2019 Noxious Weed Control Annual Report

Bigfork Hydroelectric Project FERC Project No. 2652



Prepared by:



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1.0 INTRODUCTION

The Bigfork Hydroelectric Project (FERC Project No. 2652) received a new operating license from the Federal Energy Regulatory Commission (FERC) July 25, 2003. Article 410 of the FERC License Order required that PacifiCorp file a noxious weed control plan with the FERC within one year from the date of the new license, and that the plan include the following elements:

- 1. Specific goals and objectives;
- 2. Measures to promote public education and awareness of the threat of noxious weeds;
- 3. Methods for the prevention and early detection of noxious weed infestations, including how frequent project lands and waters would be inspected;
- 4. Methods for controlling noxious weed infestations along with an evaluation of the costs and benefits of various treatment methods (mechanical, biological, and chemical);
- 5. Methods for evaluating the effectiveness of implemented noxious weed control measures;
- 6. Schedule for all actions contained in the plan and for filing noxious weed monitoring reports with the Commission; and
- 7. Schedule for periodically reviewing the plan to incorporate new data or changes in weed management practices.

On July 26, 2004, PacifiCorp submitted a Noxious Weed Management Plan pursuant to Article 410 of the new operating license. A FERC order approving and modifying the plan was issued by the FERC April 8, 2005. Following the FERC approval of the plan, PacifiCorp performed treatments and reported the results to the FERC in the annual noxious weed control report.

This report details the results of the noxious weed control program at PacifiCorp's Bigfork Hydroelectric Project located in Bigfork, Montana for 2019. The primary objective of this activity is to prevent noxious weed establishment and/or spread within the FERC project boundary lands in a manner that is consistent with all state laws and Flathead County ordinances that pertain to weed management. Specific goals of noxious weed control are:

1. Protect areas that are currently not infested with weeds;

- 2. Contain and reduce established weed populations and prevent spread to non-infested sites; and,
- 3. Restore, establish, and/or maintain healthy native plant communities.

In accordance with license Article 410 of the Bigfork Hydroelectric Project license, this report was sent out to the following agencies for a 30 day review: Flathead County Weed District, Montana Department of Environmental Quality, Montana Fish Wildlife and Parks, and United States Fish and Wildlife Service on November 1, 2019.

1.1 MONTANA STATE NOXIOUS WEED LAWS

Both state and county laws mandate control of noxious weeds in Montana. The state of Montana defines a noxious weed as "plants of foreign origin that can directly or indirectly injure agriculture, navigation, fish or wildlife, or public health" (Montana Weed Control Act, 2015): The Montana County Noxious Weed Control Act states that "It is unlawful for any person to permit any noxious weed to propagate or go to seed on the person's land, except that any person who adheres to the noxious weed management program of the person's weed management district or who has entered into and is in compliance with a noxious weed management agreement is considered to be in compliance with this section" (Montana Code Annotated Title 7 Chapter 22 Part 2116).

The state of Montana maintains a list of state noxious weeds, and for management purposes, has developed the following five priority rankings (Montana Department of Agriculture, 2019):

Priority 1A: These weeds are not present in Montana or have a very limited presence in Montana. Management criteria will require eradication if detected; education; and prevention.

Priority 1B: These weeds have limited presence in Montana. Management criteria will require eradication or containment and education.

Priority 2A: These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.

Priority 2B: These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.

Priority 3: Regulated Plants that are not on the Montana State noxious weed list. These regulated plants have the potential to have significant negative impacts. The plant 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 the regulated plant.

Montana State noxious weeds known to occur in Flathead County and the Bigfork Project FERC boundary are shown in Table 1 below.

Common Name	Scientific Name	Montana State Priority ¹	Flathead County Declared Noxious Weed ²	Known to Occur in Flathead County ³	Known to Occur in the Project Area
Baby's Breath	Gypsophila paniculata		2A	Х	
Blueweed	Echium vulgare	1B		Х	
Canada thistle	Cirsium arvense	2B		Х	Х
Common (European) buckthorn	Rhamnus cathartica L.	2A			
Common reed	Phragmites austrails ssp. austrailis	1A			
Common tansy	Tanacetum vulgare	2B		Х	Х
Curlyleaf pondweed	Potamogeton crispus	2B		Х	
Dalmatian toadflax	Linaria dalmatica	2B		Х	
Diffuse knapweed	Centaurea diffusa	2B		Х	
Dyer's woad	Isatis tinctoria	1A		Х	
Eurasian watermilfoil	Myriophyllum spicatum	2A		Х	
Field bindweed	Convolvulus arvensis	2B		Х	
Flowering rush	Butomus umbellatus	2A		Х	
Hoary alyssum	Berteroa incana	2B		Х	

Table 1. Montana and Flathead County Noxious Weeds List

Common Name	Scientific Name	Montana State Priority ¹	Flathead County Declared Noxious Weed ²	Known to Occur in Flathead County ³	Known to Occur in the Project Area
Houndstongu e	Cynogolossum officinale	2B		Х	Х
Knotweed complex	Polygonum spp.	1B		Х	
Leafy spurge	Euphorbia esula	2B		Х	
Meadow hawkweed complex	Heiracium caespitosium Heiracium praealtrum Heiracium	2A		Х	
Medusahead	Taeniatherum caput-medusae	1A			
Orange hawkweed	Hieracium aruantiacum	2A		Х	Х
Oxeye daisy	Leucanthemum vulgare	2B		Х	Х
Perennial pepperweed	Lepidium latifolium	2A		Х	
Purple loosestrife	Lythrum spp.	1B		Х	
Rush skeletonweed	Chondrilla juncea	1B		Х	
Russian knapweed	Acroptilon repens	2B		Х	
Russian thistle	Salsosa trangus		2A	Х	
Saltcedar	Tamarix spp.	2B		Х	
Scotch broom	Cytisus scoparius	1B			
Spotted Knapweed	Centaurea maculosa	2B		Х	Х
St. Johnswort (goat weed)	Hypericum perforatum	2B		Х	Х
Sulfur (erect) cincuefoil	Potentilla recta	2B		Х	
Tansy ragwort	Senecio jacobea	2A		Х	Х
Tall buttercup	Ranunculus acris	2A		Х	
White campion	Silene latifolia		2A	Х	
Whitetop	Cardaria draba,, Lepidium draba)	2B			
Ventenata	Ventenata dubia	2A			
Yellowflag iris	Iris pseudacorus	2A		Х	
Yellow toadflax	Linaria vulgaris	2B		Х	

Common Name	Scientific Name	Montana State Priority ¹	Flathead County Declared Noxious Weed ²	Known to Occur in Flathead County	Known to Occur in Project Area
Yellowstar Thistle	Centaurea solstitialis	1A		Х	Х

Source: ¹ Montana Department of Agriculture 2019

²Flathead County 2019

³Montana Weed Control Associations 2019

2.0 **PROJECT LOCATION**

The Bigfork Hydroelectric Project is located on the lower Swan River near the town of Bigfork, Montana; approximately 20 miles south of the City of Kalispell, in Flathead County (Figure 1). The project powerhouse discharges into the mouth of the Swan River near Bigfork Bay, an arm of Flathead Lake.

The project area includes those lands within the current FERC project boundary (Figure 2). Within the FERC boundary, there are a number of areas that are highly susceptible to noxious weed infestation due to frequent soil disturbance and human activities. These locations have been elevated to high priority areas for noxious weed control and include lands immediately adjacent to the diversion canal, project facilities, river access points, and areas in proximity to the Swan River Nature Trail and adjacent to maintenance and access roads.

3.0 BASELINE SURVEY

On May 23, 2005, PacifiCorp staff and Bob Gornick (a Montana state licensed pesticide applicator) performed a baseline survey of the project area to assess for the presence of noxious weeds. Based on the survey, six treatment sites were identified. Noxious weed surveys have been completed annually since the initial 2005 survey. Additional sites have been added to the survey inventory as warranted. In 2007, two survey/treatment sites were added to the annual monitoring plan based on observed weed infestations. In 2009, another two survey/treatment sites were added to the annual monitoring plan based to the annual monitoring plan. In 2017, after an inspection from the Flathead County Noxious Weed Control District and a PacifiCorp employee, five new treatment sites were added to the survey sites. Treatments were implemented at the six sites identified during the 2005 survey, the two new sites identified

in 2007, the two sites identified in the 2009 survey and the five added in 2017. In 2019 one site was identified. There are seventeen survey sights in 2019. Figure 2 outlines photo point locations for each site.

- The treatment sites included:
- 1) Fenced in area near the old fish ladder (1N05);
- 2) Various locales along the Swan River Nature Trail (2N05);
- 3) A side trail south of the Swan River Nature Trail (3N17);
- 4) Parking area at the east trailhead for the Swan River Nature Trail (4N17);
- 5) The hill behind the powerhouse (1S05);
- 6) The flowline east to the FERC boundary (2S05);
- 7) Canal intake and access to Pacific Park (3S05);
- 8) Pacific Park and road along canal (4S05);
- 9) South Shore kayaker access parking lot (5S07);
- 10) Kearney Rapids boat launch at Swan River Bridge (6S07);
- 11) Concrete flume from headworks to Pacific Park (7S09);
- 12) Areas of Pacific Park around the parking area, picnic areas, and outhouse (8S09);
- 13) Backup generator enclosure (9S09);
- 14) Hillside above the forebay (10S17);
- 15) Hillside above the bifurcation (11S17);
- 16) Communications line clearing along concrete flume (12S17) and
- 17) Survey marker installed in 2018 north of the natural trail (1N19)

3.1 MONITORING LOCATIONS

Sites were chosen based on geographic location and vary in size based on the prevalence of the noxious weeds present. Noxious weed species composition and abundance varied at each location. Below is a brief description of the site location, weed species and prevalence.

Site nomenclature was based on location in relation to the Swan River, north (N) or south (S), and include chronological ordering. The numbers 05 were added to the end of the each site name to signify that these sites were identified during the baseline surveys in 2005. Additional sites identified during the 2007 survey have been identified with a numeric ordering of 07 for 2007. As stated above, two additional sites were identified in 2007. No new sites were identified in 2008. Two additional sites were identified in 2009. These sites have been identified with a numeric ordering of 09 to signify that they were identified in 2009. Five additional sites were identified during the inspection in 2017. These sites have been identified with the numeric ordering of 17 to signify they were identified in 2017. In 2019 one site was added due to construction of a survey marker.



Figure 1: Bigfork Project Area



Figure 2: Noxious Weed Treatment Sites Sheet 1 of 3



Figure 2: Noxious Weed Treatment Sites Sheet 2 or 3



Figure 2: Noxious Weed Treatment Sites Sheet 3 or 3

Site 1N05

This site is located on the south edge of the Swan River Nature Trail near the decommissioned fish ladder. Now enclosed by fencing, this area has a history of soil disturbance caused by the construction, maintenance, and decommissioning of the fish ladder. The grass is well established and comprised mostly of native plants. This area was treated for spotted knapweed (*Centaurea maculosa*) and dandelion.

Site	e 1N05	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	80	65
	After Treatment	80	5
2006	Baseline	95	2
	After Treatment	95	2
2007	Baseline	95	2
	After Treatment	100	2
2008	Baseline	100	1
	After Treatment	100	1
2009	Baseline	100	1
	After Treatment	100	1
2010	Baseline	100	1
	After Treatment	100	1
2011	Baseline	100	1
	After Treatment	100	2
2012	Baseline	100	1
	After Treatment	100	1
2013	Baseline	100	1
	After Treatment	100	1
2014	Baseline	100	<1
	After Treatment	100	4
2015	Baseline	100	2
	After Treatment	100	1
2016	Baseline	100	1
	After Treatment	100	1

2017	Baseline	98	2
	After Treatment	100	1
2018	Baseline	98	2
	After Treatment	90	0
2019	Baseline	90	1
	After Treatment	98	2

Site 2N05

This site was established to manage the noxious weeds adjacent to the Swan River Nature Trail. Due to the southern exposure and high public use this area is prone to noxious weeds. Spotted knapweed (*Centaurea maculosa*), continues to be a pervasive problem along the trail. Individual plants and small clusters of knapweed plants are found along much of the trail with larger quantities found along the water's edge in areas frequented by fisherman. The area was treated for spotted knapweed and oxeye daisy (*Leucanthemum vulgare*) in 2019 with minimal residual plants.

	Site 2N05	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	90	15
	After Treatment	90	5
2006	Baseline	90	2
	After Treatment	90	2
2007	Baseline	85	2
	After Treatment	85	1
2008	Baseline	80	1
	After Treatment	80	1
2009	Baseline	75	1
	After Treatment	70	0
2010	Baseline	60	1
	After Treatment	60	1
2011	Baseline	60	1
	After Treatment	65	1

2012	Baseline	60	3
	After Treatment	60	3
2013	Baseline	70	2
	After Treatment	70	3
2014	Baseline	70	2
	After Treatment	70	5
2015	Baseline	70	4
	After Treatment	70	5
2016	Baseline	70	3
	After Treatment	70	1
2017	Baseline	80	1
	After Treatment	95	2
2018	Baseline	85	2
	After Treatment	95	3
2019	Baseline	95	2
	After Treatment	98	1

<u>SITE 3N17</u>

Site 3N17 is an unauthorized trail south of the Swan River Nature Trail that has a historic establishment of spotted knapweed, orange hawkweed (*Hieracium aurantiacum*), and oxeye daisy. The weeds were effectively controlled with treatments this year. Additionally dandelion was treated at this location this year.

	Site 3N17	Vegetative cover (%)	Weed Cover (%)
2018	Baseline	98*	3*
	After Treatment	98	1
2019	Baseline	75	1
	After Treatment	99	0

SITE 4N17

Site 4N17 is the parking area for the east trailhead for the Swan River Nature Trail. The area received a lot of traffic and is susceptible to weed infestation from vehicles. Large amounts of knapweed were found at this location in the summer of 2017 and controlled by hand pulling. Knapweed appeared again near the parking areas and information signs in 2019 along with common tansy (*Tanacetum vulgare*). Weed control was mostly effective this year. Repeated treatments will be required in future years to prevent establishment of weeds, including visits later in the growing season.

Site 4N17		Vegetative cover (%)	Weed Cover (%)
2018	Baseline	90	5
	After Treatment	60	2
2019	Baseline	75	10
	After Treatment	85	5

<u>Site 1S05</u>

This site is located directly behind the powerhouse where the penstocks traverse the slope. The goal is to have grasses only in this area. There are a few shrubs that need to be removed along with some spotted knapweed and dandelions that were documented during the summer survey. No treatment was done this year due to new contractor and lack of effective safety plan to tackle the area. The area adjacent to the access road has a mix of native vegetation. A plan is being developed for removing shrubs and noxious weeds in 2020.

Si	te 1S05	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	90	75
	After Treatment	90	5
2006	Baseline	90	30
	After Treatment	90	5

2007	Baseline	98	2
	After Treatment	95	2
2008	Baseline	98	1
	After Treatment	95	1
2009	Baseline	97	1
	After Treatment	95	1
2010	Baseline	100	1
	After Treatment	100	1
2011	Baseline	100	1
	After Treatment	100	1
2012	Baseline	100	1
	After Treatment	100	1
2013	Baseline	100	1
	After Treatment	100	4
2014	Baseline	100	<1
	After Treatment	100	1
2015	Baseline	100	<1
	After Treatment	100	2
2016	Baseline	100	1
	After Treatment	100	1
2017	Baseline	95	1
	After Treatment	90	1
2018	Baseline	95	1
	After Treatment	90	1
2019	Baseline	95	2
	After Treatment	85	3

Site 2S05

This site, located on the south side of the Swan River, includes the area adjacent to the flowline and to the east and south of the FERC project boundary. The majority of this area has healthy grasses and forbs. However, the east and west ends of the open swale area as well as the entire length of the earthed canal adjacent to the road continues to experience small amounts of spotted knapweed. These areas will require attention with backpack spraying in 2020.

	<i>Site 2S05</i>	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	95	75
	After Treatment	95	5
2006	Baseline	90	10
	After Treatment	90	2
2007	Baseline	100	2
	After Treatment	100	2
2008	Baseline	98	1
	After Treatment	99	1
2009	Baseline	99 99 999	1
	After Treatment	99	1
2010	Baseline	100	1
	After Treatment	100	1
2011	Baseline	100	1
	After Treatment	100	1
2012	Baseline	100	1
	After Treatment	100	1
2013	Baseline	100	11
	After Treatment	100	5
2014	Baseline	100	<1
	After Treatment	100	2
2015	Baseline	98	<1
	After Treatment	95	1
2016	Baseline	85	1
	After Treatment	85	1
2017	Baseline	90	1
	After Treatment	95	1
2018	Baseline	95	5
	After Treatment	95	2
2019	Baseline	98	2
	After Treatment	99	1

Site 3S05

This site is located on the south side of the river and adjacent to the canal intake. The spring inspection noted spotted knapweed and dandelion. Treatment was successful for those species, however houndstounge (*Cynoglossum officinale*) was detected later in the season and was treated post survey.

	Site 3S05	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	75	70
	After Treatment	75	5
2006	Baseline	90	5
	After Treatment	90	2
2007	Baseline	100	2
	After Treatment	100	1
2008	Baseline	99	2
	After Treatment	99	1
2009	Baseline	99	0
	After Treatment	100	0
2010	Baseline	100	2
	After Treatment	100	5
2011	Baseline	100	3
	After Treatment	98	5
2012	Baseline	60	3
	After Treatment	60	3
2013	Baseline	100	2
	After Treatment	100	1
2014	Baseline	100	1
	After Treatment	100	4
2015	Baseline	100	3
	After Treatment	100	1
2016	Baseline	100	0
	After Treatment	100	0
2017	Baseline	95	1
	After Treatment	98	1

2018	Baseline	95	1
	After Treatment	98	1
2019	Baseline	97	1
	After Treatment	95	3

Site 4S05

This site covers the Pacific Park area and the access road adjacent to the canal across from the park. Some spotted knapweed and houndstoungue were detected during the spring survey. A small amount of dandelion was observed along the access road. Treatment for these weeds were successful, however a small patch of tansy was detected during the summer survey was treated post survey.

	Site 4S05	Vegetative cover (%)	Weed Cover (%)
2005	Baseline	95	70
	After Treatment	95	5
2006	Baseline	95	5
	After Treatment	95	5
2007	Baseline	90	20
	After Treatment	80	2
2008	Baseline	80	2
	After Treatment	85	1
2009	Baseline	85	1
	After Treatment	85	10
2010	Baseline	80	5
	After Treatment	80	2
2011	Baseline	80	2
	After Treatment	75	1
2012	Baseline	80	2
	After Treatment	75	1
2013	Baseline	85	2
	After Treatment	80	2

2014	Baseline	85	<1
	After Treatment	80	<1
2015	Baseline	80	<1
	After Treatment	75	2
2016	Baseline	80	1
	After Treatment	80	1
2017	Baseline	95	1
	After Treatment	85	1
2018	Baseline	85	1
	After Treatment	85	1
2019	Baseline	85	2
	After Treatment	98	1

Site 5S07

This site is located at the South Shore kayaker access parking lot. The vegetation in this area continues to become comprised mostly of native plants and weed populations are minimal. Small amounts of dandelion were detected this spring and a small patch of knapweed was detected in the summer survey. Both were treated successfully with minimal residual plants.

	Site 5S07	Vegetative cover (%)	Weed Cover (%)
2007	Baseline	60	30
	After Treatment	60	5
2008	Baseline	85	5
	After Treatment	85	1
2009	Baseline	85	1
	After Treatment	85	2
2010	Baseline	90	1
	After Treatment	90	5
2011	Baseline	95	4
	After Treatment	90	2

2012	Baseline	95	4
	After Treatment	90	2
2013	Baseline	90	1
	After Treatment	90	1
2014	Baseline	90	<1
	After Treatment	90	<1
2015	Baseline	92	1
	After Treatment	92	2
2016	Baseline	95	1
	After Treatment	95	1
2017	Baseline	95	1
	After Treatment	95	1
2018	Baseline	95	1
	After Treatment	95	1
2019	Baseline	98	1

<u>Site 6S07</u>

This site includes road shoulders and vegetative buffer strips along the Kearney Rapids Boat Launch at Swan River Bridge. Dandelion is becoming established in areas disturbed during construction at the Kearney Rapid Boat Launch in 2017 along with common tansy and Canada thistle (*Cirsium arvense*). Spotted knapweed is also found on an unauthorized trail that goes down to the water near the bridge. Later in the growing season, orange hawkweed and oxeye daisy were detected. This area is heavily used by boaters. This area will require vigilant weed control due to the heavy use that it receives.

	<i>Site 6S07</i>	Vegetative cover (%)	Weed Cover (%)
2007	Baseline	95	50
	After Treatment	85	5
2008	Baseline	85	5
	After Treatment	85	1

2009	Baseline	85	1
	After Treatment	85	1
2010	Baseline	90	2
	After Treatment	90	3
2011	Baseline	90	3
	After Treatment	85	2
2012	Baseline	85	1
	After Treatment	80	4
2013	Baseline	85	1
	After Treatment	80	7
2011	Baseline	85	1
2014	A fter Treatment	80	2
2015	Baseline	85	2
2015	Δ fter Treatment	80	3
2016	Basalina	80	1
2010	A fter Treatment	80	1
2017	Baseline	85	1
2017	A fter Treatment	85	1
2010	Pagalina	85	1
2018	A fter Treatment	85	1
2010	Alter Treatment	80	2
2019	Baseline	80	2
	After Treatment	90	5

Site 7S09

This site includes various locations along the north side of the concrete flume between the headworks and Pacific Park. Localized communities of knapweed were observed in 2019 to the east of Pacific Park. Houndstongue and dandelion were also detected. This area was successfully treated in 2020

	Site 7S09	Vegetative cover (%)	Weed Cover (%)
2009	Baseline	95	15
	After Treatment	85	2

2010	Baseline	75	0
	After Treatment	75	2
2011	Baseline	15	2
	After Treatment	40	5
2012	Baseline	20	5
	After Treatment	20	10
2013	Baseline	25	2
	After Treatment	30	4
2014	Baseline	25	<1
	After Treatment	50	2
2015	Baseline	60	1
	After Treatment	60	3
2016	Baseline	85	2
	After Treatment	95	0
2017	Baseline	95	1
	After Treatment	98	2
2018	Baseline	95	3
	After Treatment	98	2
2019	Baseline	95	2
	After Treatment	98	0

Site 8809

Site 8S09 was identified during the 2009 fall survey and began receiving herbicide treatment in 2010. This site includes areas of Pacific Park around the parking area, picnic areas, and outhouse. The 2019 inspections detected some dandelion and common tansy growing along the edge of the grass near the tree line. The grass is healthy and well established.

	<i>Site</i> 8509	Vegetative cover (%)	Weed Cover (%)
2010	Baseline	85	10
	After Treatment	80	2
2011	Baseline	85	4
	After Treatment	85	5
2012	Baseline	85	10
	After Treatment	75	1
2013	Baseline	90	1
	After Treatment	95	3
2014	Baseline	95	<1
	After Treatment	90	<1
2015	Baseline	95	<1
	After Treatment	90	0
2016	Baseline	95	1
	After Treatment	95	1
2017	Baseline	98	2
	After Treatment	99	1
2018	Baseline	98	2
	After Treatment	99	1
2019	Baseline	99	1
	After Treatment	98	2

<u>SITE 9809</u>

Site 9S09 was identified during the 2013 survey and includes the area surrounding the generator enclosure. The final 2019 inspection located no vegetation within the area

	Site 9S09	Vegetative cover (%)	Weed Cover (%)
2013	Baseline	3	2
	After Treatment	0	0

2014	Baseline	1	1
	After Treatment	0	0
2015	Baseline	0	0
	After Treatment	0	0
2016	Baseline	0	0
	After Treatment	0	0
2017	Baseline	1	1
	After Treatment	0	0
2018	Baseline	1	1
	After Treatment	0	0
2019	Baseline	2	1
	After Treatment	0	0

<u>SITE 10S17</u>

Site 10S17 is the hillside above the forebay and was noted as an area of concern during an inspection by the Flathead County Weed Control Department (FCWCD) in fall of 2017. The area was recently disturbed during a construction project. In the spring of 2019 several detections of knapweed have become established as well as some dandelion. Treatment was successful, however, additional treatment late summer will be required next year to control late growing spotted knapweed.

	Site 10517	Vegetative cover (%)	Weed Cover (%)
2018	Baseline	95*	4*
	After Treatment	90	2
2019	Baseline	95	2
	After Treatment	97	1

SITE 11S17

Site 11S17 is on the hillside above the bifurcation. The open meadow and hillside south of the bifurcation has scattered spotted knapweed, dandelion, and houndstounge. The area was another site identified by the FCWCD which required continued attention. Herbicide treatment in 2019 was largely effective at controlling mullein and dandelion, however, knapweed and houndstongue persist in this area and will require a second late summer treatment in 2020.

	Site 11517	Vegetative cover (%)	Weed Cover (%)
2018	Baseline	90*	5*
	After Treatment	95	3
2019	Baseline	90	3
	After Treatment	95	2

<u>SITE 12S17</u>

Site 12S17 is along the utility line. During an early spring inspection a large patch of hawkweed, tansy, and knapweed was detected. Area was successfully treated. We may consider planting grass seed fall of 2020 to discourage weed growth.

	Site 12S17	Vegetative cover (%)	Weed Cover (%)
2019	Baseline	93	3
	After Treatment	97	1

<u>SITE 1N19</u>

Site 1N19 was established in 2019 due to a 2018 construction area for a survey marker. Some spotted knapweed was detected and treated in 2019. Area was successfully treated.

S	ite 1N19	Vegetative cover (%)	Weed Cover (%)

2019	Baseline	10	1
	After Treatment	25	1

4.0 TREATMENT

Each of the weed treatment areas were treated with an herbicide application in 2019. These applications were applied by Sandry Construction and all required documentation has been supplied to the Flathead County Weed District for each day herbicides were applied. These forms include control methods used (chemical rate and amount applied), the date, time, and weather at the time the control methods were implemented. All sites were treated with a combination of the following herbicides and mixed with surfactants as needed to be effective:

Trade Name	EPA Registration	Active Ingredient
Transline [®]	62719-259	Clopyralid
Milestone®	566191-89-7	Aminopyralid
Amine®	34704-120	2-4-D

Successfully treating noxious weeds with herbicides requires timing for the target species and favorable conditions, specifically, clear weather with light to no winds. Herbicide treatments occurred over several days between July 7, 2019 and October 18, 2019.

The applicator used a handheld spray gun to complete the treatments. Documentation of the 2019 herbicide treatments are included Appendix A.

5.0 RESULTS

The follow-up survey performed July 18, 2019 found that sites continue to maintain a noxious weed cover that is less than or equal to three percent with the exception of site 14N17, 1S5, and 6S7. Site 14N17 and 6S7 were expanded in 2019 to include the ground

along the bridge on both sides. This area had a notable increase in spotted knapweed. Treatment was successful, however, it will require vigilant work over the next couple years. PacifiCorp is considering removing shrubs and the scattered weeds at site 1S5 in 2020 with the goal of reseeding with grasses. As in previous years, at no time did the treatments result in completely denuded soils that would have required revegetation to control the reestablishment of noxious weeds or contribute to potential erosion. With the exception of 9S09, this is a fenced generator facility that is void of all vegetation for operations. Photographs of all sites were taken during the spring baseline survey prior to any treatment and again following herbicide application to document the effectiveness of the treatments (Appendix B).

Overall the treatments have maintained the cover of grasses and native forbs. Noxious weed density is fairly moderate this year. The Swan River Nature Trail (2N05) are continuing to become established with large amounts of knapweed in areas that are inaccessible to truck-mounted sprayers and will require special attention with backpack spraying. In other areas, foot traffic and vehicular use is creating soil disturbance which allows for weed growth, particularly at Kearney Rapids Boat Launch (6S07) and Pacific Park (8S09).

In undisturbed areas away from roadways, the treatment program is proving to be mostly effective at keeping the weed population in check. Individual weeds are being found across the entire site, but have not yet established large colonies. Multi-seasonal spraying will be employed site-wide to bring late season weed populations under better control.

PacifiCorp will continue these treatments as needed through the duration of the FERC license and will provide annual reports by December 31 of each year.

As required in the order approving the Noxious Weed Control Plan, public information signs have been installed in the FERC project area. Noxious Weed Management Area signs have been placed in treatment areas accessible to the public to inform them of these management activities. Additional signs located at the powerhouse entrance, entrance to Swan River Nature Trail, and the entrance to Pacific Park inform the public about local noxious weeds and measures that should be taken to prevent their spread. These signs are included as Appendix C to this report.

6.0 MANAGEMENT RECOMENDATIONS

PacifiCorp conducts two noxious weed surveys, in spring and summer. For recommendations on top of the surveys, PacifiCorp has contracted Sandry Construction to provide recommendations related to controlling noxious weeds at the project site. Sandry Construction will provide, on an as needed basis, recommendations to reduce any spread of noxious weeds including, but not limited to, native seed mixes to be used for revegetation. Upon approval, Sandry Construction treated recommended sites. PacifiCorp recommends that sites continue to be monitored annually and treated as needed to control noxious weeds. It is anticipated that annual to biennial treatment should be sufficient to prevent the reestablishment of weeds at each site.

7.0 **REFERENCES**

- Montana Weed Control Act. 2015. Montana Department of Agriculture accessed at: <u>https://agr.mt.gov/Weeds</u>. August 15, 2019
- Flathead County. 2017. Flathead County Declared Noxious Weeds effective February 2017 accessed at: https://flathead.mt.gov/weeds/FlatheadCountyDeclaredNoxiousWeeds.php. August 15, 2019.
- Montana Department of Agriculture. 2019. Montana Noxious Weed List effective June 2019. Available at: <u>http://agr.mt.gov/weeds</u>. August 15, 2019.
- Thu University of Georgia Center for Invasive Species and Ecosystem Health. Noxious Weed Disribution Maps accessed at: EDDMapSWest. <u>https://www.eddmaps.org/west/distribution/</u>. August 15, 2019.
- Montana Weed Control Association (MWCA) (2019). Weed ID accessed at: https://www.mtweed.org/weeds/weed-id/. August 15, 2019.

Appendix A Documentation of 20154 Herbicide Treatment

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FLATHEAD COUNTY WEED DISTRICT -	1257 Willow Glen Drive – K	alispell, MT 59901 -	(406) 758-5798 - FAX (406) 758-5888
Applicator: Joe Brabban	Equipment # 2	Data a	FAmiliantian (a. 13, 7010
Area of Application: Bigfor K Hyd	voelectric Pr	oject	
5	Please check one o	the following:	
Federal State	(County	Private
Location description (mile markers, etc):	Darking lot + d.	o bridge	R both sides
	Acres 1	reated (#): 3) .
Hour began: 10'.30 Hour finished:	10:50 Actual	spray time: 20	Min. Total hours: 30 Min.
Wind direction: N S E	W Wind y	elocity: 0-3 mph	4-7 mph; 8-12 mph
Approximate temperature:62*	Signifi	cant weather factor	rs: 900d
Noxious weeds treated:			
Spotted knapweed	Canada thistle	Leafy S	purgeSt. Johnswort
Dalmatian Toadflax	Common tansy	Oxeye I	DaisyOrange hawkweed
Tansy RagwortHounds	ongueTall but	tercup OTHER	: Mullein
Trade name: (refer to other side)	Chemical(s) a	pplied:	
			Mixture rate:
Trade name: (refer to other side)	Q. DD Org	•	60 gal per acre
	Quantity user.		Mixture rate:
Carrier gallons used:	S	rfactant total.	1
		3	<u></u>
Description:			
Trade name: (refer to other side)	m	1 (6	
	11	ade name: (refer to	other side)
Manufacturer #: (refer to other cide)			
(refer to other side)	Ma	inufacturer # : (refe	er to other side)
Dow Agro Sciences			
62719 -510	1E.I	A. Registration #	:
Active ingredient:	Ac	tive ingredient:	
Active ingredient:	Ac	Active ingredient:	
	I		
Memo:			
Special management posting areas			
Vas application enforcement related?			
f ves. was application method reviewed with	landowners?		
ANDOWNER SIGNATIOE.			
STADO WINER DIOINATURE:	·		DAIE:
Note: All equip	ment is 20 gallons per	acre unless oth	erwise noted.

OFFICIAL RECORD - DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

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Alerta A

FLATHEAD COUNTY WEED DISTRIC	T -1257 Willow Glen Dri	ve – Kalispell, MT 59901 -	(406) 758-5798 - FAX (406) 758-5888	
Applicator:) de Brabham	Fauinment # 2	Data	64-11-11- 10:13. DO19	
Area of Application: Bigfork t	1 yoro electric	Project		
5	Please check	one of the following.		
Federal State		County	Private	
Location description (mile markers, etc)	Swan River	Nature Trail		
		cres treated (#).		
Hour began: 6:30 Hour finished	1: 10:30 A	ctual spray time: 4	hrs Total hourse la	
Wind direction: N S (E)	WV	Vind velocity: (0-3 mph	4-7 mph: 8 12 mph	
Approximate temperature:		Significant weather factor	rs: GOOD	
Noxious weeds treated:		0		
Spotted knapweed	Canada thi	stle Leafy Sr	ourge / St Johnswort	
Dalmatian Toadflax	Common t	ansyOxeye D	Daisy Orange hawkweed	
Tansy RagwortHour	dstongueT	all buttercup OTHER:	Mullein	
Trade service (c. C. d.	Chemic	al(s) applied:		
I rade name: (refer to other side)	Quantity used:	ng A	Mixture rate:	
Milestone	6 OZ.		60 gal per acre	
1 rade name: (refer to other side)	Quantity used:		Mixture rate:	
Carrier gallons used: 50		Surfactant total:	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Description		0	<u> </u>	
Description:		-		
Trade name: (refer to other side)		Trade name: (refer to other side)		
Milestone				
Manufacturer # : (refer to other side)		Manufacturer # : (refer to other side)		
Day Agro Science				
E.P.A. Registration # :		E.P.A. Registration # :		
Active ingredient:		Active ingredient:		
Active ingredient:		Active ingredient:		
Acuve ingretiteni:		Active ingredient:		
Memo:				
Special management posting areas:			· · · · · · · · · · · · · · · · · · ·	
Vas application enforcement related?				
f yes, was application method reviewed wi	th landowners?			
ANDOWNER SIGNATURE:		I	DATE:	
Note: All equ	inment is 20 gallor	s per acre unlace ath	ervice noted	
	-Parton 10 20 Barlon	ber dore unicss officers		

OFFICIAL RECORD – DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

FLATHEAD COUNTY WEED DISTRIC	T -1257 Willow Glen Driv	ve-Kalispell, MT 59901 -	(406) 758-5798 - FAX (406) 758-5888	
Applicator: Joe, Brabban	A Fauinment # 5	Data	Application (a) (4, 2019	
Area of Application: Bigfork	Hydroelectri	c Project		
5	Please check	one of the following.		
Federal State		County	Private V	
Location description (mile markers, etc)	: Swan Rive	er Nature T	rail	
	A	cres treated (#): _, 7 9	õ.	
Hour began: <u>''' 'OO</u> Hour finishe	d: 10:00 A	ctual spray time: 3	hrs Total hours: 5 hrs	
Wind direction: N S (E)	w w	Vind velocity: (0-3 mpl	h; 4-7 mph; 8-12 mph	
Approximate temperature: 65	S	Significant weather facto	is: windy had to stop	
Noxious weeds treated:				
Spotted knapweed	Canada thi	stleLeafy S	purgeSt. Johnswort	
Dalmatian Toadflax	Common t	ansyOxeye I	DaisyOrange hawkweed	
Tansy RagwortHou	ndstongueTa	all buttercup OTHER	:	
Trade name: (refer to other side)	Chemic: Onantity used:	al(s) applied:	Mixture rote:	
Tardia			which is a second secon	
Trade name: (refer to other side)	Quantity used:	1	Mixture rote	
	Quantity asou.		Mixiule fale.	
Carrier gallons used: UK		Surfactant total:		
<u> </u>		0		
Description:				
Trade name: (refer to other side)		Trade name: (refer to	other side)	
		Traite name. (refer to		
Manufacturer # : (refer to other side)		Manufacturer # : (refer to other side)		
Dail Accessibilities				
E.P.A. Registration #:	-0	E.P.A. Registration # :		
Active ingredient:	59	Active ingradiants		
Clopyralid		Active ingredient:		
Active ingredient:		Active ingredient:		
Memo:				
Special management posting areas:		1		
Vas application enforcement related?				
If yes, was application method reviewed v	vith landowners?			
LANDOWNER SIGNATURE:			DATE:	
Note: All ec	uipment is 20 gallor	ns per acre unless ot	herwise noted.	

OFFICIAL RECORD – DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

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FLATHEAD COUNTY WEED DISTRICT -1257 Willow Glen Drive - Kalispell, MT 59901 - (406) 758-5798 - FAX (406) 758-5888					
Applicators De Brabbaux Fourment # 17 Decentry (25:2019					
Area of Application: Bigtor & Hydro electric Oraclect					
	Please check or	e of the following			
Federal State		County	Private V		
Location description (mile markers, etc): <u>1</u> <u>include 8509, 4505, (25</u> <u>Ramp 1507</u> Hour began: <u>7:30</u> Hour finished: <u>_</u> Wind direction: N (S) E Approximate temperature: <u>165-75</u>	Acific Par 517,7609,95 Aci 1:30 Aci W With 5"	K, South Sh 09, 3505, 5 restreated (#): tual spray time: and velocity: 0-3 mpl gnificant weather facto	5 507, Kearney Rapids Boat 5 5 Total hours: 6 4-7 mph; 8-12 mph rs: Windy had to Stop		
Noxious weeds treated:					
Spotted knapweed	Canada thist	leLeafy S	purgeSt. Johnswort		
Dalmatian Toadflax	Common tan	syOxeye I	DaisyOrange hawkweed		
Tansy RagwortHoundst	ongueTall	buttercup OTHER	<u>Scentless chamomille</u> , mullein		
Trade name: (refer to other side)	Quantity used:		Mixture rate:		
Milestone	6 02.		20 gal Der acres		
Trade name: (refer to other side)	Quantity used:		Mixture rate:		
Carrier gallons used: 20		Surfactant total: 3			
Description:			v		
Trade name: (refer to other side)		Trade name: (refer to	other side)		
Milestone					
Manufacturer # : (refer to other side)		Manufacturer # : (refer to other side)			
Dow Aaro Sciences			f.		
E.P.A. Registration #:		E.P.A. Registration #	:		
Active ingredient: Amin 0.01150	lid	Active ingredient:			
Active ingredient:		Active ingredient:			
Memo:					
Special management posting areas:					
Vas application enforcement related?					
If yes, was application method reviewed with landowners?					
LANDOWNER SIGNATURE: DATE:					
Note: All equipment is 20 gallons per acre unless otherwise noted.					
OFFICIAL RECORD – DO NOT DESTROY FOR AT LEAST THREE (3) YEARS					

FLATHEAD COUNTY WEED DISTRICT	-1257 Willow Glen Drive – Ka	lispell, MT 59901 -	(406) 758-5798 - FAX	(406) 758-5888	
he Bralles	2			N 0010	
Applicator: <u>OCOTABNAM</u>	Equipment #	Date o	f Application: 6	7.2019	
Area of Application: BIGFORK t	1ydroelectric	Project			
\mathbf{C}	Please check one of	the following:			
Federal State	0	County	Privat	e /	
Location description (mile markers, etc):	Swan River Nat	ure Trail	North sic	de all cliff	
embankments including	area 3N17		1		
4	A cres t	rested (#). 2	or ves		
Hour began: 7:00 Hour finished:	(2:00 Actual	sprav time:	Total hour		
Wind direction: N S (\vec{E})	W Wind v	elocity: (0-3 mpl	-7 mph:	8	
Approximate temperature: (65-75) Sionifi	cant weather facto		8-12 mpn	
Noxious weeds treated:	Signation of the second	ount wounter nacto			
Snotted knapweed	Canada thistle	I soft O		T .	
	Callada tilistle	Leary S	purgeSi	Johnswort	
	Common tansy	Oxeye I	DaisyO	range hawkweed	
Iansy KagwortHounds	stongueTall but	tercup OTHER	•		
Trade name: (refer to other side)	Chemical(s) a	pplied:	1.		
	Quantity used:		Mixture rate:		
Transline	d pints		60 gal	per acre	
Trade name: (refer to other side)	Quantity used:		Mixture rate:		
	Read				
Carrier gallons used: 120 031	St	rfactant total: 🛠	00.		
i se yat		<u> </u>			
Description:	and the second				
Trade name: (refer to other side)		Trade name: (refer to other side)			
Transline					

Transline		
Manufacturer # : (refer to other side)	Manufacturer # : (refer to other side)	
Dow Agro Sciences		
E.P.A. Registration #: 62719-259	E.P.A. Registration # :	
Active ingredient:	Active ingredient:	
Active ingredient:	Active ingredient:	

Memo:

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Note: All equipment is 20 gallons per acre unless otherwise noted.

OFFICIAL RECORD - DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

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FLATHEAD COUNTY WEED DISTRICT -1257 Willow Glen Drive - Kalispell, MT 59901 - (406) 758-5798 - FAX (406) 758-5888					
Amington be Brabban Equipment 5					
Area of Application: Bigfork t	fudro elect	ric Project	r Application: 1.0 3019		
	Please check (The of the following:			
Federal State		County	Private		
Location description (mile markers, etc):	3505 to 11	SIT, Singled	ccess Maintenance road		
1519 to Pacific Pa	rk		,		
	A	cres treated (#): 1,2	5		
Hour began: <u>1:00</u> Hour finished: <u>1:00</u> Actual spray time: <u>6</u> Total hours: <u>6</u>					
Wind direction: (N) S E	w w	vind velocity: (0-3 mph	4-7 mph; 8-12 mph		
Approximate temperature: <u>65-75</u>	S	ignificant weather factor	s: none		
Noxious weeds treated:					
Spotted knapweed	Canada this	stleLeafy Sp	purgeSt. Johnswort		
Dalmatian Toadflax	Common ta	unsyOxeye [DaisyOrange hawkweed		
Tansy Ragwort Hounds	ongueTa	Il buttercup OTHER	: Mullein		
Trade name: (refer to other side)	Chemica Quantity used:	al(s) applied:	1 Martine and a		
	Quantity used.		Mixture rate:		
Trade name: (refer to other side)	20 0x	-	60 gallon per acre		
The manie. (Teres to other side)	Qualitity used.		Mixture rate:		
Carrier gallons used:	5 	Surfactant total.	1		
Saura Barrow more 1/2	· .	Sarraciani Wiai. 12	- 026		
Description:					
	an an ann an				
		T			
I rade name: (refer to other side)		Trade name: (refer to other side)			
Milestone					
Manufacturer # : (reter to other side)		Manufacturer # : (refe	er to other side)		
Dow Hgro Sciences					
E.F.A. Registration #: 62719-51	7	E.P.A. Registration # :			
Active ingredient:	bild	Active ingredient:			
Active ingredient:		Active ingredient:			
<i>1</i> /		1			
Memo:					
Special management nosting areas					
Vas application enforcement related?					
If yes was application method reviewed with	landowners?		د. المحق		
LANDOWINER SIGNATURE:			DAIE:		
Note: All equip	ment is 20 gallon	s per acre unless oth	erwise noted.		

OFFICIAL RECORD - DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

1

FLATHEAD COUNTY WEED DISTRICT -1257 Willow Glen Drive - Kalispell, MT 59901 - (406) 758-5798 - FAX (406) 758-5888					
Applicators De Brabhan Regimment # 5					
Area of Application: Bigfork H	ydro Electr	ic Project	Application		
Federal State	Please check of	ne of the following: County		Private	
Location description (mile markers, etc);	Trail outsic	le FFRC av	63 to	Dribate	
property designated + marked by Kendel Enguagesson					
Hour began: <u>1.00</u> Hour finished:	1:00 Ac	ctual spray time: 6	To	tal hours: (
Wind direction: N S E	w w	ind velocity: 0-3 mph	;) 4-7	mph; 8-12 mph	
Approximate temperature: 65-75	Si	gnificant weather factor	s: <u>nor</u>	12	
Noxious weeds treated:	. /				
Spotted knapweed	Canada this	tleLeafy Sp	ourge	St. Johnswort	
Dalmatian Toadflax	Common tar	nsy <u>V</u> Oxeye D	aisy	Orange hawkweed	
Tansy Ragwort Houndst	ongueTal	ll buttercup OTHER:	Mulle	211	
Trade name: (refer to other side)	Quantity used:	l(s) applied:	Mixture ra	te:	
Milestone	21 02.		60		
Trade name: (refer to other side)	Quantity used:		Mixture rai	Balluib per acre	
Carrier gallons used: 180		Surfactant total: 2	ninte		
Description			prais		
Description:		en e			
				an a standard and a s	
Trade name: (refer to other side)		Trade name: (refer to	other side)		
Milestone					
Manufacturer # : (refer to other side)		Manufacturer # : (refer to other side)			
Dow Agro Sciences	ŝ				
E.P.A. Registration #: 62719-519	1	E.P.A. Registration # :			
Active ingredient:	4	Active ingredient:			
Active ingredient:		Active ingredient:			
Memo:	-				
Special management posting areas					
Vas application enforcement related?					
If ves, was application method reviewed with landowners?					
LANDOWNER SIGNATURE: DATE					
Note: All comin	ment is 20 colle			_ J	
rote. An equip	ment is 20 ganons	s per acre unless oth	erwise not	eu.	

OFFICIAL RECORD - DO NOT DESTROY FOR AT LEAST THREE (3) YEARS

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Appendix B Noxious Weed Photographs – Baseline & Treatment

1) 1N05, fenced in area near the old fish ladder, before and after treatment.



2) 2N05, various locales along the Swan River Nature Trail, before and after treatment.



3) 3N17, a side trail south of the Swan River Nature Trail, before and after treatment.



4) 4N17, parking area at the east trailhead for the Swan River Nature Trail, before and after treatment.



5) 1S05, the hill behind the powerhouse.



6) 2S05, the flowline east to the FERC boundary, before and after treatment.



7) 3S05, canal intake and access to Pacific Park, before and after treatment.



8) 4S05, Pacific Park and road along canal, before and after treatment.



9) 5S07, South Shore kayaker access parking lot, before and after treatment.



10) 6S07, Kearney Rapids boat launch at Swan River Bridge, before and after treatment.



11) 7S09, concrete flume from headworks to Pacific Park, before and after treatment.



12) 8S09, areas of Pacific Park around the parking area, picnic areas, and outhouse, before and after treatment.



13) 9S09, backup generator enclosure, before and after treatment.



14) 10S17, hillside above the forebay, before and after treatment.



15) 11S17, hillside above the bifurcation, before and after treatment.



16) 12S17, communications line clearing along concrete flume, before and after treatment.



17) 1N19, survey marker on the north side of the nature trail, before and after treatment.



Appendix C Noxious Weed Public Information Signs

Please Help PacifiCorp Prevent Noxious Weeds



Common Tansy Spotted Knapweed

Oxeye Daisy

Canada Thistle

Please remove noxious weeds from your clothing, vehicle, and pets before entering the area and avoid driving or walking through areas where noxious weeds are present. If you encounter any noxious weed infestations please alert PacifiCorp at 503-813-6666 or <u>recreation@pacificorp.com</u>.

Thank you for your assistance.

