

# 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>
Musk Thistle	12.00	12.00	12.00
Hoary Alyssum	0.82	0.05	0.05
Leafy Spurge	2.30	0.08	0.08
<b>Project Site Totals</b>	<b>15.12</b>	<b>12.13</b>	<b>12.13</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
May 29, 2014	Refuge Management Project	Hoary Alyssum	2	Chemical treatment of hoary alyssum around refuge parking area
July 2, 2014	Refuge Management Project	Musk Thistle	4	Chemical treatment of musk thistle infestation at Pumphouse
September 29, 2014	Refuge Management Project	Leafy Spurge	2	Chemical spot treatment of historical leafy spurge patch at Pumphouse and Benton Lake visitor center

#### Coordination and Cooperation

- ISST staff coordinated with Deputy Project Leader, Bob Johnson, prior to the project.



Canada Thistle, post treatment, at Benton Lake NWR. Photo by: Levi Morgan

### **Prevention and Education**

- Hoary alyssum, Musk thistle and Leafy spurge were targeted on the refuge and at the Pumphouse unit to prevent further spread to surrounding areas.
- Surrounding roadways will continue to be a potential vector for invasion on this site.

### **Early Detection and Rapid Response**

- Biological Technicians, Bob Jordan and Steve Dawes, found a small patch of Leafy spurge near the visitor center entrance.

### **Inventory and Monitoring**

- ISST surveyed a 2.30 acre area outside of the 0.04 acre Leafy spurge infestation; no satellite infestations were found.

### **Management**

- ISST treated 12.00 acres of Musk thistle on July 2, 2014
  - The infestation is located at the Pumphouse unit and was treated per request by Deputy Project Leader, Bob Johnson. Four ISST members applied Milestone using ATVs and boom spray equipment.
- ISST treated 0.05 acres of Hoary alyssum on May 29, 2014.
  - This infestation was discovered and treated in 2013.
  - In 2014, ISST first mechanically treated the area by digging and bagging the post emergent plants. Then, the area was chemically treated with Escort XP.
- ISST treated 0.04 acres of Leafy spurge at Benton Lake NWR visitor center and 0.04 acres at Pumphouse unit.

### **Herbicide Applied**

- ISST applied 0.03 ounces of Escort XP to the Hoary alyssum infestation
- ISST applied 54.61 ounces of Milestone to Musk thistle on Benton Lake NWR Pumphouse unit
- ISST applied 0.20 ounces of Plateau to Leafy spurge on Benton Lake NWR Pumphouse unit
- ISST applied 0.07 ounces of Plateau to Leafy spurge on Benton Lake NWR

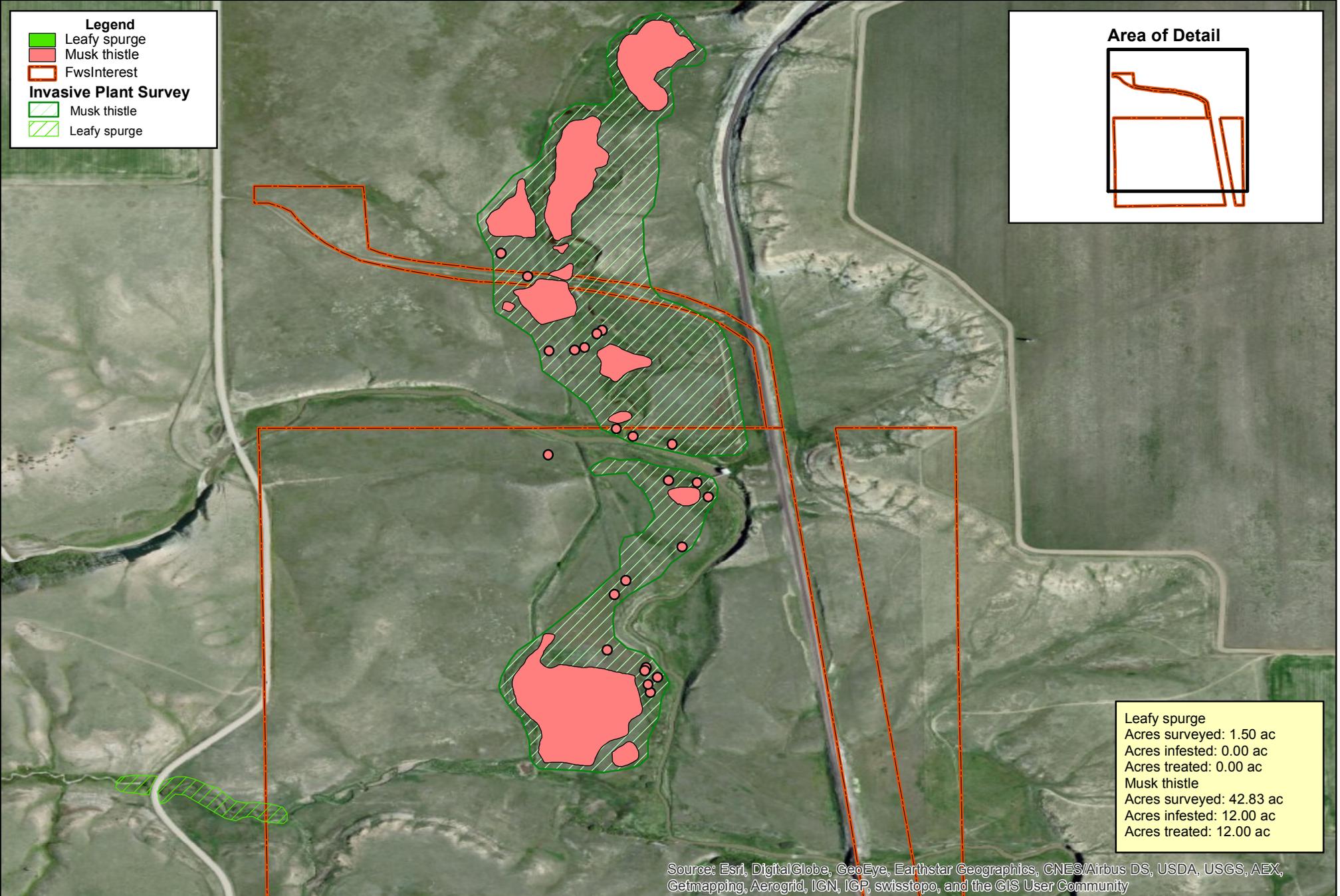
### **Recommendations**

- Continued Hoary alyssum treatments should be made to eradicate the infestation. For best effectiveness, treatments should be made post-emergence from pre-bloom to bloom stages of the plants. Detectability can be difficult at this early phenological stage and will require coordination among refuge staff to detect it and whether strike team assistance is requested.
- Musk thistle treatments at Pumphouse in 2014 proved very effective. Chemical treatments should continue in 2015.
  - Mowing has also been used to control the infestation. Mowing reduces the nutrient storage in the roots and suppresses flower formation. For mowing to be most effective, it should be repeated every 3 to 4 weeks.
  - Repeated mowing coupled with chemical treatments is the optimal control method for Musk thistle on the refuge.



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





**Legend**

- Leafy spurge
- Musk thistle
- FwsInterest

**Invasive Plant Survey**

- Musk thistle
- Leafy spurge

**Area of Detail**

Leafy spurge
Acres surveyed: 1.50 ac
Acres infested: 0.00 ac
Acres treated: 0.00 ac
Musk thistle
Acres surveyed: 42.83 ac
Acres infested: 12.00 ac
Acres treated: 12.00 ac

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

