

# Benton Lake National Wildlife Refuge

## Benton Lake ISST

### Accomplishments

Weed Species	Total Survey Acres <sup>1</sup>	Surveyed Acres Infested <sup>2</sup>	Acres Treated <sup>3</sup>
Crested wheatgrass	1.70	1.56	1.56
<b>Project Site Totals</b>	<b>1.70</b>	<b>1.56</b>	<b>1.56</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.			

### Highlights

#### Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
5-June-2012	Refuge Management Project	Crested wheatgrass	3	Chemically treated crested wheatgrass plot along scenic drive.

#### Coordination and Cooperation

- ISST staff coordinated with refuge biologist, Vanessa Fields, prior to the project.

#### Prevention and Education

- The plot is part of a larger refuge study of removing non-native crested wheatgrass from the landscape and reestablishing native grasses.
- Initial management of the plot included chemical treatment of non-native grass followed by reseedling of native grasses and forbs.
- Current crested wheatgrass plants within the plot were newly established infestations from seed bank.
- The goal of management was to promote continued reestablishment of native mixed grass prairie species such as western wheatgrass.



ISST members Levi Morgan and Eric Lassance spot treating crested wheatgrass. Photo by Chase Burns.

#### Early Detection and Rapid Response

- Early Detection and Rapid Response was not a priority of this project.

#### Inventory and Monitoring

- ISST estimated that the percent cover of the crested wheatgrass managed to be over 60%.

#### Management

- Spot treated all crested wheatgrass with backpack sprayers within the plot as outlined by Vanessa Fields.
- Crested wheatgrass in this plot had been chemically treated in previous years. ISST conducted a spot retreatment of crested wheatgrass within the plot.
- There were heavy rains in the area later that day which may have affected the efficiency of treatments.

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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# 103749-15
NAME Benton Lake NWR Invasive Species Strike Team	ADDRESS (Refuge or WPA) Benton Lake
CITY, STATE, ZIP Great Falls, MT 59404	PHONE 406-727-7400 Ext. 213

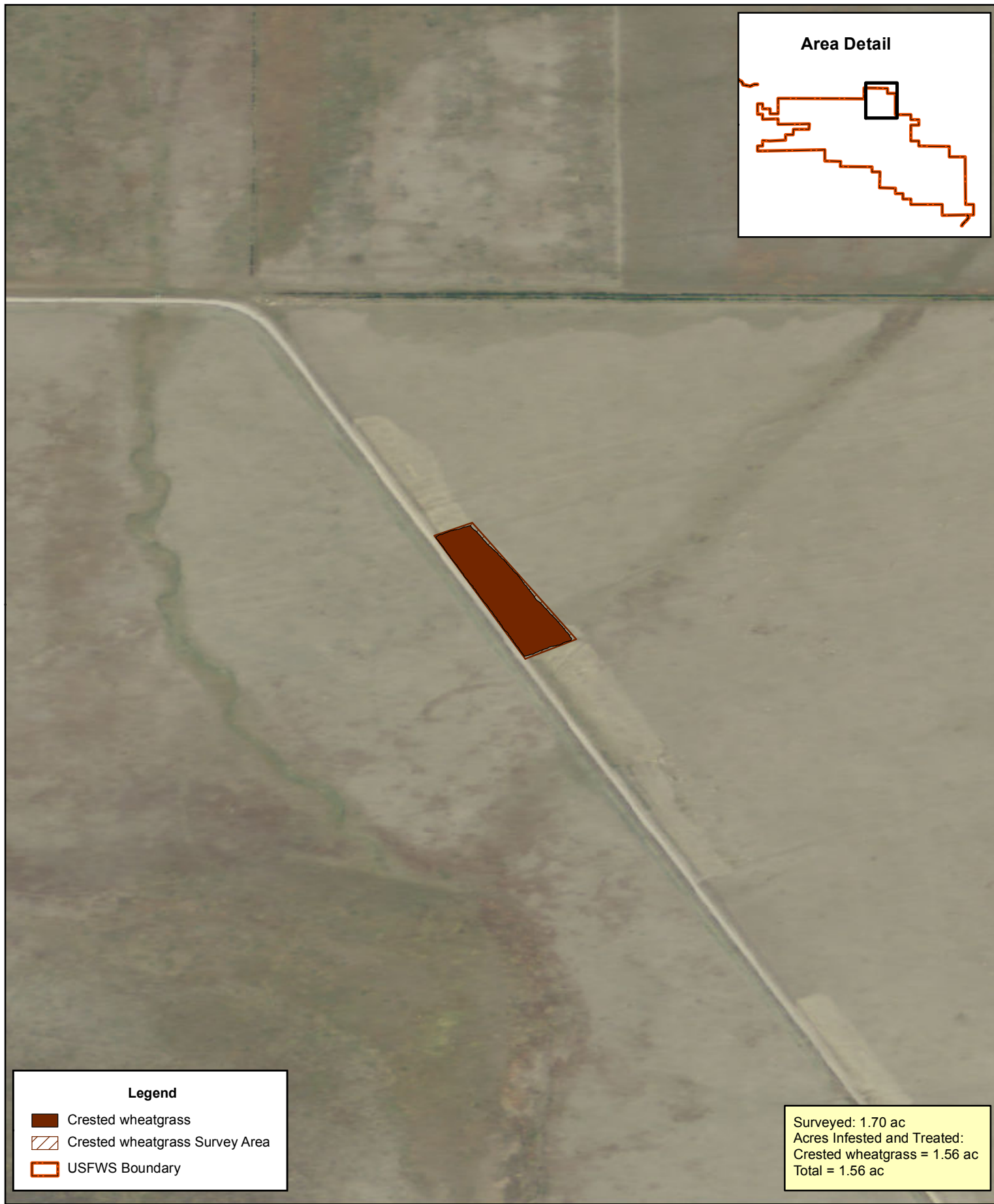
	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Eric Lassance	
Date	6/15/12	
County	Cascade	
Time Start/Stop	1300-1600	
Temperature	60°F	
Relative Humidity	40%	
Wind Speed/Direction (from)	4 mph / North	
Pesticide Manufacturer	Monsanto	
Trade Name	Roundup Pro	
EPA Reg # or Formulation	524-475	
Rate: Product/Diluent Per Acre	5% solution	
Amount of Chemical Applied	19.2 oz	
Equipment Used (atv,backpack,truck,saw)	Eric Backpack Sprayer	
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		
Plant Phenology & Stage	leaf -on	
Dominant Pest(s)	Crested Wheatgrass	
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

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U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team *Benton Lake NWR - 2012 Survey Acres Infested & Treated*



0 0.05 0.1 0.2 Miles

Reference image from 2009 Montana NAIP Imagery

## Benton Lake Wetland Management District

### Pumphouse Unit

#### *Benton Lake ISST*

#### Accomplishments

Weed Species	Total Survey Acres <sup>1</sup>	Surveyed Acres Infested <sup>2</sup>	Acres Treated <sup>3</sup>
Houndstongue	87.26	4.52	4.55
Leafy spurge	0.03	0.005	0.009
Whitetop/Hoary cress	82.05	0.09	0.09
<b>Project Site Totals</b>	<b>97.77</b>	<b>4.62</b>	<b>4.65</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.			

#### Highlights

#### Schedule

Dates	Project Type	Target Species	Size of Crew	Project Notes
24-May-2012	Refuge Management Project	Houndstongue	2	Point to point mechanical treatment of historic populations within the unit.
29-May-2012	Refuge Management Project	Whitetop/Hoary cress	4	Point to point chemical treatment of historic populations within the unit.
	Refuge Management Project	Houndstongue	4	Point to point chemical and mechanical treatment of historic populations within the unit.
30-May-2012	Refuge Management Project	Whitetop/Hoary cress	3	Point to point chemical treatment of historic populations within the unit.
	Refuge Management Project	Houndstongue	3	Point to point chemical and mechanical treatment of historic populations within the unit.
	EDRR	Leafy spurge	1	New detection of leafy spurge while treating historical houndstongue populations.
31-May-2012	Refuge Management Project	Houndstongue	2	Point to point chemical and mechanical treatment of historic populations within the unit.
	EDRR	Leafy spurge	2	Mechanical treatment and mapping on 05/30/12.
11-June-2012	Refuge	Houndstongue	4	Point to point mechanical

	Management Project			treatment of historic populations within the unit.
4-October-2012	EDRR	Leafy spurge	3	Point to point chemical treatment of population found on 05/3012.

#### Coordination and Cooperation

- Project priorities and scheduling were coordinated with refuge by proposals and staff discussions.
  - Amy Graham assisted with leafy spurge chemical treatment.

#### Prevention and Education

- Historically, this is a heavily infested site. The Strike Team provides significant effort controlling houndstongue and whitetop/hoary cress preventing additional infestation.

#### Early Detection and Rapid Response

- A small population of leafy spurge (0.005 acres) was found in culvert along road near the unit's southwest border.

#### Inventory and Monitoring

- ISST surveyed 97.77 total acres in 2012 compared to 393.87 acres in 2011 since point-to-point was used rather than systematic coverage of an entire area.
- Of the total area surveyed, 87.26 acres was searched within the area of historical houndstongue infestations compared to 321.13 acres transected in 2011.
  - Observed fewer senesced seed heads in treated areas than in 2011.
  - Houndstongue flushed intermittently making it difficult to treat all populations.
- ISST searched 82.05 acres of historical whitetop/hoary cress infestations and found 0.09 acres were infested (0.05 acres in 2011).
  - Two new small populations were discovered while treating historical houndstongue populations.
  - Weather and phenology permitting, chemical treatments should be made in May 2013.
- Other weed species not targeted included: bull thistle, Canada thistle, cheatgrass, crested wheatgrass, field pennycress, musk thistle, and spotted knapweed.



Michael Hader and Chase Burns digging up houndstongue near Muddy Creek. Photo by Levi Morgan.

#### Management

- ISST treated 0.09 acres of whitetop/hoary cress during several visits in 2012.
  - Populations were spread sporadically throughout the unit mainly near Muddy Creek and its tributaries and canals.
  - Canopy cover density decreased in populations compared to 2011.
  - Two new satellite populations were chemically treated while treating houndstongue.
  - Whitetop treatments appeared effective upon review during subsequent houndstongue mechanical treatments.
- ISST treated .009 acres of leafy spurge during two visits in 2012.
  - After population discovery, flowers and seed heads were clipped and bagged, then disposed of in a dumpster to prohibit seed dispersal.
  - The infestation was also treated with Plateau herbicide in the fall.
  - In above accomplishments table, acres treated is 0.004 acres greater than surveyed acres infested due to two treatments (one mechanical and one chemical) to the same infestation.
- ISST treated 4.55 acres (13.68 acres in 2011) of houndstongue during several visits in 2012.
  - ISST treated all historical houndstongue populations accessible with ATV tank sprayers. Not all areas inaccessible to ATVs were treated due to time constraints and degree of infestations. Populations untreated were in thick shrubs/trees and needed to be removed with shovels.
  - Mechanical treatments were necessary due to weather and proximity to trees and bushes.



- Populations were primarily in the drainages and understory of shrubs and trees.
- Seed heads were bagged and disposed of in a dumpster.
- In the accomplishments table above, acres treated is 0.03 acres greater than surveyed acres infested due to multiple treatments within the same area to treat repeated flushes of houndstongue over the course of 2012.
- Effectiveness of houndstongue and whitetop/hoary cress chemical treatments on 05/29/12 may have been affected by a rain storm in the afternoon.
- In the accomplishments table above, the surveyed acres infested of each species does not add up to the project site total because in some instances multiple species shared the same area. For example, each species was recorded as infesting one acre; but since they infest the same acre the acreages were not added together.
- All ISST activities in the Pumphouse Unit were conducted point-to-point around historic observations of known weed populations. Although this minimizes disturbance to the site, it reduces the ability of the ISST to detect new populations before they become established on the rest of the WPA. It also dramatically limits the scope of weed mapping data for tracking invasive species population size over time and prevents the use of these data for rigorously determining effectiveness or supporting adaptive management strategies. Additional resources and methodologies will be required by refuge staff to now to determine or answer these types of questions.



Leafy spurge close-up at Pumphouse Unit. Photo by Levi Morgan.



Whitetop/hoary cress at Pumphouse Unit. Photo by Eric Lassance.



Leafy spurge at Pumphouse Unit. Photo by Levi Morgan.



Phone 406-444-3730

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AGRICULTURAL SCIENCES DIVISION  
PO BOX 200201  
HELENA, MT 59620-0201  
Phone 406-444-3730

BUSINESS U.S. Fish and Wildlife Service	LICENSE# 103749-15
NAME Benton Lake NWR Invasive Species Strike Team	ADDRESS (Refuge or WPA) Pumphouse unit
CITY, STATE, ZIP Great Falls, MT 59404	PHONE 406-727-7400 Ext. 213

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Chase Burns	Chase Burns
Date	5/29/2012	5/29/2012
County	Teton	Teton
Time Start/Stop	1000-1300	1300-1530
Temperature	60	60
Relative Humidity	52%	52%
Wind Speed/Direction (from)	2.5mph/ East	4.0 mph/ SE
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.08oz	
Equipment Used (atv,backpack,truck,saw)	ATV #6 handgun (64 GPA)	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		dig, handpull
Plant Phenology & Stage	flower, pre-flower	flower, pre-flower
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
CPS Filename		

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CITY, STATE, ZIP Great Falls, MT 59404	PHONE 406-727-7400 Ext. 213

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Mike Hader	Mike Hader
Date	5-29-2012	5-29-2012
County	Teton	Teton
Time Start/Stop	1000-1300	1300-1530
Temperature	60°F	60°F
Relative Humidity	52%	52%
Wind Speed/Direction (from)	2.5mph/ East	4.0 mph/ SE
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.17 oz	
Equipment Used (atv,backpack,truck,saw)	ATV #3 handgun (76 GPA)	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		dig, handpull
Plant Phenology & Stage	flower, pre-flower/ flower, pre-flower	flowering, pre-flower
Dominant Pest(s)	hoary cress/houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
CPS Filename		

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Levi Morgan	Levi Morgan
Date	5-30-2012	5-30-2012
County	Teton	Teton
Time Start/Stop	930 - 1500	1500 - 1600
Temperature	62°F	62°F
Relative Humidity	30%	30%
Wind Speed/Direction (from)	5 mph/ West	5 mph/ West
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1 oz/acre	
Amount of Chemical Applied	.14 oz	
Equipment Used (atv,backpack,truck,saw)	ATV#1 handgun (80 GPA)	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		dig/shovel
Plant Phenology & Stage	flower, pre-flower, leaf-on, basal rosette	flower, pre-flower, leaf-on, basal rosette
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Chase Burns	Chase Burns
Date	05-30-2012	05-30-2012
County	Teton	Teton
Time Start/Stop	0930-1500	1500-1600
Temperature	62°F	62°F
Relative Humidity	30%	30%
Wind Speed/Direction (from)	5 mph/West	5 mph/West
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.176 oz	
Equipment Used (atv,backpack,truck,saw)	ATV#10 handgun (64 GPA)	Shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		dig/shovel
Plant Phenology & Stage	pre-flower/flower	pre-flower/flower
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
CPS Filename		

[illegible]

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Eric Lassance	
Date	5-30-2012	
County	Teton	
Time Start/Stop	0930-1500	
Temperature	63	
Relative Humidity	30%	
Wind Speed/Direction (from)	5mph/ West	
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.16 oz	
Equipment Used (atv,backpack,truck,saw)	ATV #8 handgun (80 GPA)	
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		
Plant Phenology & Stage	basal rosette/pre-flower	
Dominant Pest(s)	Houndstongue/hoary cress	
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

[illegible]

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Levi Morgan	Levi Morgan
Date	5-31-2012	5-31-2012
County	Teton	Teton
Time Start/Stop	1120-1500	1500-1600
Temperature	62°F	
Relative Humidity	47%	
Wind Speed/Direction (from)	6 mph/ SW	
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.11 oz	
Equipment Used (atv,backpack,truck,saw)	ATV #1 handgun (80 GPA)	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		dig, handpull
Plant Phenology & Stage	flower, pre-flower, basal rosette	pre-flower, flower
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Chase Burns	Chase Burns
Date	5-31-2012	5-31-2012
County	Teton	Teton
Time Start/Stop	1120-1500	1500-1600
Temperature	62	
Relative Humidity	47%	
Wind Speed/Direction (from)	6 mph/ SW	
Pesticide Manufacturer	Dupont	
Trade Name	Escort XP	
EPA Reg # or Formulation	352-439	
Rate: Product/Diluent Per Acre	1oz/acre	
Amount of Chemical Applied	.14 oz	
Equipment Used (atv,backpack,truck,saw)	ATV #10 handgun (64 GPA)	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		Dig,handpull
Plant Phenology & Stage	Pre-flower, flower	Pre-flower, flower
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

[illegible]

Phone 406-444-3730

Location #1 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....)
-East of Muddy creek working south of pumphouse structure and the wooded area west of the train bridge. Historical houndstongue populations.	-good weather -couldn't spray due to brush and trees -Hoary cress dying that we had sprayed a couple weeks ago
Location #2 (Site specific description)	
-Same as above	

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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Eric Lassance	Chase Burns
Date	6/11/12	6/11/12
County	Teton	Teton
Time Start/Stop	1030-1500	1030-1500
Temperature	75°F	75°F
Relative Humidity	30%	30%
Wind Speed/Direction (from)	6 mph/west	6 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)	shovel	shovel
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		
Plant Phenology & Stage	basal rosette, pre-flower, flower	basal rosette, pre-flower, flower
Dominant Pest(s)	houndstongue	houndstongue
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

<b>Location #1</b> (Site specific description)	<b>COMMENTS/MAP:</b> (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....)
-East of Muddy creek working south of pumphouse structure and the wooded area west of the train bridge. Historical houndstongue populations.	-good weather -couldn't spray due to brush and trees -Hoary cress dying that we had sprayed a couple weeks ago
<b>Location #2</b> (Site specific description)	
-Same as above	



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Applicator/Operator Name (s)		
Date		
County		
Time Start/Stop		
Temperature		
Relative Humidity		
Wind Speed/Direction (from)		
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)		
Plant Phenology & Stage		
Dominant Pest(s)		
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

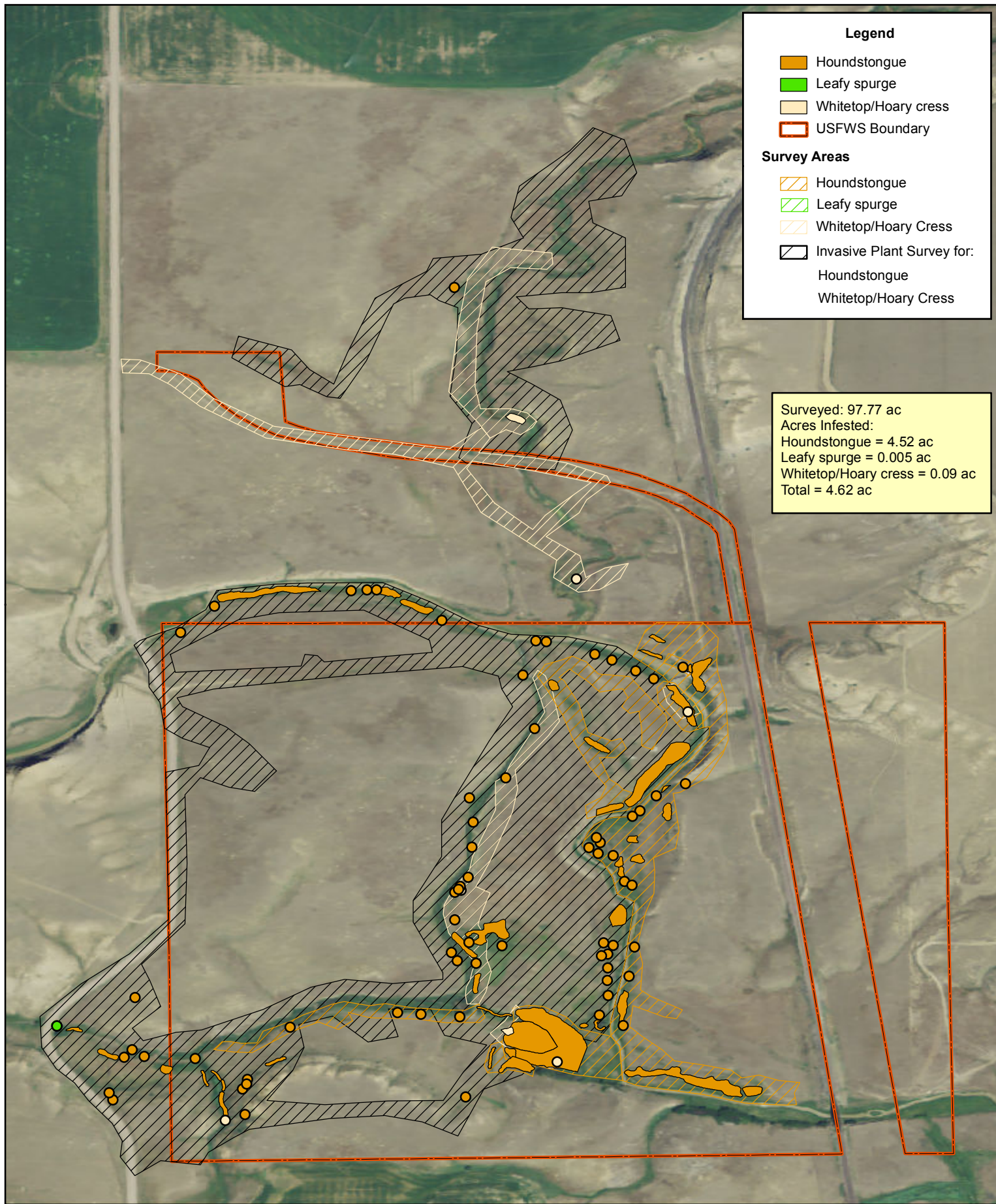
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	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)		
Date		
County		
Time Start/Stop		
Temperature		
Relative Humidity		
Wind Speed/Direction (from)		
Pesticide Manufacturer		
Trade Name		
EPA Reg # or Formulation		
Rate: Product/Diluent Per Acre		
Amount of Chemical Applied		
Equipment Used (atv,backpack,truck,saw)		
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)		
Plant Phenology & Stage		
Dominant Pest(s)		
Equipment Used		
Acres/Area Treated or # of plants	Spot treatment, gps mapped	Spot treatment, gps mapped
GPS Filename		

[illegible]



0 0.05 0.1 0.2 Miles

Reference image from 2009 Montana NAIP Imagery



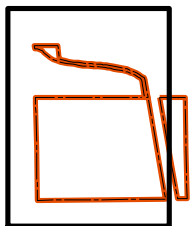


U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team

Pumphouse Unit - 2012 Survey Acres Infested & Treated

### Area Detail



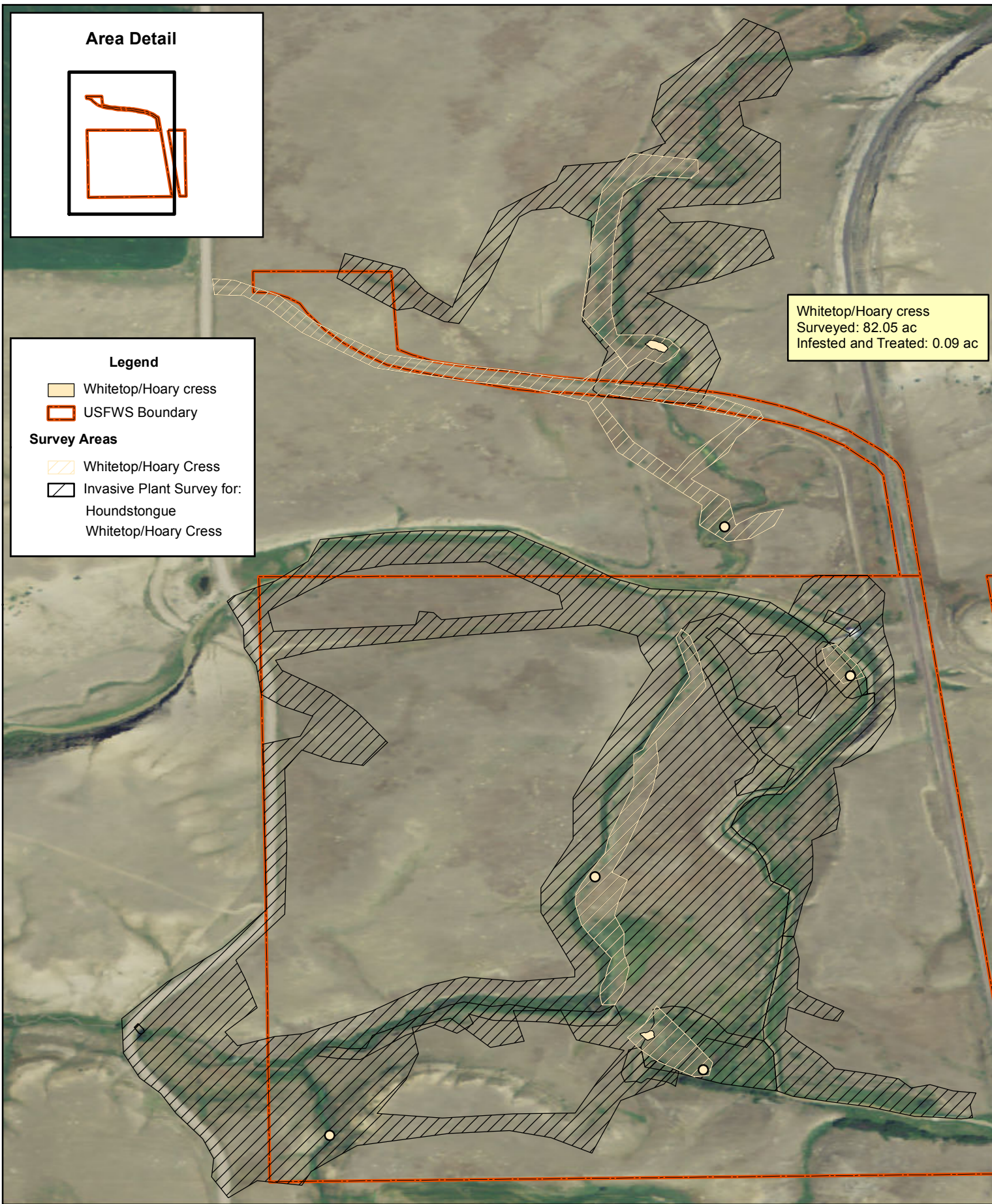
### Legend

- Whitetop/Hoary cress
- USFWS Boundary

### Survey Areas

- Whitetop/Hoary Cress
- Invasive Plant Survey for:  
Houndstongue  
Whitetop/Hoary Cress

Whitetop/Hoary cress  
Surveyed: 82.05 ac  
Infested and Treated: 0.09 ac



0 0.05 0.1 0.2 Miles

Reference image from 2009 Montana NAIP Imagery

Whitetop/Hoary cress - 2 of 4 Maps






U.S. Fish & Wildlife Service


MOYOCO Invasive Species Strike Team

Pumphouse Unit - 2012 Survey Acres Infested & Treated


Houndstongue  
Surveyed: 87.26 ac  
Infested: 4.52 ac


**Legend**

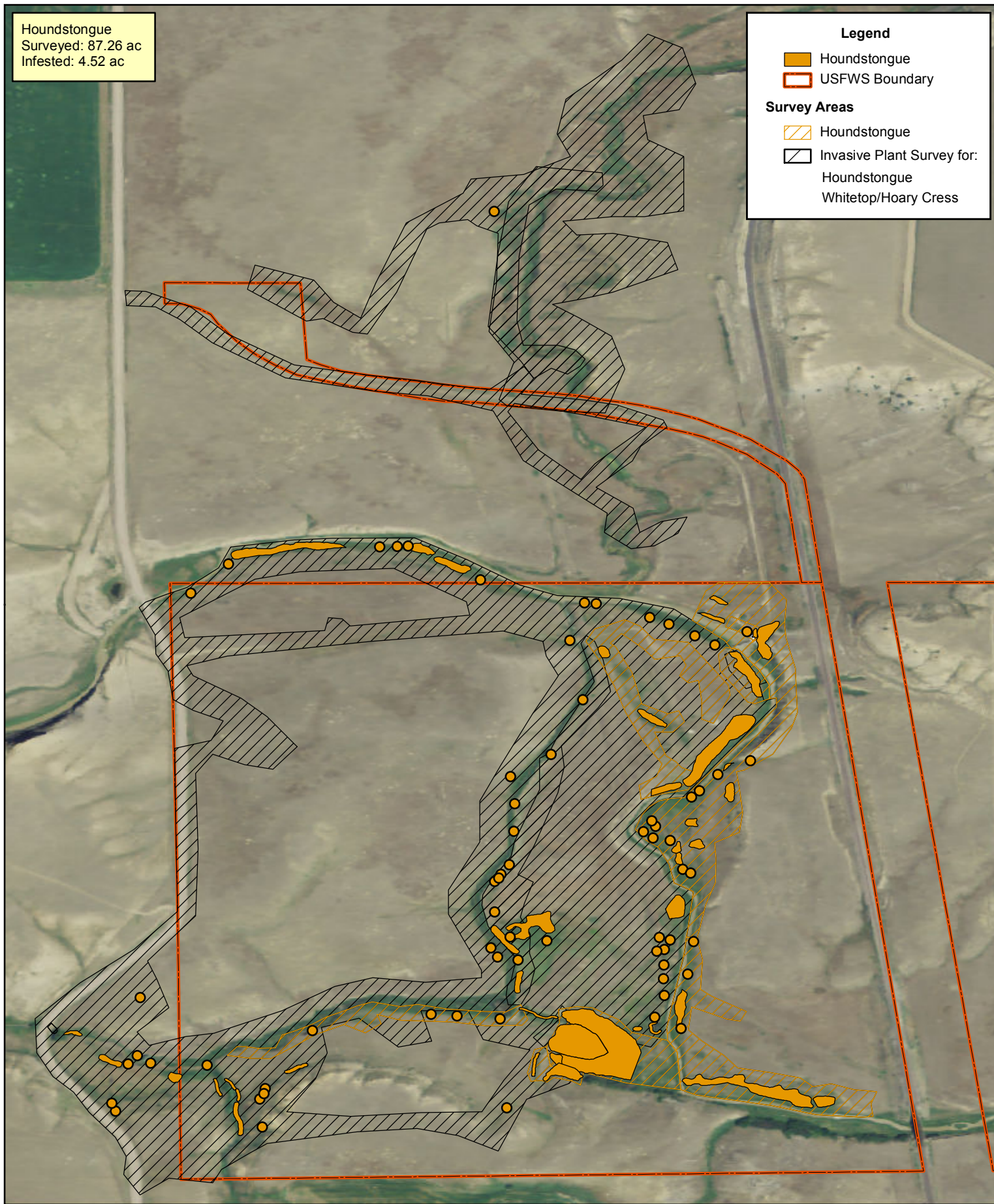
 Houndstongue

 USFWS Boundary

**Survey Areas**

 Houndstongue

 Invasive Plant Survey for:  
Houndstongue  
Whitetop/Hoary Cress



0 0.075 0.15 0.3 Miles

Reference image from 2009 Montana NAIP Imagery

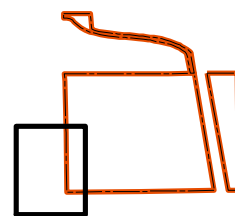
Houndstongue - 3 of 4 Maps





Leafy spurge  
Surveyed: 0.03 ac  
Infested: 0.005 ac

Area Detail



Legend

- Leafy spurge
- Leafy spurge Survey Area
- USFWS Boundary



0 0.025 0.05 0.1 Miles

Reference image from 2009 Montana NAIP Imagery