

Benton Lake National Wildlife Refuge

Benton Lake ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Surveyed Acres Infested ²	Acres Treated ³
Hoary alyssum	0.0	0.005	0.005
Houndstongue	0.29	0.014	0.014
Project Site Totals	0.29	0.019	0.019
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
2-June-2011	Mechanical Treatment	Houndstongue	1	Limited time at the end of ATV Safety class. Treated weeds within historic locations of houndstongue.
25-July-2011	Mechanical Treatment	Hoary Alyssum	1	Treated hoary alyssum found near headquarters.

Coordination and Cooperation

- Due to the limited nature of these projects, no coordination or cooperation with refuge staff was required.

Prevention and Education

- Houndstongue sprouts multiple times over the course of the summer. The small houndstongue patch would benefit from multiple treatments during the season by refuge staff to increase chances of eradication, as long as they stay within limits for application or use mechanical methods.
- High traffic areas of refuge staff are vectors for noxious weed movement and must be checked regularly as illustrated by the hoary alyssum discovery.

Early Detection and Rapid Response

- ISST member Jenny Beuerman discovered a single hoary alyssum plant along the pathway between headquarters and the maintenance facilities.



Hoary alyssum. Internet photo.

Inventory and Monitoring

- ISST observed senesced houndstongue stalks at the treatment site. More treatments will likely have to be conducted in the future.

Management

- Mechanically treated houndstongue along a dike road near the wildlife drive. The weeds were in the basal rosette and pre-flowering growth stage and were dug up with a shovel. Chemical treatment was not an option this year do to high water levels near the weed infestation.
- .005 acres of houndstongue were treated in the same area in 2010 illustrating need for continued monitoring and treatment to ensure treatment exhausts the seed bank.
- Mechanically treated hoary alyssum along the pathway between refuge headquarters and the maintenance area. The weed was in the flowering growth stage and was dug up with a shovel. Periodic visits to this site will need to be conducted in 2012 to further evaluate the status of the infestation.

Benton Lake Wetland Management District

Pumphouse Unit

Benton Lake and Lee Metcalf ISST

Accomplishments

Weed Species	Total Survey Acres ¹	Surveyed Acres Infested ²	Acres Treated ³
Houndstongue	321.13	6.77	8.33
Spotted knapweed	271.97	13.68	13.68
Whitetop/Hoary cress	3.70	0.05	0.05
Project Site Totals	356.28	20.47	22.06
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
12-May-2011	Mechanical Treatment	Houndstongue	5	Survey for and treat weeds based on historical treatment data collected in 2010.
18-May-2011	Mechanical Treatment	Houndstongue	5	Survey for and treat weeds based on historical treatment data collected in 2010.
23-May-2011	Inventory & Monitoring	Whitetop/Hoary cress, Spotted knapweed	3	Survey for and treat weeds based on historical treatment data collected in 2010. Also mapped spotted knapweed and early detection of whitetop/hoary cress.
	Mechanical treatment	Houndstongue		
24 & 26-May-2011	Mechanical treatment	Houndstongue	4	Survey for and treat weeds based on historical treatment data collected in 2010.
31-May-2011	Chemical Treatment	Whitetop/Hoary cress	2	Rapid response to detection of Whitetop/Hoary cress.
29-June-2011	Chemical & Mechanical Treatment	Houndstongue, Spotted knapweed	3	Survey for and treat weeds based on historical treatment data collected in 2010.

25-July-2011	Chemical & Mechanical Treatment	Spotted knapweed, Houndstongue	4	Survey for and treat weeds based on historical treatment data collected in 2010.
26-July-2011	Mechanical Treatment	Spotted knapweed, Houndstongue	3	Survey for and treat weeds based on historical treatment data collected in 2010.
8-August-2011	Mechanical Treatment	Spotted knapweed, Houndstongue	2	Survey for and treat weeds based on historical treatment data collected in 2010.
24-August-2011	Chemical Treatment	Spotted knapweed	1	Survey for weeds based on historical treatment data collected in 2010.

Coordination and Cooperation

- Project priorities and scheduling were coordinated with refuge by proposals and staff discussions.

Prevention and Education

- This site is extremely infested and has been for a long time. Strike team has provided significant effort to control houndstongue, spotted knapweed, and whitetop/hoary cress to prevent further spread to surrounding areas.

Early Detection and Rapid Response

- Mapped early detection of whitetop/hoary cress in one location within the Pumphouse Unit.
 - A population was near the canal that runs north/south in the middle of the unit.



Houndstongue chemical treatments.
Photo by Michael Hader.

Inventory and Monitoring

- ISST surveyed 393.87 total acres in 2011 compared to 111.27 acres in 2010.
- ISST searched 321.13 acres for houndstongue compared to 17.78 acres in 2010, and therefore more acreage (8.33 acres) was treated compared to 1.26 acres in 2010. Increase in treatment was a function of covering more area, not because the infestation grew in one year.
 - Houndstongue continued to flush throughout the season making it difficult to treat all populations in the historical areas.
- ISST searched 3.70 acres within the vicinity of whitetop/hoary cress infestations and 0.05 acres were infested (0.005 acres treated in 2010).
 - One historical population is almost eradicated, while one new population discovered.
 - Weather and phenology permitting, chemical treatments should be made in May 2012.
- ISST searched a total of 271.97 acres for spotted knapweed compared to 93.49 in 2010 and 13.68 acres were treated (4.89 acres in 2010), again a greater treatment area as a result of additional area covered.
- Other weed species noted by crew members, but not targeted include: bull thistle, Canada thistle, cheatgrass, crested wheatgrass, field pennycress, and musk thistle.

Management

- ISST members prior to their ATV certification treated some whitetop/hoary cress using backpack sprayers. Otherwise ISST treated all noxious weeds using ATVs equipped with a hand gun.
- Syl-Tac surfactant was used with Chaparral, Escort, and Milestone.
- ISST treated 0.05 acres of whitetop/hoary cress during two visits in 2011.
 - Whitetop/Hoary cress was in the pre-flower growth stage.
 - One population along Muddy creek is almost eradicated.

- ISST treated 13.68 acres of houndstongue over the course of ten visits in 2011.
 - Mechanical treatments were frequent and necessary due to poor weather, frequency of sprouting during the year, and proximity to trees and bushes.
 - Populations were primarily in the wet areas of the unit and were in the following growth stages: basal rosette, pre-flower, flower, senesced, and seed-out.
 - Seed heads were bagged and disposed of in a dumpster.
 - In the accomplishments table above, acres treated is 1.56 acres greater than surveyed acres infested due to multiple treatments within the same area to treat repeated flushes of houndstongue over the course of 2011.
- ISST treated 13.68 acres of spotted knapweed over the course of five visits in 2011.
 - Spotted knapweed was in the following growth stages: basal rosette, leaf on, bolt, and flower.
 - Populations were primarily near the wet areas of the unit.
- 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.

Chemical Use

Dates	Chemical Trade Name	Rate	Chemical Applied	Target Species
31-May-2011	Escort XP	1 oz/acre	0.09 oz	Whitetop/Hoary cress
29-June-2011	Escort XP	1 oz/acre	0.17 oz	Houndstongue
29-June-2011	Milestone	7 oz/acre	0.6 oz	Spotted knapweed
25-July-2011	Milestone	7 oz/acre	3.06 oz	Houndstongue, Spotted knapweed
25-July-2011	Chaparral	3 oz/acre	1.59 oz	Houndstongue, Spotted knapweed
26-July-2011	Milestone	7 oz/acre	6.44 oz	Houndstongue, Spotted knapweed
26-July-2011	Chaparral	3 oz/acre	0.82 oz	Houndstongue, Spotted knapweed
24-August-2011	Milestone	7 oz/acre	1.37 oz	Spotted knapweed

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

	APPLICATION #1	APPLICATION #2
Applicator/Operator Name (s)	Levi Morgan	
Date	06/02/2011	
County	Cascade	
Time Start/Stop	1400 – 1630	
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)	ATV, shovel	
Bio-Control (genus species)		
# released / acre		
Mechanical (mow,hand-pull)	Dig	
Plant Phenology & Stage	Basal rosette, Pre-flowering	
Dominant Pest(s)	Houndstongue	
Equipment Used	Shovel	
Acres/Area Treated or # of plants	GPS Mapped	GPS Mapped
GPS Filename		

Location #1 (Site specific description) Southeast side of wildlife drive along gravel road in previously mapped houndstongue population on refuge. Location #2 (Site specific description)	COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....)
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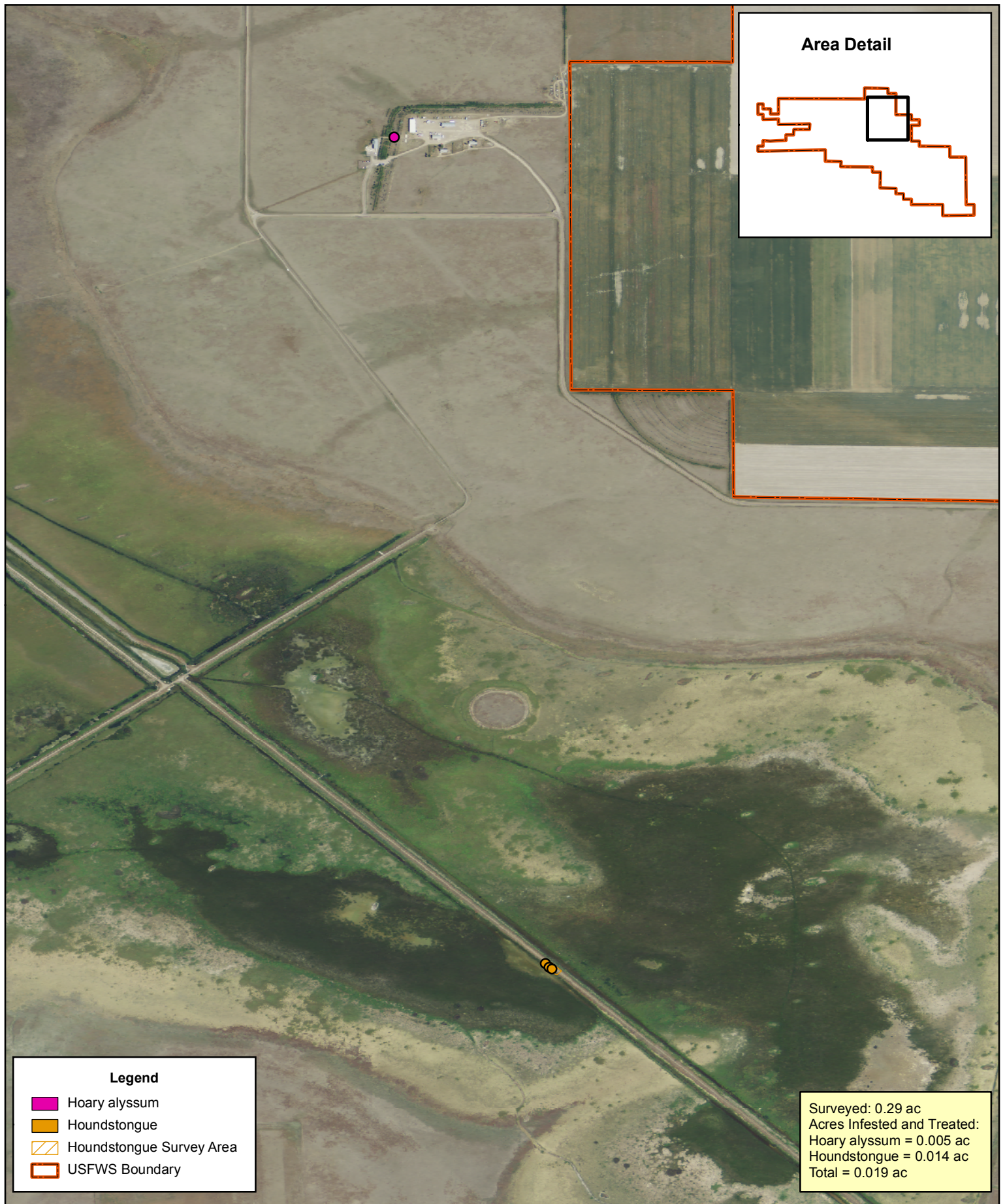
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CITY, STATE, ZIP Great Falls, MT 59404	PHONE 406-727-7400 Ext. 213

<p>Location #1 (Site specific description)</p> <p>One plant along pathway between maintenance facilities and headquarters.</p> <p>Location #2 (Site specific description)</p>	<p>COMMENTS/MAP: (any surfactant or dye used, PUP number, concerns with weather prior or post treatment, DETAILS, etc....)</p>
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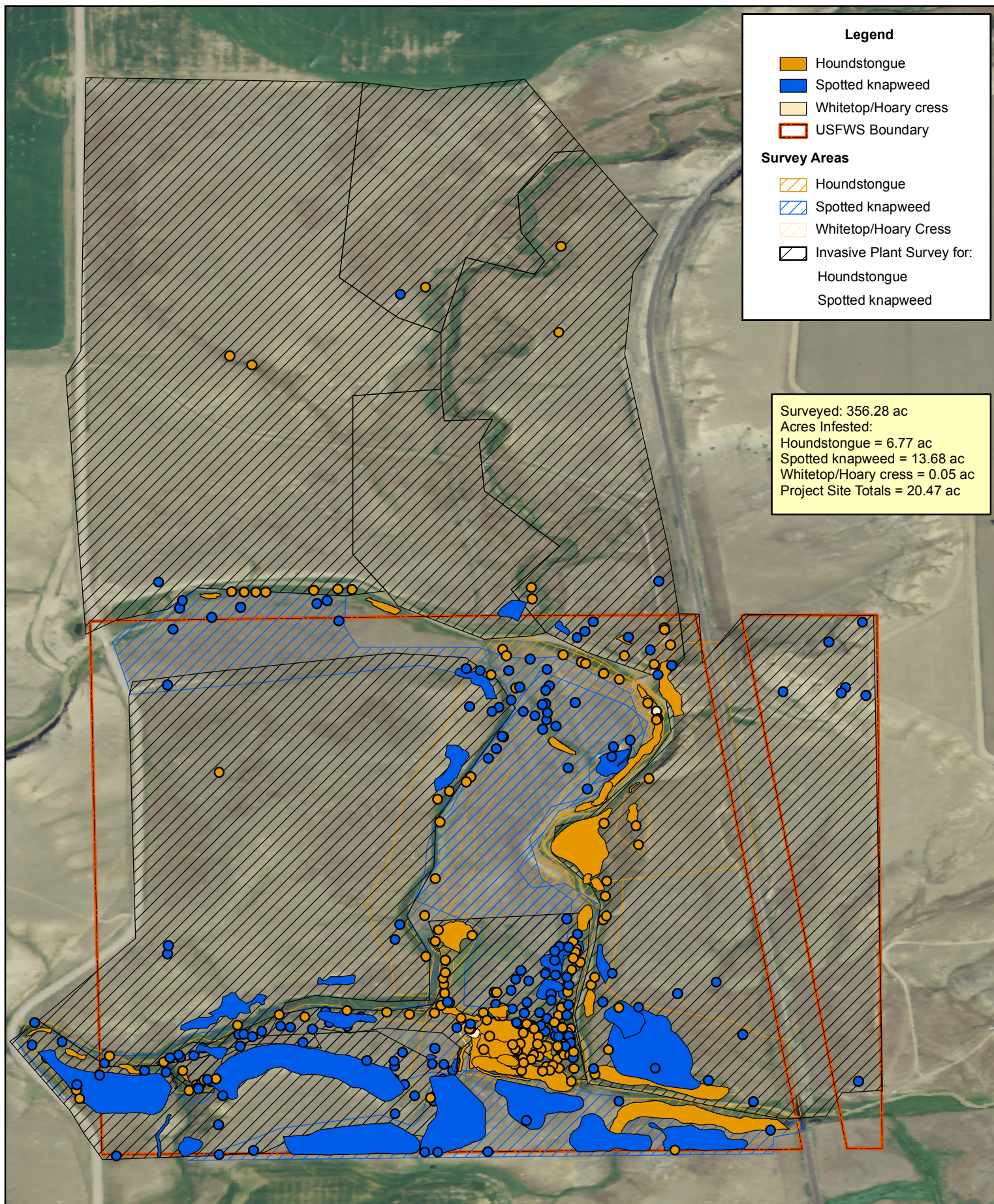


U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team *Benton Lake NWR - 2011 Survey Acres Infested & Treated*



Reference image from 2009 Montana NAIP Imagery



0 0.05 0.1 0.2 Miles

Reference image from 2009 Montana NAIP Imagery

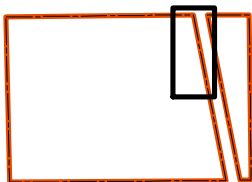


U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team

Pumphouse Unit - 2011 Survey Acres Treated

Area Detail



Legend

- Whitetop/Hoary cress
- USFWS Boundary
- Whitetop/Hoary Cress Survey Area

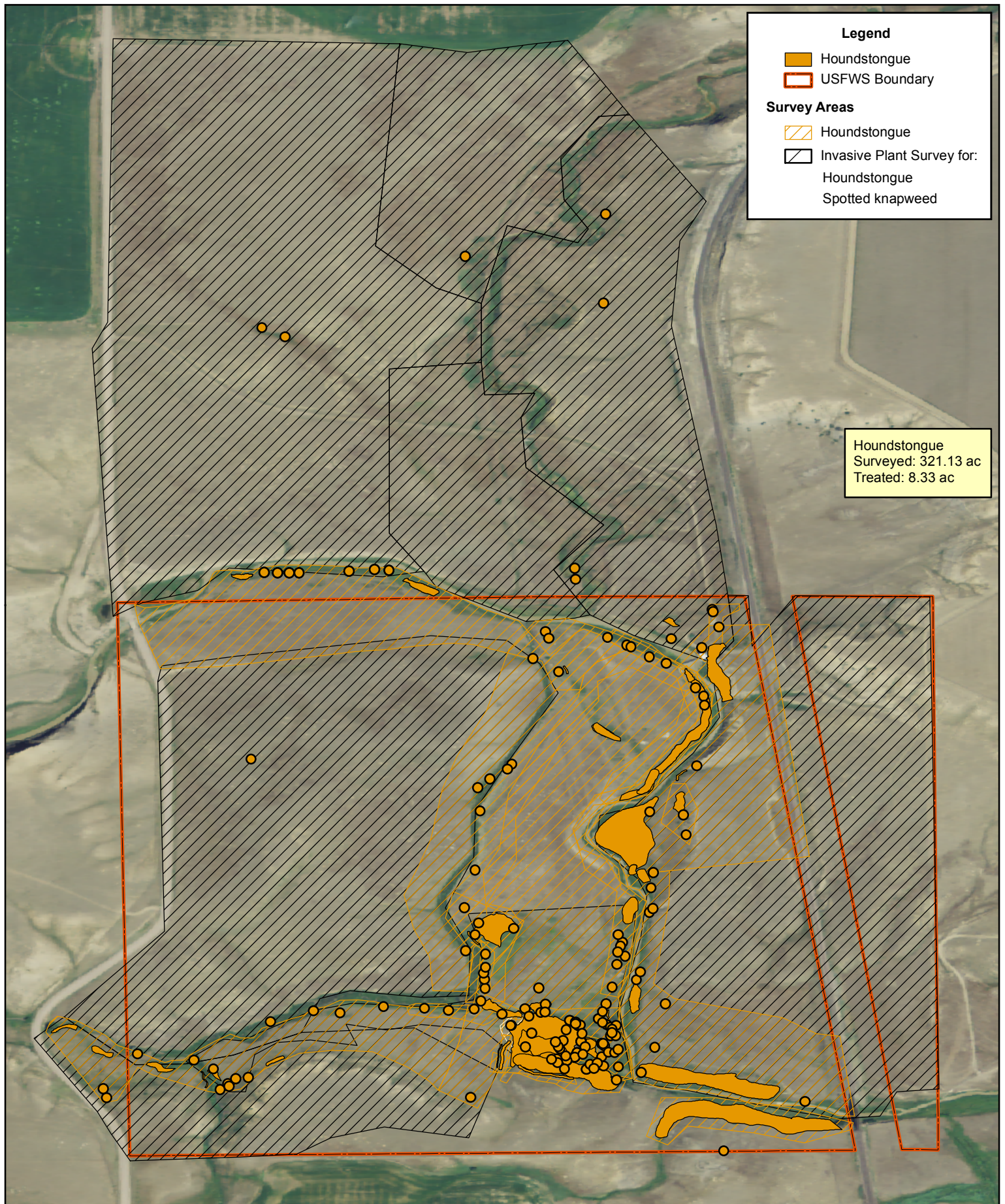
Whitetop/Hoary cress
Surveyed: 3.70 ac
Treated: 0.05 ac



0 0.025 0.05 0.1 Miles

Reference image from 2009 Montana NAIP Imagery

Whitetop/Hoary cress - 2 of 4 Maps



0 0.05 0.1 0.2 Miles

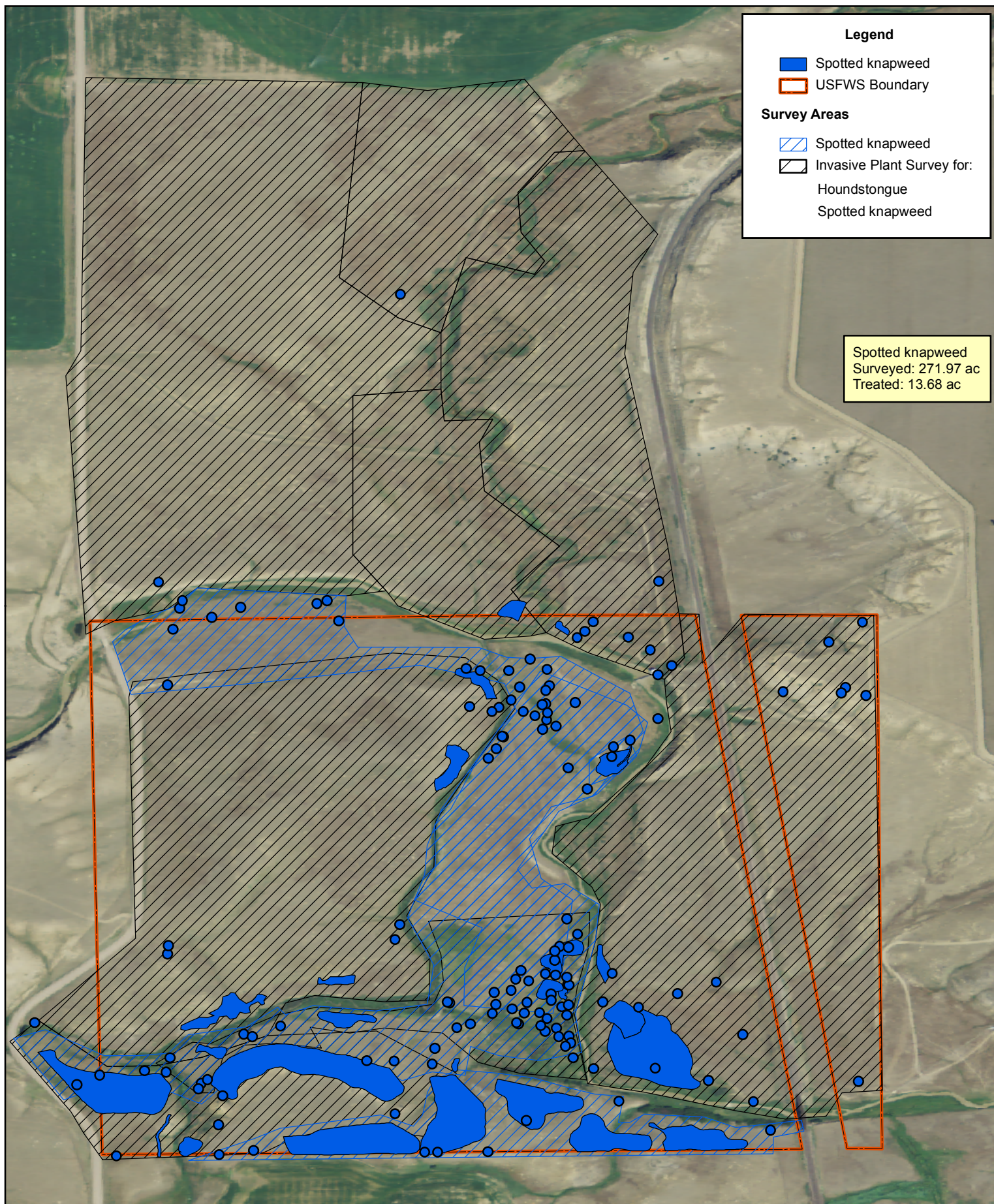
Reference image from 2009 Montana NAIP Imagery



U.S. Fish & Wildlife Service

MOYOCO Invasive Species Strike Team

Pumphouse Unit - 2011 Acres Treated



0 0.05 0.1 0.2 Miles

Reference image from 2009 Montana NAIP Imagery

Spotted knapweed - 4 of 4 Maps