

Northwest Montana Wetland Management District

Anderson WPA, Batavia WPA, Duck Haven WPA, and McGregor Meadows WPA

Benton Lake and Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Survey Acres Infested ²	Acres Treated ³
Absinthe wormwood	364.08*	3.57	0
Bull thistle	0	0.30	0
Canada thistle	364.08*	67.60	0
Cheatgrass	0	0.68	0
Common tansy	364.08*	1.32	0
Common teasel	385.79*	0.97	0.97
Field pennycress	0	0.09	0
Houndstongue	1,281.64*	0.17	0.02
Leafy spurge	462.67	0.28	0.34
Meadow hawkweed	1,281.64*	0.26	0
Musk thistle	364.08*	35.86	0
North Africa grass	0	0.01	0
Orange hawkweed	895.85*	0.11	0
Oxeye daisy	917.56*	0.04	0
Purple loosestrife	385.79*	0.00	0
Russian knapweed	531.77*	0.01	0
Spiny plumeless thistle	364.08*	11.08	0
Spotted knapweed	895.85*	29.54	0
St. Johnswort	531.77*	0.03	0
Sulfur cinquefoil	364.08*	0.05	0
Yellow toadflax	1,281.64*	41.21	0
Flathead County Totals	895.85	192.33	0.01
Lake County Totals	462.67	1.27	1.32
District Totals	1,358.52	193.60	1.33

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.

* One survey area was searched for multiple species but this survey acreage was only counted once. Target surveys were not conducted for all species. Details of species included in this survey category are included in the individual project reports.

Summary

Flathead County

- ISST surveyed a combined 895.85 acres on Batavia and McGregor Meadows Waterfowl Production Areas (WPAs)
- Large scale inventories were conducted on these sites for the purpose of inventorying noxious weeds present.

- Batavia was found to be significantly more infested (177.39 acres infested) than McGregor Meadows WPA (14.94 acres infested).
- Knowing what species composition and approximate acreages can aid site managers in prioritizing and implementing management strategies for controlling the spread of weeds across the landscape.
- Treatment of weeds on these sites was not a priority this season.
 - No weeds were treated at Batavia and on McGregor Meadows only a single houndstongue plant was treated because it was the only houndstongue plant found on the west side of the site.



Meadow hawkweed found at McGregor Meadows WPA. Photo by John Miskella.

Lake County

- ISST surveyed a combined 462.67 acres on Anderson and Duck Haven WPAs
- On Anderson, the team treated leafy spurge on two separate occasions to help prevent seeding by clipping patches and then later spraying them in the fall.
 - The team mapped a total of 0.29 acres of leafy spurge.
 - North Africa grass and oxeye daisy were mapped in the northern part of Anderson WPA. These locations were incidental observations that were noted to alert managers of these species presence and are not inclusive of the entire infestation that may/may not be present on this site.
- 385.79 acres were covered on Duck Haven WPA during point-to-point surveys to treat multiple species including common teasel, houndstongue, and oxeye daisy.
 - Other species including leafy spurge, meadow hawkweed and purple loosestrife were searched for and would have been treated if found.
 - Lake County Weed District employee worked with ISST for a day helping with spray efforts onsite.
 - Less than 1 acre of weeds were found and treated during the survey period on Duck Haven WPA.

Northwest Montana Wetland Management District, Lake Co.

Anderson WPA

Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Survey Acres Infested ²	Acres Treated ³
Leafy spurge	76.88	0.28	0.34
Meadow hawkweed	0	0	0
North Africa grass	0	0.005	0
Oxeye daisy	0	0.005	0
Project Site Totals	76.88	0.29	0.34

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.

Highlights

Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
10-July-2014	Mechanical Treatment	Leafy spurge	2	Point-to-point surveys based on historic locations, plus a 30M buffer around all spurge found
22-Sept-2014	Chemical Treatment			

Coordination and Cooperation

- ISST Crew Leader, Jessica Zarate, coordinated with Biologist, Amy Lisk, via email using the “Strike Team Expectation and Accomplishment Checklist” (see Appendix A and B). Since Amy would not be available the week of July 7th, all coordination was done prior to arrival via email and phone.
- Upon arrival and exit, Jessica worked with Lead Biologist, Brendan Moynahan to procure site keys, a refuge vehicle and radio for use throughout the week. The work plan, priorities and any questions were also discussed prior to beginning work. All equipment used was returned at the end of the work week.

Prevention and Education

- Leafy spurge flowers are clipped-off during summer and then plants are later sprayed in the fall. The suppression of seed production, followed by systemic treatment may be most effective to inhibit its ability to spread.

Early Detection and Rapid Response

- Leafy spurge is limited in its abundance and distribution on this site and it is an ideal candidate for early detection and rapid response treatment.

Inventory and Monitoring

- In July, ISST also searched for meadow hawkweed near the south fence line because it had been found in this area last season. However, no meadow hawkweed plants were detected on site this season.
- North Africa grass was found onsite but this species was not a priority for survey or mapping this year. A point was taken at one location to indicate presence, but this is not inclusive of all North Africa grass observed during surveys. It was also seen outside of the boundary near the site access gate. Future inventory of this species may be useful to determine the extent of this infestation if treatment of this species becomes a priority.
- One small oxeye daisy patch was found during the July survey, so its location was mapped although this species was not a priority at this time. It is possible more oxeye daisy is present.

Management

- The treated acres are larger than acres infested because the site was treated twice in 2014.
- Infested acres of spurge in 2013 were 0.47 acres, and that decreased to 0.29 acres in 2014, which may indicate control efforts (mechanical, chemical and grazing) are having an effect on reducing leafy spurge in this area.
- Amy Lisk requested ISST include a patch of spurge that is located on private property, immediately northeast of the site, in all control efforts since they had been granted permission to apply treatments in this area.

Herbicide Applied

- 3.05oz of Plateau was used for treatment of leafy spurge

Proposed 2015 Schedule

- Meadow hawkweed should continue to monitored and treated when found.
- Leafy spurge is difficult to control and may take several years to eradicate but given the small infestation present, removal of this species from the project area with continued intensive effort may be possible. Therefore mechanical removal of developing flowers and seeds, chemical treatments and scheduled grazing as appropriate for the site are recommended to continue to suppress and kill this species.



The Anderson WPA project site is situated within the beautiful Mission Valley. Photograph by Jessica Zarate.

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: National Bison Range Complex Date of Visit: 07/07/14-07/10/14

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
<i>Ventenata dubia</i>	NBR Refuge	Alexander Basin (2297ac)	Systematic transecting	No	N/A
Yellow toadflax, hawkweeds, oxeye daisy, Dame's rocket			Systematic transecting	No	N/A
Leafy spurge	NBR Refuge	Alexander Basin	Systematic transecting & Historic points	Yes, clip and bag flowers	N/A
Meadow hawkweed & Oxeye daisy	NBR Refuge	Sheep Pasture	Point-to-point with 30M buffer around historic and current plants.	Yes, backpack spray. Clip roses following application.	Milestone 6oz/acre
Leafy spurge	Anderson WPA	Historic points	No	Yes, clip and bag flowers	N/A

Notes:

Two people from Metcalf team will go to Alexander Basin to clip known locations of spurge since not enough time was available to complete this during the last visit in June.

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. ATVs will be used in Alexander Basin if permitted in some areas and use

will be discussed with Amy Lisk on arrival. It is anticipated that the majority of this inventory will be completed on foot.

Other access issues, conflicts, etc...:

It is the nesting seasons, so we will be on the lookout for ground nesting birds and do try to avoid riding over nests. Bison, rattlesnakes, and other wildlife may be present in areas worked and safety will be discussed prior to starting surveys.

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

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitoring	Treat	Completed (yes or no with explanation)
<i>Ventenata dubia</i>	NBR Refuge	Alexander Basin (2297ac)	Systematic transecting	No	Yes, continued surveys where we left off from last visit.
Yellow toadflax, hawkweeds, oxeye daisy, Dame's rocket			Systematic transecting	No	Yes, none found this visit. Only Dame's rocket and leafy spurge found during last survey period.
Leafy spurge	NBR Refuge	Alexander Basin	Systematic transecting & Historic points	Yes, clip and bag flowers	No. Not enough time to go back and clip these plants following inventory surveys.
Meadow hawkweed & Oxeye daisy	NBR Refuge	Sheep Pasture	Point-to-point with 30M buffer around historic and current plants.	Yes, backpack spray. Clip roses following application	Yes, all found were treated.
Leafy spurge	Anders on WPA	Historic points	No	Yes, clip and bag flowers	Yes, all found were treated.

Notes:

Alexander Basin – We did not complete the triangle-shape corner fields that are located north of the tour road and fenced off from the rest of the pasture. I was not able to meet with Amy to coordinate on that this week, so that area was left un-surveyed and can be added later if needed.

Concerns with Project:

None.

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: 09/22/14-09/25/14

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Yellow toadflax	NBR Refuge	Alexander Basin and on North Boundary Road	Point-to-point historic locations plus a 30M buffer around these areas and new plants found	Yes	Tordon and Distinct – Refuge/ISS T
Leafy spurge		Alexander Basin	Systematic transecting & Historic points	Yes, clip and bag flowers	Plateau and MSO – Refuge
Leafy spurge	Anderson WPA	Historic points	No	Yes, clip and bag flowers	Plateau and MSO – Refuge

Notes:

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. ATVs will be used for treatments as needed but many of the areas will likely be accessed on foot with a backpack sprayer.

Other access issues, conflicts, etc...:

Bison, rattlesnakes, and other wildlife may be present in areas worked and safety will be discussed prior to starting surveys.

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

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitoring	Treat	Completed (yes or no with explanation)
Yellow toadflax	NBR Refuge	Alexander Basin and on North Boundary Road	Point-to-point historic locations plus a 30M buffer around these areas and new plants found	Yes	Yes, none found on boundary road and only two plants found in Alexander Basin were pulled. Extremely dry conditions.
Leafy spurge		Alexander Basin	Systematic transecting & Historic points	Yes, clip and bag flowers	Yes, historic locations were treated. Most plants very dry except where found within the snowberry.
Leafy spurge	Anderson WPA	Historic points	No	Yes, clip and bag flowers	Yes, location off site was still green but plants onsite were very dry.
Yellowflag iris	Ninepipe NWR	Entire site	No	Yes	No, see notes below.

Notes:

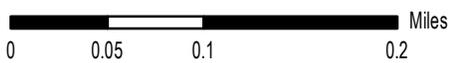
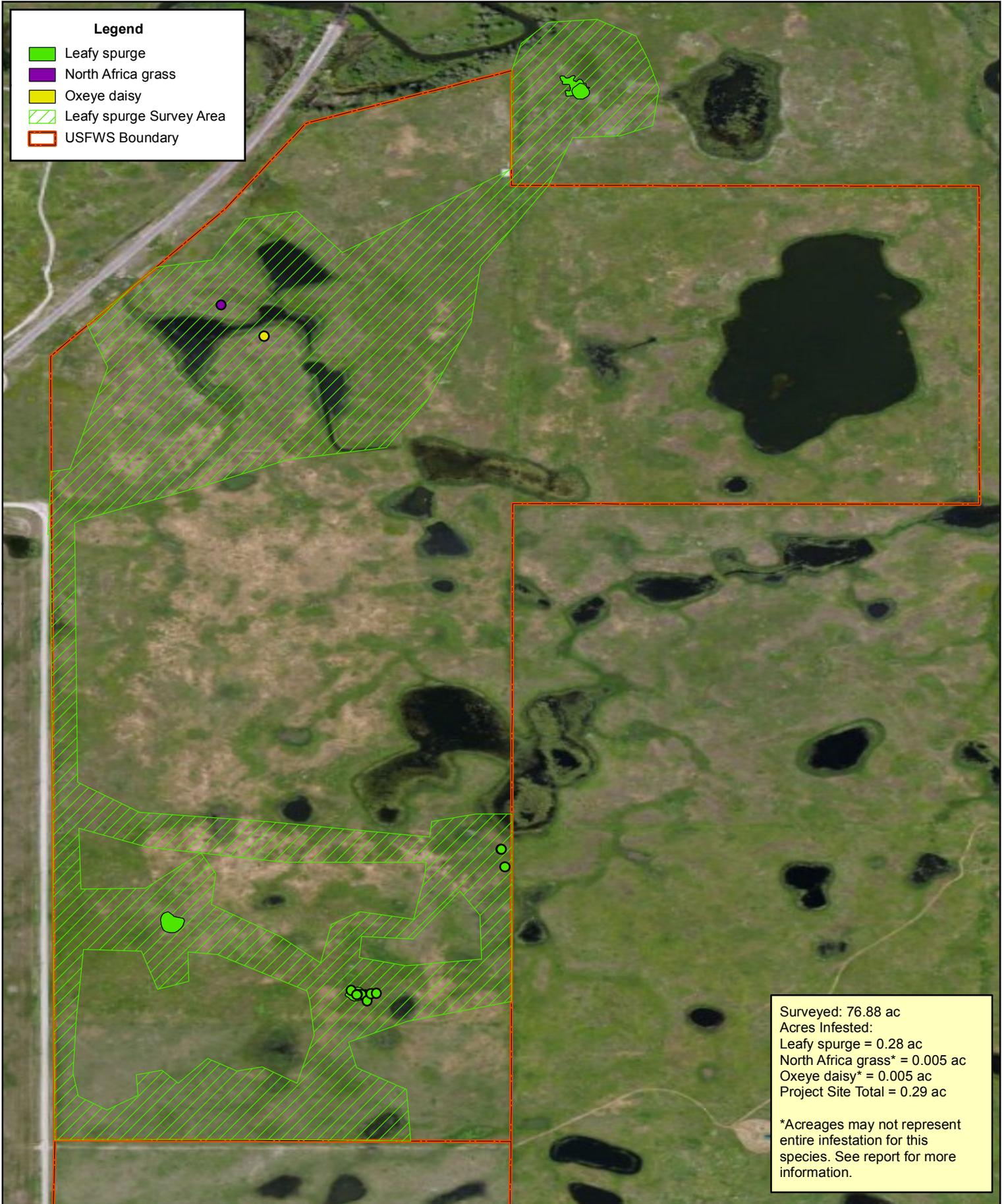
Ninepipe NWR: There were two people working north of the lake and three people to the south. We began work on the west side and worked moving East. We covered most of the north and two-thirds of the south side.

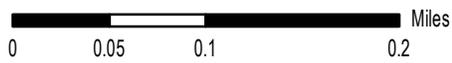
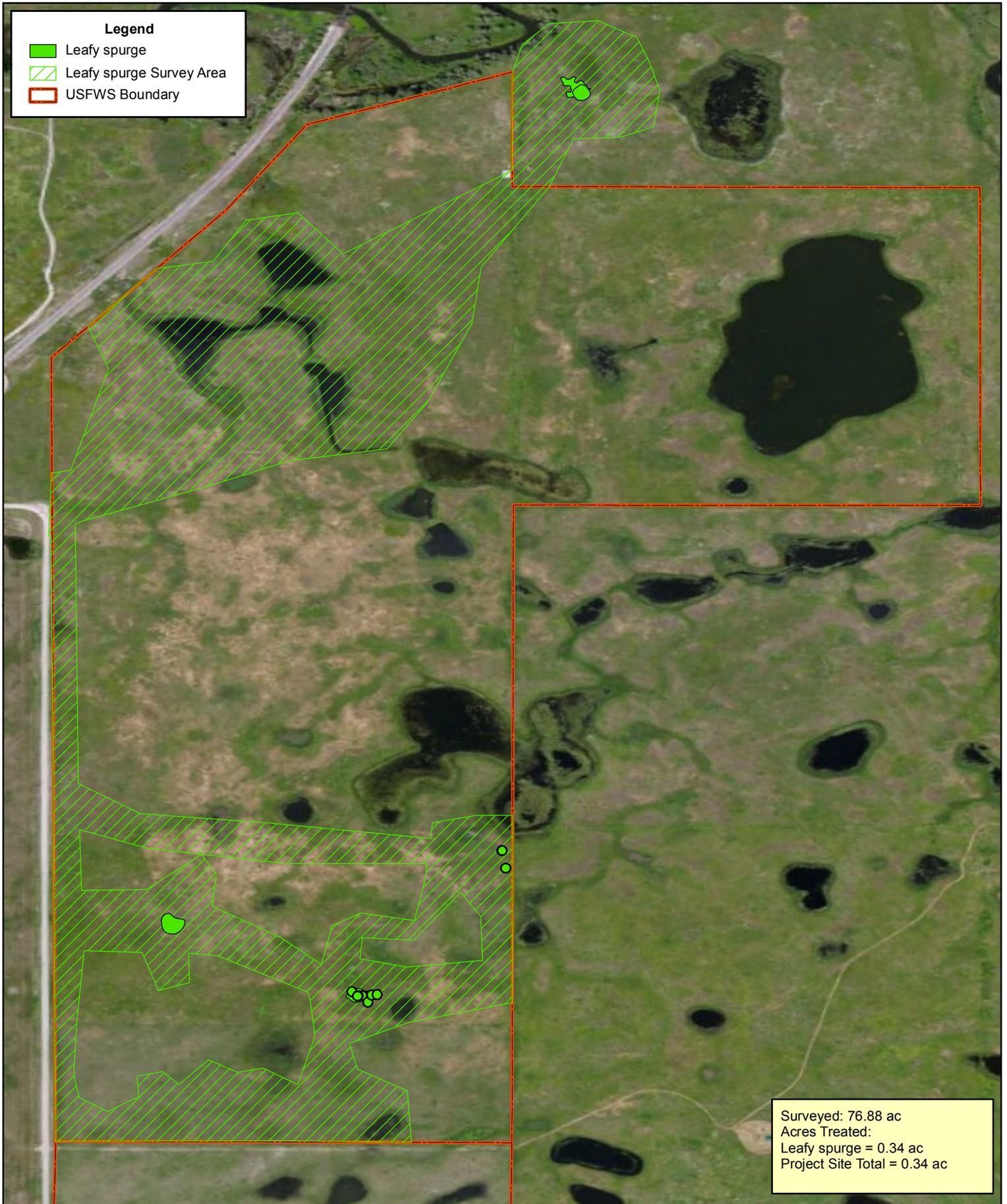
Concerns with Project:

None.

Station or Site Manager (or

Acting): _____ Date: _____





Compliments of the

MONTANA DEPARTMENT OF AGRICULTURE
 AGRICULTURAL SCIENCES DIVISION
 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) Anderson WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	J. Zarate	C. Holtz
Date	7/10/2014	7/10/2014
County	Lake	Lake
Time Start/Stop	9:30am-11:00am	9:30am-11:00am
Temperature	82°F	82°F
Relative Humidity	15%	15%
Wind Speed/Direction (from)	3 mph S	3 mph S
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	Hand clipped
Plant Phenology & Stage	Flowering/Post Flowering	Flowering/ Post Flowering
Dominant Pest(s)	Leafy Spurge	Leafy Spurge
Equipment Used	Hand shears	Hand shears
Acres/Area Treated or # of plants	0.5 acres	0.0001 acres
GPS Filename	-	-

<p>Location #1 (Site specific description)</p> <p>North end of site at historic locations.</p> <p>Location #2 (Site specific description)</p> <p>South end of site at historic locations.</p>	<p>COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....</p> <p>Location #1: Spurge only found at off-site location of the northern patches surveyed. Many other weeds present: St. Johnswort, Oxeye Daisy, Poison Hemlock, Common Teasel, Ventenata, Sulfur Cinquefoil, etc...</p> <p>Location #2: No hawkweed found.</p>
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BUSINESS U.S. Fish and Wildlife Service	LICENSE# 101891-15
NAME Lee Metcalf Invasive Species Strike Team	ADDRESS (Refuge or WPA) Anderson WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	J. Wilson	B. Mullen
Date	9/22/2014	9/22/2014
County	Lake	Lake
Time Start/Stop	1:30pm-3:00pm	12:30am-3:30am
Temperature	77°F	77°F
Relative Humidity	32%	32%
Wind Speed/Direction (from)	0-3 mph S	3 mph NE
Pesticide Manufacturer	BASF	BASF
Trade Name	Plateau	Plateau
EPA Reg # or Formulation	241-365	241-365
Rate: Product/Diluent Per Acre	11oz/ac	11oz/ac
Amount of Chemical Applied	0.92oz (3 gal mix)	2.13oz (6 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV handgun (36 GPA)	ATV handgun (31 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Rosette, Post Flowering	Senescing
Dominant Pest(s)	Leafy Spurge	Leafy Spurge
Equipment Used	-	-
Acres/Area Treated or # of plants	0.08 acres	0.19 acres
GPS Filename	-	-

Location #1 (Site specific description) South section (3 polygons) Location #2 (Site specific description) North end of site	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... For both applications: Noble used at 32oz/acre Dynamark dye used at 3oz/10gal
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Northwest Montana Wetland Management District

Batavia WPA

Benton Lake and Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Surveyed Acres Infested ²	Acres Treated ³
All noxious weeds	364.08	--	0.00
Absinthe wormwood	364.08*	3.57	0.00
Canada thistle	364.08*	58.45	0.00
Common tansy	364.08*	1.32	0.00
Houndstongue	364.08*	0.10	0.00
Meadow hawkweed	364.08*	0.22	0.00
Musk thistle	364.08*	35.85	0.00
Orange hawkweed	364.08*	0.07	0.00
Spiny plumeless thistle	364.08*	11.08	0.00
Spotted knapweed	364.08*	25.08	0.00
Sulfur cinquefoil	364.08*	0.50	0.00
Yellow toadflax	364.08*	41.15	0.00
Project Site Totals	364.08	177.39	0.00

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
 *One survey area was searched for multiple species but this survey acreage was only counted once.

Highlights

Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
14-July-2014 to 18-July-2014	Refuge Inventory and Monitoring Project	All noxious weed	5	ISST transect surveyed, on ATVs, the entire WPA to document all invasive species.

Coordination and Cooperation

- Scheduling and protocol were developed from proposals and discussions with refuge staff Beverly Skinner and Kevin Shinn.
- Maps for the project were provided by ISST

Prevention and Education

- Eleven different species of invasive weeds were documented on Batavia WPA in 2014.
- The area is heavily infested by invasive weeds; treatments need to be considered to prevent further spread on to neighboring lands.

Early Detection and Rapid Response

- Early detection and rapid response was not the focus for this project. The goal for targeting all invasive species was to map the entire infested area and present the data to the Refuge Manager so a treatment proposal can be made.
- Early detection and rapid response treatment of weeds is critical to keep large tracts of land free of invasive and noxious species that degrade wildlife habitat.

Inventory and Monitoring

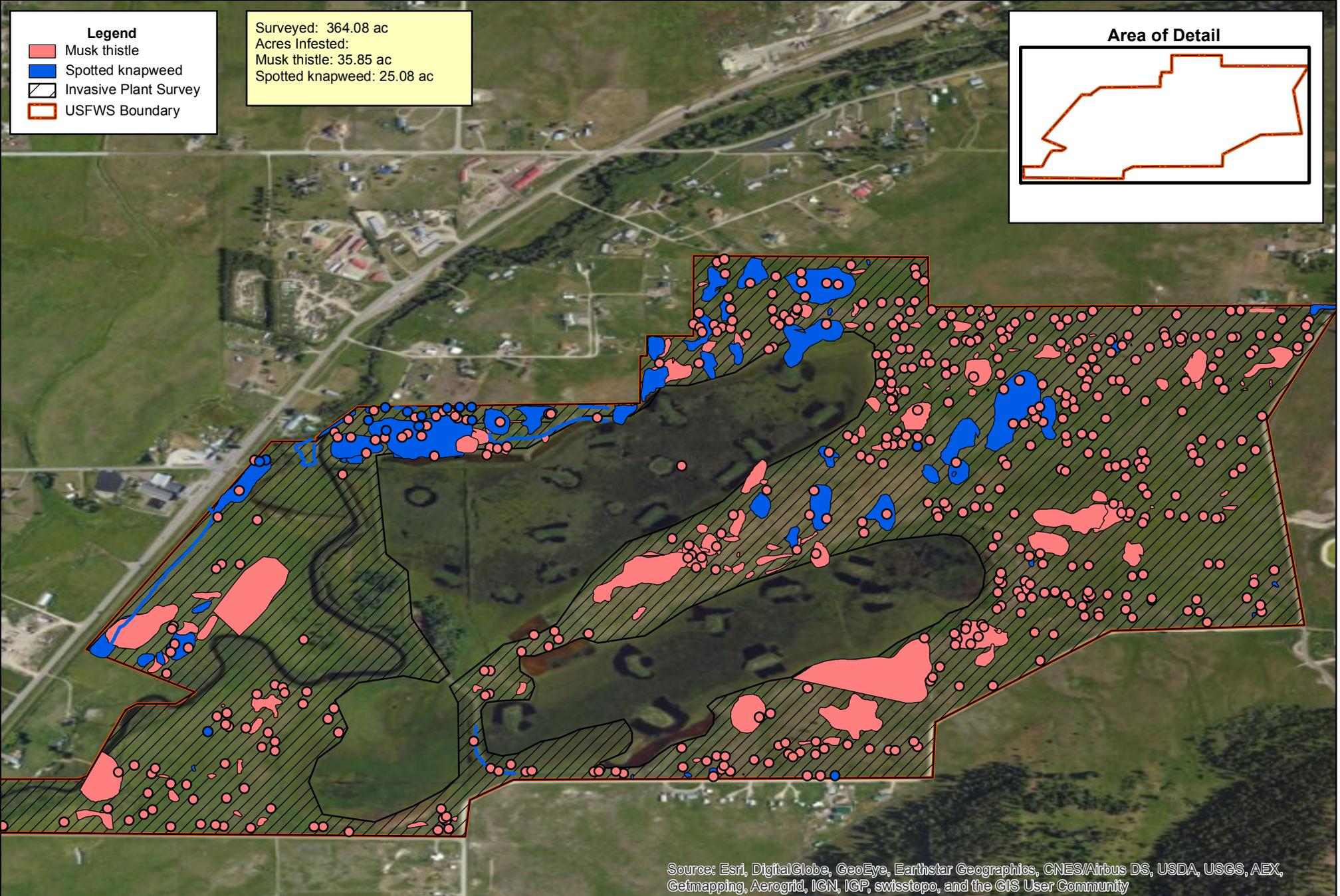
- GPS data were collected by ISST to provide information on patch size and locations. The GPS track logs, provided by ISST showing these locations, were used to digitize the survey area and calculate the estimated survey area acres.
- ISST searched 364.08 acres within Batavia WPA
 - With the exception of steep hillsides, ditches, and wetland areas, the entire area was surveyed on ATVs.

Management

- Management was not the objective of this project.

Recommendations

- Although difficult to control, houndstongue, meadow hawkweed, orange hawkweed, and sulfur cinquefoil populations are limited in distribution and abundance. Eradicating these species early will reduce management burden and preserve critical wildlife habitat.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



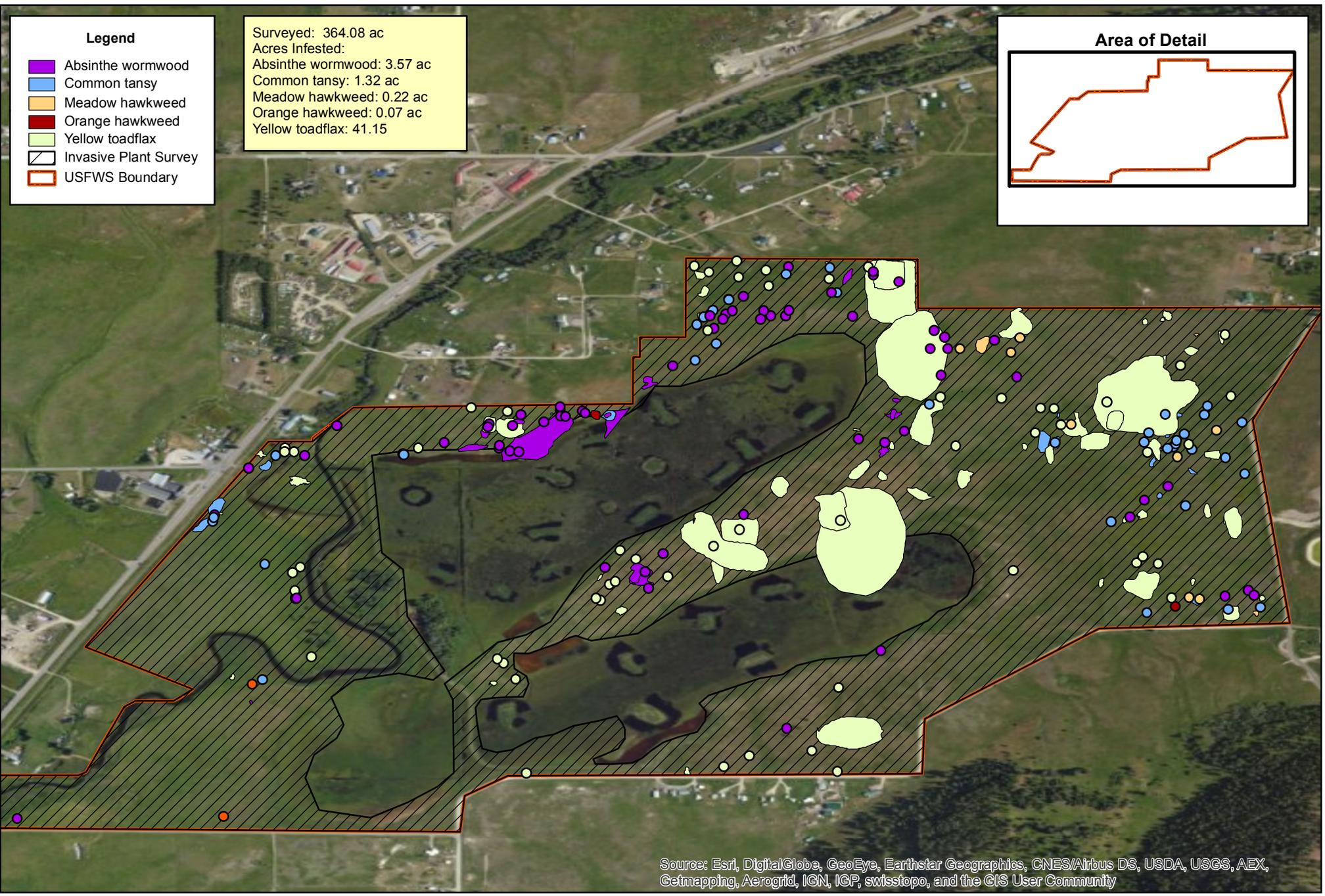


Legend

- Absinthe wormwood
- Common tansy
- Meadow hawkweed
- Orange hawkweed
- Yellow toadflax
- Invasive Plant Survey
- USFWS Boundary

Surveyed: 364.08 ac
 Acres Infested:
 Absinthe wormwood: 3.57 ac
 Common tansy: 1.32 ac
 Meadow hawkweed: 0.22 ac
 Orange hawkweed: 0.07 ac
 Yellow toadflax: 41.15

Area of Detail



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

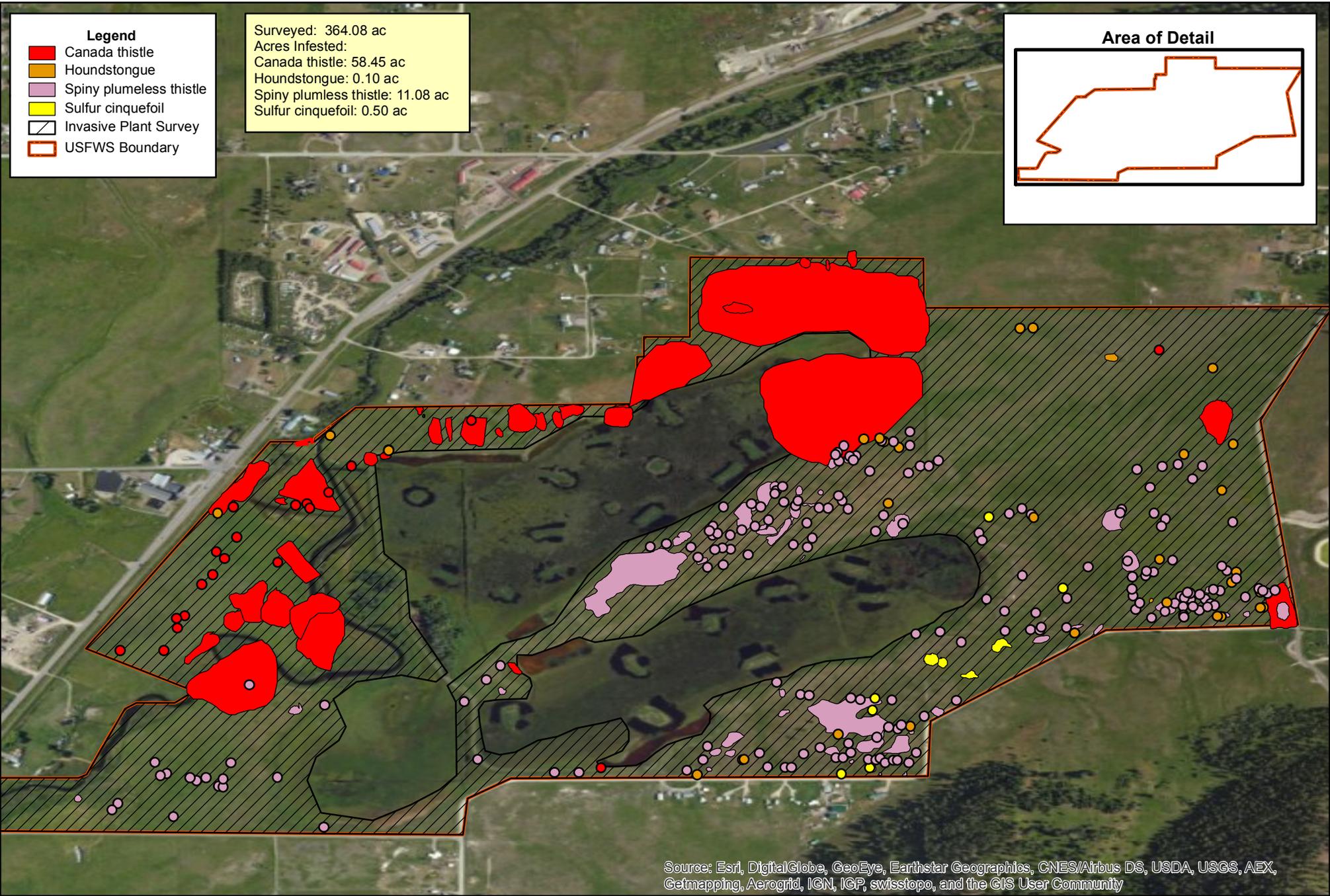
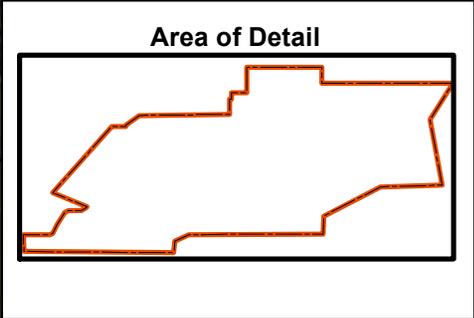




Legend

- Canada thistle
- Houndstongue
- Spiny plumeless thistle
- Sulfur cinquefoil
- Invasive Plant Survey
- USFWS Boundary

Surveyed: 364.08 ac
 Acres Infested:
 Canada thistle: 58.45 ac
 Houndstongue: 0.10 ac
 Spiny plumless thistle: 11.08 ac
 Sulfur cinquefoil: 0.50 ac



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Northwest Montana Wetland Management District, Lake Co. Duck Haven WPA

Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Survey Acres Infested ²	Acres Treated ³
Common teasel	385.79*	0.97	0.97
Houndstongue	385.79*	0.01	0.01
Leafy spurge	385.79*	0	0
Meadow hawkweed	385.79*	0	0
Oxeye daisy	385.79*	0	0
Purple loosestrife	385.79*	0	0
Yellow toadflax	385.79*	0	0
Project Site Totals	385.79	0.98	0.98

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³ The area or subset of infested area that has received some form of treatment as measured by GPS feature.
 * One survey area was searched for multiple species but this survey acreage was only counted once.

Highlights

Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
4-June-2014 to 5-June-2014	Refuge Project Chemical Treatment	Common teasel	2-4	Point-to-point surveys based on historic locations, plus a 30M buffer around all target plants found.
	EDRR Chemical Treatment Project	Meadow hawkweed, Oxeye daisy, Purple loosestrife		

Coordination and Cooperation

- ISST Crew Leader Jessica Zarate coordinated with Biologist Amy Lisk upon arrival to outline a plan for the week using the “Strike Team Expectation and Accomplishment Checklist” (see Appendix A).
- The team was not originally scheduled to work this site. Duck Haven priorities were added because target species on the Bison Range were not readily identifiable this early in the season.
- The National Bison Range works cooperatively with *Lake County Weed Control* on several projects. Since most of the Strike Team staff was attending mandatory training on June 4th, Amy Lisk coordinated with the County to have one of their employees, Kelsey Guffey work with ISST this day.

Prevention and Education

- Target species were observed to be readily identifiable in other known locations off-site prior to the survey period.
- Treatments of species that occur in limited distribution are targeted in an effort to reduce the noxious weed management burden and prevent their spread across the landscape.

Early Detection and Rapid Response

- Only a few houndstongue plants were detected and treated in 2013, the team retreated all areas in 2014. Seed heads were removed and bagged for disposal prior to spraying these species.
- Leafy spurge and purple loosestrife are both known to occur in close proximity to this WPA. No leafy spurge or purple loosestrife plants were found during the survey this season.
- Meadow hawkweed is known to be present on the western half of this WPA but has yet to be found east of the central fence.
- Prior to survey of this WPA, oxeye daisy plants were found to be flowering in Mission Pasture on the National Bison Range. Close to an acre of oxeye daisy was mapped and treated onsite in 2013. All historic location and their surrounding areas were surveyed but no oxeye daisy plants were found this season. Future monitoring of this species is recommended and treatment as a priority when found to prevent resurgence.
- No yellow toadflax was found during the survey. The only known location onsite to date is a single patch of yellow toadflax mapped in 2012, which was located and treated in the fall of 2013.
 - Continuing early treatments to prevent seeding and root spread while infestations are small are essential for future eradication of this species.

Inventory and Monitoring

- Weeds known to be present onsite include the following: bull thistle, Canada thistle, common teasel, Dalmatian toadflax, field bindweed, meadow hawkweed, musk thistle, North Africa grass, oxeye daisy, reed canary grass, spotted knapweed, St. Johnswort, sulfur cinquefoil, whitetop/hoary cress and yellow toadflax.

Management

- Common teasel plants were readily identifiable at the time of survey and the team mapped and treated significantly less this season than in 2013, with a total of 3.73 acres in 2013 as compared to 0.97 acres in 2014. Even infestations in the north that appeared to be large long-standing patches were greatly reduced in size.
 - There are several historic areas where teasel plants were not found, or were found to be significantly reduced in size in 2014.
 - While the reason for this rapid decline is unclear, it's may be a result of several factors, such as effective control of sprouting seedlings from residual *Milestone*, herbicide in the soil, changes in the water regime, difficulty detecting rosettes, and/or increased competition from other invaders.
 - A returning ISST member noted that several previously treated areas appeared to now be dominated by Canada thistle, smooth brome, St. Johnswort and other undesirable species.
 - Other crew members noted Canada thistle dominated every area treated in 2013.
- Although common teasel is not a Montana State-listed Noxious Weed, it is known to have the ability to readily invade and degrade wetland habitats.
- Duck Haven WPA supports many wetlands and a large diversity of wildlife. Therefore even though common teasel is abundant in many areas throughout the Mission Valley, its distribution on this site is limited and is recommended to continue to be priority for control onsite.
 - Consistent survey areas from year-to-year would allow ISST to best track populations over time to determine effectiveness and inform adaptive management strategies.

Herbicide Applied

- 13.54oz of *Milestone* was used for treatment of common teasel

Proposed 2014 Schedule

- Meadow hawkweed should continue to be treated late June – early July

- Common teasel and houndstongue are recommended to be priorities for annual treatment onsite in June or July. Monitoring for other species such as oxeye daisy, leafy spurge, purple loosestrife, and yellow toadflax could also be done at this time, but it is essential to review other known locations to ensure these species are up and readily identifiable at the time of the survey.
- If found, yellow toadflax could be clipped during flowering to prevent seeding which is can occur from mid-late July to early September and should be chemical treatment in the fall.



One of the many wetlands located on the Duck Haven WPA that support an abundance of waterfowl and other species. Photo by Jessica Zarate.

Appendix A

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: National Bison Range Complex

Date of Visit: 06/2/14-06/5/14

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
<i>Ventemata dubia</i>	NBR Refuge	Alexander Basin	Systematic transecting	No	N/A
Leafy spurge, yellow toadflax, hawkweeds, oxeye daisy, Dame's rocket			Systematic transecting	No	N/A

Notes:

Mon 6/2 – Meet with NBR staff and visit location with known *Ventemata dubia* for training for surveys and then begin transect surveys on foot for this species & other EDRR target species.

Tues 6/3 – Biocontrol Tour in the Mission Valley. Inventory surveys in Alexander Basin continued if time available.

Wed 6/4 – 2 people continue surveys in Alexander Basin and 3 people will be doing ATV training.

Thurs 6/5 – Inventory in Alexander Basin continued in the morning only. Will be calibrating quads in the afternoon.

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. ATVs will be used in Alexander Basin if permitted and use will be discussed with Amy Lisk on arrival.

Other access issues, conflicts, etc...:

It is the nesting seasons, so we will be on the lookout for ground nesting birds and do try to avoid riding over nests. Bison, rattlesnakes, and other wildlife may be present in areas worked and safety will be discussed prior to starting surveys.

Station or Site Manager (or

Acting): _____ Date: _____

(back has Exit Interview)

Exit Interview

Species	Unit	Section of Unit	Inventory/ Monitoring	Treat	Completed (yes or no with explanation)
<i>Ventenata dubia</i>	NBR Refuge	Alexander Basin	Systematic transecting	No	No, species was up but panicle was not yet open making the plants and patch boundaries difficult to discern. This survey will be conducted in a few weeks.
Leafy spurge, yellow toadflax, hawkweeds, oxeye daisy, Dame's rocket			Systematic transecting	No	T No, will be searched for when <i>Ventenata</i> surveys are conducted
Biocontrols		Along tour road	Yes, mapped release and future collection sites	No	Yes, worked with Amy to map collections and release sites
Oxeye daisy	Duck Haven	Entire site	No	Yes, Milestone @6oz/ac with Spreader 90 @1pt/100 gal	Yes, no oxeye found
Common teasel					Yes, all found was sprayed. Significantly less found than was mapped last year.
Houndstongue				Yes, mechanical	Yes, all found was shoveled and early developing flower heads were chopped off. No old stalks were found.

Notes:

Checked oxeye daisy in Mission Valley Pasture at NBR prior to heading to Duck Haven for treatment and plants were up and in early flower. While at Duck Haven we also keep watch for leafy spurge, meadow hawkweed, yellow toadflax, and purple loosestrife while doing point-to-point surveys for species targeted for treatment. Kelsey Guffey of Lake County worked with us on Wed at Duck Haven.

Concerns with Project:

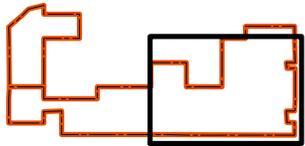
None.

Station or Site Manager (or

Acting): _____ Date: _____



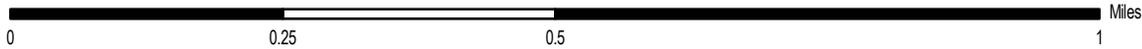
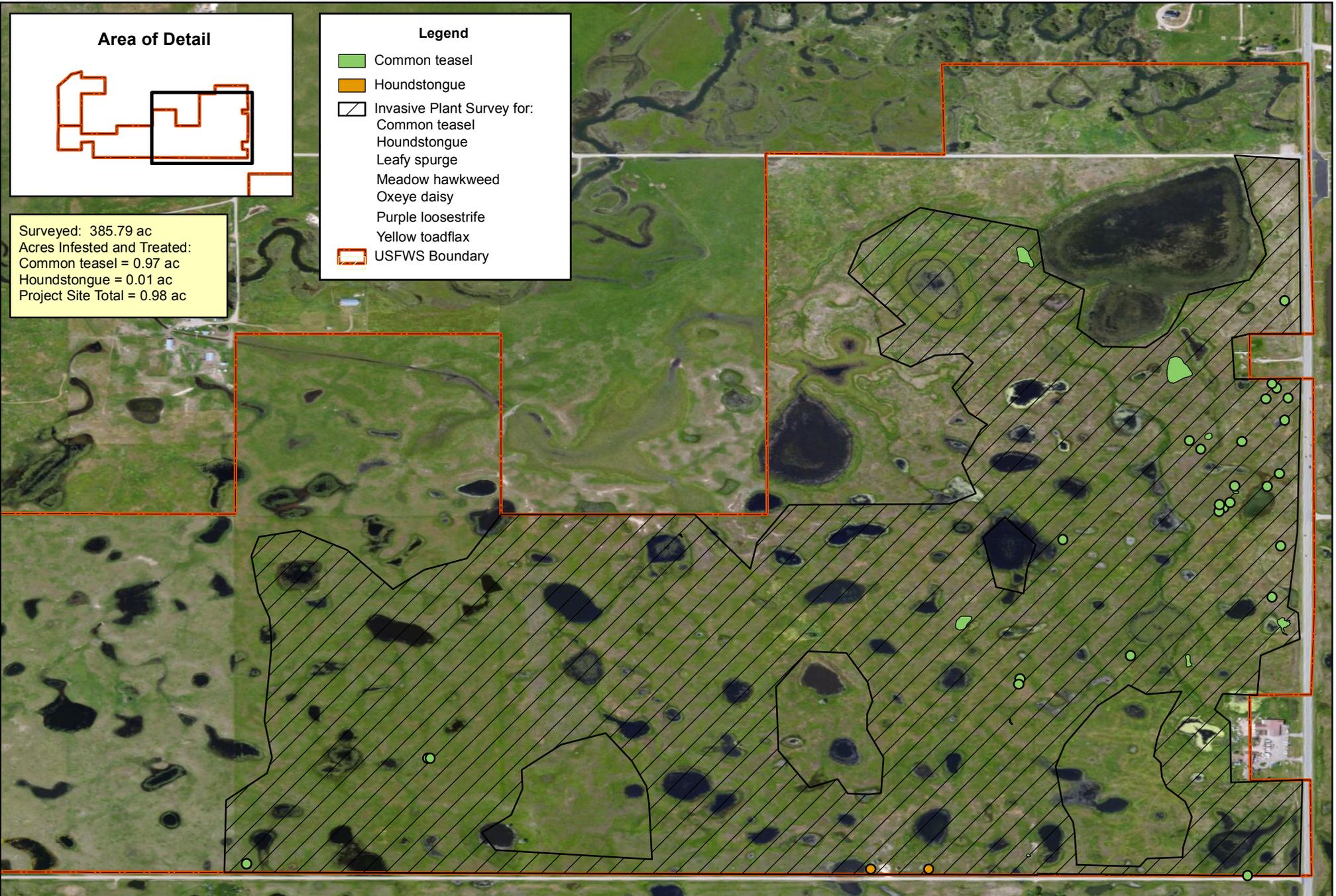
Area of Detail



Legend

- Common teasel
- Houndstongue
- Invasive Plant Survey for:
Common teasel
Houndstongue
Leafy spurge
Meadow hawkweed
Oxeye daisy
Purple loosestrife
Yellow toadflax
- USFWS Boundary

Surveyed: 385.79 ac
 Acres Infested and Treated:
 Common teasel = 0.97 ac
 Houndstongue = 0.01 ac
 Project Site Total = 0.98 ac



Compliments of the

MONTANA DEPARTMENT OF AGRICULTURE
 AGRICULTURAL SCIENCES DIVISION
 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) Duck Haven WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	B. Mullen	K. Guffey
Date	6/4/2014	6/4/2014
County	Lake	Lake
Time Start/Stop	1:30am-5:00pm	1:30am-4:00pm
Temperature	68°F	68°F
Relative Humidity	27%	27%
Wind Speed/Direction (from)	3-5 mph variable	3-5 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	1.5oz (4 gal mix)	2.86oz (5.25 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV Boom (16 GPA)	ATV Boom (11 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Basal rosette	Basal rosette
Dominant Pest(s)	Common teasel / Oxeye daisy	Common teasel
Equipment Used	-	-
Acres/Area Treated or # of plants	0.25 acres	0.875 acres
GPS Filename	-	-

Location #1 (Site specific description) Northeast side Location #2 (Site specific description) Southwest side	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... For both applications: Spreader 90 used at 3.2oz/10gal HiLight used at 3oz/10gal No oxeye daisy found at historic locations and there appeared to be fewer teasels than in 2013.
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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) Duck Haven WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	B. Mullen	J. Wilson
Date	6/5/2014	6/5/2014
County	Lake	Lake
Time Start/Stop	8:00am-12:00pm	8:00am-12:00pm
Temperature	52°F	52°F
Relative Humidity	85%	85%
Wind Speed/Direction (from)	0-3 mph S	0-3 mph S/SE
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	3.75oz (10 gal mix)	0.43oz (1 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV Boom (16 GPA)	ATV Boom (14 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Basal rosette	Basal rosette
Dominant Pest(s)	Common teasel	Common teasel
Equipment Used	-	-
Acres/Area Treated or # of plants	0.56 acres	0.7 acres
GPS Filename	-	-

Location #1 (Site specific description) Northeast side Location #2 (Site specific description) East and central areas	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... For both applications: Spreader 90 used at 3.2oz/10gal HiLight used at 3oz/10gal Many historic patches were absent of common teasel.
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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) Duck Haven WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	C. Holtz	J. Miskella
Date	6/5/2014	6/5/2014
County	Lake	Lake
Time Start/Stop	8:00am-11:30pm	8:00am-11:30pm
Temperature	52°F	52°F
Relative Humidity	85%	85%
Wind Speed/Direction (from)	0-3 mph S	0-3 mph S/SE
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	4.5oz (9 gal mix)	0.5oz (1 gal mix)
Equipment Used (atv,backpack,truck,saw)	ATV Boom (12 GPA)	ATV handgun (123 GPA)
Bio-Control (genus species)	-	-
# released / acre	-	-
Mechanical (mow,hand-pull)	-	-
Plant Phenology & Stage	Basal rosette, Pre-flowering	Basal rosette
Dominant Pest(s)	Common teasel	Common teasel
Equipment Used	-	-
Acres/Area Treated or # of plants	0.75 acres	0.01 acres
GPS Filename	-	-

Location #1 (Site specific description) Southeast region Location #2 (Site specific description) South central region	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... For both applications: Spreader 90 used at 3.2oz/10gal Hi-Light used at 3oz/10gal
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Northwest Montana Wetland Management District

McGregor Meadows WPA

Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Surveyed Acres Infested ²	Acres Treated ³
Bull thistle	0	0.30	0
Canada thistle	0	9.15	0
Cheatgrass	0	0.68	0
Field pennycress	0	0.09	0
Houndstongue	531.77*	0.06	0.005
Meadow hawkweed	531.77*	0.04	0
Musk thistle	0	0.01	0
Orange hawkweed	531.77*	0.04	0
Oxeye daisy	531.77*	0.03	0
Russian knapweed	531.77*	0.005	0
Spotted knapweed	531.77*	4.46	0
St. Johnswort	531.77*	0.03	0
Yellow toadflax	531.77*	0.06	0
Project Site Totals	531.77	14.94	0.005

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.

* One survey area was searched for multiple species but this survey acreage was only counted once.

Highlights

Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
14-July-2014 to 16-July-2014	Inventory Project	Noxious Weeds, excluding Cheatgrass	4-9	Systematic survey for noxious weeds. Canada thistle was mapped initially but later excluded they became largely abundant.
5-August-2014	Inventory Project	Noxious Weeds excluding Cheatgrass and Thistles	9	

Coordination and Cooperation

- ISST Crew Leader, Jessica Zarate coordinated project priorities with Refuge Manager, Kevin Shinn via email using “Strike Team Expectation and Accomplishment Checklist” (Appendix A).

Prevention and Education

- This site has limited infestations and can be protected with minimal treatment, as long as monitoring for new infestations continue to occur at a minimum of every three years.

Early Detection and Rapid Response

- Early detection of new invaders onsite was the focus of efforts this season. Finding and targeting infestations while they are small provides a higher cost benefit relative to treatment costs, and further enhances protection of the area.

Inventory and Monitoring

- ISST systematically transected over 530 acres of this site, using quads where suitable and on foot
- Canada thistle was initially targeted the first day of the survey however, as the team got into the southwest corner, their presence became abundant and given time constraints, mapping was discontinued for this species.
 - The team however did continue to map smaller, more isolated patches of Canada thistle.
- Bull thistle, musk thistles, cheatgrass, and field pennycress were not targeted by all surveyors and therefore the acreages shown may not be inclusive of these species within the survey area.
- Most infestations mapped were less than 0.1 acre including: houndstongue, meadow hawkweed, orange hawkweed, oxeye daisy, Russian knapweed, spotted knapweed, and yellow toadflax.
 - It is recommended these species are prioritized and targeted for treatment in 2015.
- Nearly 4.5 acres of spotted knapweed was found with the majority of infestations occurring in the northwest corner and along the fence borders.
 - Large, dense patches of spotted knapweed were observed on the private property immediately to the East of the site. Currently, only a few small patches are beginning to creep in along this fence line. Well timed treatment in 2015, to prevent seeding and coordination with adjacent landowners is recommended for most effectively managing this area.
- Other weed species noted by crew members but not include in the inventory common mullein, curly dock, lambs quarters, prickly lettuce, redtop grass, reed canary grass, smooth brome, water hemlock and western salsify.
- The team documented a few other interesting finds during the survey including:
 - Native hawkweeds including a white flowered species *Hieracium albiflorum* were found.
 - A GPS point was collected where a breeding pair of Goshawks were displaying aggressive nest defense, vocalizing and swooping down. This observation was a surprise given the small stature and tight structure of trees they were found in.
 - A GPS point was collected where the south fence has been cut near a highly active game trail.



Baker Mariposa lily (*Calochortus apiculatus*) flowers found occasionally in the forest openings on the west side of the site. Photo by Jessica Zarate.

Management

- Treatment was not the focus of surveys this season.
- A single houndstongue rosette was removed from the west side of the site. No other houndstongue plants were found in this region.
 - Other houndstongue plants were found along the forest edge in the southeast corner and a larger patch was found centrally on the east fence line. Only 0.06 acres of houndstongue were mapped, therefore the refuge may want to prioritize treatment of this species while infestations are small and less costly to manage.
- A patch of yellow toadflax was found to be defoliated by the biocontrol agent toadflax moth (*Calophasia lunula*).

- Several caterpillars were found on the patch and comments on presence were noted in the GPS location data.
- This agent does not kill the plant but defoliates it and causes severe damage resulting in stunted growth, and often the inability to propagate and produce seeds.
- Most literature indicates this species is established in Canada and the United States but notes this species typically does not establish well in colder climates.



Biocontrol agent toadflax moth (*Calophasia lunula*), (above) defoliating yellow toadflax at McGregor Meadows WPA (below). Photos by Jessica Zarate.

Proposed 2015 Schedule

- ISST recommends the refuge review the inventory data and assess priorities based on site goals, current acreages of infestations and suitability for treatment.
- Timing and herbicide(s) selected may be effective for treatment of several species during the same visit. For example:
 - Spotted knapweed, hawkweeds, St. Johnswort, oxeye daisy could be treated with *Milestone* possibly in June-July. If late in full to late flower, oxeye daisy and St. Johnswort could be treated with *Escort XP* instead and houndstongue could also be managed with this herbicide.
 - Russian knapweed, yellow toadflax, spotted knapweed all could be treated in the fall. Knapweeds can be sprayed with *Milestone* or *Curtail* herbicides. For optimal control, spotted knapweed could be treated twice during the same growing season with *Milestone* if rates are kept low and do not exceed 14oz/acre combined. *Tordon 22K* mixed with *Distinct* appears to be the most effective on yellow toadflax, but an approved PUP needs to be in place for the use of this tank mix.



Appendix A

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: McGregor WPA

Date of Visit: July 14-16 2014

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
All noxious weeds	McGregor Meadows WPA	Entire Site	Yes	No	N/A

Notes:

ISST is scheduled to inventory all noxious weeds onsite. Canada thistle, cheatgrass, and other weeds found to be abundant and widespread may/may not be mapped depending upon the presence of other higher priority targets identified and time available to cover the site.

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)

Per discussion with Kevin Shinn via phone on July 14, 2014, ATV use is permitted onsite. Single file tracks should be used for entering and exiting the site and whenever possible transects are to be made parallel to roads and fences to reduce visibility.

Other access issues, conflicts, etc...:

Sign on the fence indicated the site was closed through July 15th, however per discussion with Kevin the WPAs throughout the district were opening a day early so it would be fine for us to begin work on July 14th.

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)
All noxious weeds	McGregor Meadows WPA	All noxious weeds	Yes	No	No, see below.
Houndstongue		All noxious weeds	Yes	Yes	Yes, removed the only houndstongue plant found.

Notes:

Some yellow toadflax was found but appeared to be much less than in previous years based on the historic data. Toadflax moth caterpillars (*Calophasia lunula*) biocontrol were found at one of the patches and had defoliated the majority of the yellow toadflax present.

Canada thistle was mapped until we got into the forested area in the southwest corner where dense patches of this species were found. Many patches of cheat grass were mapped but not all found was mapped.

All locations of spotted knapweed, bull thistle, orange hawkweed, meadow hawkweed, and oxeye daisy were mapped when found.

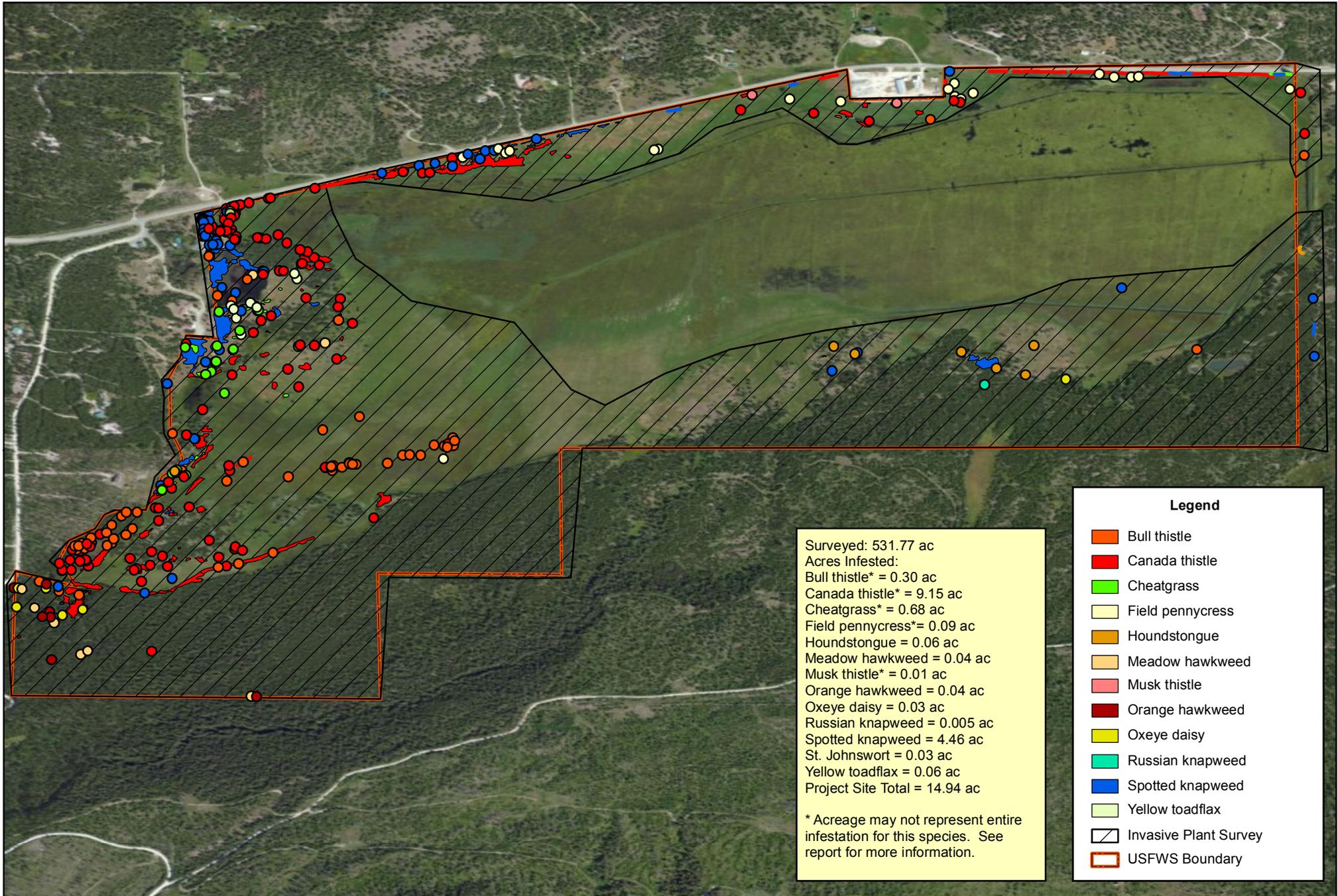
Reed canarygrass (*Phalaris arundinacea*) is also abundant and widespread onsite but was not mapped.

Several species were incidentally mapped by some crew members but these were not targeted throughout the survey period as they are not typically priority species for inventory and treatment. Incidentally mapped species include redtop grass, field penny cress, lambs quarters, mullein, curly dock, and water hemlock.

Concerns with Project:

None.

Site Manager (or Acting): _____ Date: _____



Surveyed: 531.77 ac
 Acres Infested:
 Bull thistle* = 0.30 ac
 Canada thistle* = 9.15 ac
 Cheatgrass* = 0.68 ac
 Field pennycress* = 0.09 ac
 Houndstongue = 0.06 ac
 Meadow hawkweed = 0.04 ac
 Musk thistle* = 0.01 ac
 Orange hawkweed = 0.04 ac
 Oxeye daisy = 0.03 ac
 Russian knapweed = 0.005 ac
 Spotted knapweed = 4.46 ac
 St. Johnswort = 0.03 ac
 Yellow toadflax = 0.06 ac
 Project Site Total = 14.94 ac

* Acreage may not represent entire infestation for this species. See report for more information.

Legend

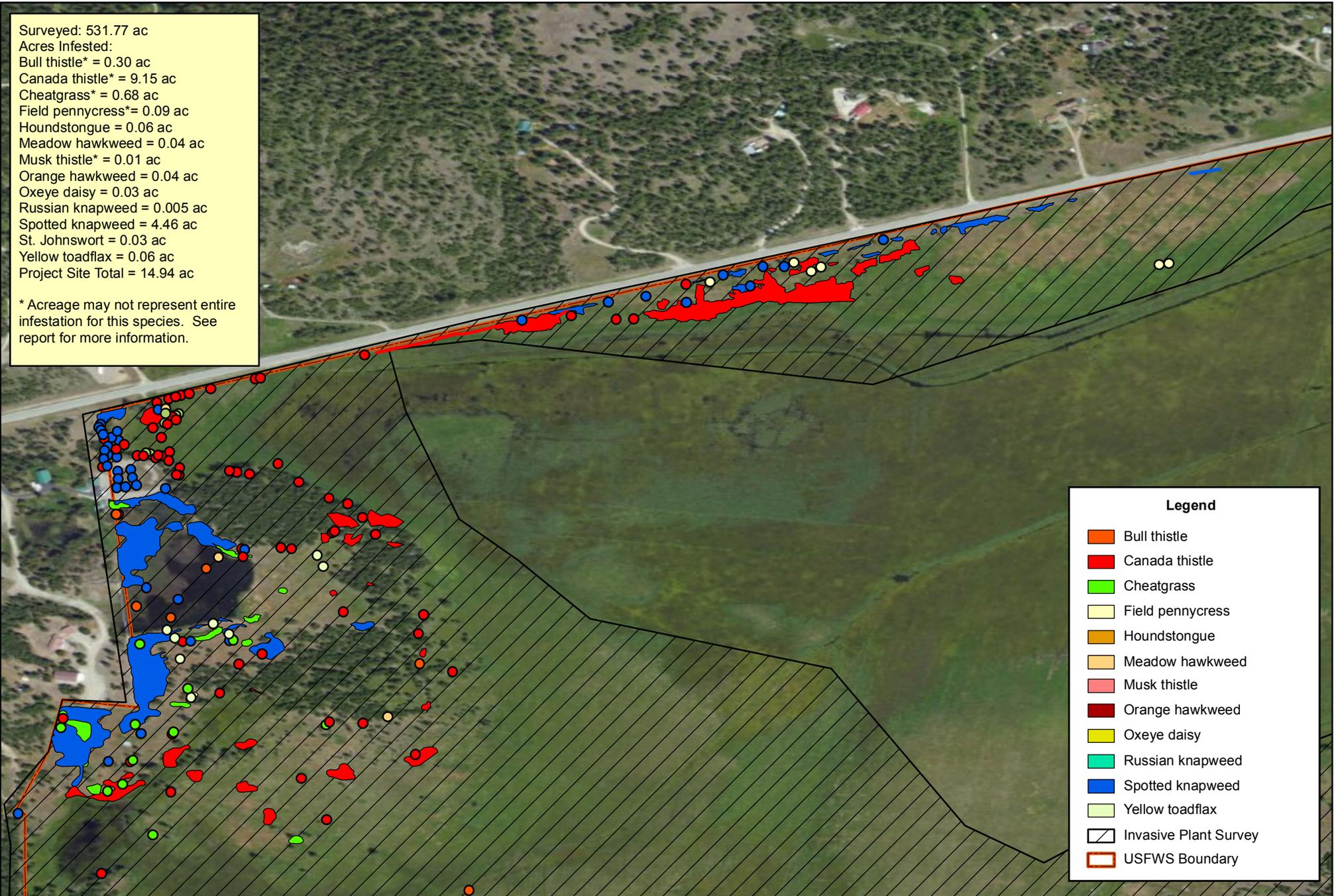
- Bull thistle
- Canada thistle
- Cheatgrass
- Field pennycress
- Houndstongue
- Meadow hawkweed
- Musk thistle
- Orange hawkweed
- Oxeye daisy
- Russian knapweed
- Spotted knapweed
- Yellow toadflax
- Invasive Plant Survey
- USFWS Boundary





Surveyed: 531.77 ac
 Acres Infested:
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 Project Site Total = 14.94 ac

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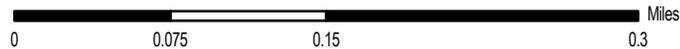
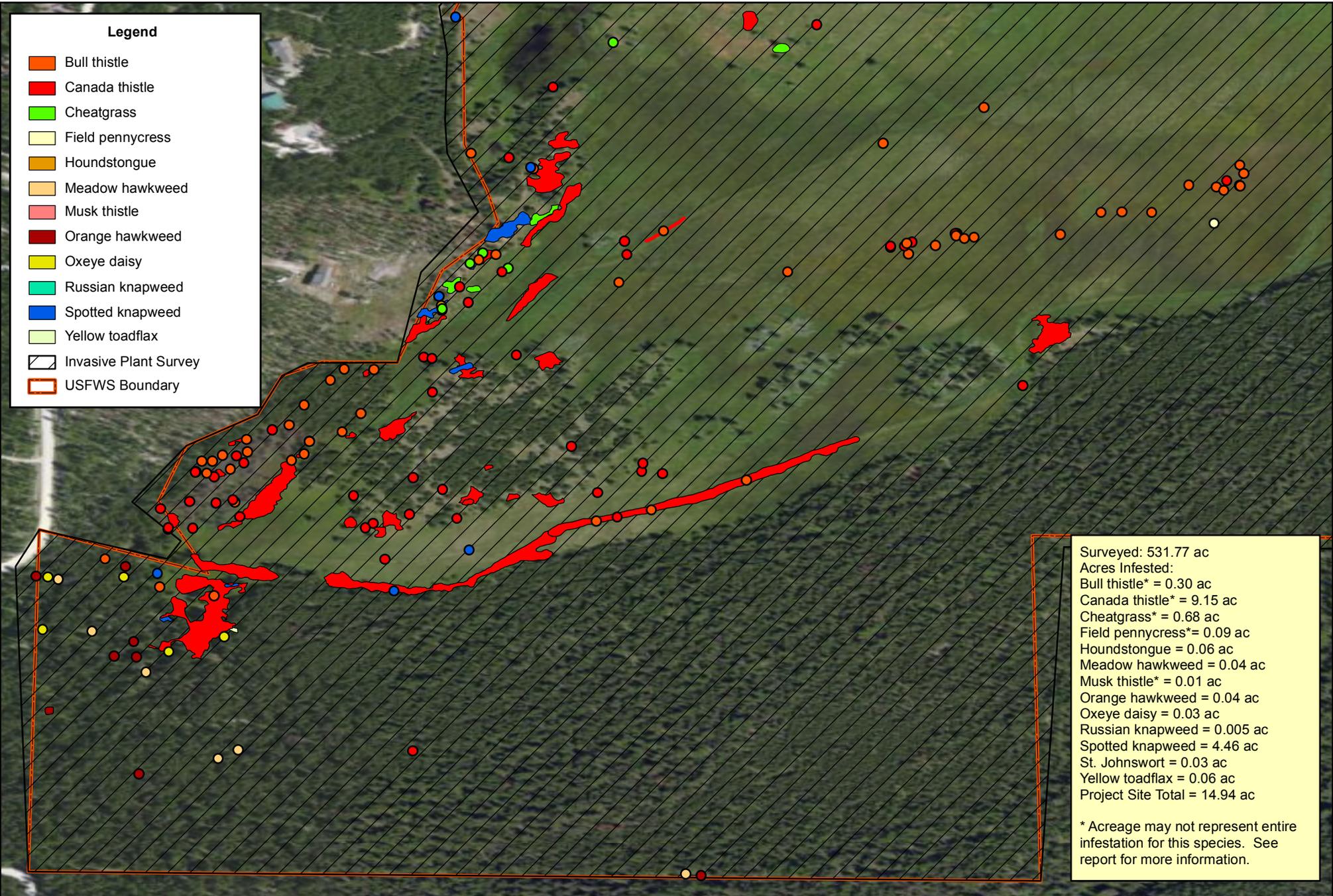


Legend

- Bull thistle
- Canada thistle
- Cheatgrass
- Field pennycress
- Houndstongue
- Meadow hawkweed
- Musk thistle
- Orange hawkweed
- Oxeye daisy
- Russian knapweed
- Spotted knapweed
- Yellow toadflax
- Invasive Plant Survey
- USFWS Boundary



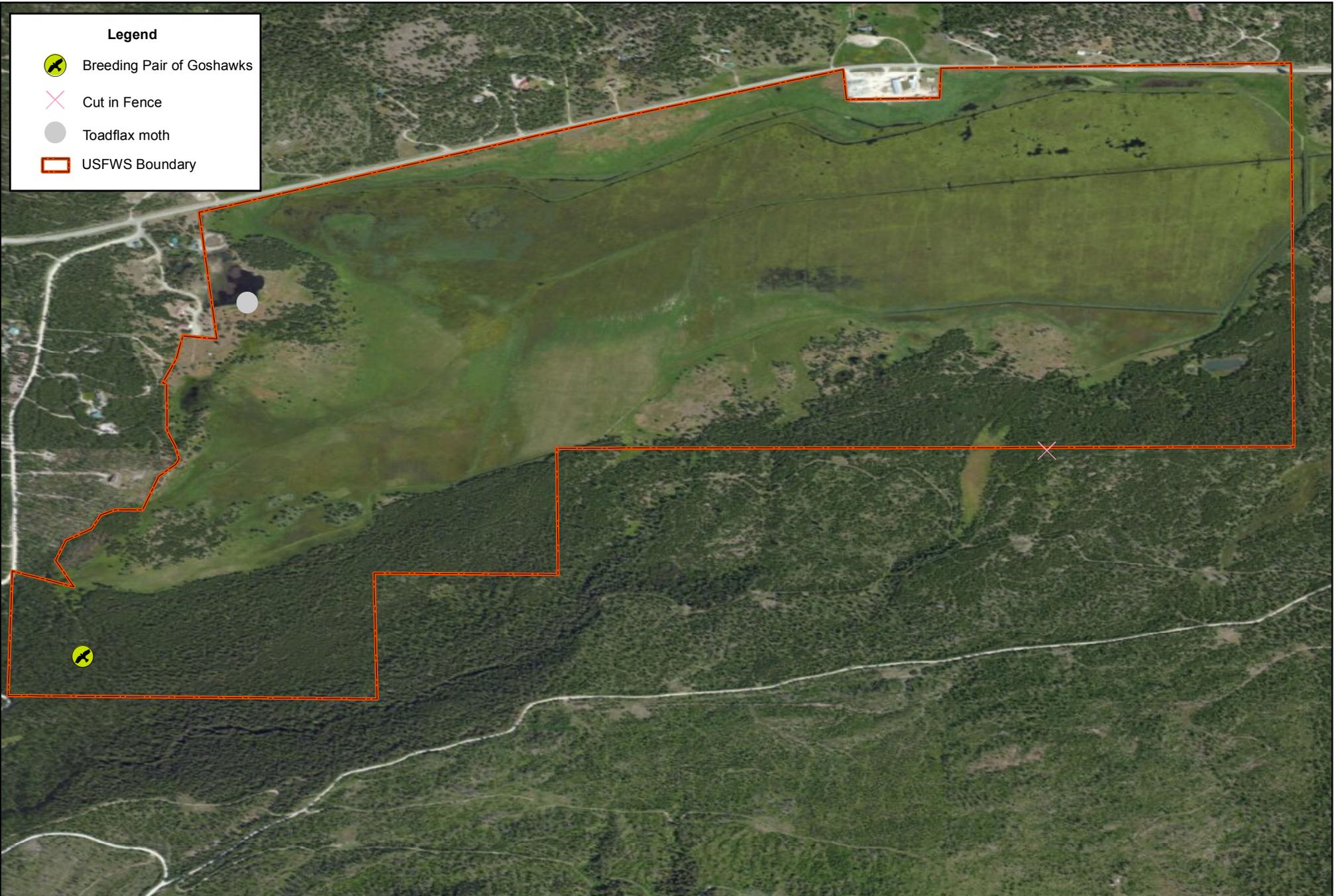
Reference image from ESRI ArcMap Basemap Imagery





Legend

-  Breeding Pair of Goshawks
-  Cut in Fence
-  Toadflax moth
-  USFWS Boundary



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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) McGregor Meadows WPA
CITY, STATE, ZIP Stevensville, MT 59870	PHONE (406) 544-2552

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	J. Zarate	
Date	7/16/2014	
County	Flathead	
Time Start/Stop	9:30am	
Temperature	70°F	
Relative Humidity	65%	
Wind Speed/Direction (from)	0-3 mph West	
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-pull	
Plant Phenology & Stage	Basal Rosette	
Dominant Pest(s)	Houndstongue	
Equipment Used	Shovel	
Acres/Area Treated or # of plants	<0.0001 acres (1 plant)	
GPS Filename		

Location #1 (Site specific description) On West fence line	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc.... No other houndstongue plants found in this region.
Location #2 (Site specific description)	