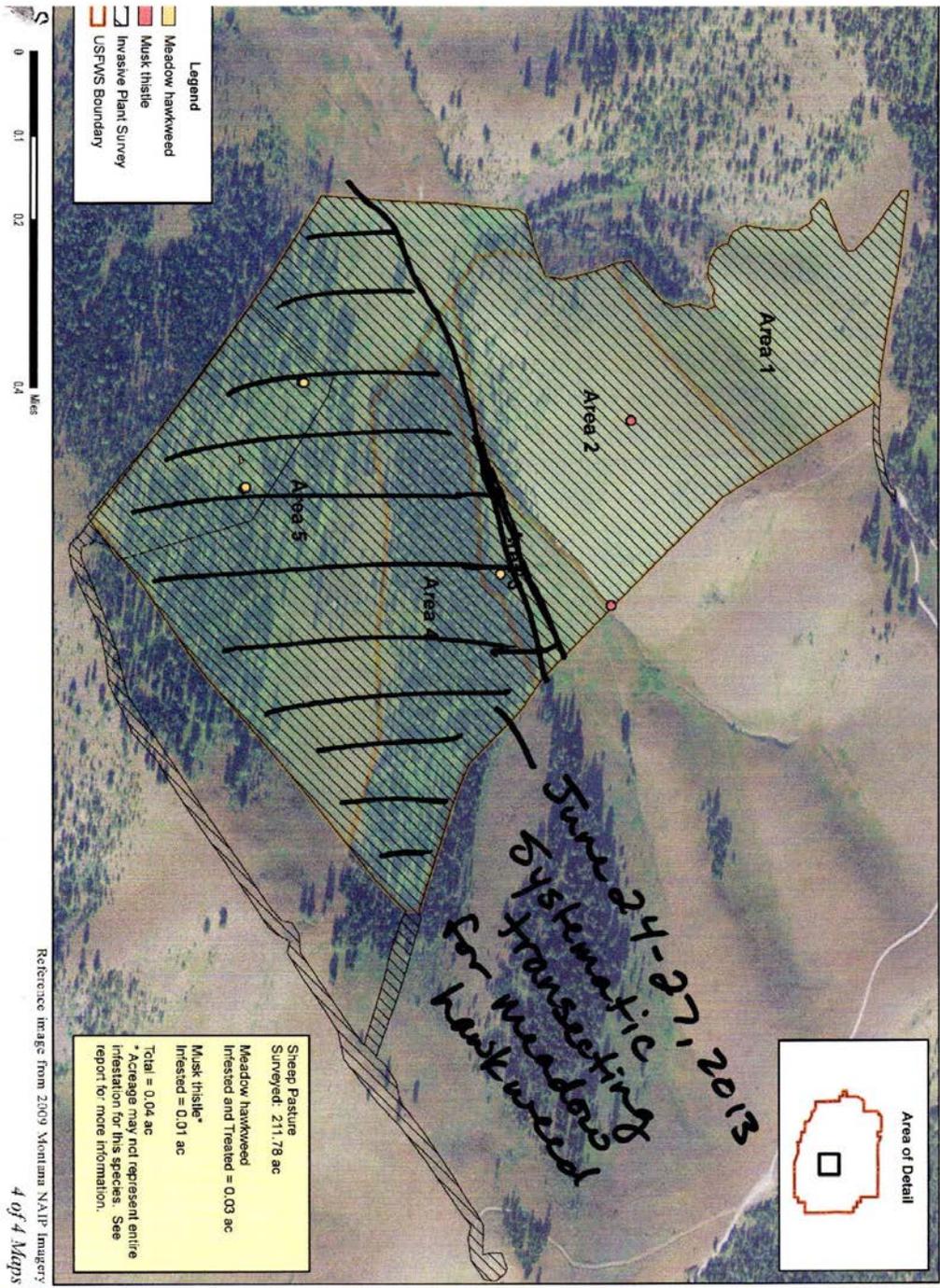
The weather was overcast and rainy Mon. to Wed. this week so we spent these days searching for meadow hawkweed using tight transects (roughly 10-15M apart). All meadow hawkweed found was mapped and treated. The majority of the plants were in rosette stage but some plants were bolting and flowering. Tuesday evening, I compiled all tracklogs which were used on Wed to survey any gaps resulting from the crew spreading out as they moved through the wooded areas, ensuring all areas were covered in the search. On Wednesday night I compiled all monitoring data collected to create a background map to be used for treatment. On Thursday, two teams of two worked to treat all infestations found earlier in the week.

For planning purposes, an entire week with a 4 person crew for systematic transecting and treatment is needed if the work completed were to be duplicated in the future.

Concerns with Project:

Many of the patches found were in the rosette stage and had not yet bolted or flowered. These patches are very difficult to detect given the dense vegetation and number of “look-a-like” rosettes such as wooly and white hawkweeds, golden aster, silver leaved scorpion weed, etc. We did search the area carefully in an effort to find all patches, however the last day worked we did find a couple of additional patches of meadow hawkweed that were not detected earlier in the week. These patches were bolting with flowers just starting to open. It is possible that patches of rosettes that had not bolted and/or flowered may have not been found. If time is available, additional surveys may be warranted in some areas (such as in the disturbed areas) as plants more plants are beginning to bolt/flower becoming more readily identifiable.

Station or Site Manager (or Acting): _____ Date: _____



Appendix C

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: National Bison Range Complex

Date of Visit: 09/23/13-09/26/13

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Leafy Spurge	NBR Refuge	Amphitheater	Point-to-Point with 25M buffer survey around each known infestation	Spray & map	Plateau (ISST) & MSO (ISST or Refuge)
Yellow toadflax	NBR Refuge	Along north fence (see Dan Sharps for location) And in Amphitheater	Point-to-Point with 25M buffer survey around known infestations	Spray & map	Telar (Refuge) & Non-ionic surfactant (ISST or Refuge)
Yellow toadflax	Duck Haven	Previously mapped locations from 2012 (Map 3 from final report)	Point-to-point locations plus 25M buffer	Spray & map	
Yellowflag iris	NBR refuge	Nature Pond and EE Pond	Systematic transecting	Spray & map	Aquatic glyphosate (Refuge)

Notes:

Possible Rates we've used in the past (please specify what you would like used & where, if different from site to site):

Plateau @ 11 oz/ac with MSO @ 2pts/ac

Tordon @ 32 oz/ac with Distinct or Overdrive @ 6oz/ac

Telar @ 2 oz/ac with Spreader 90 @ 1qt/100gal (or other surfactant)

I will see what herbicide is available and use the recommended rates on the label.

ATV Use: (define whether allowed, if partial allowance any restricted areas or travel directions, including only along fence line or not, only along two-track or if can systematically traverse project site, or if point-to-point treatment)

ATV use is permitted in all areas being worked but there is limited access on the creek for ATVs. The truck or Kubota could be stationed in such a way to make refilling of backpacks easier.

Other access issues, conflicts, etc...:

On Anderson WPA, one infestation of leafy spurge is on private property and per refuge proposal permission has been granted to treat this patch. Refuge staff will coordinate with the landowner.

Station or Site Manager (or Acting): _____ Date: _____

(back has Exit Interview)

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Completed (yes or no with explanation)
Leafy Spurge	NBR Refuge	Amphitheater	Point-to-Point with 25M buffer survey around each known infestation	Spray & map	Yes all sprayed.
Yellow toadflax	NBR Refuge	Along north fence (see Dan Sharps for location) And in Amphitheater	Point-to-Point with 25M buffer survey around known infestations	Spray & map	Yes sprayed and possible hybrid found at NBR also. Photos and plant samples left for Amy Lisk.
Yellow toadflax	Duck Haven	Previously mapped locations from 2012 (Map 3 from final report)	Point-to-point locations plus 25M buffer	Spray & map	
Yellowflag iris	NBR refuge	Nature Pond and EE Pond	Systematic transecting	Spray & map	No, aquatic permit required.
Yellow toadflax	Pablo	Whole site	Systematic transecting	No, due to rainy weather	No, completed most of the East half only. Additional time needed to cover the whole site.

Notes:

We tried mapping this species in July but it was not readily identifiable at that time. Therefore many of the areas covered in July were re-surveyed and yellow toadflax was found and mapped.

Concerns with Project:

Herbicide used for treatment of yellow toadflax will have to be selected carefully due to the presence of shallow groundwater and wetlands.

Station or Site Manager (or Acting): _____ Date: _____

Appendix D – Invasive Species Management Contact

Statement of Work

Invasive Plant Management on National Bison Range

Background:

The National Bison Range is home to a varied population of both avian and terrestrial wildlife species and bison. The Range encompasses a diversity of habitats from wetlands, marshes, streams and rivers to open meadows, native prairie uplands and forests. . Intermountain and Palouse native prairies consist of cool season grasses including rough fescue, Idaho fescue, bluebunch wheatgrass, needlegrasses and western wheatgrass. Palouse and intermountain prairie habitats are some of the most endangered prairie habitats in the United States. Vigorous and diverse native grassland communities provide nesting cover for a variety of nesting song birds and waterfowl; and forage for native ungulates.

Invasive species consistently threaten the health and quality of the habitat by not providing the necessary components of nutrition and cover for native species to thrive. Invasive nonnative plants detrimentally affect native plants through competitive exclusion, altering pollinator behaviors, niche displacement, hybridization, and changes in insect predation. They outcompete, invade and displace native plant communities, altering species composition and relationships, and reducing species diversity. They form monocultures that change the physical structure of the native communities, increase soil erosion resulting in changes in soil structure and chemical composition, and alter microclimate. Thus weeds alter ecological processes such as community productivity, soil water and nutrient dynamics, community successional patterns and disturbance cycles.

Objective:

The requirement is for herbicide application of infestations of Dalmatian toadflax (*Linaria dalmatica*) in areas detailed below and identified on the attached maps pending funding availability starting with Priority 1 area:

Priority 1: West Loop: rolling to steep terrain, mixed native grasses and shrub habitat. Target species occur in patches throughout. This site is highly visible to the public and used seasonally for display of bison.

Priority 2: Hardin Tract: Flat to rolling terrain, mixed native/tame grassland with intermittent shrub component and trees in a few areas with target species scattered in patches throughout.

Priority 3: Ravalli Ponds: rolling to steep terrain with widespread infestations of target species.

Scope of Work/Tasks:

Infestations will range from high to low density infestations. Target treatment of all infestations of Dalmatian toadflax in each priority area. Treatment will occur in conjunction with surveying the area. Subsequent priority areas will not be surveyed until all treatment has been completed on first priority area pending funding availability.

Spot-spray application of Plateau@ herbicide with methylated seed oil and dye from backpack or atv, but take necessary actions to minimize disturbance to the sites, and use caution as terrain can be rugged. Truck access is limited.

Target specificity and limited non-target effects are paramount.

Performance based criteria are 100% of each priority area surveyed with infestations mapped in a geographical information system (GIS) depicting perimeter of surveyed area, polygon or point location of all infestations, canopy cover of each infestation by high (61-100%), medium (31-61%), or low (0-30%), spot-spray application of all infestations with 90-100% kill to target vegetation and less than 1-3% non-target impacts. Denote treatment with above mentioned herbicide in GIS data. Performance based criteria also includes whether all infestations mapped are treated with above mentioned herbicide, therefore treatment must occur as surveying the area, prior to moving to a new survey/treatment area. The following three locations are ordered by priority order for access, so second and third areas are not visited until first area completed as time permit.

Provide continuous operation from day to day weather permitting, until completion of the work within the allotted time frame. Contract work will include actual spray time as listed on daily spray logs and reasonable on site set-up time. Montana Daily Pesticide Application Records must be completed in their entirety and provide to the U.S. Fish and Wildlife Service, along with the electronic spatial files with completion of the project.

Period of Performance:

09/1/2013-11/15/2013

Government Furnished Property of Items:

None

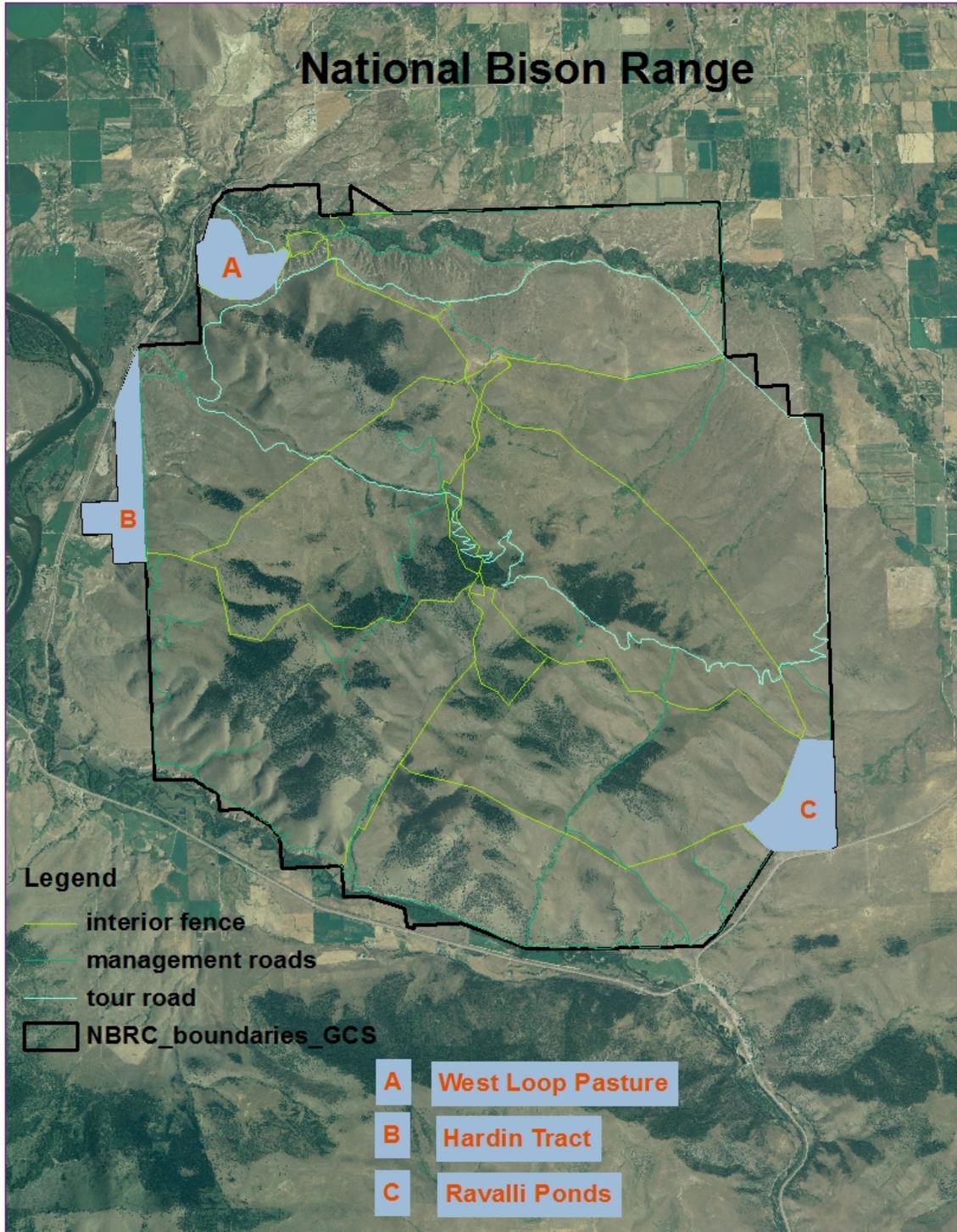
Deliverables

Contractor will provide and use a GPS data logger that will be able to export to Arcview/Map shapefiles. Contractor will furnish POC with inventory data CDs containing all collected data files by project name. All points or polygons of treatment areas will have an estimate of density. GPS polygon for perimeter of total work area: outermost perimeter of survey area for infestations will be maintained spatially and provided with infestation location data. GPS information must be provided electronically in shapefile format with associated files.

Administrative Point of Contact: Lindy Garner 406-727-7400 x213; Lindy_Garner@fws.gov

Field Project Point of Contact: Amy Lisk 406-644-2211 x217; Amy_Lisk@fws.gov

Map of Proposed Work



National Bison Range



Contact Name: Amy Lisk
Address: 922 Bootlegger Trail Great Falls, MT 59404
Phone: 406-727-7400 x213
Record Date: Nov 6, 2013
Time: 8:30 AM - 4:30 PM
Total Man Hours: 16
Area Treated: 24.3156969027 acres
Density: Light 1 2 3 4 5 Dense
Slope: Flat 1 2 3 4 5 Steep

Notes:

	AM	PM
Temperature	33°F	43°F
Sky Conditions	Partly Cloudy	Partly Cloudy
Wind Conditions	1-5 mph	1-5 mph

Crew Members

	Hours	Certification Num
Martin Clark (<i>Leader</i>)	8	
Drew Gentry	8	

Methods Used

Client Relations
 Equipment Maintenance
 Foliar - ATV/UTV

Species Treated

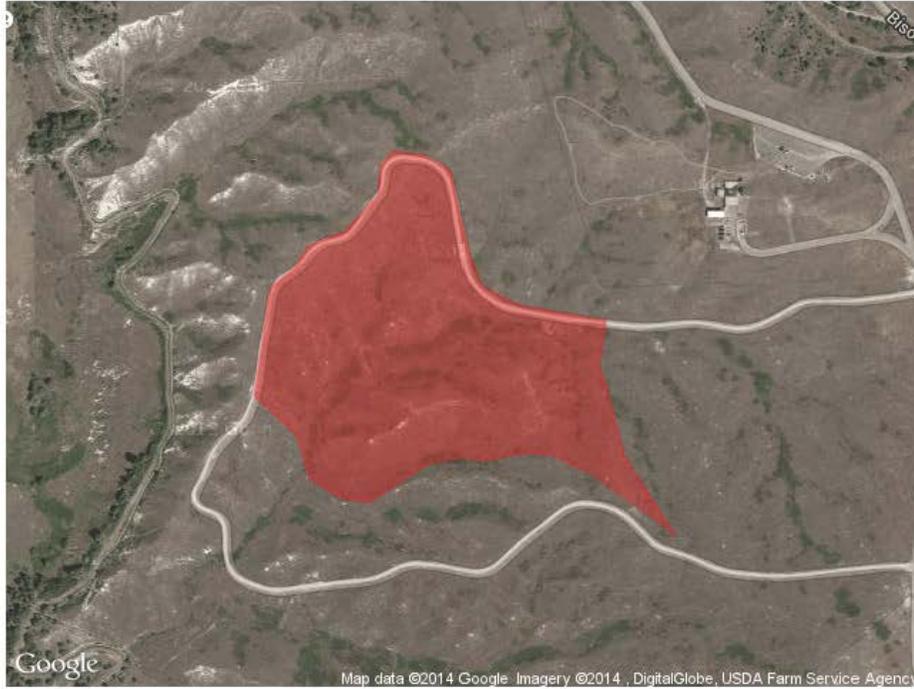
Dalmatian toadflax

Chemicals Used

EPA #	Brand Name	Total Solution	Rate	% Solution	Surfactant	Dye
241-365	Plateau	132 gal	12 oz/acre		MSO @ 1.5 pts/ac	ProSolution SC

Polygons

■ 24.31570 acres or 1,059,192 sq feet @ ~ (47.365415, -114.260405)



National Bison Range



Contact Name: Amy Lisk
Address: 922 Bootlegger Trail Great Falls, MT 59404
Phone: 406-727-7400 x213
Record Date: Nov 7, 2013
Time: 9:30 AM - 1:30 PM
Total Man Hours: 8
Area Treated: 16.6032140026 acres
Density: Light 1 2 **3** 4 5 Dense
Slope: Flat 1 2 **3** 4 5 Steep
Notes:

	AM	PM
Temperature	37°F	43°F
Sky Conditions	Cloudy	Rain
Wind Conditions	6-10 mph	6-10 mph

Crew Members

	Hours	Certification Num
Martin Clark (<i>Leader</i>)	4	
Drew Gentry	4	

Methods Used

Foliar - ATV/UTV

Species Treated

Dalmatian toadflax

Chemicals Used

EPA #	Brand Name	Total Solution	Rate	% Solution	Surfactant	Dye
241-365	Plateau	77 gal	12 oz/acre		1.5 pts/ac MSO	ProSolutions SC

Polygons

■ 16.60321 acres or 723,236 sq feet @ ~ (47.364275, -114.26107)



National Bison Range



Contact Name: Amy Lisk
Address: 922 Bootlegger Trail Great Falls, MT 59404
Phone: 406-727-7400 x213
Record Date: Nov 8, 2013
Time: 8:00 AM - 3:30 PM
Total Man Hours: 12
Area Treated: 27.3921654114 acres
Density: Light 1 2 3 4 5 Dense
Slope: Flat 1 2 3 4 5 Steep
Notes: 30-50 mph wind gusts in afternoon.

	AM	PM
Temperature	39°F	43°F
Sky Conditions	Cloudy	Cloudy
Wind Conditions	Calm	

Crew Members

	Hours	Certification Num
Martin Clark (<i>Leader</i>)	6	
Drew Gentry	6	

Methods Used

Foliar - ATV/UTV

Species Treated

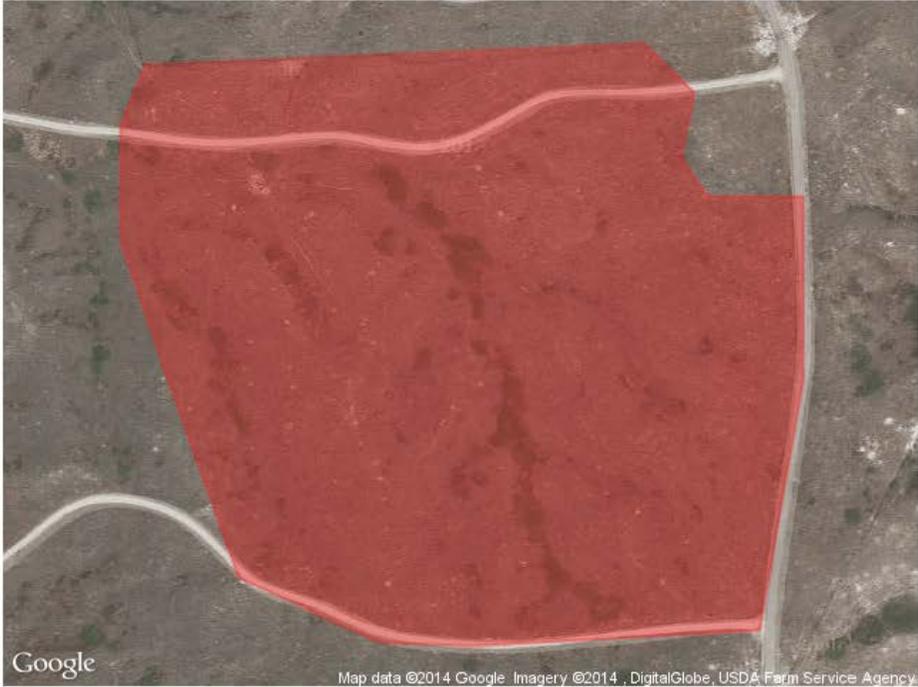
Dalmatian toadflax

Chemicals Used

EPA #	Brand Name	Total Solution	Rate	% Solution	Surfactant	Dye
241-365	Plateau	72 gal	12 oz/acre		1.5 pts/ac MSO	ProSolution SC

Polygons

27.39217 acres or 1,193,203 sq feet @ ~ (47.364575, -114.255965)



National Bison Range



Contact Name: Amy Lisk
Address: 922 Bootlegger Trail Great Falls, MT 59404
Phone: 406-727-7400 x213
Record Date: Nov 11, 2013
Time: 8:00 AM - 4:30 PM
Total Man Hours: 16
Area Treated: 43.074386092 acres
Density: Light 1 2 **3** 4 5 Dense
Slope: Flat 1 2 3 **4** 5 Steep

Notes:

	AM	PM
Temperature	34°F	42°F
Sky Conditions	Cloudy	Cloudy
Wind Conditions	Calm	Calm

Crew Members

	Hours	Certification Num
Martin Clark (<i>Leader</i>)	8	
Drew Gentry	8	

Methods Used

Foliar - ATV/UTV

Species Treated

Dalmatian toadflax

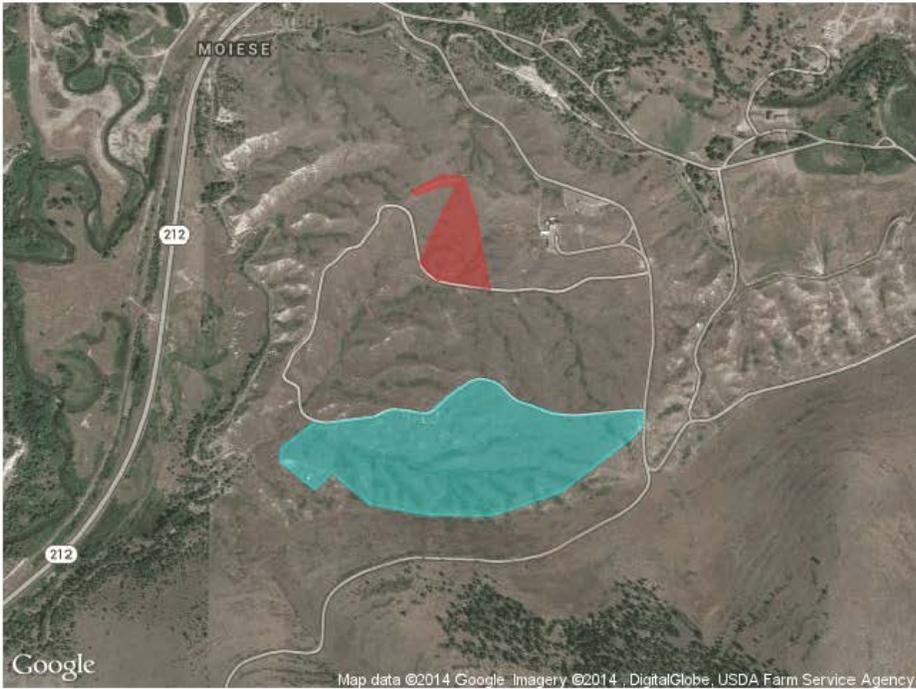
Chemicals Used

EPA #	Brand Name	Total Solution	Rate	% Solution	Surfactant	Dye
241-365	Plateau	80 gal	12 oz/acre		1.5 pts/ac MSO	ProSolution SC

Polygons

■ 5.70528 acres or 248,522 sq feet @ ~ (47.366765, -114.259455)

■ 37.36911 acres or 1,627,798 sq feet @ ~ (47.362395, -114.25913)



National Bison Range



Contact Name: Amy Lisk
Address: 922 Bootlegger Trail Great Falls, MT 59404
Phone: 406-727-7400 x213
Record Date: Nov 12, 2013
Time: 8:00 AM - 2:00 PM
Total Man Hours: 12
Area Treated: 12.9444932254 acres
Density: Light 1 2 3 4 5 Dense
Slope: Flat 1 2 3 4 5 Steep
Notes:

	AM	PM
Temperature	35°F	42°F
Sky Conditions	Cloudy	Cloudy
Wind Conditions	1-5 mph	1-5 mph

Crew Members

	Hours	Certification Num
Martin Clark (<i>Leader</i>)	6	
Drew Gentry	6	

Methods Used

Foliar - ATV/UTV

Species Treated

Dalmatian toadflax

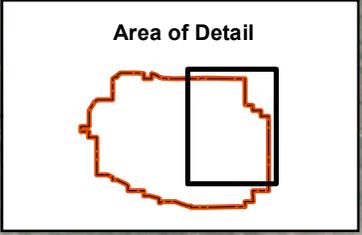
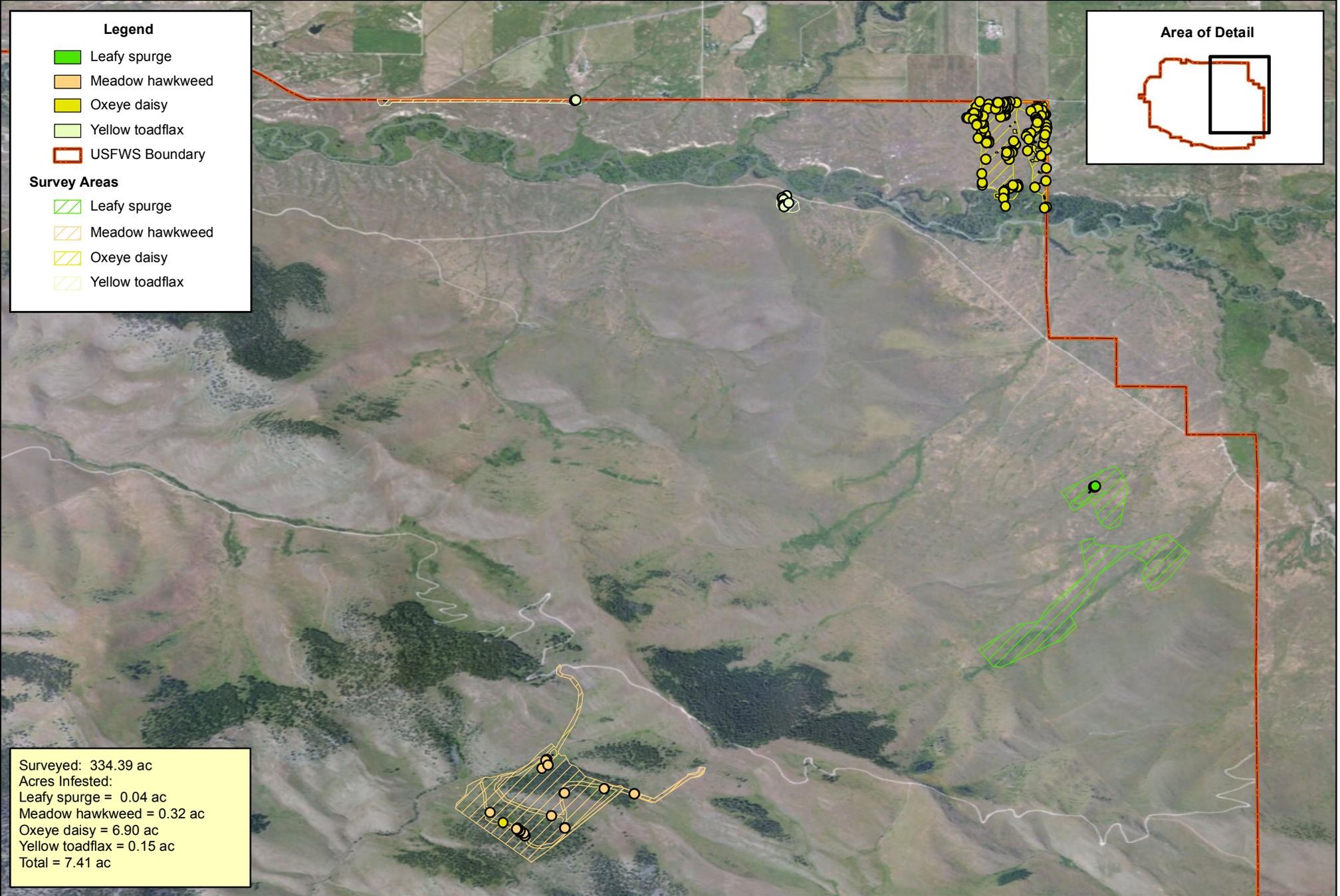
Chemicals Used

EPA #	Brand Name	Total Solution	Rate	% Solution	Surfactant	Dye
241-365	Plateau	80 gal	12 oz/acre		1.5 pts/ac MSO	ProSolution SC

Polygons

12.94449 acres or 563,862 sq feet @ ~ (47.36527, -114.26298)







U.S. Fish & Wildlife Service

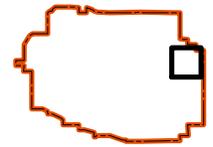
MOYOCO Invasive Species Strike Team

National Bison Range NWR - 2013 Survey Acres Treated

Legend

- Leafy spurge
- Leafy spurge Survey Area
- USFWS Boundary

Area of Detail



Leafy Spurge
Surveyed: 107.36 ac
Infested and Treated = 0.04 ac



0 0.125 0.25 0.5 Miles

Reference image ESRI ArcMap Basemap Imagery

Leafy Spurge - 2 of 5 Maps



U.S. Fish & Wildlife Service

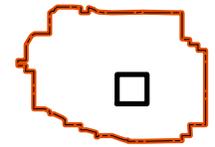
MOYOCO Invasive Species Strike Team

National Bison Range NWR - 2013 Survey Acres Treated

Legend

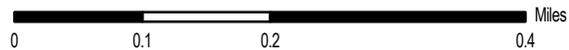
-  Meadow hawkweed
-  Oxeye daisy
-  Meadow hawkweed Survey Area
-  USFWS Boundary

Area of Detail



Meadow Hawkweed
 Surveyed: 150.02 ac
 Infested and Treated = 0.32 ac

Oxeye daisy
 Infested and Treated = 0.005 ac



Reference image ESRI ArcMap Basemap Imagery

Sheep Pasture - 3 of 5 Maps



U.S. Fish & Wildlife Service

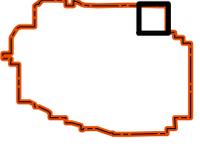
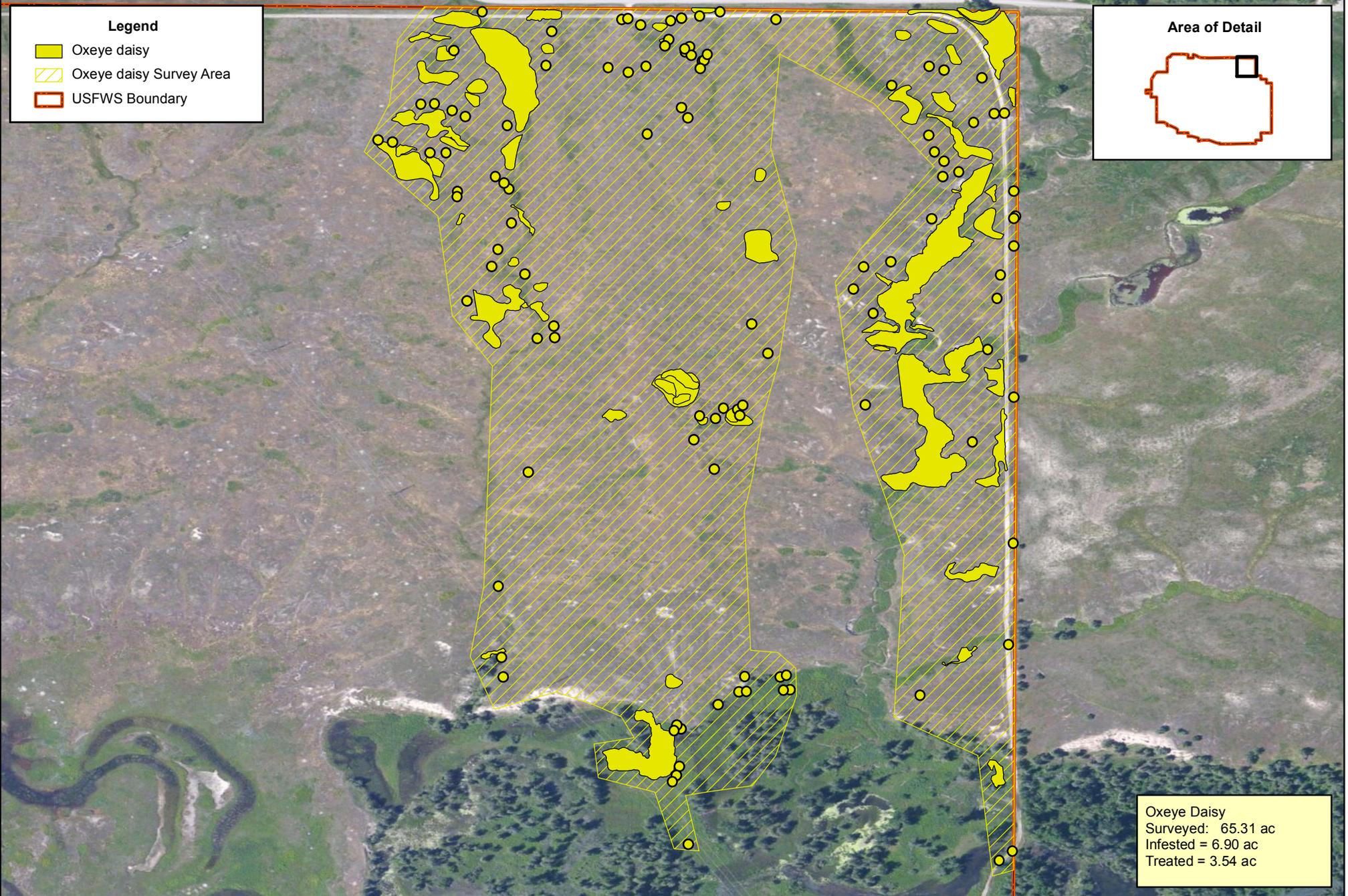
MOYOCO Invasive Species Strike Team

National Bison Range NWR - 2013 Survey Acres Treated

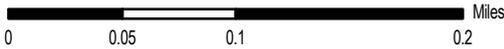
Legend

-  Oxeye daisy
-  Oxeye daisy Survey Area
-  USFWS Boundary

Area of Detail

Oxeye Daisy
 Surveyed: 65.31 ac
 Infested = 6.90 ac
 Treated = 3.54 ac



Reference image ESRI ArcMap Basemap Imagery

Oxeye Daisy - 4 of 5 Maps



U.S. Fish & Wildlife Service

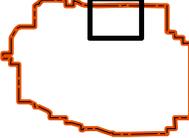
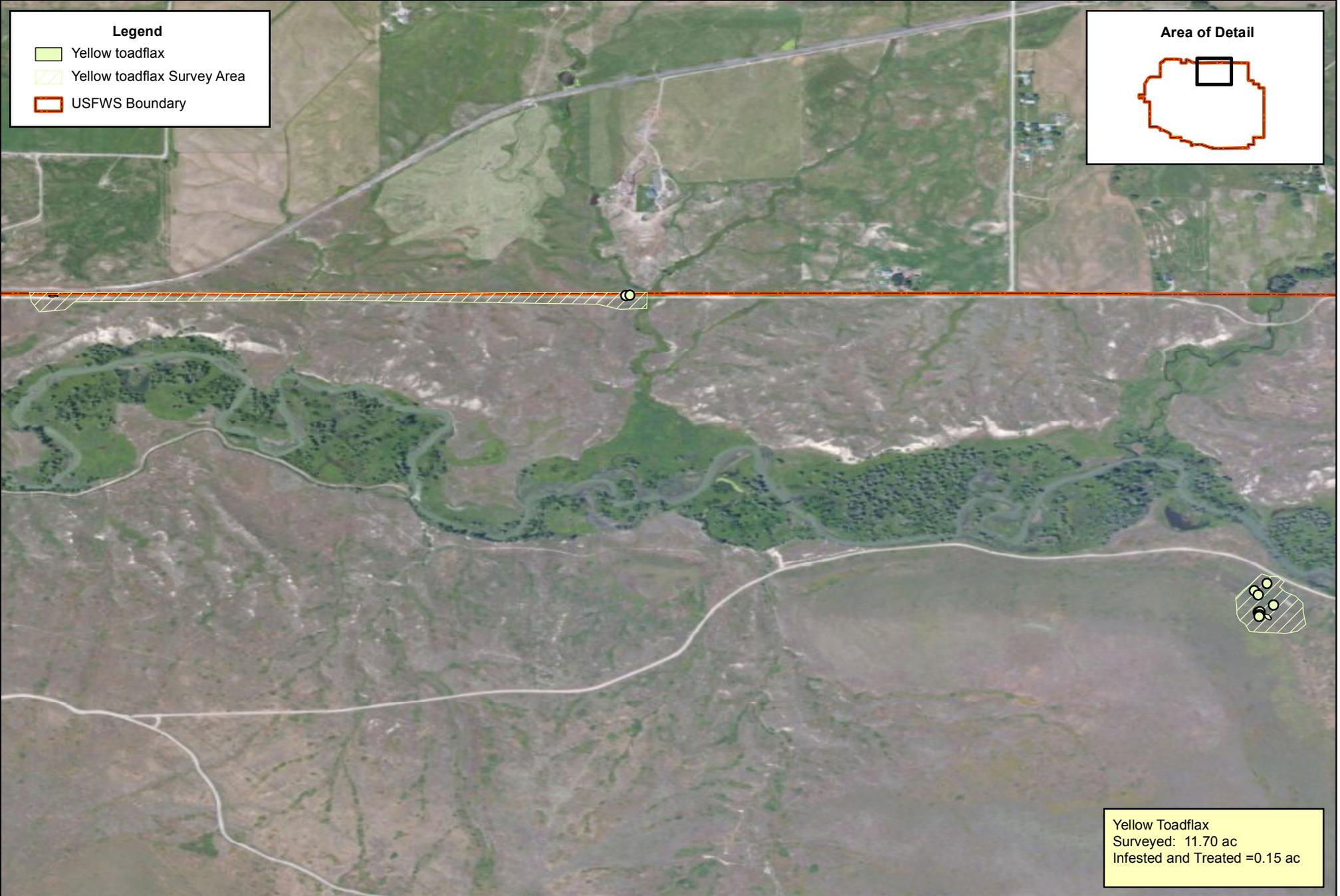
MOYOCO Invasive Species Strike Team

National Bison Range NWR - 2013 Survey Acres Treated

Legend

-  Yellow toadflax
-  Yellow toadflax Survey Area
-  USFWS Boundary

Area of Detail

Yellow Toadflax
 Surveyed: 11.70 ac
 Infested and Treated = 0.15 ac



Reference image ESRI ArcMap Basemap Imagery

Yellow Toadflax - 5 of 5 Maps

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MONTANA DEPARTMENT OF AGRICULTURE
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 PO BOX 200201
 HELENA, MT 59620-0201
 Phone 406-444-3730

DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	D. Solomon, J. Zarate, B. Mullen, G. Mazza	
Date	6/11/13	
County	Lake	
Time Start/Stop	9:00-12:00	
Temperature	66 °F	
Relative Humidity	49%	
Wind Speed/Direction (from)	0.7 mph N	
Pesticide Manufacturer	-	
Trade Name	-	
EPA Reg # or Formulation	-	
Rate: Product/Diluent Per Acre	-	
Amount of Chemical Applied	-	
Equipment Used (atv,backpack,truck,saw)	-	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	Hand Clipped	
Plant Phenology & Stage	Flowering	
Dominant Pest(s)	Leafy spurge	
Equipment Used	Hand Clippers	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

Location #1 (Site specific description) Historic data within Alexander Basin Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	B. Mullen	D. Solomon
Date	6/12/13	6/12/13
County	Lake	Lake
Time Start/Stop	11:00-17:00	11:00-17:00
Temperature	59°F	59°F
Relative Humidity	66%	66%
Wind Speed/Direction (from)	2.5 mph variable	2.5 mph variable
Pesticide Manufacturer	Dow AgroSciences	Dow AgroSciences
Trade Name	Milestone	Milestone
EPA Reg # or Formulation	62719-519	62719-519
Rate: Product/Diluent Per Acre	6oz/ac	6oz/ac
Amount of Chemical Applied	1.06oz (6 gal mix)	1.46oz (9 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV Handgun (34 GPA)	ATV Handgun (37 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Flowering	Flowering
Dominant Pest(s)	Oxeye daisy	Oxeye daisy
Equipment Used	-	-
Acres/Area Treated or # of plants	GPS Mapped	GPS Mapped
GPS Filename	-	-

Location #1 (Site specific description) North end, east side of Mission Creek Pasture Location #2 (Site specific description) Approximately 100M off of east fence of Mission Creek Pasture	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... Highlight used @ 2oz/10gal No surfactant used
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	G. Mazza	
Date	6/12/13	
County	Lake	
Time Start/Stop	12:00 - 17:00	
Temperature	59°F	
Relative Humidity	66%	
Wind Speed/Direction (from)	2.5mph variable	
Pesticide Manufacturer	Dow AgroSciences	
Trade Name	Milestone	
EPA Reg # or Formulation	62719-519	
Rate: Product/Diluent Per Acre	6oz/ac	
Amount of Chemical Applied	0.97oz (6 gal mix)	
Equipment Used (atv,backpack,truck,saw)	ATV Handgun (37 GPA)	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	-	
Plant Phenology & Stage	Flowering	
Dominant Pest(s)	Oxeye daisy	
Equipment Used	-	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

Location #1 (Site specific description) North end of Mission Creek pasture Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... No surfactant used Highlight @ 2 oz/10gal
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	B. Mullen	D. Solomon
Date	6/13/13	6/13/13
County	Lake	Lake
Time Start/Stop	8:15 – 12:00	8:30 – 12:30
Temperature	55°F	57°F
Relative Humidity	48%	70%
Wind Speed/Direction (from)	1.5mph NW	2.4mph N
Pesticide Manufacturer	Dow AgroSciences	Dow AgroSciences
Trade Name	Milestone	Milestone
EPA Reg # or Formulation	62719-519	62719-519
Rate: Product/Diluent Per Acre	6oz/ac	6oz/ac
Amount of Chemical Applied	1.41oz (8 gal mix)	2.92oz (18 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV Handgun (34 GPA)	ATV Handgun (37 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Flowering	Flowering
Dominant Pest(s)	Oxeye daisy	Oxeye daisy
Equipment Used	-	-
Acres/Area Treated or # of plants	GPS Mapped	GPS Mapped
GPS Filename	-	-

Location #1 (Site specific description) North side of Mission Creek on the east side Location #2 (Site specific description) North side of Mission Creek pasture	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... No surfactant Highlight @ 2oz/ 10gal Started raining at 14:00
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	G. Mazza	
Date	6/13/13	
County	Lake	
Time Start/Stop	8:15 – 12:00	
Temperature	55°F	
Relative Humidity	48%	
Wind Speed/Direction (from)	1.5mph NW	
Pesticide Manufacturer	Dow AgroSciences	
Trade Name	Milestone	
EPA Reg # or Formulation	62719-519	
Rate: Product/Diluent Per Acre	6oz/ac	
Amount of Chemical Applied	1.46oz (9 gal mix)	
Equipment Used (atv,backpack,truck,saw)	ATV Handgun (37 GPA)	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	-	
Plant Phenology & Stage	Flowering / bolting	
Dominant Pest(s)	Oxeye daisy	
Equipment Used	-	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

Location #1 (Site specific description) North end of Mission Creek - East Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... No surfactant Highlight @ 2 oz/10gal Started to drizzle around 14:00
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	D. Solomon, B. Mullen	G. Mazza
Date	6/27/13	6/27/13
County	Lake	Lake
Time Start/Stop	9:00-11:30	9:00-12:15
Temperature	56°F	65°F
Relative Humidity	78%	78%
Wind Speed/Direction (from)	2 mph variable	2 mph SW
Pesticide Manufacturer	Dow AgroSciences	Dow AgroSciences
Trade Name	Milestone	Milestone
EPA Reg # or Formulation	62719-519	62719-519
Rate: Product/Diluent Per Acre	6oz/ac	6oz/ac
Amount of Chemical Applied	0.24oz (1 gal mix)	0.44 oz (2 gal mix)
Equipment Used (atv,backpack,truck,saw)	Backpack (25 GPA)	Backpack (27 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Basal rosette, flowering	Basal rosette, flowering
Dominant Pest(s)	Meadow hawkweed	Meadow hawkweed
Equipment Used	-	-
Acres/Area Treated or # of plants	GPS Mapped	GPS Mapped
GPS Filename	-	-

Location #1 (Site specific description) Sheep Pasture – south region Location #2 (Site specific description) Sheep Pasture – south region	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... Surfactant: Spreader 90 @ 1 pt/100gal Dye: Highlight @ 2oz/10gal
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	D. Solomon	
Date	9/23/13	
County	Lake	
Time Start/Stop	1:00pm – 2:00pm	
Temperature	57°F	
Relative Humidity	60%	
Wind Speed/Direction (from)	3mph var.	
Pesticide Manufacturer	BASF	
Trade Name	Plateau	
EPA Reg # or Formulation	241-365	
Rate: Product/Diluent Per Acre	11oz/ac	
Amount of Chemical Applied	<0.1oz (<0.25 gal mix)	
Equipment Used (atv,backpack,truck,saw)	Backpack (25 GPA)	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	-	
Plant Phenology & Stage	Flowering / Post-flowering	
Dominant Pest(s)	Leafy spurge	
Equipment Used	-	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

Location #1 (Site specific description) Amphitheater Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... MSO @ 2pts/ac Hi-Light @ 3oz/10gal Rained in afternoon off and on.
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DAILY PESTICIDE APPLICATION RECORD

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NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	G. Mazza	
Date	9/23/13	
County	Lake	
Time Start/Stop	15:30 – 17:00pm	
Temperature	62°F	
Relative Humidity	60%	
Wind Speed/Direction (from)	2mph W	
Pesticide Manufacturer	DuPont	
Trade Name	Telar	
EPA Reg # or Formulation	352-654	
Rate: Product/Diluent Per Acre	2oz/ac	
Amount of Chemical Applied	0.10oz (1gal mix)	
Equipment Used (atv,backpack,truck,saw)	Backpack (21GPA)	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	-	
Plant Phenology & Stage	Leaf on	
Dominant Pest(s)	Yellow toadflax	
Equipment Used	-	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

<p>Location #1 (Site specific description)</p> <p>Just above tour road down by Mission Creek around historic locations.</p> <p>Location #2 (Site specific description)</p>	<p>COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....</p> <p>Spreader-90 @ 2pts/100gal Possible Dalmatian and yellow toadflax hybrid in this area</p>
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DAILY PESTICIDE APPLICATION RECORD

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) National Bison Range
CITY, STATE, ZIP Stevensville, MT	PHONE 406-544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	D. Solomon	
Date	9/26/2013	
County	Lake	
Time Start/Stop	07:30 – 09:30	
Temperature	50°F	
Relative Humidity	60%	
Wind Speed/Direction (from)	2mph var.	
Pesticide Manufacturer	DuPont	
Trade Name	Telar	
EPA Reg # or Formulation	352-654	
Rate: Product/Diluent Per Acre	2oz/ac	
Amount of Chemical Applied	<0.02oz (<0.25 gal mix)	
Equipment Used (atv,backpack,truck,saw)	Backpack (21GPA)	
Bio-Control (genus species)	-	
# released / acre	-	
Mechanical (mow,hand-pull)	-	
Plant Phenology & Stage	Post-flowering	
Dominant Pest(s)	Yellow toadflax	
Equipment Used	-	
Acres/Area Treated or # of plants	GPS Mapped	
GPS Filename	-	

Location #1 (Site specific description) Amphitheater Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... Spreader-90 @ 1pt/100 gal Hi-Light @ 3 oz/10 gal
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