

Mystic Lake Hydroelectric Project
FERC Project No. 2301
10-Year Weed Management Plan
(2025-2034)



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Executive Summary

NorthWestern Corporation, d/b/a NorthWestern Energy (NorthWestern) owns and operates the Mystic Hydroelectric Project (FERC Project No. 2301, hereafter referred to as the “Project”) in the Absaroka Mountains near Fishtail, Montana. The Project is located on West Rosebud Creek, in Stillwater and Carbon counties, Montana. The Federal Energy Regulatory Commission (FERC) boundary for the entire Project is located on U.S. Forest Service (USFS) lands within the Custer Gallatin National Forest and encompasses 673.5 acres of federal lands. The site is located at approximately 6,400 to 7,600 feet above mean sea level and is bordered by the Absaroka-Beartooth Wilderness Area. Lands within and adjacent to the Project boundary are managed by the Custer Gallatin National Forest – Beartooth Ranger District.

FERC issued a new license for the Project on December 17, 2007 (121 FERC ¶ 62, 198). The current 40-year license was effective starting January 1, 2010.

The new license includes USFS Section 4(e) Condition No. 19 requiring the Licensee to prepare and implement a weed management plan (WMP) for the Project area, which encompasses the FERC Project boundary excluding Mystic Lake (451 acres). The current 2014 WMP is effective through 2024 (PPL Montana 2014). This document updates the 2014 WMP and will be effective through 2034 (10 years), pending FERC approval. NorthWestern prepared the 2025 WMP, this report, in consultation with the Custer Gallatin National Forest, in compliance with USFS Section 4(e) Condition No. 19.

In July 2024, a comprehensive weed inventory was completed for the Project area (451 acres), excluding the perimeter of Mystic Lake. The inventory recorded some areas where weed infestations were reduced (e.g., transmission right-of-way), some areas where weed infestations increased (e.g., high-use areas, areas with recent ground disturbance) and some areas where weed infestations presented shifts in location and size since the 2014 inventory.

The inventory recorded a total of 11 noxious weed species in the inventoried area with the majority represented by Spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*) and tall buttercup (*Ranunculus acris*), totaling 2.95 acres. Tall buttercup was a new species recorded in the Project area since the 2014 inventory and was typically found in lower-lying wet meadow sites sporadically along the transmission line corridor and along the West Rosebud Lake shoreline. There were three additional noxious weed species, recorded in 2024 in the Project area (covering a total of 306 square feet), including oxeye daisy (*Leucanthemum vulgare*), hoary alyssum (*Berteroa incana*), and common tansy (*Tanacetum vulgare*) that were not recorded in 2014.

Many of the noxious weeds colonize disturbed soils or heavily used areas, and weed infestations are most common in high-use locations, including the NorthWestern Camp and West Rosebud Lake areas.

NorthWestern proposes the following weed management priorities for implementation over the next 10 years (2025-2034) based on the weed inventory data collected during the 2024 site evaluation.

The highest priority for weed treatment in the Project area includes those areas near the Absaroka-Beartooth Wilderness boundary; small patches of noxious weeds and/or new noxious weed(s) infestation(s) identified in Project area.

Another high priority in the Project area includes high-use areas such as NorthWestern's Camp area, perimeter of West Rosebud Lake, and Mystic Lake trailhead and associated parking area.

The lower priority for weed treatment in the Project area encompasses the transmission line corridor and 50-foot, 25 feet from either side of power pole, right-of-way (ROW) from West Rosebud Lake downstream to Line Creek Substation. Weed species cross NorthWestern's Project boundary and extend onto, or cross from Forest service lands and/or private lands. Effective treatment of species within the ROW is dependent on collaboration with USFS to provide effective treatment to control/reduce larger weed infestations inside and outside the transmission line ROW.

NorthWestern evaluated the effectiveness of the weed control measures implemented between 2014 and 2024 and concluded the annual treatment is an important management strategy to reduce the potential introduction of additional noxious weed species or increased expansion of existing infestations as recreation use continuous to increase in the drainage. NorthWestern proposes to continue annual weed control efforts and submit a summary of the annual weed management activities to the USFS Beartooth Ranger District by December 31 each year. NorthWestern also proposes to provide a periodic site review and qualitative assessment of weed control efforts every 3 years (2027, 2030, 2032) and continue the comprehensive weed inventory interval once every 10 years (next one to occur in 2034). The annual management schedule, periodic review of treated areas, and the 10-year comprehensive inventory of the Project area provide a method to evaluate the effectiveness of the weed management plan in the short-term and long-term. If management objectives are not being met, NorthWestern will re-evaluate current weed control actions and modify as appropriate.

1.0 Introduction

NorthWestern Corporation, d/b/a NorthWestern Energy (NorthWestern) owns and operates the Mystic Lake Hydroelectric Facility (FERC Project No. 2301, hereafter referred to as the “Project”) in the Absaroka Mountains near Fishtail, Montana. The Project is located on West Rosebud Creek, in Stillwater and Carbon counties, Montana. The Federal Energy Regulatory Commission (FERC) boundary for the entire Project (referred to as the “Project boundary”) is located on U.S. Forest Service (USFS) lands within the Custer Gallatin National Forest. The site is located at approximately 6,400 to 7,600 feet above mean sea level and is bordered by the Absaroka-Beartooth Wilderness Area. Lands within and adjacent to the Project boundary are managed by the Custer Gallatin National Forest.

FERC issued the current license on December 17, 2007 (121 FERC ¶ 62, 198), effective for 40 years starting January 1, 2010. The FERC boundary encompasses 673.5 acres located on Forest lands. The current Project boundary (Overview Map) encompasses Mystic Lake and the Mystic Lake Dam; West Rosebud Lake and the West Rosebud Lake Dam (Re-regulation Dam); the flow line, surge tank, penstock, and powerhouse; and NorthWestern’s Camp located adjacent to the powerhouse. The Camp includes four homes for NorthWestern employees, maintenance buildings, transmission lines, and appurtenant facilities.

The Project’s authorized capacity is 11.25 megawatts (MW). The Project has two reservoirs on West Rosebud Creek: (1) Mystic Lake, which is the Project’s storage reservoir; and (2) West Rosebud Lake, which is located downstream from Mystic Lake and is used to moderate peaking flows from the powerhouse.

Water flowing into Mystic Lake is impounded by Mystic Lake Dam, a 45-foot high, 368-foot-long concrete arch-type structure. Mystic Lake has a full pool elevation of 7,673.5 feet above mean sea elevation and a total volume of approximately 47,000 acre-feet. Water from the lake flows through the Project’s 2.4-mile-long flow line to the powerhouse, which contains two Pelton turbines with an installed capacity of 11.25 MW. Two 50-kilovolt (kV), 5.38-mile-long transmission lines run from the powerhouse to NorthWestern’s Line Creek Substation.

After exiting the powerhouse, water re-enters West Rosebud Creek and flows for approximately one mile to West Rosebud Lake, impounded by the Re-regulation Dam. The Re-regulation Dam is a 19-foot high by 420-foot-long earth-filled structure that modulates peaking flows from the powerhouse.

NorthWestern operates the Project in both base load and peaking modes depending on water availability, electric demands, and license constraints. Mystic Lake is used to store water during heavy runoff months (May through July), which is used to augment flows during the remainder of the year.

2.0 Project Compliance

The Project's FERC license includes USFS Section 4(e) Terms and Conditions filed on May 3, 2007. USFS Section 4(e) Condition No. 19 requires the Licensee to prepare and implement a weed management plan (WMP) for the Project area, which encompasses the Project boundary excluding Mystic Lake (451 acres). The Licensee prepared a WMP in 2009 and 2014. The current 2014 WMP is effective through 2024 (PPL Montana 2014).

This report presents the results of the 2024 weed inventory and updates the WMP for the next 10 years, 2025-2034. Details of the 2024 weed inventory are presented in Sections 3 and 4, and the 2025 WMP is presented in Section 5. This document updates the 2014 WMP and will be effective through 2034 (10 years), pending FERC approval.

3.0 Weed Inventory Methodology

3.1 Inventory Area

The inventory area (referred to as the Project area) is approximately 451 acres and covers the FERC Project boundary except for the perimeter of Mystic Lake. The Overview Map in Appendix A depicts the weed inventory area, which includes the transmission line corridor, Northwestern Camp area, West Rosebud Lake shoreline, tram and flow line, and lake house area at the Mystic Lake Dam.

3.2 Data Collection

DJ&A, P.C. (DJ&A) completed the weed inventory for the Project area in 2024. DJ&A vegetation specialists reviewed the existing inventory, monitoring maps and inventory reports from 2014 (PPL Montana 2014). A comprehensive pedestrian survey was conducted between July 22 and 24, 2024. All spatial data were recorded using a sub-meter Trimble GNSS/GPS receiver with Trimble Catalyst positioning services paired with an Apple iPad running ESRI Field Collector version 21.0.4. All data were collected using the North America Datum of 1983 (NAD83) Montana State Plane Meters. Data were recorded in the field during the site investigations, including the location, size, and cover of noxious weeds and invasive species infestations.

The point locations were buffered into polygon data to represent the appropriate size of each infestation identified. All noxious weed infestations identified were less than 1.3 acres in size and were saved in the GIS coverage file as a single GPS point, then converted to polygon data to represent the area of infestation.

Deliverable files are in ArcGIS format to easily merge into existing USFS datasets and meet USFS protocol. ESRI's ArcGIS Pro 3.2.2 was used to incorporate the GPS data into a shapefile, manage the data, and calculate the area of the weed occurrences. GIS was also used to compare current weed locations to historic weed layers and to prepare figures for this report. The attributes collected for each weed infestation location are consistent with the 2014 WMP and USFS weed dataset field format definitions.

3.3 Noxious Weed Species List

USFS Section (e) Condition No. 19 requires NorthWestern to manage weeds utilizing the State of Montana list of noxious species. Weed species of concern for the USFS (within the Project area) include State and county listed noxious weeds (USDA 2006 Appendix A). The 2024 weed inventory evaluated the Project area for the noxious weed species listed by the state of Montana and counties (Carbon and Stillwater). The most recent State of Montana Department of Agriculture (MDA) and Stillwater and Carbon county lists (MDA 2019, 2020) includes 36 noxious weed species and 5 invasive weed species, described below by State priority.

The Stillwater County noxious weed list matches the State of Montana list, with the addition of four county-specific weed species that are shown following the State weed list. The Carbon County noxious weed list also matches the State of Montana list with the addition of five county-specific weed species (MDA 2020). All plant nomenclature has been updated according to the

Natural Resources Conservation Service's most recent PLANTS Database, managed by the U.S. Department of Agriculture (USDA).

State of Montana Priority 1A

State of Montana Priority 1A noxious weeds are those that are not present or have a very limited presence in Montana. Management requires eradication if detected, and education and prevention of further proliferation.

- Yellow starthistle (*Centaurea solstitialis*)
- Dyer's woad (*Isatis tinctoria*)
- Common reed (*Phragmites australis* ssp. *australis*)
- Medusahead (*Taeniatherum caput-medusae*)

State of Montana Priority 1B

State of Montana Priority 1B noxious weeds are those which have a limited presence in Montana. Management criteria require eradication or containment and education.

- Knotweed complex (*Polygonum cuspidatum*, *P. sachalinense*, *P. x bohemicum*, *Fallopia japonica*, *F. sachalinensis*, *F. x bohémica*, *Reynoutria japonica*, *R. sachalinensis*, and *R. x bohémica*)
- Purple loosestrife (*Lythrum salicaria*)
- Rush skeletonweed (*Chondrilla juncea*)
- Scotch broom (*Cytisus scoparius*)
- Blueweed (*Echium vulgare*)

State of Montana Priority 2A

State of Montana Priority 2A noxious weeds are those which are common in isolated areas in Montana. Management criteria require eradication or containment. Management is prioritized by local weed districts.

- Tansy ragwort (*Senecio jacobaea*)
- Meadow hawkweed complex (*Hieracium caespitosum*, *H. praealtum*, *H. floribundum*, *H. piloselloides*). There are many hybridizations of this genus which makes the plethora of species difficult to discern.¹
- Orange hawkweed (*Hieracium aurantiacum*)
- Tall buttercup (*Ranunculus acris*)
- Perennial pepperweed (*Lepidium latifolium*)
- Yellowflag iris (*Iris pseudacorus*)
- Eurasian watermilfoil (*Myriophyllum spicatum*, *Myriophyllum spicatum* x *Myriophyllum sibiricum*)
- Flowering rush (*Butomus umbellatus*)

¹ There is some variation with regard to the correct hawkweed botanical classification. Lessica, in his recent *Manual of Montana Vascular Plants* (2012) designates meadow hawkweed as *Hieracium caespitosum* and corrects other usage believing that *H. pratense* was misapplied. Other confounding factors have been reported with this complex; interbreeding may give the plant other appearances, making it difficult to key out (Lessica 2012).

- Common buckthorn (*Rhamnus cathartica* L.)
- Ventenata (*Ventenata dubia*)

State of Montana Priority 2B

State of Montana Priority 2B noxious weeds are those which are abundant in Montana and widespread in many counties. Management criteria require eradication, or containment where less abundant. Management is prioritized by local weed districts.

- Canada thistle (*Cirsium arvense*)
- Field bindweed (*Convolvulus arvensis*)
- Leafy spurge (*Euphorbia esula*)
- Whitetop (*Cardaria draba*)
- Russian knapweed (*Acroptilon repens*)
- Spotted knapweed (*Centaurea stoebe*)
- Diffuse knapweed (*Centaurea diffusa*)
- Dalmatian toadflax (*Linaria dalmatica*)
- St. Johnswort (*Hypericum perforatum*)
- Sulfur cinquefoil (*Potentilla recta*)
- Common tansy (*Tanacetum vulgare*)
- Oxeye daisy (*Leucanthemum vulgare*)
- Houndstongue (*Cynoglossum officinale*)
- Yellow toadflax (*Linaria vulgaris*)
- Saltcedar (*Tamarix* spp.)
- Curlyleaf pondweed (*Potamogeton crispus*)
- Hoary alyssum (*Berteroa incana*)

State of Montana Priority 3

State of Montana Priority 3 plants are those which are regulated and considered invasive; they are not Montana listed noxious weeds. These plants have the potential to have significant negative impacts. They may not be intentionally spread or sold other than as a contaminant in agricultural products. The State recommends research, education and prevention to minimize the spread of these plants.

- Cheatgrass (*Bromus tectorum*)
- Hydrilla (*Hydrilla verticillata*)
- Russian olive (*Elaeagnus angustifolia*)
- Brazilian waterweed (*Egeria densa*)
- Parrot feather watermilfoil (*Myriophyllum aquaticum* or *M. brasiliense*)

Stillwater County Noxious Weeds

The Stillwater County noxious weed list matches the State of Montana list with the addition of the three following weed species:

- Common burdock (*Arctium minus*)
- Common mullein (*Verbascum thapsus*)

- Black henbane (*Hyoscyamus niger*)
- Poison hemlock (*Conium maculatum*)

Carbon County Noxious Weeds

The Carbon County noxious weed list matches the State of Montana list with the addition of the five following weed species:

- Milk thistle (*Silybum marianum*)
- Musk thistle (*Carduus nutans*)
- Absinth wormwood (*Artemisia absinthium*)
- Scotch thistle (*Onopordum acanthium*)
- Common mullein (*Verbascum Thapsus*)

4.0 Weed Inventory Results

Between 2014 and 2024, Northwestern contracted with noxious weed professionals to complete herbicide treatments in the Project area. Over the last 10 years, these treatments have proven successful in some areas and less effective in others, as is reflected in the accompanying Maps 1–6. The 2014 and 2024 data are directly comparable due to the same data collection methodology, plant phenology during surveys, and personnel completing and supporting each inventory. The maps show weed reductions, increases, and shifts in location and size since the 2014 weed inventory. The locations of the noxious and invasive species identified during the 2014 and 2024 weed inventories are provided on Maps 1–6. These maps show all weed points and size locations from 2014 (all in black), overlaid by all point, size location, and individual color by species from 2024. The following table lists the noxious and invasive species, and the approximate size of infestations recorded within the Project area during the July 2024 weed inventory.

Table 1. List of noxious and invasive weed species identified in the weed inventory area and area of infestations size (square feet and acres).

Noxious Weed List		
Common Name	Scientific Name	2024 Infestation Size in square feet (acres)
Spotted knapweed	<i>Centaurea stoebe</i>	53,147 (1.22)
Tall buttercup	<i>Ranunculus acris</i>	52,310 (1.20)
Canada thistle	<i>Cirsium arvense</i>	23,197 (0.53)
Field bindweed	<i>Convolvulus arvensis</i>	2,042 (0.05)
Meadow hawkweed complex	<i>Hieracium pretense</i> , etc. (see section 3.3)	1,417 (0.03)
Houndstongue	<i>Cynoglossum officinale</i>	430 (0.01)
Oxeye daisy	<i>Leucanthemum vulgare</i>	317 (0.01)
Sulfur cinquefoil	<i>Potentilla recta</i>	88 (<0.0001)
Musk thistle	<i>Carduus nutans</i>	3 (<0.0001)
Common tansy	<i>Tanacetum vulgare</i>	3 (<0.0001)
Hoary alyssum	<i>Berteroa incana</i>	3 (<0.0001)
Invasive Weed List		
Common Name	Scientific Name	Infestation Size in square feet (acres)
Cheatgrass	<i>Bromus tectorum</i>	231,724 (5.3)

Many of the weeds colonize on disturbed soils or heavily used recreation and construction areas, and weed infestations were most common in high-use locations, including the NorthWestern Camp and West Rosebud Lake (Maps 2 and 3). Moist areas generally tend to support more competitive, non-invasive vegetation. Still, some of these areas contained patches of Canada

thistle and tall buttercup, both of which thrive in wetter soils. Other than isolated occurrences of spotted knapweed, weeds were not commonly recorded between the NorthWestern Camp area and the Mystic Lake dam (Maps 1 and 2). There are occurrences of several weed species, including spotted knapweed, Canada thistle, houndstongue, and oxeye daisy, located around the NorthWestern Camp area during the July 2024 inventory (Map 2). Other occurrences are scattered across the remaining portions of the Project area.

Species-specific observations include the following:

- Cheatgrass has the highest amount of square feet mapped and is scattered in sporadic patches along portions of the transmission line corridor but does not cover the majority of the Project area as it was mapped in 2014.
- Spotted knapweed is lightly scattered across some drier sites and in high-use areas such as the NorthWestern Camp area and West Rosebud Lake (Maps 2–6). The flow line/tram and penstock/upper railroad tracks to Mystic Lake also had limited occurrences of spotted knapweed. The disturbed and high-use nature of the parking lots and areas around the parking lots and trails cause continued weed growth and contribute to the weed seed bank.
- Canada thistle is located in both wet and dry sites and is seen along West Rosebud Lake areas in occasional patches within the transmission line corridor.
- The remaining mapped weed populations are small, isolated patches and occur sporadically in both disturbed and non-disturbed sites.

Four species of noxious weeds were reported in 2024 that were not reported in 2014: oxeye daisy, hoary alyssum, common tansy, and tall buttercup.

- Oxeye daisy (Montana Priority 2B) was found in two small (approximately 300 square feet) isolated occurrences adjacent to West Rosebud Creek near the NorthWestern Camp area. This species has not historically been recorded, making it a new invader to the project area.
- Hoary alyssum (Montana Priority 2B) was found in one small (3 square feet) isolated location next to the service road to the NorthWestern Camp area. While this species is “new” when comparing the 2014 and 2024 mapping, it has been recorded for the last 10 years during annual treatments. It can be assumed that hoary alyssum was present and not noted during the 2014 survey.
- Common tansy (Montana Priority 2B) was recorded in a dry upland site in one small (3 square feet) isolated location in the transmission line corridor. This species has not historically been recorded, making it a new invader to the Project area.
- Tall buttercup (Montana Priority 2A) was the third most common noxious weed recorded in 2024 and was mapped as covering approximately 52,310 square feet (1.2 acres). The locations where this species was found are typically wet areas and sporadically along the shoreline of West Rosebud Lake area and lower-lying wet meadow sites along the transmission line corridor. This species has not been recorded in past inventories (2009 or 2014), making it a new invader to the Project area.

The 2024 inventory showed an increase in coverage of all the noxious species but a decrease in

the invasive species (i.e., cheatgrass). There was a spatial shift of occurrences between 2014 and 2024 and weed infestations in the Project area are relatively low overall (Table 2). Comparing past annual surveys between 2014 and 2024, and surveys that supported the replacement of the poles along the transmission corridor in 2021, the area and location of weed species often shift. Maps 2, 3 and 5 show a shift in distribution of weeds along roads, near the campground, and along the Mystic Lake shoreline. The increase of weeds between 2014 and 2024 could be a result of several components:

1. Timing of weed inventory—Some surveys between 2014 and 2024 were completed after herbicide treatment and others completed before.
2. Seed bank—Because weeds generate high amounts of long-lived seeds, there is an existing seed bank that can contribute to the proliferation of weeds over time.
3. Annual climate—Precipitation in 2023 was recorded as six inches more than the 100-year average at the Western Regional Climate Center Mystic Lake Cooperative Station, which may have led to a robust growing season for weeds.

Cheatgrass is the most prolific invasive weed species delineated in the weed inventory area in 2024. The 2024 inventory identified cheatgrass coverage in most areas with droughty soil, with sporadic patches occurring along portions of the transmission line right-of-way between the NorthWestern Camp and Line Creek Substation. However, cheatgrass is not common overall in the inventory area, and the five acres mapped in 2024 are significantly lower than the 68 acres mapped in 2014. Note that the approach in 2014 for mapping cheatgrass was to map the species as covering the entirety of the transmission line portion of the Project area. This approach was meant to convey that there was some amount of cheatgrass across this portion of the Project area. In 2024, cheatgrass was mapped only where it was established, presenting a more accurate representation of infestations.

Spotted knapweed has increased when comparing 2014 data to 2024 data, although most knapweed points taken in 2024 were single plants or patches with less than five plants. The majority of the increases in spotted knapweed were around the NorthWestern Camp area, West Rosebud Lake, and the Line Creek Substation (Maps 2, 3, and 6 in Appendix A).

Canada thistle showed an increase from 2014 data, but most patches were relatively small and had canopy covers of 15 percent or less. The majority of the increases in Canada thistle were around the NorthWestern Camp area and West Rosebud Lake (Maps 2 and 3 in Appendix A).

While documented in 2014, leafy spurge was not located in the inventory area in 2024. This is likely a result of successful repeat treatments during the last 10 years.

Table 2. Noxious and invasive weeds along with area of infestation (square feet and acres) recorded in 2024 compared to 2014.

Common Name	Scientific Name	2024 Infestation Size in square feet (acres)	2014 Infestation Size in square feet (acres)
Noxious Weeds			
Spotted knapweed	<i>Centaurea stoebe</i>	53,147 (1.22)	17,465 (0.40)
Tall buttercup	<i>Ranunculus acris</i>	52,310 (1.20)	-
Canada thistle	<i>Cirsium arvense</i>	23,197 (0.53)	33,500 (0.08)
Field bindweed	<i>Convolvulus arvensis</i>	2,042 (0.05)	706 (0.02)
Meadow hawkweed complex	<i>Hieracium pretense</i> , etc. (see Section 3.3)	1,417 (0.03)	185 (<0.001)
Houndstongue	<i>Cynoglossum officinale</i>	430 (0.01)	82 (<0.001)
Oxeye daisy	<i>Leucanthemum vulgare</i>	317 (0.01)	-
Sulfur cinquefoil	<i>Potentilla recta</i>	88 (<0.001)	367 (0.01)
Musk thistle	<i>Carduus nutans</i>	3 (<0.001)	16 (<0.001)
Common tansy	<i>Tanacetum vulgare</i>	3 (<0.001)	-
Hoary alyssum	<i>Berteroa incana</i>	3 (<0.001)	-
Leafy spurge	<i>Euphorbia esula</i>	-	314 (<0.001)
Invasive Weeds			
Common Name	Scientific Name	Infestation Size in square feet (acres)	2014 Infestation Size in square feet (acres)
Cheatgrass	<i>Bromus tectorum</i>	231,724 (5.30)	2,962,080 (68.00)

5.0 10-Year Weed Management Plan

NorthWestern proposes the following WMP for implementation over the next 10 years (2025-2034) based on the weed inventory data collected during the 2024 site evaluation. The following text outlines the 10-year WMP, including management goals and objectives for the Project area, priority areas for weed management, annual weed control actions, monitoring and reporting, and a schedule for the next comprehensive inventory.

This 10-year WMP was developed in compliance with requirements of the USFS 4(e) Condition No. 19 in the FERC license for Project 2301 and with reference to the Montana Noxious Weed Management Plan (MDA 2017), Custer National Forest Weed Management Environmental Impact Statement (USDA 2006) and Stillwater County Weed Management Plan (2020).

5.1 Management Goals and Objectives

The objective of the 2025 WMP is to monitor and manage noxious weed species within the weed inventory area for the next 10 years, from 2025 through 2034. The 2025 WMP will provide a framework to continue to control those plant species that are listed as “noxious” by the State of Montana and Stillwater and Carbon counties. The 2025 WMP will focus on prevention of new noxious weed infestations and control of existing noxious weed infestations identified in the 2024 inventory while they are still small and manageable. In addition, NorthWestern proposes expansion of integrated management methodology by incorporating releases of knapweed root-feeding weevils and bud-feeding weevils to help manage knapweed stands in steep, difficult to access sites (Duncan et al. 2017). This strategy can help reduce the amount of herbicide used in this management program. Currently, the USFS and counties (Stillwater and Carbon) do not actively manage for the cheatgrass, an invasive species. Therefore, no control measures for cheatgrass are identified for implementation in this 10-year WMP.

5.2 Priorities for Weed Management

The USFS identifies weed species of concern within the Project area based on State and county listed noxious weeds (USDA 2006 Appendix A). Table 3 provides a list of the weed species recorded in the Project area that are included on the State and county lists (refer to Section 3.3) and USFS weed species of concern (USDA 2006), and their respective management priority.

Treatment priority also refers to management goals and objectives for noxious weeds identified by the State and counties (see Section 3.3), as well as the Greater Yellowstone Coordinating Committee (GYCC). GYCC delineates weeds into three groups: *potential invaders* currently absent from Custer Gallatin National Forest; *new invaders*; and *widespread invaders*. First priority is to prevent or eradicate potential invaders if discovered in the Forest. Second priority for new invaders is containment with emphasis on reducing populations. Third priority for widespread invaders are containment within infested areas and reduction of plant populations.

Table 3 identifies the priority level provided by the state of Montana (MDA 2019) and GYCC priority (USDA 2006), along with which year(s) each species was recorded within the Project area during the 2009, 2014 and 2024 inventory.

Table 3. List of noxious weed species documented in the Project area in 2009, 2014, and 2024, including Montana noxious weed management priority (2019), and GYCC priority (USDA 2006 Appendix A).

Common Name	Montana State Priority	GYCC Priority	Inventory Year Documented		
			2009	2014	2024
Canada thistle	2b	3	x	x	x
Common tansy	2b	3			x
Field bindweed	2b	2		x	x
Hoary alyssum	2b		x		x
Houndstongue	2b	3	x	x	x
Oxeye daisy	2b	3			x
Spotted knapweed	2b	3	x	x	x
Sulfur cinquefoil	2b	3	x	x	x
Leafy Spurge	2b	2		x	
Meadow hawkweed complex	2a	2	x	x	x
Tall buttercup	2a	2			x
Cheatgrass	3		x	x	x
Musk thistle	NA			x	x

NorthWestern priority criteria for treatment of noxious weed species in the Project area aligns with criteria presented in the Custer National Forest Weed Environmental Impact Statement, Executive Summary (USDA 2006):

- **Highest Priority**
Areas with the highest priority for weed treatment include areas where a new species is identified with potential for significant ecological impact; areas of new infestations; areas of concern such as, but not limited to high traffic spread vectors and sources of infestation (e.g., parking lots, trailheads, roadsides, etc.); and areas of species concerns such as riparian corridors, sensitive plant populations, proximity to wilderness area, big game winter ranges; and areas where partnership/cooperator agreements are in place.
- **Second Priority**
Areas of second priority of treatment are applicable to large weed infestations that focus on State, county, and Forest-listed highest priority species as well as access points leading to areas of concern (e.g., roadsides, trails, and trailheads).
- **Third Priority**
Control existing large infestations of State-listed species and Forest second priority species.
- **Fourth Priority**
Suppression of existing large infestations when eradication/control or containment is not possible.

NorthWestern proposes the following prioritization for weed management in the Project area:

- The **highest priority** for weed treatment in the Project area includes those areas near the Absaroka-Beartooth Wilderness boundary; small patches of noxious weeds and/or new noxious weed(s) infestation(s) identified in Project area.
- Another **high priority** in the Project area includes high-use areas that can be access points to areas of concern such as NorthWestern's Camp area, perimeter of West Rosebud Lake, and Mystic Lake trailhead and associated parking area.
- The **lower priority** for weed treatment in the Project area encompasses the transmission line corridor and 50-foot, 25 feet from either side of power pole, right-of-way (ROW) from West Rosebud Lake downstream to Line Creek Substation. Weed control efforts along the transmission corridor shall be completed in partnership with USFS.

Weed species cross NorthWestern's Project boundary and extend onto, or cross from Forest service lands and/or private lands. Effective treatment of species within the ROW is dependent on collaboration with USFS to provide effective treatment to control/reduce larger weed infestations inside and outside the transmission line ROW.

5.3 Frequency of Weed Control Actions

The following section outlines NorthWestern's recommendations for annual weed control actions (chemical and biological) within the Project area, excluding the perimeter of Mystic Lake. Based on the presence of weeds documented during the 2024 inventory, annual control efforts appear to be effective management strategy in the Project area and are critical to addressing presence of new invader species and managing areas with existing infestations. NorthWestern proposes to continue to implement annual weed control measures and continue to coordinate with USFS, as appropriate for the next 10 years (2025-2034).

NorthWestern proposes to integrate weevil releases in the Project area consistent with Section III, item E2 of the Stillwater County Noxious Weed Management Plan (2020) and the Record of Decision for the Custer National Forest Weed Management Final Environmental Impact Statement (USDA 2006) and monitor the effectiveness of this method. Biologic controls that have proven successful in reduction of knapweed stands in Montana include the root feeding weevil (*Cyphocleonus achates*) and the two seed-head feeding weevils (*Larinus minutus* and *L. obtusus*). These organisms are typically captured from mature knapweed stands near Missoula and mailed to release sites in July and early August. Multiple release years may be required to develop self-sustaining colonies that effectively feed on seed buds and roots.

Herbicides (active ingredient and trade name) identified for use in the Project area with guidelines based on applicable habitat type is provided in Table 4. Table 4 summarizes the active herbicide ingredient, Environmental Protection Agency (EPA) registered herbicide trade names, target species, and the USFS management guidelines for aquatic zones such as streamside and wetland areas (USDA 2006).

Table 4. Summary of herbicide active ingredient, EPA registered herbicide trade names (partial list), target weed species (not all species found in Project area), and USFS management guidelines for sensitive management zones such as streamside and wetland areas (USDA 2006).

Herbicide Active Ingredient	EPA List of Trade Names (partial list)	Target Weed Species	Streamside <i>Perennial and intermittent stream riparian areas.</i>	Wetland <i>Seasonal and permanent wetlands</i>
2,4-D	Hi-Dep, Weedar, 64, Weed RHAP, Amine 4, Aqua-Kleen (Amines)	Thistles, sulfur cinquefoil, dyers woad, knapweeds, purple loosestrife, Eurasian water milfoil, tall buttercup, whitetop. Some broadleaf, woody and aquatic plants susceptible.	Limited use. Use only formulations approved for use in or near water. In the amine form or aquatic labeled formulations, it can be applied up to the water edge (without direct contact to the water). Nonaquatic formulations of 2,4-D are prohibited.	Limited Use. Use only formulations approved for use in or near water. In the amine form or aquatic labeled formulations, it can be applied up to up to 25 feet from water's edge if there is a vegetative buffer with slopes equal to or less than 6%
Aminopyralid	Milestone	Perennial and biennial thistles, knapweeds, sulfur cinquefoil. Tolerated by most grasses.	Permitted Use. It can be applied up to the water's edge (without direct contact to the water). Per label instruction, not to be used in areas of standing water.	Use permitted. Per label instruction, not to be used in areas of standing water.
Chlorsulfuron	Telar	Spot treatment only with hand application methods. Dyer's woad, thistles, common tansy, whitetop, houndstongue, tall buttercup. Some broadleaf plants and grasses are susceptible.	Limited use. Do not use it in flooded areas or on saturated soils. Spot treatment allowed up to 5 feet from water's edge. Use only once per growing season on alkaline soils.	Limited use. Do not use it in flooded areas or on saturated soils. Spot treatment is allowed up to 25 feet from the water's edge if there is a vegetative buffer with slopes less than 6 percent. Use only once per growing season on alkaline soils.
Clopyralid	Stinger, Curtail, Transline, Redeem	Thistles, yellow starthistle, hawkweeds, knapweeds, rush skeletonweed, oxeye daisy. Many broadleaf and woody species are susceptible.	Use Prohibited within 50 feet of water's edge.	

Herbicide Active Ingredient	EPA List of Trade Names (partial list)	Target Weed Species	Streamside <i>Perennial and intermittent stream riparian areas.</i>	Wetland <i>Seasonal and permanent wetlands</i>
Dicamba	Banvel, Clarity, others	Houndstongue, knapweeds, oxeye daisy, tall buttercup, leafy spurge, tansy ragwort, common crupina, blueweed, yellow starthistle. Some broadleaf, brush, vines susceptible.	Use Prohibited within 50 feet of water's edge.	
Diuron	Diuron 4L	Non-aerial spraying. Annual weeds and broadleaves for infrastructure maintenance needs such as right-of-ways. Broad spectrum	Use Prohibited within 50 feet of water's edge.	Use Prohibited
Glyphosate	Roundup, Rodeo, Accord, Glyphomate	Purple loosestrife, field bindweed, yellow starthistles, cheatgrass, common crupina, toadflax.	Limited Use. Use only formulations approved for use in or near water (i.e., Glypro, Rodeo). Spot treat target plants only within riparian area to avoid injury to non-target riparian plants. Non-aquatic formulations prohibited.	
Hexazinone	Velpar, Pronone 10G	Poison hemlock, cheatgrass, oxeye daisy, yellow starthistle, thistles. Broad spectrum.	Use Prohibited within 50 feet of water's edge.	
Imazapic	Plateau	Cheatgrass, leafy spurge, toadflax. Some broadleaf plants and grasses are susceptible.	Limited Use. Maximum of 0.188 lb acid equivalent per acre. Allowed up to 5 feet from water's edge if there is a vegetative buffer that has slopes less than 6 percent.	
Imazapyr	Arsenal, Chopper	Salt cedar, purple loosestrife, dyers woad, field bindweed.	Use of Habitat or Arsenal on cut stump or hand spraying salt cedar may come into contact with surface water per label instruction. For all species, use of imazapyr is allowed up to 5 feet from water's edge if there is a vegetative buffer that has slopes less than 6 percent.	
Metsulfuron methyl	Escort, Ally	Houndstongue, thistle, sulfur cinquefoil, common crupina, dyers woad, purple loosestrife, common tansy, whitetop, blueweed.	Use Prohibited within 50 feet of water's edge.	
Picloram	Tordon, Grazon, Pathway	Thistles, yellow starthistle, common crupina, hawkweeds, knapweeds, rush skeleton weed, common tansy, toadflax, leafy spurge.	Use Prohibited within 50 feet of water's edge.	

Herbicide Active Ingredient	EPA List of Trade Names <i>(partial list)</i>	Target Weed Species	Streamside <i>Perennial and intermittent stream riparian areas.</i>	Wetland <i>Seasonal and permanent wetlands</i>
Sulfometuron methyl	Oust	Cheatgrass, whitetop, oxeye daisy, tansy ragwort, musk thistle. Broad spectrum.	Limited Use. Allowed up to 25-feet from water's edge if there is a vegetative buffer with slopes less than 6 percent. Spot treatment only with hand application methods.	
Triclopyr	Garlon, Redeem, Remedy	Purple loosestrife, Eurasian watermilfoil, hawkweeds, sulfur, cinquefoil, knapweed, oxeye daisy, thistle. Woody, some broadleaf, root-sprouting species are susceptible. Grasses are tolerant.	Limited Use. Use only formulations approved for use in or near water. Aquatic labeled formulations can be applied up to the water's edge (without direct contact to the water). Non-aquatic formulations prohibited. Do not use high application rates in order to avoid potential hazards to birds and mammals. The use of triclopyr is limited to selective application techniques (e.g., spot spraying). No aerial spraying.	

Note: Aquatic zone – only those formulations of 2,4-D, glyphosate, imazapyr, or triclopyr that have been approved for use in or near water are permitted. All other formulations are prohibited. Only surfactants labeled for use in and around water would be permitted. (USDA 2006 Appendix I)

The EPA registered trade names for active herbicide ingredients presented in Table 4 is a partial list and one should refer to the EPA website (<https://www.epa.gov/caddis/herbicides>) for the most current list. Target species listed in Table 4 include species not recorded in the Project area. Herbicide specific protection measures for areas near water, such as streamside and wetland areas are also presented in Table 4. Adherence to label directions applies to all herbicides in all management zones (e.g., aquatic, streamside, wetland, rangeland, etc.). The species-specific control treatment information provided in Tables 4 is further detailed in Appendices C, E, and I in the Custer National Forest Weed Management Environmental Impact Statement (USDA 2006).

NorthWestern proposes to continue to coordinate with USFS over the next 10 years to modify the list for species-specific herbicide controls identified in Table 4 and biocontrol, as appropriate. NorthWestern will coordinate with USFS to implement other available techniques as options are or become available and are considered appropriate for the location, target species, and infestation severity in the Project area.

5.4 Monitoring Plan

NorthWestern will submit an annual summary of the year's weed management activities to the USFS Beartooth Ranger District by the end of each calendar year (December 31). An annual review of the bio-control release sites will be conducted to evaluate insect survival, establishment of populations, and effect on target plants. The annual summary will include treatment dates, treatment techniques (e.g. chemical, biological, mechanical), acres treated, herbicides used, and a map depicting locations of the treatments.

Every third year (e.g., 2027, 2030, 2032), NorthWestern proposes to complete a review of the herbicide-treated weed management areas and qualitatively assess treatment effectiveness. These periodic site reviews will be scheduled to occur after the year's herbicide application. NorthWestern will prepare and submit a summary of their observations and assessment, accompanying the annual summary, to the USFS Beartooth Ranger District (in 2027, 2030, 2032). These measures will help monitor and evaluate the short-term and long-term effectiveness of the weed control efforts.

NorthWestern will complete a subsequent weed inventory of the Project area (refer to Overview Map) and review weed management actions every 10 years (next one to occur in 2034) for the duration of the license (40 years). The comprehensive weed inventory of the treated areas provides a method to evaluate the effectiveness of the 10-year WMP. If management objectives are not being met, weed control actions will be modified.

5.5 Summary

The Project area has experienced lots of activity over the last 10 years related to construction and recreation use. Construction activities have included road maintenance, bridge replacement, transmission line replacement, temporary access route use/development, construction of a new trail from the Mystic Lake trailhead parking area to the bridge over the tram (foot traffic bypasses the NorthWestern Camp), and Project infrastructure operations and maintenance.

Recreation use surveys from 2013 and 2019 indicate a 12 percent increase in vehicle traffic on West Rosebud Lake Road and 45 percent increase in pedestrian traffic on Mystic Lake Trail crossing the bridge over the tram tracks (Pinnacle Research and American Lands 2013, 2020).

Vectors for weed infestations in the drainage may originate from various sources such as vehicles, construction equipment, recreationists, campers, and wildlife. Recreation and construction activities create opportunities for new vectors to introduce/spread noxious weeds from outside the drainage basin to the Project area. In addition, the associated ground disturbing activities create opportunities for the introduction of noxious weeds. Thus, increases in weed infestations, shifts in infestation locations, and presence of new species can be attributed to increased activity in the area over the last 10 years.

Annual weed management is a critical tool to minimize opportunities for new species to spread and provide management of existing weed infestations and endeavor to reduce infestations and protect areas of concern from weed introduction and/or expansion of infestations (e.g., wilderness areas). The integration of bio-controls into this management program is expected to help manage existing stands of noxious weeds.

The USFS 4(e) Condition No. 19 specifies that NorthWestern will be responsible for the prevention and control of noxious weeds within the Project area. NorthWestern has evaluated the effectiveness of the weed control measures implemented between 2014 and 2024 and concluded the annual efforts provide an important management strategy to reduce vectors for introduction of noxious weed species or increased expansion of existing infestations as recreation use continues to increase in the drainage.

NorthWestern proposes to continue annual weed control efforts and submit a summary to the USFS Beartooth Ranger District annually, provide a site review and qualitative assessment of weed control efforts every 3 years (2027, 2030, 2032), and continue the comprehensive weed inventory interval once every 10 years (next one to occur in 2034). The annual management schedule, periodic review of treated areas, and the 10-year comprehensive inventory of the Project area will help evaluate the effectiveness of the weed management plan in the short-term and long-term. If management objectives are not being met, NorthWestern will re-evaluate current weed control actions and modify as appropriate.

6.0 References

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Appendix A – 2024 Weed Inventory Maps

NorthWestern Energy

Mystic Lake

2024 Weed Inventory

Overview Map

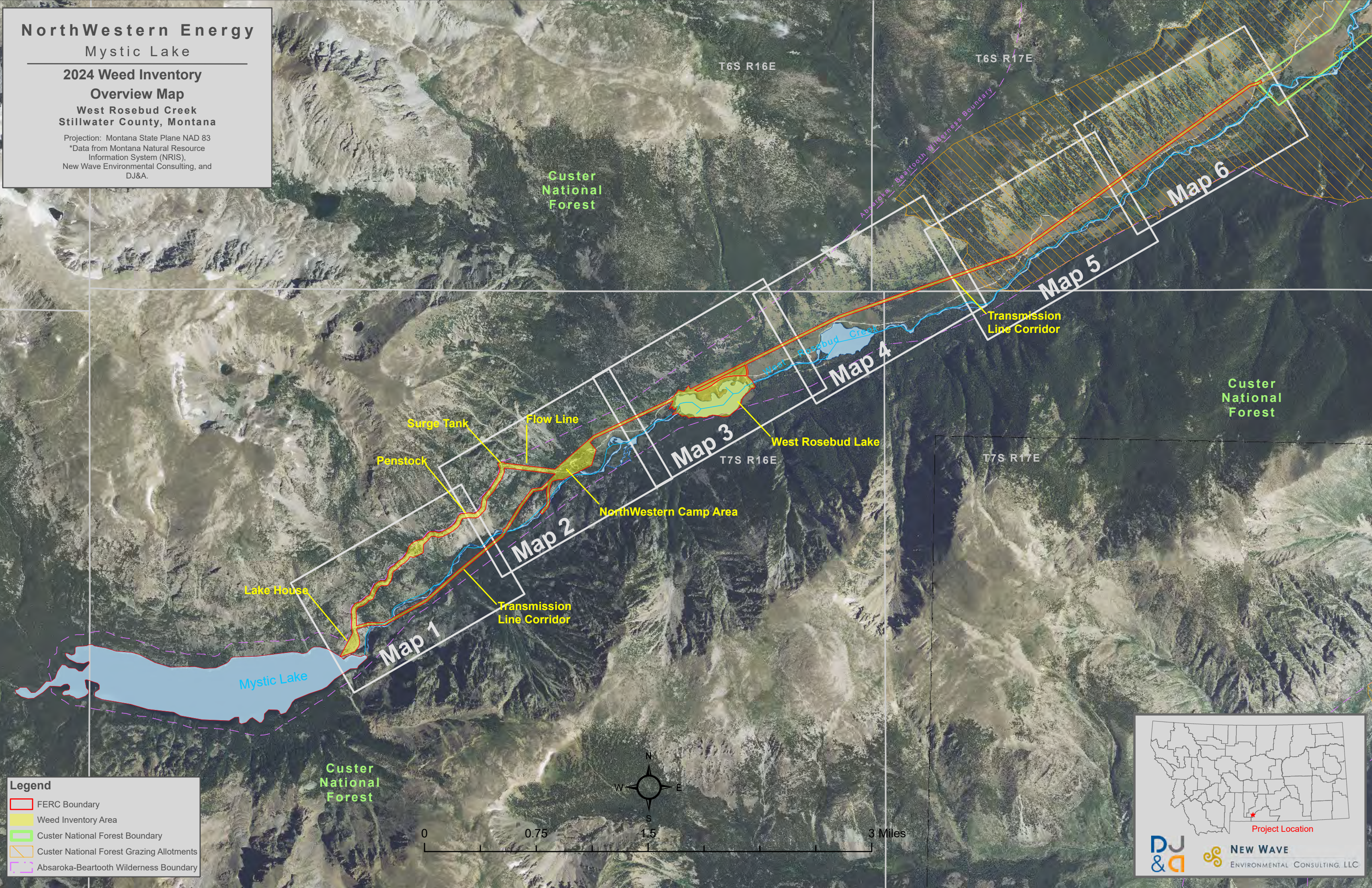
West Rosebud Creek
Stillwater County, Montana

Projection: Montana State Plane NAD 83

*Data from Montana Natural Resource

Information System (NRIS),

New Wave Environmental Consulting, and
DJ&A.

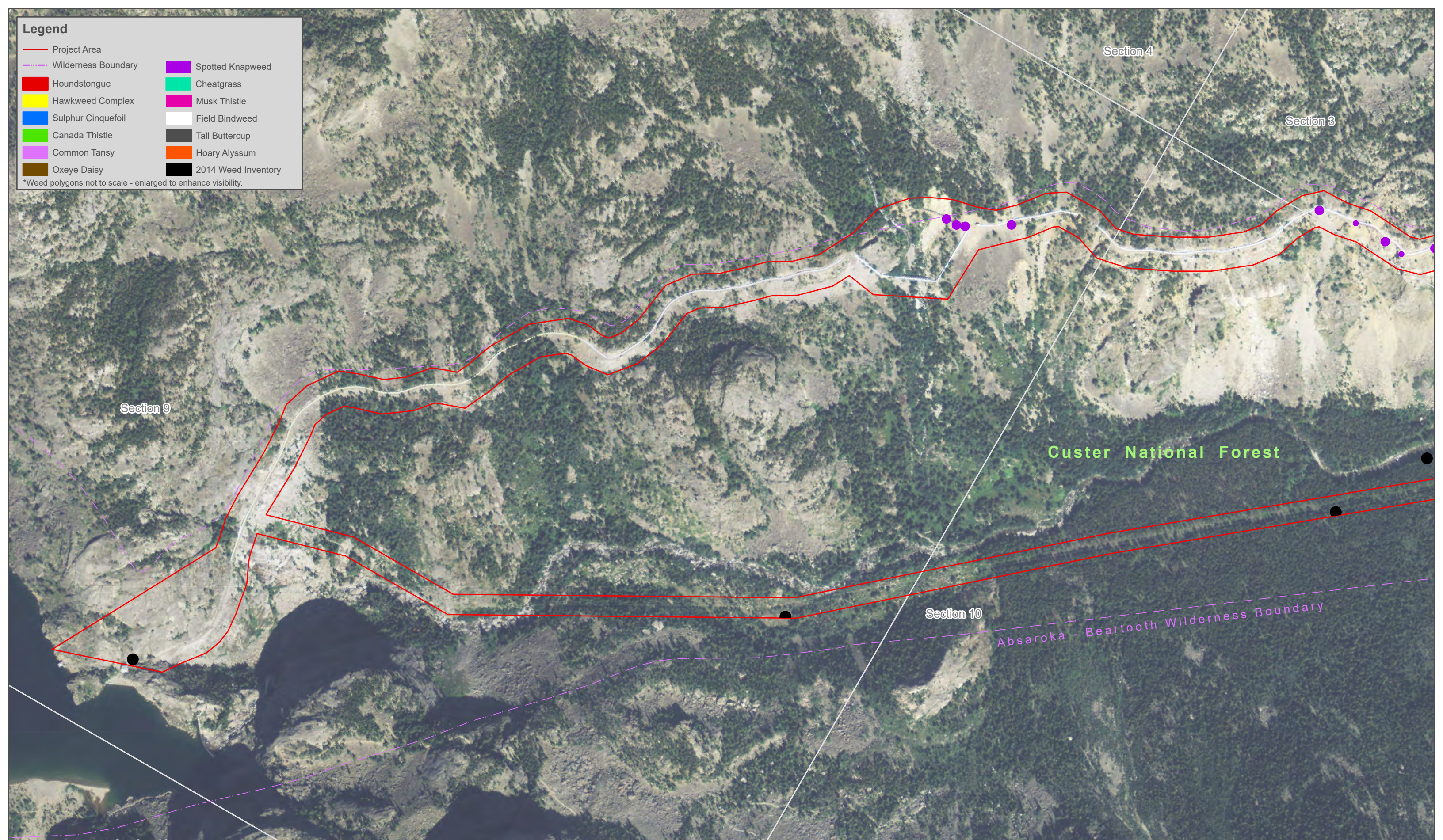


DJ & A **NEW WAVE**
ENVIRONMENTAL CONSULTING, LLC

Legend

- Project Area
- - - Wilderness Boundary
- Houndstongue
- Hawkweed Complex
- Sulphur Cinquefoil
- Canada Thistle
- Common Tansy
- Oxeye Daisy
- Spotted Knapweed
- Cheatgrass
- Musk Thistle
- Field Bindweed
- Tall Buttercup
- Hoary Alyssum
- 2014 Weed Inventory

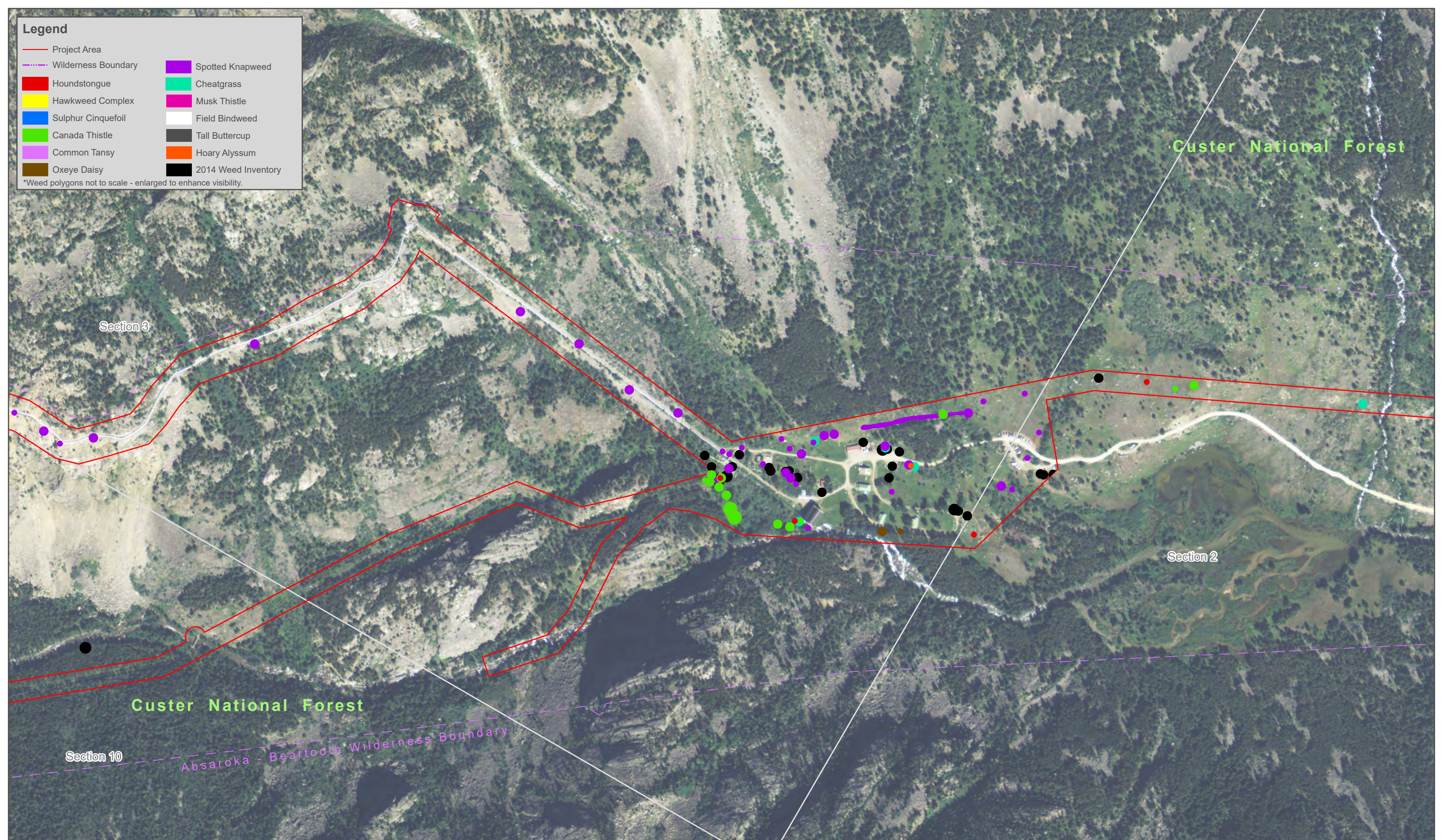
*Weed polygons not to scale - enlarged to enhance visibility.



Legend

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- Houndstongue
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- Cheatgrass
- Musk Thistle
- Field Bindweed
- Tall Buttercup
- Hoary Alyssum
- 2014 Weed Inventory

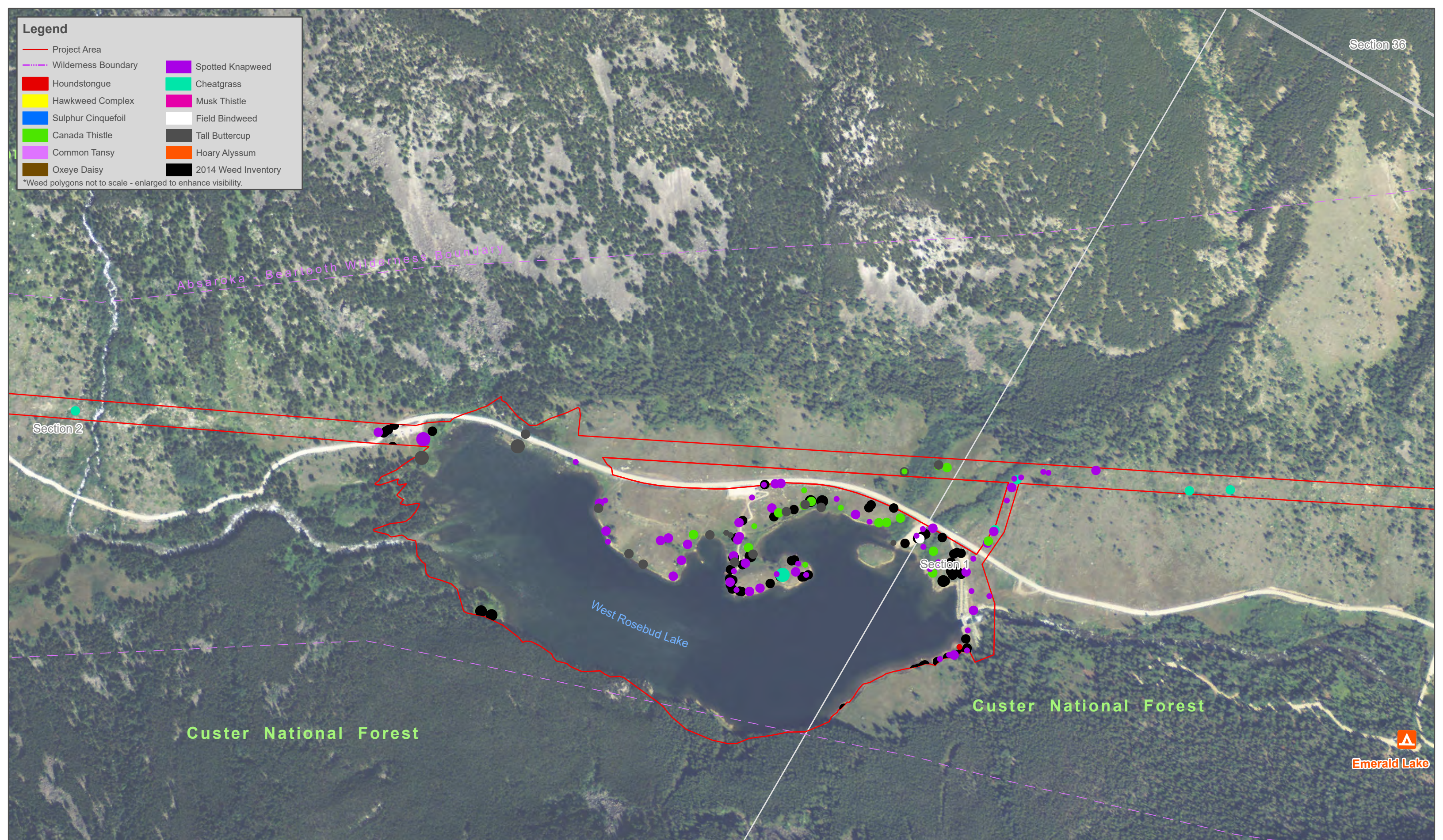
*Weed polygons not to scale - enlarged to enhance visibility.



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- Musk Thistle
- Field Bindweed
- Tall Buttercup
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- 2014 Weed Inventory

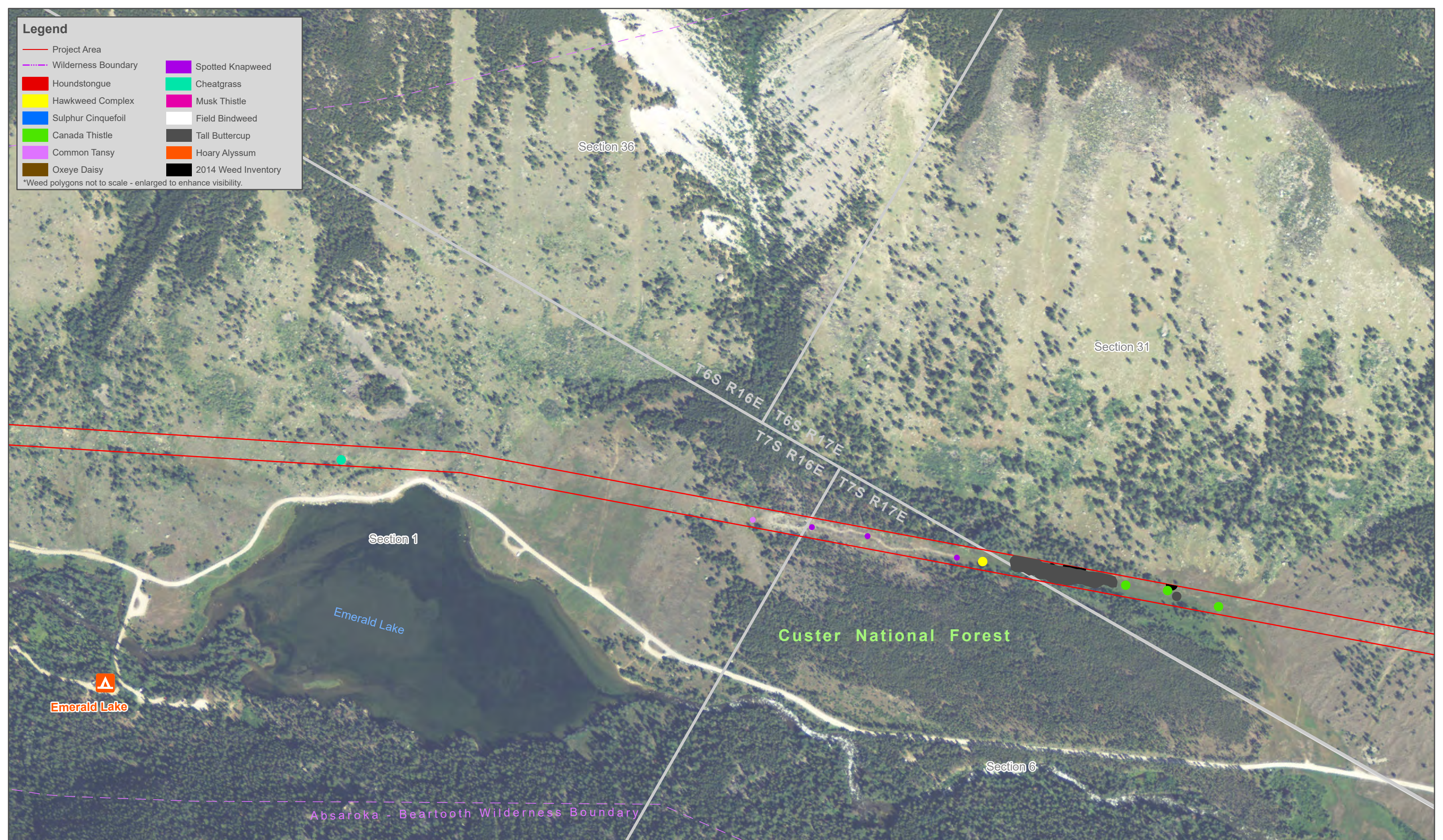
*Weed polygons not to scale - enlarged to enhance visibility.



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*Weed polygons not to scale - enlarged to enhance visibility.

Section 29

Section 31

Section 32

Custer National Forest

T6S R17E
T7S R17E

Absaroka - Beartooth Wilderness Boundary

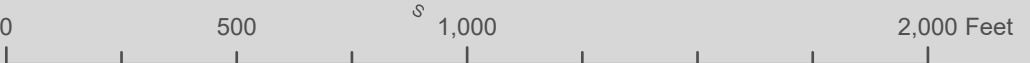

Section 6

NEW WAVE
ENVIRONMENTAL CONSULTING, LLC



NorthWestern Energy
Mystic Lake
HYDROELECTRIC PROJECT
2024 Weed Inventory

West Rosebud Creek
Stillwater County, Montana
Projection: Montana State Plane NAD 83
*Data from Montana Natural Resource Information System (NRIS),
New Wave Environmental Consulting, and DJ&A.

Map 5 of 6

Drawn By: Travis Benton
Checked by: Tyler Andrews
Date: 8/9/2024

Legend

- Project Area
- - - Wilderness Boundary
- Houndstongue
- Hawkweed Complex
- Sulphur Cinquefoil
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