

# Lost Trail NWR

## Benton Lake and Lee Metcalf ISST

### Accomplishments

Weed Species	Total Survey Acres <sup>1</sup>	Surveyed Acres Infested <sup>2</sup>	Acres Treated <sup>3</sup>
Bull thistle	135.94*	0.37	0.37
Canada thistle	135.94*	0.20	0.20
Houndstongue	135.94*	0.73	0.73
Spotted knapweed	134.94*	14.26	14.26
St. Johnswort	134.94*	1.62	1.62
Sulfur cinquefoil	35.57	0.13	0.13
Tansy ragwort	0	0.01	0
Yellow toadflax	0.06	0.09	0
<b>Project Site Totals</b>	<b>136.0</b>	<b>17.07</b>	<b>16.98</b>

<sup>1</sup> Area covered during the course of weed management activities regardless of presence or absence of target weed species as measured by perimeter in GIS.

<sup>2</sup> 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.

<sup>3</sup> 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.

Threatened Species Spalding's catchfly	Total Survey Acres	Estimated Acres of Spalding's Present	Estimated Number of Plants
"West" Area	61.21	0.41	308
"Central" Area	36.66	0.38	144
"East" Area	97.14	1.51	467
"Far East" Area	0	0.07	34
<b>Project Site Totals</b>	<b>195.01</b>	<b>2.37</b>	<b>953</b>

Does not include survey acres for Spalding's catchfly that was completed using transects generated using predictive modeling. However, estimated acres and number of Spalding's are inclusive of all data collected for the site this season, regardless of the detection method.

### Highlights

#### Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
22-July-2013 to 26-July-2013	Refuge Management Project	All noxious weeds	4	Treatment of weeds in the East Spalding's area.
1-August-2013 to	Refuge Inventory and	Spalding's catchfly	8	Surveyed, flagged, mapped, and counted Spalding's catchfly in

4-August-2013	Monitoring Project			West, Central and East areas.
	Refuge Management Project	All noxious weeds	8	Treated weeds encroaching in Spalding's habitat.
5-August-2013 & 6-August-2013	Modeling Inventory & Monitoring Project	Spalding's catchfly	8-10	Surveyed for Spalding's along transects generated through predictive model project.

#### Coordination and Cooperation

- Strike Team supervisors Lindy Garner and Bill Sparklin initially coordinated work for this project with Refuge Biologist, Lynn Verlanic.
  - Treatment priorities, survey protocols, herbicides, and the use of predictive modeling onsite were discussed for work to be completed in Spalding's catchfly (*Silene spaldingii*) habitat.
- The Benton Lake and Lee Metcalf Strike Team crews coordinated logistics and supply needs prior to arrival.
- ISST Crew Leader Levi Morgan met with Refuge Manager Kevin Shinn to further coordinate priorities and accomplishments using the "Strike Team Expectation and Accomplishment Checklist" (Appendix A).

#### Prevention and Education

- Each year ISST works closely with refuge staff to ensure refuge mapping and treatment priorities are met.
  - ISST annually provides inventory data on Spalding's catchfly and treatment of encroaching weeds which pose a significant threat to survival.
  - New invaders are mapped and whenever possible treated immediately to help reduce the potential for spread to other areas.

#### Early Detection and Rapid Response

- Yellow toadflax was found in the Central Spalding's area and on a road that extends north to south between the biologist residence and refuge headquarters.
  - These two patches were mapped and the raw data and a PDF map were provided to the refuge so infestations could be located and treated in the fall.
- While performing transects for Spalding's the team incidentally found two patches of tansy ragwort which is a high priority species for removal by the refuge.
  - The locations were mapped in the east side the site and the refuge manager and biologist were promptly notified so they could be targeted for treatment.

#### Inventory and Monitoring

- Surveys for Spalding's catchfly have been consistently conducted over the past few years in 3 of 4 areas known to historically support this species.
  - Locations of surveys are referred to as West (Population 1), Central (Population 2), and East (Population 3) Spalding's Areas.
  - The Far East Area has been excluded in the past as the lowest priority area and had not been previously surveyed by Strike Team because time constraints.
  - The team worked in the Central Area for the first time in 2012.
- Strike team efforts provided significant new information on locations of this threatened plant that may had been missed without their site visits.
- In the West, Central and East Spalding's areas, surveys were



Spalding's catchfly at Lost Trail NWR.  
Photo by Jessica Zarate.

- conducted to flag and map all Spalding’s plants prior to managing weeds in these areas.
- All flags were removed immediately following completion of work in these areas.
- Following treatment efforts, the teams conducted transect surveys for Spalding’s catchfly.
  - Transects were generated through the use of a predictive model.
  - Using this model allowed for the team to expand the survey area for Spalding’s catchfly and target locations that may be most suitable to support this species.
  - For the purpose of this report Spalding’s plants that were detected during transecting are included in this summary of data based on the historic area plants found were nearest to.
- The use of predictive modeling and extended survey efforts significantly increased the detection of this species on the refuge.

Comparison of Spalding’s Catchfly Project Data Totals Over the Past 4 Years						
Year	Total Survey Acres	Spalding’s catchfly Estimated Acres	Total Number of Plants “West” Area	Total Number of Plants “Central” Area	Total Number of Plants “East” Area	Total Number of Plants “Far East” Area
2013	195.01*	2.37	308	144	467	34
2012	136.81	1.16	223	55	224	~
2011	119.08	0.78	215	~	193	~
2010	242.71	0.32	70	~	64	~

The 2013 acreage does not include survey acres for Spalding’s catchfly that was completed using transects generated for a unique modeling project. However, the total number of plants is inclusive of all data collected regardless of the detection methods.

**Management**

- Spalding’s plants are known not to come up year after year, so historic data is used both to ensure known locations are thoroughly searched and to avoid herbicide treatment in these areas.
- Treatment efforts completed are conducted based on guidelines established to ensure the protection of this threatened species (Appendix B), which included a few modification this season.
  - Following surveys for Spalding’s, mechanical treatments are performed. Weeds are removed by hand or with shovels within 25 feet of all historic location and 10 feet of any newly found Spalding’s plant. Flowering and seeding plants are typically bagged and removed from the area. Plants typically store enough nutrients in roots and stems to produce viable seeds long before the process is complete. Therefore pollinated flowers and immature seeds may still reach maturity and become viable after pulling.
  - Backpack spraying is then performed outside of this mechanically managed area approximately 100 feet out surrounding these plants. To ensure strips of weeds are not left in between Spalding’s plants within a population this sprayed area is sometimes expanded.
  - Beyond 100 feet, ATVs may be used for weed treatments, however, surveys for Spalding’s should be completed to ensure none are present before any vehicle use.
- ISST spent a full three weeks working on the Spalding’s inventory and treatment project.
- Outside historically treated areas weed populations increased tremendously suggesting treatment is very effective but these neighboring infestations will continue to be a significant threat to Spalding's if additional refuge treatment effort is not provided in these areas.

**West Area**

- ISST surveyed 26.76 acres conducting inventory and treatment of weeds. The following species were managed in this area:
  - bull thistle, 0.01 acre;
  - houndstongue, 0.01 acre;
  - spotted knapweed, 1.05 acres;
  - St. Johnswort, 0.08 acres.

- Sulfur cinquefoil was also found throughout this area but not targeted this season. With the notable appearance of reduced weeds and increased Spalding's the team had concerns about mechanically treating this species.
  - Sulfur cinquefoil spreads both by seed and rhizomatous roots. Therefore mechanical methods of treatment are not recommended and can often exacerbate the problem.
  - Many sulfur cinquefoils plants were found in close proximity to Spalding's.
  - Shoveling mature plants would have caused significant disturbance to soils and possibility aided in the spread of this weed.
  - ISST recommends exceptions are made to treatment protocol that allows for spot treatments of herbicide throughout the area for control of this species.
- St. Johnswort is also a rhizomatous species but very few plants were found in the area and all were treated.
  - Plants found were small, not flowering and were either sprayed or resulted in little disturbance from their removal.
- The team observed that this area supported fewer weeds than seen in previous years, and ISST recommends this area continues to be a priority for treatment and monitoring.

### **Central Area**

- ISST surveyed 35.57 acres conducting inventory and treatment of weeds. The following species were managed in this area:
  - houndstongue, 0.005 acre;
  - spotted knapweed, 4.19 acres;
  - St. Johnswort, 1.56 acres;
  - Sulfur cinquefoil, 0.13 acre.
- All mechanically treated plants that were in flower or post-flower were bagged, hauled out and disposed of off-site.
- Sulfur cinquefoil was targeted in this area, since the infestation was small and many plants were far enough away from Spalding's to be treated chemically.
  - Some plants were removed mechanically and care was taken to remove as much of the root as possible with minimal soil disturbance.
  - Spot treatments of herbicide are most suitable for control of this species.
- St. Johnswort was found to be well dispersed throughout the area in varying size and abundance. Plants were treated both mechanically and chemically based on treatment guidelines for Spalding's areas.
  - Mechanical treatments are anticipated to be effective only where small (1-3 inches tall), sparse patches were removed. Other areas are likely to re-sprout because not all of the root could be removed without significant disturbance soils and surrounding plants.
  - Because the infestation is extensive and mechanical methods offer little to no control for rhizomatous species, other management techniques should be reviewed and considered for future efforts.
- Spotted knapweed was the most abundant weed in the area with expansive patches that continue across the hillside beyond the surveyed area.
  - Over 4 acres of spotted knapweed were treated using mechanical methods and backpack sprayers.



Before (left) and after (right) mechanical removal of spotted knapweed the Central Spalding's Area. Orange flags indicate nearby Spalding's catchfly plants. Photographs by Jessica Zarate.

- Following treatments within the survey area, remaining herbicide was used to spray knapweed and St. Johnswort, immediately adjacent to the Southeast and East of the survey area.
  - Data collection problems at the end of the day prevented the team from capturing the locations of species and track logs for the area worked.
  - This survey area could not be accurately delineated without tracks and therefore is not included in the maps or survey acres summary data.
  - No Spalding's catchfly plants were found during this application.
- Given the extent of the invasion occurring in this Spalding's habitat, ISST recommends it continues to be considered a priority for treatment in future years.

### ***East Area***

- ISST surveyed 61.69 acres conducting inventory and treatment of weeds. The following species were managed in this area:
  - bull thistle, 0.01 acre,
  - Canada thistle, 0.20 acre,
  - houndstongue, 0.01 acre;
  - spotted knapweed, 8.89 acres;
  - St. Johnswort, 0.01 acres;
- Since this area is more expansive than the others and supports large well established patches of weeds, the team worked this area for a week in July and an additional 3 days in August to get it completed.
- Spotted knapweed mechanical and chemical treatment was the primary focus of the team in this area.
- Sulfur cinquefoil was not found to be present in this area.
- Only two patches of St. Johnswort plants were detected.
  - Plants found were small and not flowering, so they could be removed chemically or with little disturbance to soils if pulled.
- This area is recommended to remain a priority for future treatment and monitoring.

### ***Road 1019***

- At the end of the week a few gallons of herbicide that needed to be used prior to leaving the site were sprayed along the 1019 roadway.
  - The use of remaining herbicide was discussed with both the refuge manager and maintenance to determine the most suitable area and to avoid over application resulting from additional refuge treatments.
- ISST surveyed 11.91 acres in this area and managed the following species:
  - bull thistle, 0.01 acre,
  - houndstongue, 0.70 acre;
  - spotted knapweed, 0.20 acre;
- These acreages are not representative of the entire infestation in the area. Several more acres are present that were not captured in this effort.

### **Herbicide Applied**

- 51.96oz of *Transline* was used for treatment of spotted knapweed and thistles.
- 5.02oz of *Milestone* was used for treatment of St. Johnswort, sulfur cinquefoil, and spotted knapweed.
- 1.17oz of *Escort XP* was used for treatment of houndstongue.

### **Recommendations**

- Late July/Early August is typically ideal for the Spalding's inventory project since these plants are bolting and often flowering at that time.
- Additional transecting this year identified new areas where Spalding's are present and have encroaching weed infestations.

- Also since some individual Spalding's were found while transecting, the refuge may want a larger survey area around these locations to determine if more are present in these areas.
- Given the extent of the existing Spalding's project that is completed annually and the new areas to be inventoried and managed for weeds, the refuge will need to consider prioritization of efforts and revision of protocols used to most efficiently meet the goals of the project.

➤ Appendix A

①

Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: Lost trail NWR

Date of Visit: 7.22.13

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Spotted bromeliad	East/North of Dahl Lake Access	Road	yes	yes	translim
St. Johns wort	East / North of Dahl Lake Access	Road	yes	yes	milestone
Sulfur Cinquifid	North/east of Dahl Lake Access	Road	yes	yes	milestone
Canada Thistle					
Ball Thistle					
Handbongue					

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) Access areas from where the public is less likely to notice ATV use/tracks

Other access issues, conflicts, etc...:

Station or Site Manager (or Acting): Kevin J. Shaw Date: 7/22/13

(back has Exit Interview)



Exit Interview

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Completed (yes or no with explanation)
Spotted Knapweed	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Dug 0-25ft for historical plants Dug 0-10ft for newly found plants Dug 0-100ft @ pop #2 BP sprayed 25ft-100ft pop. 2+3
Houndstongue	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Pop #2 → 0-100' → digging Pop # 2+3 → 0-25ft → digging 55-100' → chemical
St. Johnswort	Populations 1, 2, 3	entire area	Gps mapped	Mechanical → BNL Pop 1, 3 Chemical → LMC Pop 2	Pop 1 → 0-100' → digging Pop 3 → 0-25' → digging 25-100' → chemical microwave
Canada thistle	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; mechanical	Pop 1 → 0-100' → digging Pop 2, 3 → 0-25' → digging 25-100' → chemical
Bull thistle	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Pop 1, 3 → 0-100ft → digging Pop 2 → 0-25ft → digging 25-100ft → chemical
Sulfur Cingulifol	Population 2	entire area	Gps mapped	Chemical	digging 0-25' chemical, 25-100' Allotment

- Notes:
- The extra first week and the second 8 day hitch allowed for much more detail to be applied to the project.
  - Based on the approximately 200 additional plants we found while surveying, management next year will require additional time.
  - while digging, flowering and senescing houndstongue and spotted knapweed were cut and bagged to be disposed of.
  - monitored yellow toadflod. by LMC crew. → EDRR species.

- Concerns with Project:
- Digging st. Johnswort and Sulfur Cingulifol may possibly be spreading it worse because of the rhizomatous roots.
  - Common Tansy was found and mapped above Dahl Lake → not in windings area.

Station or Site Manager (or Acting): Kenn J. Skrin Date: 8/6/13

### **Spalding's Catchfly (*Silene spaldingii*) Guidelines:**

The following Refuge guidelines are to be used for treating weeds in the Spalding's catchfly areas:

- Historic locations of Spalding's should be loaded onto each GPS unit to use for navigation. Start by searching the areas for Spalding's within and immediately surrounding the previously known locations. Use pin-flags or tie flagging to nearby vegetation to mark all Spalding's found. Individuals and groups of Spalding's are flagged in order to avoid any inadvertent harm during treatment. Map plants found as points, lines or polygons using the monitoring geodatabase. In the comments, put the name "Spalding's" as well as an exact count or estimated number of plants in the case of large patches.
- Once plants are clearly marked with flagging, weeds within 3 meters (or 10 feet) adjacent to Spalding's should be hand-pulled or removed with shovels, causing as little disturbance to the soil as possible.
- Any weeds found beyond 3 meters (or 10 feet) are to be carefully treated with herbicide using a backpack sprayer. However, if it is windy **error on the side of caution** and mechanically treat plants to the extent necessary to ensure no drift will hit the Spalding's.
- Weeds occurring beyond 30 meters (or 100 feet) may be considered for treatment with an ATV sprayer. ATV use is permitted only if access and herbicide application can be performed while avoiding any potential damage to the actively growing plants, i.e. trampling, accidental spraying, and driving over plants or areas where the threatened plant was not found to be actively growing this season.
- Following treatment, **all flagging must be removed!**

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Strike Team Expectation and Accomplishment Checklist

Arrival Interview

Station: Lost trail NWP

Date of Visit: 7.22.13

Objectives and Priority Areas defined:

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Chemical (ref or isst)
Spotted knapweed	East / North of Dahl Lake	Access Road	yes	yes	transline
St. Johns wort	East / North of Dahl Lake	Access Road	yes	yes	milestone
Sulfur Cinquifol.	North / east of Dahl Lake	Access Road	yes	yes	milestone
Canada Thistle					
Bull Thistle					
Houndstongue					

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) Access areas from where the public is less likely to notice ATV use (trails)

Other access issues, conflicts, etc...:

Station or Site Manager (or Acting): Kevin J. Sharr

Date: 7/22/13

(back has Exit Interview)

Exit Interview

Species	Unit	Section of Unit	Inventory/Monitor	Treat	Completed (yes or no with explanation)
Spotted Knapweed	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Dug 0-25 ft for histrial plants Dug 0-10 ft for newly found plants Dug 0-100 ft @ pop #1 BP sprayed 25ft-100ft pop. 2+3
Houndstongue	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Pop #1 → 0-100' → digging Pop #2+3 → 0-25' → digging 25-100' → chemical
St. Johnswort	Populations 1, 2, 3	entire area	Gps mapped	Mechanical → BNL Pop 1, 3, 3 Chemical → LMC Pop 2	Pop 1 → 0-100' → digging Pop 2, 3 → 0-25' → digging 25-100' → chemical Milestone
Canada thistle	Populations 1, 2, 3	entire area	Gps mapped	Chemical ? Mechanical	Pop 1 → 0-100' → digging Pop 2, 3 → 0-25' → digging 25-100' → chemical
Bull thistle	Populations 1, 2, 3	entire area	Gps mapped	Chemical ; Mechanical	Pop 1, 3 → 0-100' ft → digging Pop 2 → 0-25' ft → digging 25-100' ft → chemical
Sulfur Cingulifol	Population 2	entire area	Gps mapped	Chemical	digging 0-25' chemical 25-100' Milestone

Notes: • The extra first week and the second 8 day hitch allowed for much more detail to be applied to the project.

• Based on the approximately 200 additional plants we found while surveying, management next year will require additional time.

• while digging, flowering and senescing houndstongue and spotted knapweed were cut and bagged to be disposed of.  
• Monitored yellow toadflax by LMC crew. → EDRR species.

Concerns with Project:

• Digging st. Johnswort and Sulfur Cingulifol may possibly be spreading it worse because of the rhizomatous roots.

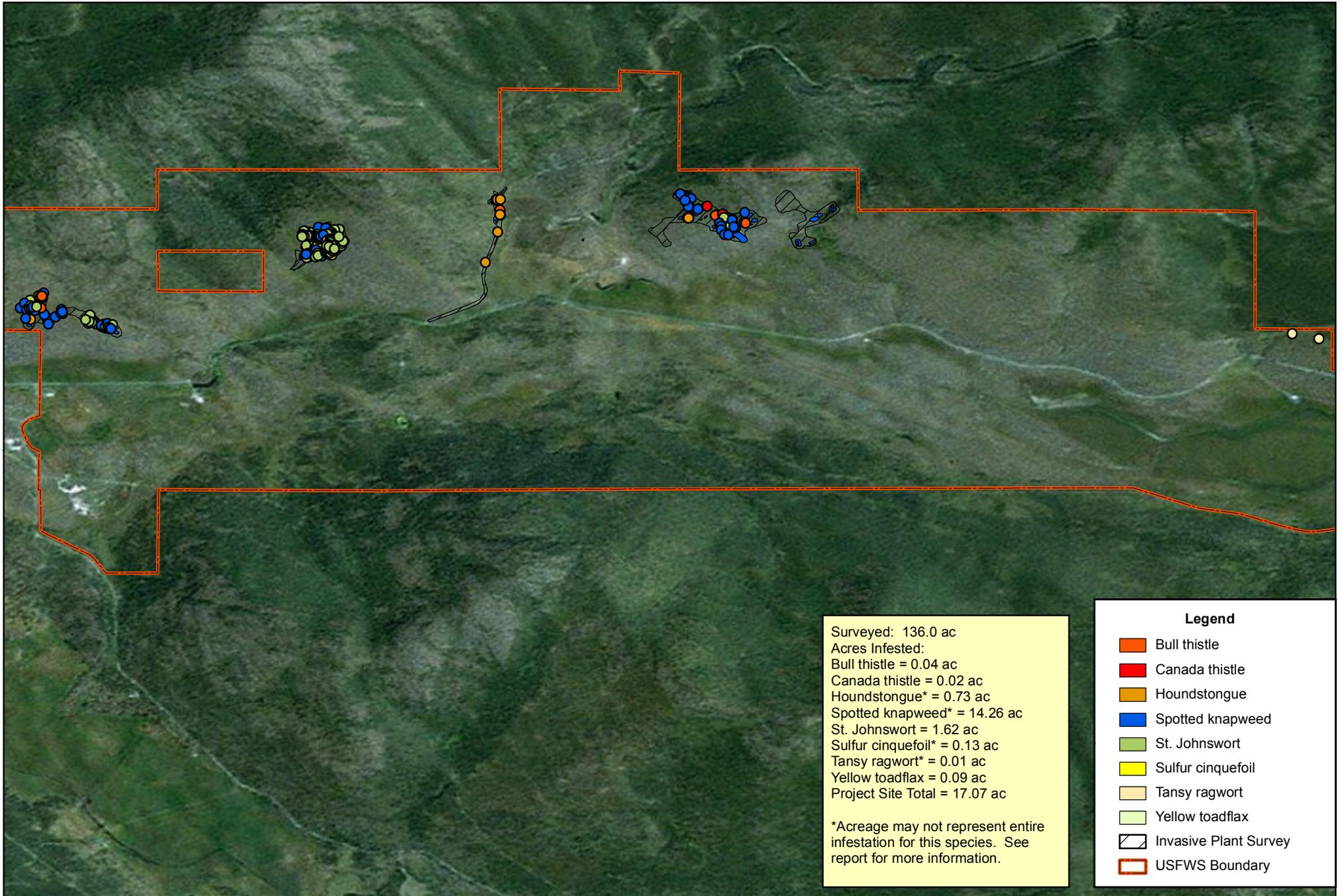
• Common Tansy was found and mapped above Dahl Lake.  
→ not in Spaldings area.

Station or Site Manager (or Acting)

Kevin J. Shan

Date:

8/6/13



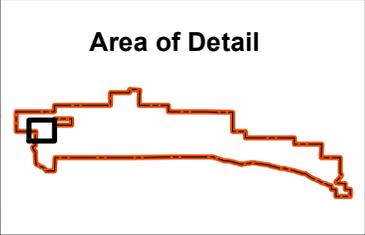
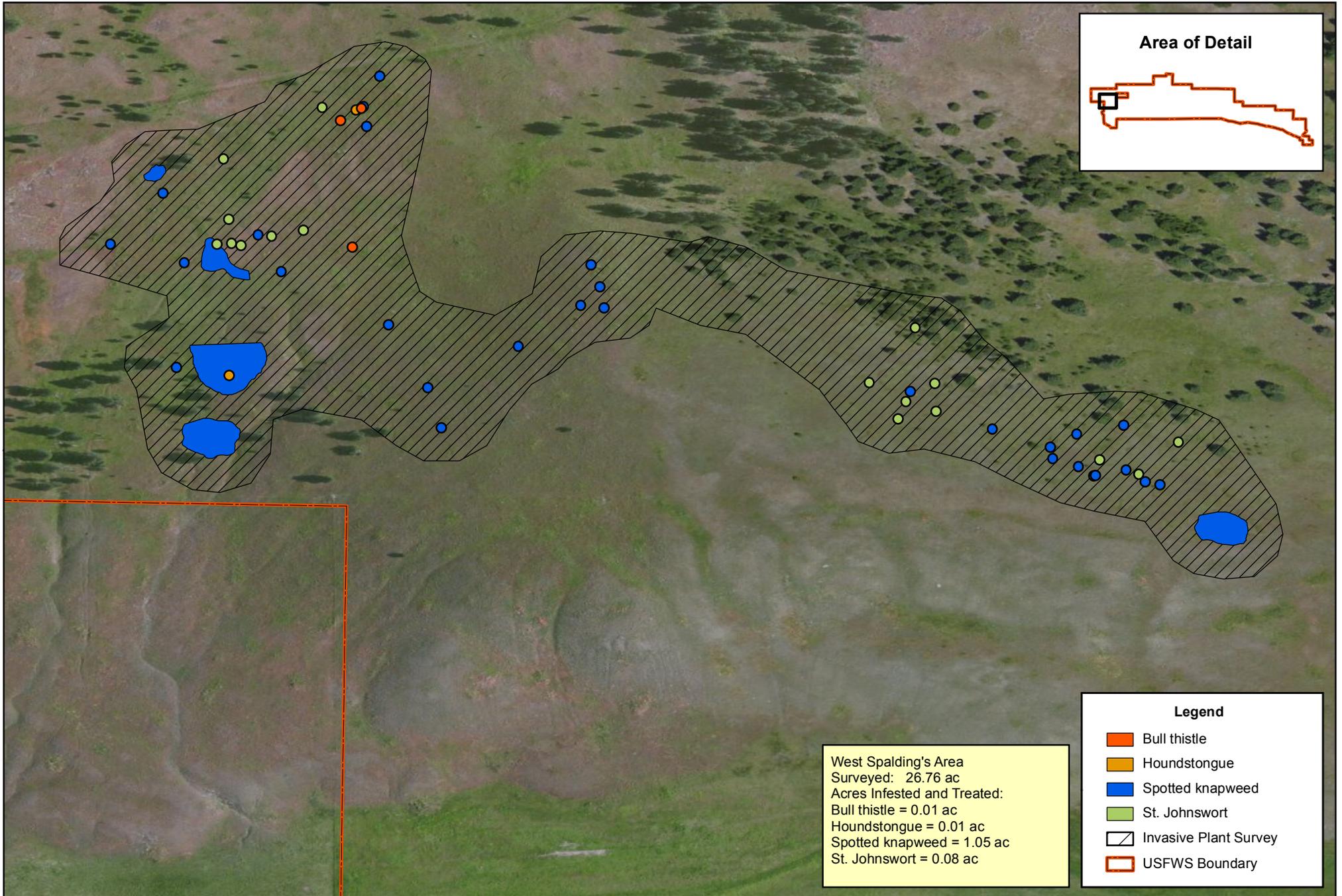
Surveyed: 136.0 ac  
 Acres Infested:  
 Bull thistle = 0.04 ac  
 Canada thistle = 0.02 ac  
 Houndstongue\* = 0.73 ac  
 Spotted knapweed\* = 14.26 ac  
 St. Johnswort = 1.62 ac  
 Sulfur cinquefoil\* = 0.13 ac  
 Tansy ragwort\* = 0.01 ac  
 Yellow toadflax = 0.09 ac  
 Project Site Total = 17.07 ac

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

**Legend**

- Bull thistle
- Canada thistle
- Houndstongue
- Spotted knapweed
- St. Johnswort
- Sulfur cinquefoil
- Tansy ragwort
- Yellow toadflax
- Invasive Plant Survey
- USFWS Boundary

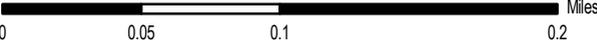




West Spalding's Area  
 Surveyed: 26.76 ac  
 Acres Infested and Treated:  
 Bull thistle = 0.01 ac  
 Houndstongue = 0.01 ac  
 Spotted knapweed = 1.05 ac  
 St. Johnswort = 0.08 ac

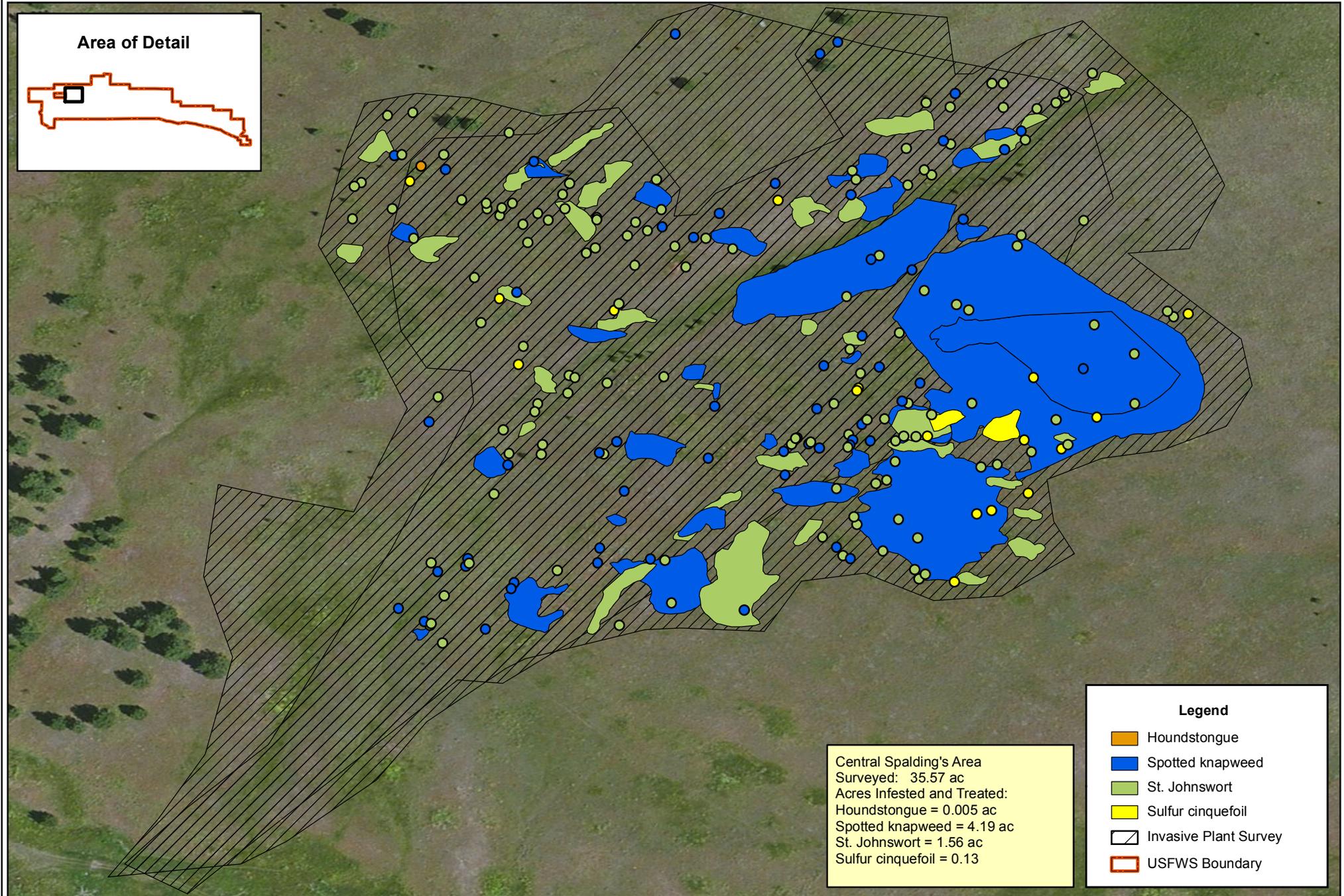
**Legend**

- Bull thistle
- Houndstongue
- Spotted knapweed
- St. Johnswort
- Invasive Plant Survey
- USFWS Boundary





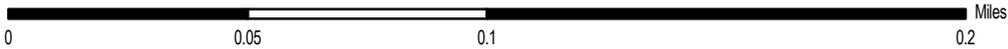
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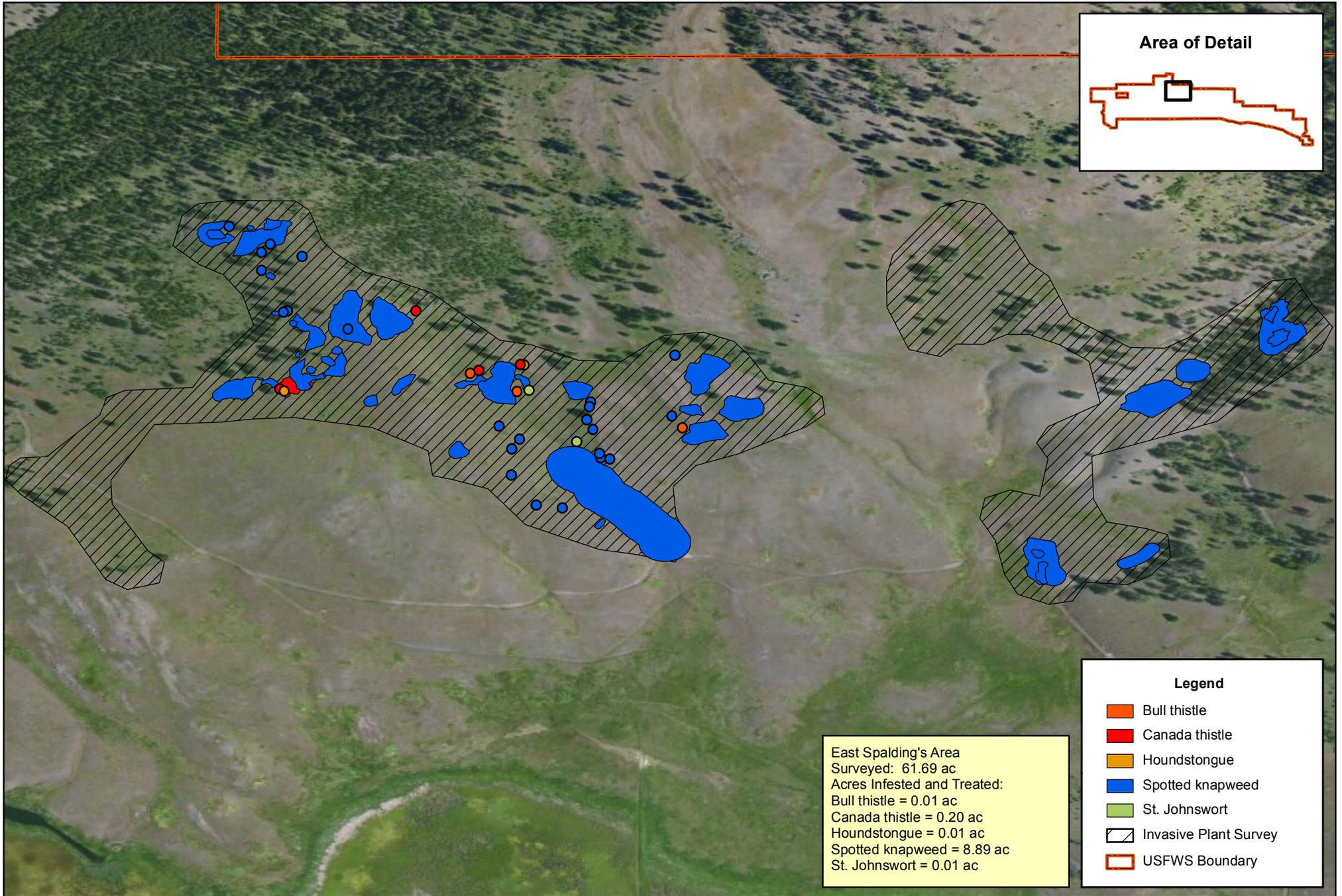


Central Spalding's Area  
 Surveyed: 35.57 ac  
 Acres Infested and Treated:  
 Houndstongue = 0.005 ac  
 Spotted knapweed = 4.19 ac  
 St. Johnswort = 1.56 ac  
 Sulfur cinquefoil = 0.13

**Legend**

- Houndstongue
- Spotted knapweed
- St. Johnswort
- Sulfur cinquefoil
- Invasive Plant Survey
- USFWS Boundary







U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team

Lost Trail NWR - 2013 Survey Acres Infested and Treated

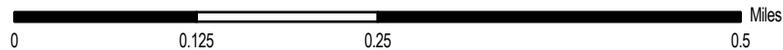


Road 1019  
 Surveyed: 11.91 ac  
 Acres Infested Treated:  
 Bull thistle\* = 0.01 ac  
 Houndstongue\* = 0.70 ac  
 Spotted knapweed\* = 0.20 ac

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

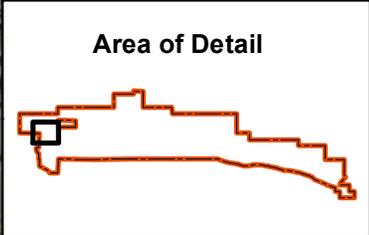
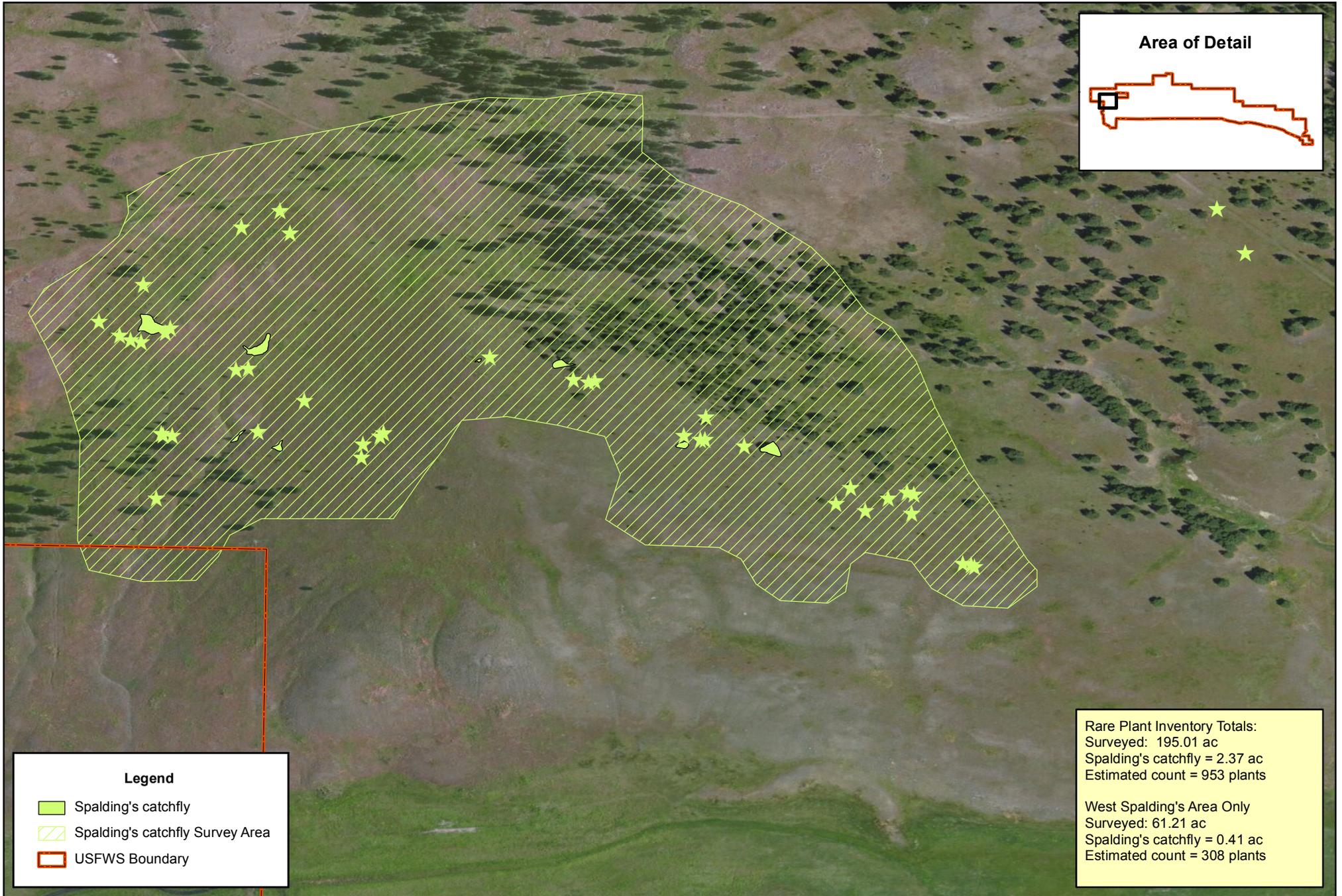
**Legend**

- Bull thistle
- Houndstongue
- Spotted knapweed
- Invasive Plant Survey
- USFWS Boundary



Reference image from ESRI ArcMap Basemap Imagery

Road 1019 - 5 of 9 Maps



**Legend**

-  Spalding's catchfly
-  Spalding's catchfly Survey Area
-  USFWS Boundary

**Rare Plant Inventory Totals:**  
 Surveyed: 195.01 ac  
 Spalding's catchfly = 2.37 ac  
 Estimated count = 953 plants

**West Spalding's Area Only**  
 Surveyed: 61.21 ac  
 Spalding's catchfly = 0.41 ac  
 Estimated count = 308 plants



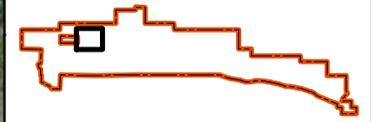
Reference image from ESRI ArcMap Basemap Imagery



Legend

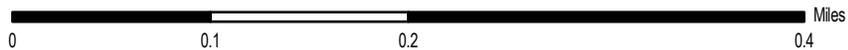
-  Spalding's catchfly
-  Spalding's catchfly Survey Area
-  USFWS Boundary

Area of Detail



Rare Plant Inventory Totals:  
 Surveyed: 195.01 ac  
 Spalding's catchfly = 2.37 ac  
 Estimated count = 953 plants

Central Spalding's Area Only  
 Surveyed: 36.66 ac  
 Spalding's catchfly = 0.38 ac  
 Estimated count = 144 plants

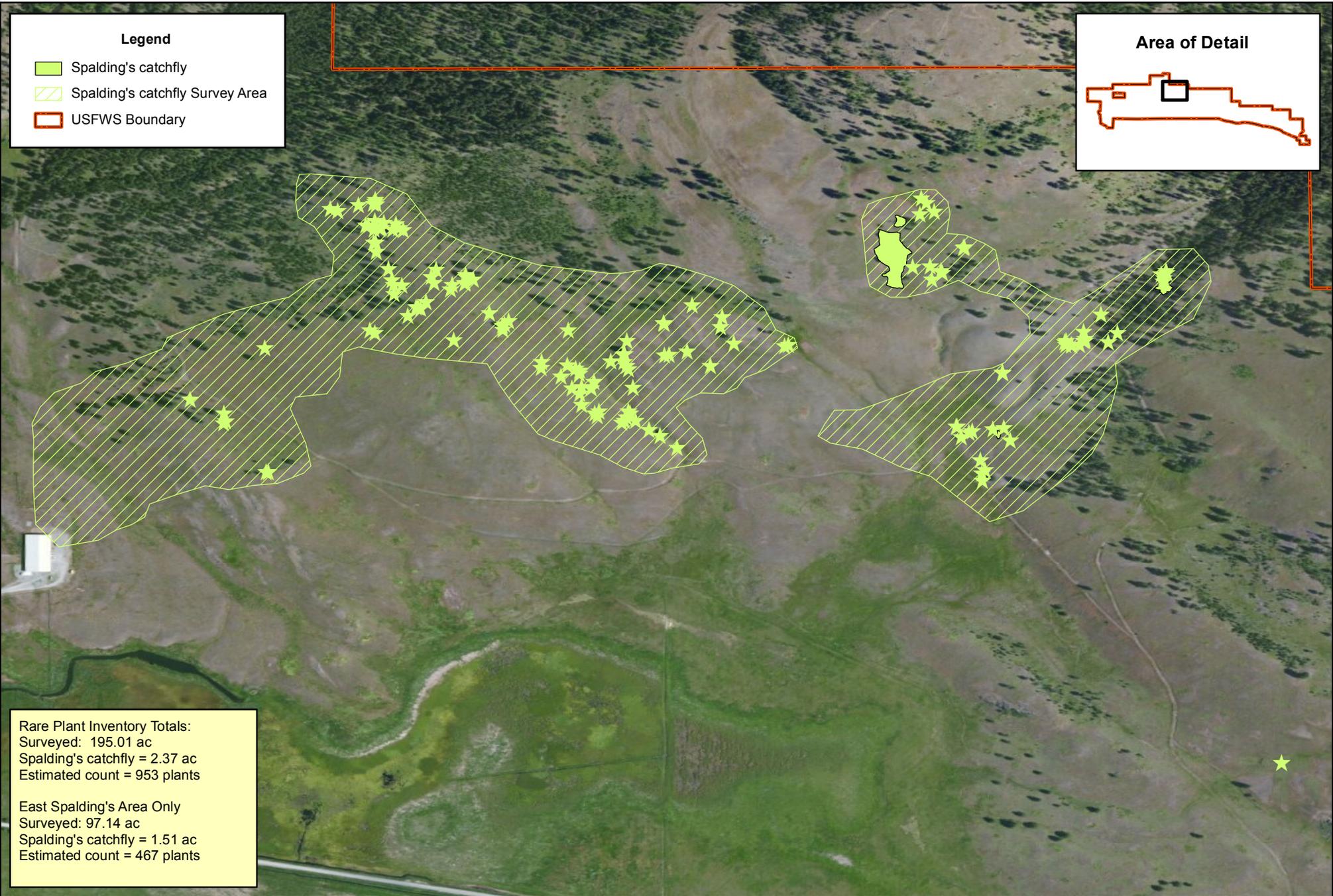
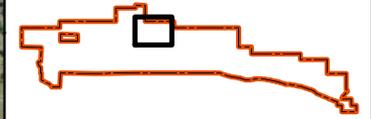




Legend

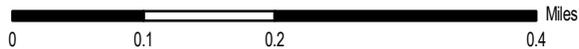
- Spalding's catchfly
- Spalding's catchfly Survey Area
- USFWS Boundary

Area of Detail



Rare Plant Inventory Totals:  
 Surveyed: 195.01 ac  
 Spalding's catchfly = 2.37 ac  
 Estimated count = 953 plants

East Spalding's Area Only  
 Surveyed: 97.14 ac  
 Spalding's catchfly = 1.51 ac  
 Estimated count = 467 plants

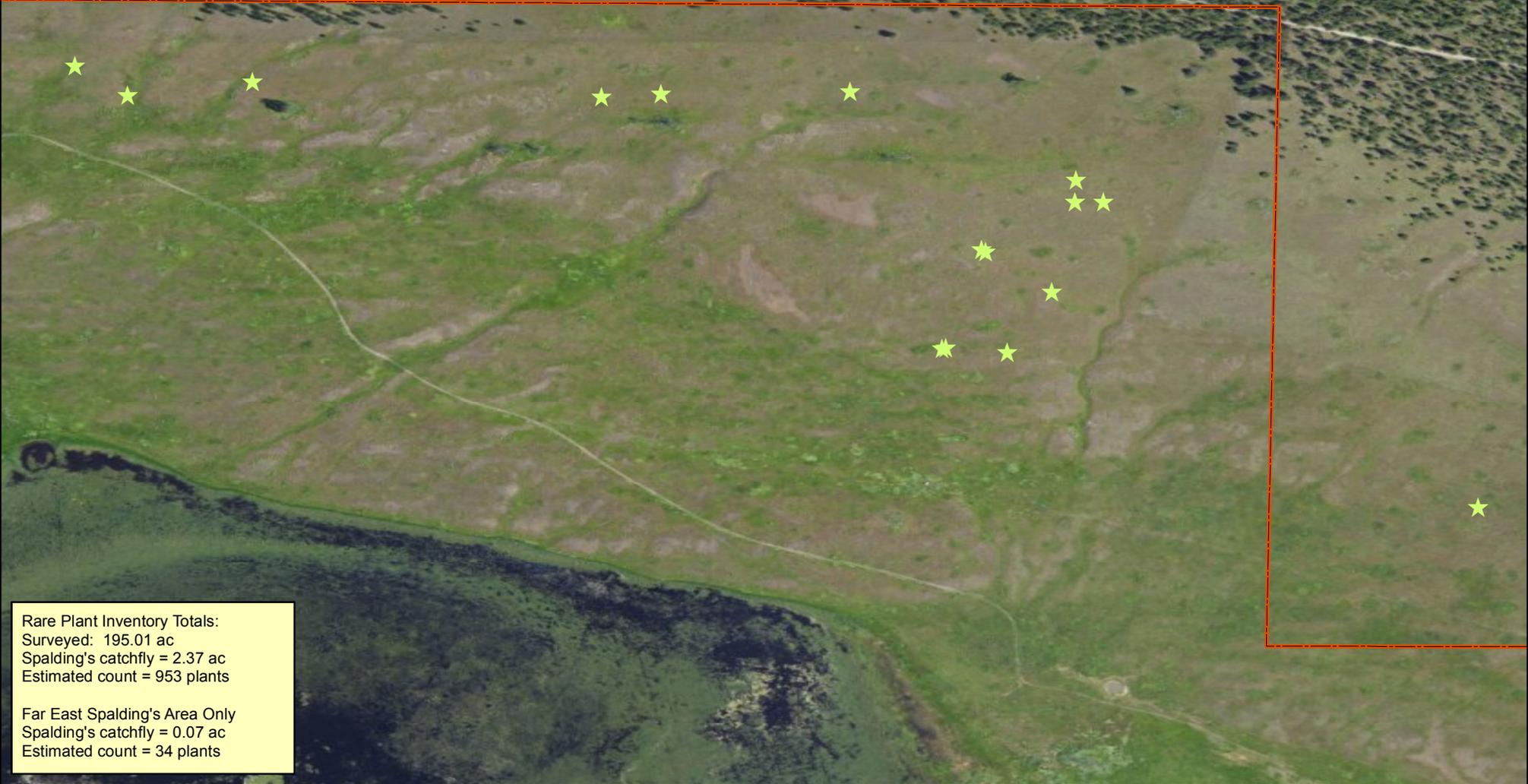




**Legend**

-  Spalding's catchfly
-  USFWS Boundary

**Area of Detail**

Rare Plant Inventory Totals:  
 Surveyed: 195.01 ac  
 Spalding's catchfly = 2.37 ac  
 Estimated count = 953 plants

Far East Spalding's Area Only  
 Spalding's catchfly = 0.07 ac  
 Estimated count = 34 plants





Compliments of the  
MONTANA DEPARTMENT OF AGRICULTURE **DAILY PESTICIDE APPLICATION RECORD**  
AGRICULTURAL SCIENCES DIVISION  
PO BOX 200201  
HELENA, MT 59620-0201  
Phone 406-444-3730

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 104342-15
NAME Benton Lake NWR Invasive Species Strike Team	ADDRESS (Refuge or WPA) Lost Trail NWR
CITY, STATE, ZIP Great Falls, MT 59404	PHONE 406-727-7400 Ext. 213

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Levi Morgan	Mike Hader
Date	07-25-13	07-25-13
County	Flathead	Flathead
Time Start/Stop	0630-1500	0630-1500
Temperature	59°F	59°F
Relative Humidity	56%	56%
Wind Speed/Direction (from)	0	0
Pesticide Manufacturer	Dow Agro	Dow Agro
Trade Name	Transline	Transline
EPA Reg # or Formulation	62719-259	62719-259
Rate: Product/Diluent Per Acre	16.0oz/Ac	16.0oz/Ac
Amount of Chemical Applied	4.48oz	5.60oz
Equipment Used (atv,backpack,truck,saw)	Backpack	Backpack
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		
Plant Phenology & Stage	Flowering	Flowering
Dominant Pest(s)	Spotted Knapweed	Spotted Knapweed
Equipment Used	Backpack	Backpack
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

<p>Location #1 (Site specific description)</p> <p>See map and GPS</p> <p>Eastern population of spaldings</p> <p>Location #2 (Site specific description)</p> <p>See map and GPS</p>	<p>COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....)</p> <p>Shield IVM @ 2 oz / 10 gal  Syl-tac @ 1.28 oz / 10 gal</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Start</th> <th>End</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>LM</td> <td>3</td> <td>0</td> <td>3</td> </tr> <tr> <td></td> <td>2</td> <td>0</td> <td>5</td> </tr> <tr> <td></td> <td>2</td> <td>0</td> <td>7</td> </tr> <tr> <td>MH</td> <td>3</td> <td>0</td> <td>3</td> </tr> <tr> <td></td> <td>2</td> <td>0</td> <td>5</td> </tr> <tr> <td></td> <td>2</td> <td>0</td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Start	End	Total	LM	3	0	3		2	0	5		2	0	7	MH	3	0	3		2	0	5		2	0	7												
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