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SAGE-GROUSE NESTING AND BROOD-REARING HABITAT MONITORING REPORT FOR 2017

Wild Horse Wind Facility



Puget Sound Energy
Ellensburg, Washington

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1.0 Introduction

This annual sage-grouse nesting and brood-rearing habitat monitoring report has been prepared by Puget Sound Energy (PSE) consistent with the Sage-Grouse Nesting and Brood-Rearing Habitat Restoration and Management Plan (the Management Plan). The Management Plan was developed in consultation with the U.S. Fish and Wildlife Service (USFWS) and the Washington Department of Fish and Wildlife (WDFW), and in coordination with the Wild Horse Wind Facility Technical Advisory Committee (TAC). The purpose of this report is to review the management and monitoring activities during the previous year related to sage-grouse nesting and brood-rearing habitat at Wild Horse.

2.0 Background

In July 2010, the TAC recommended to the EFSEC the adoption of four sage-grouse conservation measures through adaptive management process. EFSEC unanimously approved the motion to adopt these conservation measures, including:

1. Identify and remove all unnecessary fencing and wire within the project boundary to reduce the potential collision hazards for sage-grouse and other wildlife.
2. Mark necessary fences to increase visibility for sage-grouse and where practicable use temporary electric fences and lay-down fences to reduce potential for collisions.
3. Remove inactive raven nests from PSE structures within the Project boundary in accordance with the terms of the Migratory Bird Treaty Act; and
4. In cooperation with WDFW, identify appropriate locations and measures for the improvement of habitat suitable for sage-grouse nesting and brood-rearing.

In the fall of 2010, a restoration site was selected at Wild Horse and site-specific sage-grouse nesting and brood-rearing habitat improvement activities were identified in consultation with the WDFW, USFWS, and BFI native seeds. In spring of 2011, restoration activities were implemented at the site, including erosion control measures, noxious weed management, native vegetation planting, and the installation of temporary electric fencing to exclude livestock.

In spring of 2013, PSE met with WDFW, USFWS, and EFSEC to review the results and effectiveness of the initial site restoration activities and to determine future management activities.

2.1 Initial Management Actions

1. **Hydrology management:** Biodegradable straw wattles were installed in the riparian channel in 2013 with the goal of slowing water velocity and trapping sediment.
2. **Erosion control:** Exposed soils were seeded in 2013 with a native seed mix selected in consultation with BFI native seeds. Biodegradable erosion control blankets were installed on exposed banks of the stream channel to provide additional erosion protection and assist with native vegetation establishment.

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3. **Noxious weed management:** PSE works with a contractor every year to conduct weed management activities twice annually, including spraying for noxious weeds, within the restoration area, in spring and fall using a special, less harmful chemical in spring areas.
 4. **Fencing and visibility markers:** Temporary fencing was replaced with permanent fencing around the restoration site in 2013 to protect the area from livestock grazing. The permanent fencing is consistent with the EFSEC Site Certification Agreement (SCA) to promote safety of big game. Visibility markers were installed on the permanent fencing around the restoration site using NRCS specifications to reduce the potential for sage-grouse fence collisions.

2.2 Initial Monitoring Activities

Using the Sage-Grouse Habitat Assessment Framework¹, two monitoring transects were set up in 2014 within the restoration area, one upland and one riparian. Both breeding habitat (upland) and summer brood-rearing habitat (upland and riparian) transects are monitored for vegetation species composition, percent cover, and weed presence. The transects are also monitored using photo documentation and data sheets specific to each habitat type. Locations of the monitoring transects were recorded using GPS.

In May 2014, trial monitoring activities occurred to test the monitoring methods in the field for breeding habitat (upland transect).

2.3 Subsequent Monitoring & Management Activities

In April of 2015, the upland breeding habitat transect was monitored for sage brush height, shape, and percent cover; perennial grass height and percent cover; forb height and percent cover; and preferred forb availability (species and abundance).

Monitoring activities in 2016 included the breeding habitat survey of the upland transect, summer brood-rearing habitat surveys of both the upland and riparian transects, and inspections of the restoration area three times weekly during the grazing season while cattle were in the area to make sure they didn't breach the enclosure. Management activities included the installation of locks on the restoration area gates during the grazing season, and the installation of signs to inform the public that the area is a habitat restoration site.

3.0 Activities conducted in 2017

3.1 Management Activities

No additional management activities occurred in the habitat restoration area in 2017.

¹ Stiver, S. J., E. T. Rinkes, and D. E. Naugle. 2010. Sage-grouse Habitat Assessment Framework. U.S. Bureau of Land Management. Unpublished Report. U.S. Bureau of Land Management, Idaho State Office, Boise, Idaho.

3.2 Monitoring Methods

The following sections describe the methods used in 2017 to collect data for the breeding habitat monitoring upland transect, and the late summer brood-rearing monitoring upland and riparian transects.

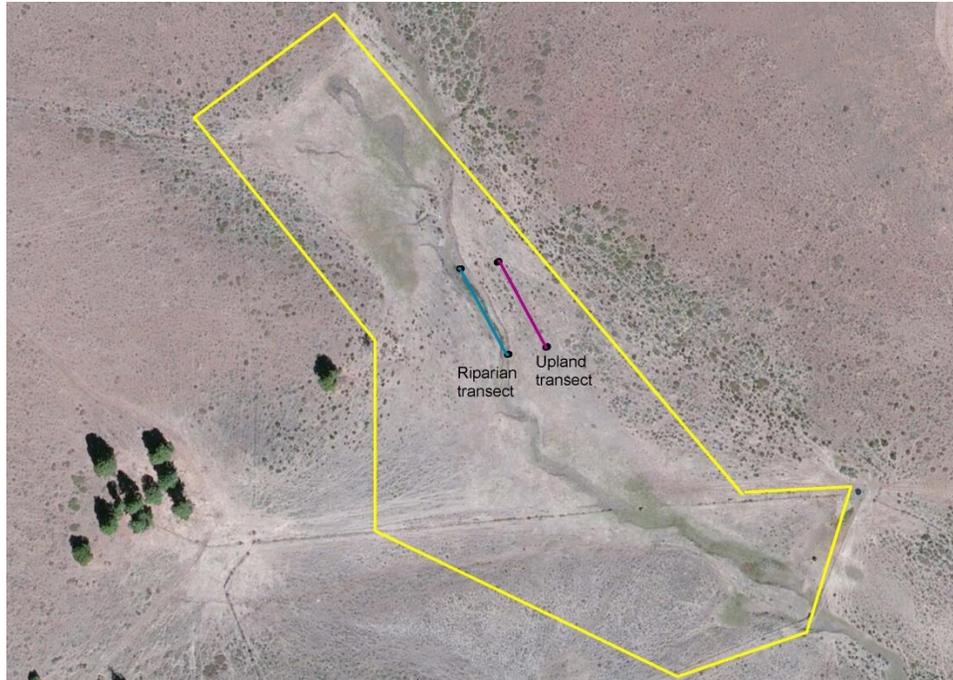


Figure 1. Restoration area boundary and monitoring transects.

3.2.1 Spring Breeding/Nesting Habitat Monitoring

For the nesting (breeding) habitat monitoring survey, the Habitat Assessment Framework recommends collecting data along a 50-meter upland habitat transect and between April and June. A transect was set up during a pilot survey in 2014, and the same monitoring transect has been used in 2015, 2016, and 2017.

The 50-meter upland transect was set up by placing two stakes at either end. The survey was conducted using a point-intercept method, placing the meter stick vertically at each meter along the transect and shrub, grass, and forb species and height were recorded. Sage brush shape was recorded for any sage brush identified along the transect. In addition, using a belt-transect method, all forb species were recorded along the transect using the Sage-Grouse Preferred Forb Availability Data Form.

3.2.2 Summer Late Brood-rearing Habitat Monitoring

For the summer and late brood-rearing habitat monitoring survey, the Habitat Assessment Framework recommends collecting data along both a 50-meter upland habitat transect and a 50-meter riparian habitat transect between July and August. The same upland transect was used for both the upland nesting habitat survey and the upland brood-rearing survey. A second 50-meter transect was set up in the riparian channel immediately downslope of the upland transect. The 50-meter riparian transect was set up in the stream channel by placing two stakes at either end (figure 1).

Using a point-intercept method, the meter stick was placed vertically at each meter along both the upland and the riparian transects and shrub, grass, and forb species were recorded. In addition, using a belt-transect method, all forb species were recorded along the transect using the Sage-Grouse Preferred Forb Availability Data Form. For sage brush identified in the upland transect the shape was also noted. Proximity to large sage brush was noted for both transects, and overall riparian function was noted for the riparian transect. According to the Habitat Assessment Framework and defined by Prichard et al. (1998, 2003) riparian function is generally defined by vegetation and structural components that support stability of the riparian area by:

- Dissipating energy, reducing erosion, and improving water quality;
- Filtering sediment and aiding in floodplain development;
- Improving flood-water retention and ground water recharge;
- Stabilizing streambanks;
- Developing diverse ponding and channel characteristics for fish and wildlife habitat and other uses; and
- Supporting greater biodiversity.

Riparian areas are considered to be in Proper Functioning Condition (PFC) if they possess all of the above characteristics. Functional at risk (FAR) sites possess some or most of these qualities but have at least one component that indicates some degradation. Non-functioning (NF) sites clearly lack the components listed above.

3.3 Monitoring Results

3.3.1 Nesting Habitat Survey

In June 2017, data was collected from the upland breeding habitat transect to determine site suitability based on sage brush percent cover, height, and shape, perennial grass percent cover and height, and preferred forb availability. Using the point-intercept method along the 50m transect, sagebrush made up approximately 10% of cover ($n=5$), with an average height of 36.6 cm and mostly spreading in shape. Overall shrub percent cover (sagebrush, rabbit brush, and bitterbrush) was also 10% of the upland transect. Perennial grasses made up 86% cover, and forbs made up 18% of the transect. Seventeen preferred forb species were identified along the transect in 2017, presented in table 1.

Table 1. Upland breeding habitat preferred forbs species list 2017.

Common name	Scientific Name	Abundance
Yarrow	<i>Achillea millefolium</i>	Abundant
Prairie dandelion	<i>Agoseris heterophylla</i>	Unknown
Blue eyed Mary	<i>Collinsia parviflora</i>	Abundant
Grand collomia (phlox)	<i>Collomia grandiflora</i>	Abundant
Slenderleaf collomia (phlox)	<i>Collomia linearis</i>	Abundant
Woodland star	<i>Descurainea richardsonii</i>	Common
Tall willowherb	<i>Epibolium brachycarpum</i>	Abundant
Parsnipflower buckwheat	<i>Erigonum heracleoides</i>	Sparse
Pinweed/stork's bill	<i>Erodium cicutarium</i>	Common
Prickly lettuce	<i>Lactuca serriola</i>	Abundant
Nineleaf biscuitroot	<i>Lomatium triternatum</i>	Trace
Sulphur lupine	<i>Lupinus laxiflorus</i>	Common
Slender phlox	<i>Microsteris gracilis</i>	Abundant
Douglas's knotweed	<i>Polygonum douglasii</i>	Abundant
Western meadow aster	<i>Symphotrichum campestre</i>	Abundant
Common dandelion	<i>Taraxacum officinale</i>	Abundant
Yellow salsify	<i>Tragopogon dubius</i>	Abundant

Most of the preferred forb species were abundant ($\geq 1\%$) along the transect with the exception of woodland star, pinweed, and sulphur lupine which were common ($0.5 - < 1\%$) and parsnipflower buckwheat which was sparse ($< 0.5\%$). In addition to the preferred forb species listed above, eight other forb species were recorded along the transect, including Torrey's catseye (*Cryptantha torreyana*), western stoneseed (*Lithospermum ruderale*), twin arnica (*Arnica sororia*), blue flag iris (*Iris missouriensis*), wild hyacinth (*Triteleia grandiflora*), Jacob's ladder (*Polemonium micranthum*), whitlow grass (*Draba verna*), and slender tarweed (*Madia gracilis*).

According to the Sage-Grouse Habitat Suitability Worksheet for Breeding Habitat, the Habitat Indicator Suitability Range determined that the sage-grouse restoration area contains suitable breeding habitat. There are three categories of site suitability (suitable, marginal, and unsuitable), and several factors used to determine which category best describes the habitat transect. Sage brush canopy cover (10%) and average sagebrush height (36.6 cm) indicate marginal habitat. However, sage brush shape (spreading), perennial grass and forb height (35.5 cm), perennial grass canopy cover (86%), perennial forb canopy cover (18%), and number of preferred forbs (17) and their abundance (common or abundant) indicate suitable habitat. With the majority of habitat indicators classified as suitable (5) and only two indicators in the marginal category, overall the site is within the range of suitable habitat.



Figure 2. Upland breeding habitat transect April 2015.



Figure 3. Upland breeding habitat transect June 2016.



Figure 4. Upland breeding habitat transect June 2017.

3.3.2 Brood-rearing Habitat Survey

Upland Habitat

In August 2017, data was collected from the upland breeding habitat transect to determine site suitability for brood-rearing based on sage brush percent cover, height, and shape, perennial grass percent cover and height, and preferred forb availability. Using the point-intercept method along the 50m upland transect, sagebrush made up approximately 4% of cover, with an average height of 45 cm and mostly spreading in shape. Overall shrub percent cover (sagebrush, rabbit brush, and bitterbrush) was 6% of the upland transect. Perennial grasses made up 90% cover, and forbs made up 10% of the transect. The majority of habitat indicators fell within the Suitable range, so overall the site is considered suitable for nesting habitat.



Figure 5. Upland brood-rearing habitat transect August 2015.



Figure 6. Upland brood-rearing habitat transect August 2016.



Figure 7. Upland brood-rearing habitat transect August 2017.

Riparian Habitat

In August 2017, data was collected from the riparian habitat transect to determine site suitability for brood-rearing based on riparian function, preferred forb availability, and proximity to sage brush cover. Using the point-intercept method along the 50m riparian transect, grass and forb species were recorded at each meter along the transect and an overall species list was recorded using the belt transect method. Riparian stability is functional at risk (FAR) since the majority of the transect had some or most vegetation or structural components the support proper function, but had at least one component that is at risk. The riparian channel vegetation and structure has improved since 2015 with the exclusion of cattle and weather conditions. There were seven preferred forb species identified in the transect, including western mountain aster (*Symphotrichum campestre*), cup clover (*Trifolium cyathiferum*), small-flowered willowherb (*Epilobium minutum*), tall annual willowherb (*Epilobium brachycarpum*), ciliate willowherb (*Epilobium ciliatum*),

American bird's-foot trefoil (*Lotus purshianus*), and desert parsley (*Perideridia gairdneri*). Most preferred forb species were abundant or common, with the exception of desert parsley (trace) and tall annual willowherb (sparse). Another habitat indicator is proximity to sage brush. In 2017, the riparian habitat transect was estimated to be adjacent (< 90m) to sage brush cover, indicating suitable habitat. This is an improvement over the estimate in 2016 of close proximity (90 - 275m) to sage brush cover, suggesting that sage brush cover is expanding in the habitat restoration area. Considering all these factors, the results of the riparian transect survey indicate that overall brood-rearing habitat condition in the riparian area is suitable.



Figure 8. Riparian brood-rearing habitat transect August 2015.



Figure 9. Riparian brood-rearing habitat transect August 2016.



Figure 10. Riparian brood-rearing habitat transect August 2017.

3.3.3 Feather collection

No feathers were found during habitat monitoring or other activities in the sage-grouse habitat restoration area in 2017.

3.3.4 Pellet count surveys

No pellets were identified in 2017.

3.3.5 Incidental Observations

On December 27, 2017, one female sage-grouse was observed incidentally on WDFW property along the site access road within 200 feet of turbine D31. At the time of the observation, the weather conditions included temperatures below freezing, fog, and no wind. This is an area where there is no grazing, and the turbines were not operating at that time. Video was captured of the sage-grouse and emailed to Mike Schroeder,

WDFW, who confirmed it was a female sage-grouse. On January 3, 2018, the sage-grouse was observed again in the exact same location. At the time of this observation, the weather conditions included temperatures below freezing, clear skies, and no wind. Video was captured of this observation as well.



Figures 11 & 12. Female sage-grouse observed on December 27, 2017 near Turbine D31.

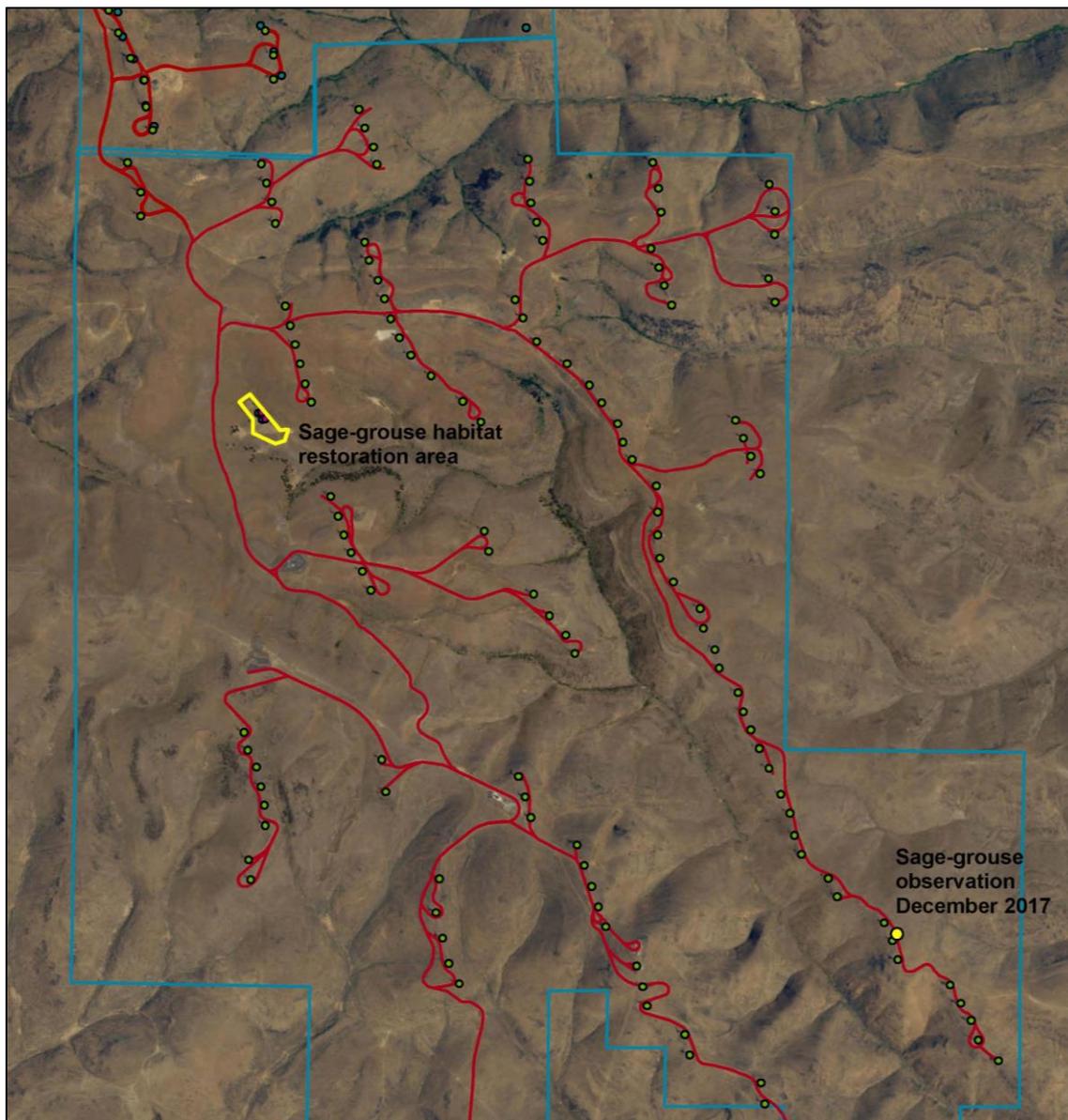


Figure 13. Map of project with 2017 sage-grouse observation and habitat restoration area locations.



Figure 14. Map of 2017 sage-grouse observation location.

4.0 Planned Activities for the Upcoming Season

The following actions are proposed for the 2018 season.

Management Activities

No additional management activities have been identified for 2018.

Monitoring Activities

- Breeding habitat site suitability monitoring (upland transect) scheduled between April and June.
- Summer brood-rearing habitat site suitability monitoring (upland transect and riparian transect) scheduled between July and August.
- The fence and gates will continue to be monitored closely to make sure that cattle are excluded during the grazing season.
- Any feathers or pellets found while conducting other monitoring activities will be documented as described in the Management Plan.

Conclusion

Overall habitat conditions seemed to improve between the 2015 and 2017 monitoring surveys. The 2016 installation of locks on the gates to the restoration area and frequent inspections of the area during the grazing season was successful in excluding cattle from

the area. Sage brush in the upland transect had a higher average height in spring 2017 (36.6 cm) compared to 2015 (30.6 cm). The number of preferred forb species increased from five in 2015 to seven in 2016 and in 2017, a total of 17 preferred forb species were recorded in the upland transect during the breeding habitat survey (table 1). This increase could be due to improved survey methods, survey timing (April 2015 compared to June 2016 and 2017), changes in weather conditions between years, and having a botanist familiar with local plants conduct the surveys. In the riparian area, improvements were noted from 2016 to 2017 in perennial grass canopy cover, perennial forb canopy cover, number of preferred forb species, and overall site suitability for brood-rearing habitat (no brood-rearing habitat surveys were conducted in 2015 due to poor site conditions caused by livestock breaching the fence).

Due to weather conditions, straw wattles, and increased vegetation in the stream channel, there was standing water observed in portions of the channel during the August survey. Since this observation of standing water occurred during the typically dry part of the season, this indicates that the overall functioning of the stream channel is improving. In addition, as sage brush continues to grow larger in the surrounding upland areas, the distance from the riparian channel to large sage brush is decreasing, which will improve the proximity to sage brush cover, and improve the overall suitability of the site. With consideration of the improving conditions observed in riparian habitat transect and site suitability for late summer brood-rearing, as the vegetation returns to the stream channel, vegetative biodiversity is increasing and riparian function is improving.

Table 1. Sage-grouse habitat monitoring results 2015-2017.

Habitat Indicator	Upland breeding (spring)			Upland brood-rearing (summer)		Riparian brood-rearing (summer)	
	2015	2016	2017	2016	2017	2016	2017
Sage brush canopy cover (%)	1	1	10	8	4	0	2
Sage brush height (average, cm)	30.6	29.6	36.6	36	45	0	17
Sage brush shape	spreading	spreading	spreading	spreading	spreading	N/A	spreading
Perennial grass/forb height (cm)	6	20.25	35.5	23.5	25.1	40.5	25.5
Perennial grass canopy cover (%)	68	32	86	16	90	38	90
Perennial forb canopy cover (%)	24	1	17	10	10	0	26
Preferred forb availability	common	common	abundant	common	common	common	abundant
Number of preferred forbs	5	7	18	3	10	5	7
Overall site suitability	marginal	marginal	suitable	marginal	suitable	marginal	suitable

In accordance with the Sage-Grouse Nesting & Brood-Rearing Habitat Restoration and Management Plan, this area will continue to be monitored until 2020, when the TAC will reevaluate the effectiveness of the management actions and the results of monitoring to determine whether the management actions have been successful at restoring the habitat to meet the intentions of the sage-grouse conservation measures identified in coordination with WDFW and USFWS and approved by the TAC.

5.0 References

Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Genhardt, R. Krapf, S. Leonard, B. Mitchell, and J. Staats. 1998. Riparian area management: A user guide to assessing proper functioning condition and the supporting science for lotic areas. Bureau of Land Management, National Applied Research Science Center, Technical Reference 1737-15, Denver, Colorado.

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