

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

1 **I. Introduction**

2 This plan describes methods and standards for restoration of areas of construction
3 disturbance. This plan applies to the areas surrounding the permanent facility components of the
4 Shepherds Flat Wind Farm.¹ The objective of revegetation is to restore the disturbed areas to
5 pre-disturbance condition or better. The site certificate for the facility requires restoration of
6 these areas. This plan has been developed in consultation with the Oregon Department of Fish
7 and Wildlife (ODFW).

8 The areas of construction disturbance include cultivated or otherwise developed
9 agricultural land (cropland) as well as areas of grassland, shrub-steppe habitat and other habitat
10 subtypes (wildlife habitat areas). The intensity of construction impact will vary. In some areas,
11 the impact will be relatively light, but in other areas, heavy construction activity will remove all
12 vegetation, remove topsoil and compact the remaining subsoil. Where vegetation has been
13 damaged or removed during construction, the certificate holder must restore suitable vegetation.
14 In addition, the certificate holder shall maintain erosion and sediment control measures put in
15 place during construction until the affected areas are restored as described in this plan and the
16 risk of erosion has been eliminated. The plan specifies monitoring procedures to evaluate
17 revegetation success of disturbed wildlife habitat areas. Remedial action may be necessary for
18 wildlife habitat areas that do not show revegetation progress. Additional mitigation may be
19 necessary if revegetation is unsuccessful.

20 **II. Description of the Project Area**

21 Most of the area within the site boundary lies within Gilliam County (approximately
22 17,943 acres). Approximately 3,975 acres within the site boundary lie within Morrow County.
23 Habitat in the northern section of the site boundary area (within Gilliam County) is characterized
24 by shallow soils. The area is used primarily for grazing of sheep, but low rainfall (approximately
25 9 inches of precipitation annually) limits forage, and sheep are typically removed from the area
26 from May to November. The northern section contains areas of bare sand, exposed rock and bare
27 soil, and there are numerous unimproved roads and off-road vehicle tracks as well as several
28 electrical transmission line corridors. Some locations are highly disturbed from congregation of
29 sheep around watering and transport sites. Invasive species (such as cheatgrass and spring-
30 Whitlow grass) are the predominant grass species in most areas, but native species (such as
31 Sandberg's bluegrass, needle-and-thread grass, bluebunch wheatgrass and six-weeks fescue) are
32 also present. Portions of Eightmile Canyon lie within or near the site boundary in the northern
33 section. Eightmile Canyon contains an intermittent stream and is cultivated in some areas.

34 The southern section of the site boundary area (within Gilliam and Morrow Counties)
35 contains deeper soils. Most of the area is cultivated for dryland wheat farming. Portions of the
36 southern section are enrolled in the Conservation Reserve Program. Some slopes contain small

¹ This plan is incorporated by reference in the site certificate for the Shepherds Flat Wind Farm and must be understood in that context. It is not a "stand-alone" document. This plan does not contain all mitigation required of the certificate holder.

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

1 stands of big sagebrush in good condition. Fourmile Canyon passes through the south area and
2 contains an ephemeral stream and a diversity of plant species.

3 **III. Revegetation Methods**

4 The certificate holder shall begin restoration of disturbed areas as soon as possible after
5 completion of facility construction activity in the area to be restored. Restoration measures
6 include soil preparation and seeding as described below. Planting should be done at the
7 appropriate time of year to facilitate seed germination, based on weather conditions. The
8 certificate holder shall choose planting methods based on site-specific factors such as slope,
9 erosion potential and the size of the area in need of revegetation.

10 **1. Correction for Compaction**

11 In the northern section, soils are generally too shallow to become compacted by
12 construction activities. Deeper soils in the southern section may become compacted. The
13 certificate holder shall examine disturbed areas as soon as construction is finished in the area.
14 Areas that appear to be affected by compaction will be treated by deep tillage or ripping
15 (scarification) using the method preferred by the landowner. In some areas, compaction might
16 not become evident until vegetation indicates the condition through poor seed sprouting, stunting
17 or plant death. Where that occurs, the area will be tilled or ripped and then re-seeded.

18 **2. Revegetation of Cropland**

19 In the dryland wheat areas, ground disturbance is likely to include off-road trenching for
20 transmission and communication lines, leveling of portions of the crane pads and disturbance by
21 the off-road crane tread paths. Areas disturbed by off-road trenching and crane paths and ground
22 disturbance around power poles and meteorological towers are limited in area and width, with
23 low risk for wind or water erosion of soils. Larger disturbed areas will be cultivated as soon as
24 possible after construction work is done. If it is the proper season for wheat planting and the
25 disturbed area is within a field that is not intended to remain fallow, the area will be planted with
26 a wheat variety selected by the landowner. Otherwise, cultivation and planting will occur on the
27 same schedule as in surrounding fields. The certificate holder will reimburse landowners for the
28 work if landowners prefer to perform the plowing and planting themselves.

29 **3. Revegetation of Wildlife Habitat Areas**

30 The predominant wildlife habitat subtype that will be disturbed by facility construction is
31 grassland. The seed mix used for revegetation in these areas will contain a mixture of species
32 expected to perform well in the affected soils and including, as available, seed adapted to the
33 local environment. The certificate holder will select a seed mix through consultation with the
34 parcel landowner and the grazing right lessee, ODFW, the Oregon State University Extension
35 Service, the Oregon Department of Agriculture, The Nature Conservancy and the Oregon
36 Department of Energy (Department). The certificate holder shall use seed provided by a
37 reputable supplier and complying with the Oregon Seed Law.

38 After construction activities are completed, disturbed areas will be evaluated to determine
39 whether restoration seeding is needed. In some areas where existing vegetation has been crushed
40 but not removed during construction, recovery is likely to occur in a reasonable time without

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

1 intervention. Seeding will not be done in areas where the pre-construction condition was exposed
2 rock, bare soil or sand that is unlikely to support vegetation.

3 Narrow areas of soil disturbance due to off-road trenching, off-road crane paths and other
4 limited disturbance may be seeded and left without mulch. Hand seeding, rather than mechanical
5 seeding, will be used in small areas where the use of planting equipment is likely to increase the
6 area of disturbance. Larger disturbed areas will be seeded followed by application of weed-free
7 straw or other mulch to protect against erosion and preserve moisture. No-till methods, such as
8 drilling or broadcast seeding, will be employed.

9 In the arid climate of the site, successful seeding is limited to mid-fall through very early
10 spring. If seeding of large disturbance areas cannot be accomplished within this optimal seeding
11 period within two months after construction disturbance, the areas will be mulched or otherwise
12 treated to minimize erosion until seeding can be done in the fall.

13 4. Weed control

14 In the spring and early summer (approximately April through June), weeds commonly
15 found on the site can be identified before they seed. After construction, all disturbed areas
16 (except areas of exposed rock, bare soil and sand) will be evaluated annually in the spring for the
17 presence of invasive weed species. The certificate holder shall implement weed control measures
18 recommended by Gilliam County and Morrow County weed control authorities. Annual weed
19 inspection and treatment of revegetation areas will be discontinued in areas that are determined
20 to be successfully revegetated, but the certificate holder shall continue to implement a weed
21 control program during facility operation, as required by Condition 38 of the site certificate.

22 IV. Monitoring

23 1. Revegetation Record

24 The certificate holder shall maintain a record of revegetation work for both cropland and
25 wildlife habitat areas. In the record, the certificate holder shall include the date that construction
26 activity was completed in the area to be restored, a description of the affected area (location,
27 acres affected and pre-disturbance condition), the date that revegetation work began and a
28 description of the work done within the affected area. The certificate shall update the
29 revegetation records from time to time, as revegetation work occurs. The certificate holder shall
30 provide copies of these records to the Department at the time of submitting the annual report
31 required under the site certificate.

32 2. Monitoring Procedures

33 Cropland

34 During the first growing season following planting of cropland previously disturbed by
35 facility construction, the certificate holder shall consult with the landowners on soil compaction,
36 construction-related erosion or poor crop growth in disturbed areas. The certificate holder may
37 rely on the judgment of the landowner regarding any corrective measures needed.

38 Wildlife Habitat Areas

39 The certificate holder shall monitor the revegetation of wildlife habitat areas as described
40 in this section, unless the landowner has converted the area to a use inconsistent with the success

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

1 criteria. The certificate holder shall employ a qualified investigator (an independent botanist or
2 revegetation specialist) to examine all non-cropland revegetation areas to assess vegetation cover
3 (species, structural stage, etc.) and progress toward meeting the success criteria described below
4 in subsection (3). Within representative sample plots, the investigator will estimate the
5 percentages of the area that are covered by bare soil, desirable native vegetation or invasive weed
6 species. The investigator will qualitatively assess the degree of erosion at each site. The
7 investigator will compare the sample plots with representative reference plots of the same habitat
8 category and subtype.

9 The investigator will survey at least 20 percent of the disturbed area. The investigator
10 will select sample plots that are representative of all habitat subtypes disturbed. Sample plots
11 must proportionally represent areas of light disturbance (crushed vegetation) and areas of heavier
12 disturbance (scraped or heavily compacted soil). Reference plots will be selected from nearby
13 undisturbed areas within the same habitat subtype and category. Reference plots should have
14 similar slopes, soil depth and prevalence of rock outcrops as the sample plots to which they will
15 be compared.

16 The investigator shall use the same reference and sample plots for every survey, unless
17 the investigator finds that a plot is no longer suitable for survey purposes. If the investigator
18 finds a plot is no longer suitable, the investigator will select a suitable replacement plot and
19 report the reasons for the replacement to the certificate holder, the Department and ODFW.

20 Revegetation monitoring surveys will be conducted annually beginning one year after
21 initial restoration seeding and continuing until there is sufficient evidence of progress for the
22 Department to conclude that additional revegetation efforts in the area are not necessary.
23 Thereafter, the restored areas will be surveyed at five-year intervals for the life of the facility.²

24 The investigator will report to the certificate holder, the Department and ODFW
25 following each inspection. In the report, the investigator shall include an assessment of whether
26 the revegetated areas are trending toward meeting the success criteria. The investigator will
27 include in the report any remedial actions recommended. The investigator shall include a report
28 on the success of weed control measures.

29 Within each revegetation area, the investigator shall evaluate the progress of habitat
30 recovery in comparison to the reference area. The investigator shall evaluate the following site
31 conditions (both within the revegetation area and within the reference area):

- 32 • Degree of erosion due to disturbance activities (high, moderate or low).
- 33 • Vegetation density.
- 34 • Relative proportion of desirable vegetation as determined by the average number
35 of stems of desirable vegetation per square foot or by a visual scan of the area,
36 noting overall recovery status.
- 37 • Species diversity of desirable vegetation.

² As used in this plan, “life of the facility” means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

3. Success Criteria

Cropland

Cropland areas are successfully revegetated when the replanted areas achieve crop production comparable to adjacent non-disturbed cultivated areas. The certificate holder shall consult with the landowner or farmer to determine whether these areas have been successfully revegetated and shall report to the Department on the success of revegetation in these areas.

Wildlife Habitat Areas

A wildlife habitat area is successfully revegetated when its habitat quality is equal to, or better than, the habitat quality of the reference area as measured by the site conditions listed above in subsection (2). When the Department finds that the condition of a revegetated wildlife habitat area satisfies the criteria for revegetation success, the Department will conclude that the certificate holder has met its restoration obligations for that area. If the Department finds that the landowner has converted a wildlife habitat area to a use that is inconsistent with the success criteria, the Department may conclude that the certificate holder has no further obligation to restore the area for wildlife habitat uses.

Revegetation will be considered successful when:

1. The percentage of vegetation cover by desirable native species in the sample plot is greater than or equal to the percentage of desirable native species cover in the reference plots.
2. The percentage of cover by invasive weed species in the sample plot is less than 10 percent; and
3. The percentage of bare soil in the sample plot is not greater than the percentage of bare soil in the reference plot, unless the percentage of desirable native species cover in the sample plot exceeds the percentage of desirable native species cover in the reference plots as described in #4 below.
4. If the percentage of desirable native species cover in the sample plot exceeds the percentage of desirable native species cover in the reference plots by 10 percent or more, then the percentage of bare soil in the sample plot may exceed the percentage of bare soil in the reference plot by up to 20 percent.

4. Remedial Action in Wildlife Habitat Areas

After each monitoring visit, the certificate holder's qualified investigator shall report to the certificate holder regarding the revegetation progress of each wildlife habitat area. The investigator shall make recommendations to the certificate holder for reseeding or other remedial measures for areas that are not showing progress toward achieving revegetation success.

Indications that an area is not showing progress toward achieving revegetation success include emergence of comparatively few plants one year after disturbance or low vegetation cover in the second monitoring year compared to reference plots and little increase in vegetation between the first and second monitoring year.

The certificate holder shall take appropriate action to meet the objectives of this revegetation plan. If soil compaction is suspected as the reason for lack of progress, the

Shepherds Flat Wind Farm: Revegetation Plan

[JULY 25, 2008]

1 compacted areas may be deep tilled or scarified to reduce compaction, followed by re-seeding.
2 The certificate holder's qualified investigator shall assess the vegetation that has appeared in the
3 disturbed area to determine specific recommendations for remediation.

4 On an annual basis as part of the annual report on the facility, the certificate holder shall
5 report to the Department the investigator's recommendations and the remedial actions taken. The
6 Department may require re-seeding or other remedial measures in those areas that do not meet
7 the success criteria.

8 If a wildlife habitat area is damaged by wildfire, the certificate holder shall work with the
9 landowner to restore the damaged area. The certificate holder shall report to the Department on
10 the damage caused by wildfire and the cause of the fire, if known. The certificate holder shall
11 continue to report on revegetation progress as described in this plan.

12 If an area is not trending toward meeting the success criteria by the fifth monitoring year
13 (and has not been converted by the landowner to an inconsistent use), the certificate holder may
14 conclude that revegetation of the area was unsuccessful and propose appropriate mitigation for
15 the loss of habitat quality or quantity. The certificate holder shall carry out mitigation actions
16 approved by the Department, subject to review by the Oregon Energy Facility Council (Council).

17 **V. Amendment of the Plan**

18 This Revegetation Plan may be amended from time to time by agreement of the
19 certificate holder and the Council. Such amendments may be made without amendment of the
20 site certificate. The Council authorizes the Department to agree to amendments to this plan. The
21 Department shall notify the Council of all amendments, and the Council retains the authority to
22 approve, reject or modify any amendment of this plan agreed to by the Department.