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Genesis Solar Energy Project

Summary Report for Botanical Conservation Measures
Year 2020

Prepared by:

Alice E. Karl, Ph.D.
P.O. Box 74006
Davis, CA 95617
heliophile@mindspring.com

Prepared for:

Genesis Solar, LLC
700 Universe Blvd.
Juno Beach, FL 33408

and

The California Energy Commission
1516 Ninth St.
Sacramento, CA 95814

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1.0 INTRODUCTION

The Genesis Solar Energy Project (GSEP or Project) began construction in January 2011 and became fully operational in Spring 2014. Condition of Certification (COC) BIO-19 from the Project license[1], the approved Project Revegetation Plan[2], the Weed Management Plan[3], and the U.S. Bureau of Land Management (BLM) Right-of-Way (ROW) Grant[4] required that several conservation measures be completed during Project construction and operation to protect and minimize impacts to special-status plant populations and natural vegetation communities and processes. Year 2020 was Year 6 after revegetation, and also the first year in which we did not measure revegetation success, which was required in Years 2, 3, 4, 5, and 10 per BIO-24 and the Revegetation Plan. This report also addresses weed management. Per BIO-14 and the Weed Management Plan, monitoring and managing weed populations in areas disturbed by the Project along the access road and transmission line are continuous.

2.0 CONSERVATION MEASURES COMPLETED IN 2020

2.1 BIO-24 and the Revegetation Plan: Revegetation and Restoration

2.1.1 Background of Restoration Methods

Restoration of temporarily disturbed areas outside the fenced power plant was conducted on the access road shoulders, the 230 kV transmission line tower pads and pulling sites, and minor early access areas. The turnarounds along the access road, initially constructed as temporary turnouts for construction, were not restored, but instead were kept to provide places for personnel and delivery trucks to pull off the access road without disturbing the restored road shoulders.

2.1.1.1 Revegetation Along the Access Road and Associated Tower Pads

Restoration proceeded in phases at GSEP because of phased construction. After the access road was paved in 2011, no further work was planned for the southern (western) disturbed road shoulder except for the future 230 kV transmission line. Accordingly, we restored that side of the road in Fall 2011. It was de-compacted, harrowed, contoured and drill-seeded[5]. Unfortunately, no precipitation fell during the next winter or throughout the following spring and early summer, resulting in

[1] California Energy Commission (CEC). 2010. Commission decision on the Genesis Solar Energy Project. Docket No.09-AFC-8. 710 pp.
[2] Karl, A. and TetraTech EC, Inc. 2010. Revegetation Plan for the Genesis Solar Energy Project. Prepared for Genesis Solar, LLC. 21 pp.
[3] TetraTech EC, Inc. 2011. Weed Management Plan for the Genesis Solar Energy Project. Prepared for Genesis Solar, LLC. 48 pp.
[4] U.S. Bureau of Land Management. 2010. Genesis Solar Energy Project Right-of-Way Lease/Grant. CACA-048880.
[5] Karl, A. 2013. Genesis Solar Energy Project summary report for botanical measures and issues associated with pre-construction and construction to January 2013. Prepared for Genesis Solar, LLC, and the California Energy Commission. 46 pp.

negligible germination. I attempted to water with water trucks each month when there was no rain, beginning in Fall 201l. However, this proved to be unsuccessful, most likely due to the application methods and difficulty prioritizing this task for the water truck. Monsoonal floods occurred in July 2012, by which time it was doubtful that much of the planted seed remained. Most likely, it had been blown away in the heavy spring winds, washed away in the monsoonal floods in July, and/or consumed by granivores.

Beginning in January 2013, the 230 kV transmission line was constructed along the southern (western) access road shoulder. While Genesis Solar, LLC, minimized additional disturbance to native habitats outside the road shoulder during the pole construction, the pole height and short distance between the poles resulted in substantial disturbance to the already-restored road shoulder. As a result, revegetation activities began anew in Fall 2013. I experimented using a box scraper to create patches of swales that varied in shape and size, attending to hydrology. The swales were seeded with mixture of the following, primarily colonizing, species, with the specific mix varying by soil type and hydrology:

Ambrosia dumosa (white bursage)
Ambrosia salsola (cheesebush)
Atriplex polycarpa (allscale)
Encelia farinosa (brittlebush)
Hilaria rigida (big galleta grass)
Lupinus arizonicus (Arizona lupine)
Sphaeralcea angustifolia (globemallow)

The seed was broadcast with a hand-seeder and manually raked in. This was immediately followed by watering with the water truck to crust the soil surface and minimize loss of seed and soil to wind. Comstock Seed (Gardnerville, Nevada), who was previously approved by BLM[6] for the initial seed collection in 2011, provided the seed. They collected it locally in Spring 2013, primarily in the Bradshaw Trail area south of the site. The seed was tested for germination before delivery. Remnant seed from the 2011 revegetation effort was also used.

In 2014 and after much debate, Genesis Solar, LLC, decided to leave the wooden pole distribution line in place in the northern (eastern) road shoulder. Restoration of this side of the road originally had been postponed until after the poles were removed. After the decision to leave the poles in place, I began restoration in March 2014 on this side of the road. Based on the very successful experimental techniques employed the previous fall, I created a highly roughened surface of swales, depressions and furrows (see earlier annual reports for a more detailed description and photographs). These microtopographical features attended to hydrology and soil types, and were varied to create a more natural, heterogeneous outcome. I also created more swales and roughened areas in a few areas on the southern shoulder where no restoration had been done. Primarily, this included ripping pole pads and depositing cobble riprap in multiple locations where runoff across the road tended repeatedly wash out the road shoulder. Because this restoration on both the north side and minor areas on the south was accomplished in March, no seeding was implemented on the

[6] E-mail from Larry LaPre, BLM California Desert District Wildlife Biologist, to Christina Lund, BLM State Botanist. April 25, 2011.

newly contoured areas[7]. Seeding is best accomplished in autumn for spring-blooming (i.e., winter) annuals and, arguably, summer for woody species. Few species germinate when seeded in spring.

No additional restoration has occurred since 2014.

2.1.1.2 Tower Pads from Wiley Well Rest Area to the Colorado River Substation (i.e., Beyond the Access Road).

Along most of the remainder of the transmission line alignment, major surface disturbance was limited to pole pads and stringing/pulling sites. A road was not graded for access for most of the alignment and vehicle damage was generally low, with minimal compaction. Each pad and disturbed area was individually evaluated to determine the best method for restoration. Tower pads in the dunes and very loose-sandy areas were not restored because it was highly likely that greater damage would have resulted from restoration activities than had occurred from the transmission line construction. These surfaces are extremely dynamic and will restore naturally. For tower pads and pulling sites outside these areas, restoration was limited to re-contouring to restore natural drainage, and shallow ripping. Seeding was not implemented because the tower pads comprised small patches of disturbance in generally depauperate habitat.

2.1.2 Monitoring Methods

Quantitative transects to determine perennial plant growth and habitat functioning began in Year 2 and continued through Year 5, with a final effort to occur in Year 10[2]. Because of the staggered restoration efforts, I standardized them to a single starting point: March 2014, when the final major restoration activities were conducted. Year 5 was 2019, during which we conducted the last quantitative data until Year 10. Specific quantitative monitoring techniques have been described in previous annual reports.

Although no quantitative measurements were collected in 2020, I visited the site to qualitatively assess growth. Rainfall was assessed during each year based on a combination of information from the National Oceanic and Atmospheric Administration [NOAA] website for the Blythe airport[8], two rain gauges installed along the road shoulder in October 2016.

2.1.3 Qualitative Habitat Restoration Observations in 2020

In Year 6 after active restoration, shrub and bunch grass regrowth is robust on the restored road shoulders and substantially greater than in the surrounding native habitat (Figure 1), consistent with earlier observations and measurements[9]. Plant density is not only much greater on the shoulders than in the surrounding native habitat, but individuals are robust - creosote bush (*Larrea tridentata*)

[7] Project management wanted to finish all construction activities in Spring 2014, requiring road restoration to be completed in spring.
[8] Available online at https://www.ncdc.noaa.gov/

[9] Karl, A.E. 2020. Genesis Solar Energy Project summary report for botanical conservation measures, Year 2019. Prepared for Genesis Solar, LLC, and the California Energy Commission. 28 pp.

Figure 1. Examples of the high growth in aggressively created berms and swales from Fall 2013 and Spring 2014 restoration

is often over a meter tall. This indicates that revegetation success has proceeded beyond mere germination; growth is also well supported.

2.2 BIO-14 and the Weed Management Plan: Weed Management

2.2.1 Background of Monitoring Methods

The primary noxious weeds at the site are Sahara mustard (*Brassica tournefortii*) and Russian thistle (*Salsola tragus*); a second mustard, London rocket (*Sisymbrium* spp.) is occasional. While all are winter annuals (i.e., they germinate in response to winter rains), Sahara mustard has been observed to respond to large summer rains as well and may have a second spring germination pulse when the soil warms and/or following late winter rains. Sahara mustard also germinates and grows earlier than Russian thistle. Hence, two weeding sessions in spring are often necessary, one in early February and potentially one in late March to early April. Every year when there is winter rain, we survey the access road, surrounding area, and transmission line south of Interstate 10 to evaluate the growth of mustard and the phenology (i.e., growth stage) in late January or early February. During these surveys we remove mustard species and Russian thistle along the access road. In 2020, we checked for weeds from 16 to 19 February.

2.2.2 Weed Observations in 2020

Along the access road to the solar site, Sahara mustard was generally occasional, becoming more abundant in areas of greater water flow or water impoundment. In washes where it was abundant, it was also abundant upslope, prior to reaching the road shoulder. Russian thistle was rare. All plants were in the basal rosette stage, well prior to flowering. All were bagged and removed. During a site visit in October, I observed a small number of Sahara mustard growing in the westernmost end of the access road. These had either escaped weeding in February or germinated later. But, there were virtually no weeds elsewhere on the road shoulders.

Along the transmission line from Wiley Well Road east to the substation, Sahara mustard was occasional to abundant along both the transmission line right-of-way and outside. A total of 599 plants was counted.

Sahara mustard was generally abundant along the facility fence and in the diversion canal. There were also tamarisk (*Tamarix* sp.), an invasive and exotic tree species, growing in seven locations along the fence perimeter and also in the diversion ditch. Weed control in the ditch is managed by the facility and the plants along the fence were too abundant to manually remove, requiring spraying by the Project's herbicide application contractor. I notified Ms. Charlyn Mosley (then Senior Environmental Compliance Officer) of the weed populations and the methods for current removal and future control (Attachment 1). During my October visit, I observed that several tamarisk were still growing in the diversion canal.

3.0 SUMMARY AND RECOMMENDATIONS

3.1 BIO-24 and the Revegetation Plan

3.1.1 Revegetation and Habitat Functioning Success

The site has experienced substantial drought since restoration began in Fall 2013. Three of seven winters have been dry and four summers have had either no rain, or only minor and patchy rainfall. Despite this, the combined restoration approaches of aggressive surface re-contouring to capture seed, sediment, and water, and to a lesser extent active seeding (on the southern shoulder), have successfully resulted in robust germination (initial recruitment) and continued growth toward a mature, functioning community. Soil functioning, water capture and seed capture appear to be sufficient to support continued passive restoration of the road shoulders. No additional efforts are currently recommended.

3.1.2 Future Monitoring

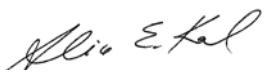
We will quantitatively monitor revegetation success again in 2024 (Year 10) and continue qualitative monitoring until that time.

3.2 BIO-14 and the Weed Management Plan

Weed monitoring and control along the road shoulders has been ongoing and successful. The recommendation is to continue with annual weed control along the road shoulders.

Weed control in the diversion channel around the facility will be perpetually difficult because of water flow and seed/soil accumulation in the rocks. However, post-emergent spraying at the appropriate times will help control weed spread. To control weeds along the fenceline, a pre-emergent herbicide should be applied in October, when the soil is still warm but before the first winter rains. All tamarisk should be removed according the Project's approved Weed Management Plan and Pesticide Use Plan.

This report has been prepared by me and is accurate to the best of my knowledge.



Alice E. Karl, Ph.D.
January 25, 2021

Attachment 1. E-mail from Alice Karl to Ms. Charlyn Mosley, 23 January 2020.

Alice Karl

From: Alice Karl <heliophile@mindspring.com>
Sent: Thursday, January 23, 2020 1:11 PM
To: 'Mosley, Charlyn'
Subject: some weeding is necessary
Attachments: Genesis Jan 2020 weed condition.pdf; Genesis PUP (5).pdf; Genesis Weed Management Plan 011911.pdf

Hi Charly,

We just finished our late winter weed check. See the attached for the solar site.

- **The yellow highlights are mustard.** It's abundant in the channel and along the fence, mostly everywhere except along the southwestern side and where there's been recent blading. The plants are in an early stage now, so the prime time to spray. If you wait even 3-4 weeks, they will already be in seed. Attached is the PUP; it looks like it was only for 3 years and I don't know if this has ever been renewed.
- **The blue highlights are tamarisk**. Those small trees are a lot tougher to get rid of, but the PUP chemicals cover it. In essence, the plants must be hand pulled by the roots or, if a plant is too large (and there are a few of those), it should be cut to near the ground. The cut pieces must either be burned or put in the dumpster. Then, when the stump starts to sprout, the herbicides are applied. It's a two step process for the larger plants that can't be pulled up completely.

The channel will be perpetually difficult, but the fenceline can be sprayed with a pre-emergent in October, when the soil is still warm but before the first winter rains. Just like BEP, that's the way to go and it will help enormously. You can do this in the channels and basins too, and I would recommend it for the smaller, more manageable ones.

Let me know if you have any questions.

Take care, Alice

Alice E. Karl, Ph.D.
Alice E. Karl and Associates
P.O. Box 74006
Davis, CA 95617
Cell: 530 304 4121

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