ATTACHMENT M: HABITAT MANAGEMENT PLAN

Draft Habitat Management Plan for the Wautoma Solar Energy Project

Prepared for:

Innergex Renewable Development USA, LLC
3636 Nobel Drive, Suite 260
San Diego, CA 92122

Prepared by:

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Acronyms and Abbreviations

Applicant	Innergex Renewable Development USA, LLC
ASC	Application for Site Certification
BCC	Benton County Code
BESS	battery energy storage system
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CRP	Conservation Reserve Program
EFSEC	Energy Facility Site Evaluation Council
FHWCA	fish and wildlife habitat conservation areas
GMA	Growth Management Act
HMP	Habitat Management Plan
JARPA	Joint Aquatic Resource Permit Application
O&M	operations and maintenance
Project	Wautoma Solar Energy Project
PV	photovoltaic
RCW	Revised Code of Washington
SCA	Site Certification Agreement
SEPA	State Environmental Policy Act
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project) in unincorporated Benton County, Washington. The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure. The Project consists of solar PV modules (or panels), support structures, electrical collector lines, power conversion systems, electrical inverters, BESS, Project substation, operations and maintenance (O&M) building, access roads, perimeter fencing, and overhead generation-tie transmission line that would connect the Project to the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation.

The Project Lease Boundary (i.e., the extent of parcels in which the Applicant has executed or is pursuing a lease to construct the Project) consists of 5,852 acres encompassing 35 privately owned parcels. Within this area, the Project would be sited within a smaller 4,573-acre Project Area (i.e., the area in which the Project's facilities would be sited during the final design). The Applicant is also pursuing easements/crossing agreements with the Bonneville Power Administration for Project access roads, collection lines, and transmission interconnection as needed within the Project Area.

The Applicant has prepared this Draft Habitat Management Plan (HMP) to support the Project's Energy Facility Site Evaluation Council (EFSEC) Application for Site Certification (ASC) and compliance with applicable regulations.

2.0 Regulations and Guidelines

2.1 EFSEC

Energy facilities subject to review by EFSEC include thermal electrical generation, pipelines, electrical transmission lines, petroleum refineries, petroleum storage, and alternative energy electrical generation (wind, solar, geothermal, landfill gas, wave or tidal action, and biomass). In the state of Washington, however, alternative energy facilities (of any size) are not required to enter the EFSEC process; the Applicant may opt in to the EFSEC process, or may choose to permit the project at the local level. For the proposed Project, the Applicant has elected to be sited under EFSEC jurisdiction.

Once an alternative energy facility has elected EFSEC permitting, EFSEC coordinates all evaluation and licensing steps. EFSEC specifies the conditions of construction and operation. If approved, a Site Certification Agreement is issued in lieu of other individual state or local agency permits. Chapter 80.50 of the Revised Code of Washington (RCW) includes the laws EFSEC must follow in siting and

[1] Megawatt rating provided in alternating current (MWac)

regulating major energy facilities. Title 463 of the Washington Administrative Code (WAC) sets forth the regulations establishing how EFSEC functions under state and federal law.

EFSEC is responsible for evaluating applications under the Washington State Environmental Policy Act (SEPA; see Section 2.3) and to ensure that environmental and socioeconomic impacts are considered before a site is approved. After evaluating an application, EFSEC submits a recommendation to the Governor. If EFSEC determines that constructing and operating the facility will produce minimal adverse effects on the environment, ecology of the land and wildlife, and ecology of the state waters and aquatic life, and meets its construction and operation standards, then it recommends that a Site Certification Agreement (SCA) be approved and signed by the Governor. The SCA lists the conditions the applicant must meet during construction and while operating the facility.

WAC 463-60-332 outlines how potential impacts to habitat, vegetation, fish, and wildlife must be addressed in the EFSEC ASC. This information has been prepared and presented in Sections 4.3, 4.8, and 4.9 of the Applicant's ASC. This Draft HMP has been prepared pursuant to WAC 463-60-332(3), which requires that the EFSEC ASC include a detailed mitigation plan. In addition, this Draft HMP describes how the Project follows the habitat characterization and mitigation provisions of the WDFW Wind Power Guidelines (WDFW 2009), as applicable, and Policy M-5002, pursuant to WAC 463-60-332(4).

2.2 Benton County Critical Areas Ordinance

Under Washington State's Growth Management Act (GMA), all cities and counties are directed to adopt critical areas regulations. Counties and cities are required to include the best available science in developing policies and development regulations to protect the functions and values of critical areas (RCW 36.70A.172). Benton County's Critical Areas Ordinance (CAO) was developed to comply with the requirements of the GMA, and was most recently updated on August 21, 2018, consistent with the GMA periodic review requirement in RCW 36.70A.130.

Benton County's regulations regarding critical areas are established in Title 15 of the Benton County Code (BCC). Title 15 defines critical areas as including any of the following areas or ecosystems: 1) wetlands (see Chapter 15.04 BCC), 2) critical aquifer recharge areas (see Chapter 15.06 BCC), 3) frequently flooded areas (see Chapter 15.08 BCC), 4) geologically hazardous areas (see Chapter 15.12 BCC), and 5) fish and wildlife habitat conservation areas (FWHCA; see Chapter 15.14 BCC).

Per BCC 15.14.010, FWHCAs include the following: 1) areas where federal or state designated endangered, threatened, and sensitive species have a primary association[2]; 2) state priority

[2] Primary association area - The area used on a regular basis by, in close association with, or is necessary for the proper functioning of the habitat of a critical species. Regular basis means that the habitat area is normally, or usually known to contain a critical species, or based on known habitat requirements of the species, the area is likely to contain the critical species. Regular basis is species and population dependent. Species that exist in low numbers may be present infrequently yet rely on certain habitat types (Benton County 2018).

habitats and areas associated with state priority species; 3) habitats and species of local importance as designated by Benton County (i.e., shrub-steppe habitat); 4) waters of the state; 5) naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat; 6) lakes, ponds, streams, and rivers planted with native fish populations; 7) Washington State Wildlife Areas; and 8) Washington State Natural Area Preserves and Natural Resource Conservation Areas (Benton County 2018). Information provided in Sections 4.8 and 4.9 of the EFSEC ASC submitted for this Project, as well as this HMP, addresses the requirement per BCC 15.14.030 for the Applicant to provide a habitat assessment and discuss the habitat avoidance, minimization, and mitigation measures proposed for the Project.

As described in Sections 4.8 and 4.9 of the EFSEC ASC, the Project would include disturbance in areas considered FWHCAs as defined by the CAO (e.g., shrub-steppe and associated wildlife species; elk winter range). This HMP addresses avoidance, minimization, and potential compensatory mitigation for impacts to upland habitats, including upland areas considered FWHCAs. In addition, as described in Section 4.3 of the EFSEC ASC, surveys for the Project identified three emergent wetlands and 34 ephemeral stream segments (which are considered waters of the state) within the Project Area (Tetra Tech 2022). The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the current Project layout. Some Project impacts for temporary and permanent access road crossings will occur within ephemeral streams and frequently flooded areas as described in Part 3 Section 3,and Part 4, Section 4.3 of the ASC, and the Joint Aquatic Resources Permit Application (JARPA) in ASC Attachment T. The Applicant is designing the Project to minimize impacts to ephemeral streams to the extent feasible and will obtain a Washington Hydraulic Project Approval and Clean Water Act Nationwide Permit through the JARPA once potential stream impacts are verified with final design prior to construction. Appropriate avoidance, minimization, and mitigation measures consistent with the Benton County CAO will be developed during development of the JARPA (e.g., erosion control measures). In addition, Part 4, Section 4.3 of the ASC provides additional details on measures that would be implemented to minimize impacts on ephemeral streams within the Project Area.

2.3 Washington State Environmental Policy Act

SEPA is the state interdisciplinary policy that identifies and analyzes environmental impacts associated with state governmental decisions, including permits to construct energy facilities. The applicable SEPA statutes and regulations include RCW Ch. 43.21C, Washington Environmental Policy Act, WAC Ch. 197-11, Washington State Department of Ecology SEPA Rules, and Section 6.35 of the BCC, which establish requirements for compliance with SEPA. As the Applicant has elected to be sited under EFSEC jurisdiction, as discussed above, EFSEC will serve as the lead agency for SEPA review.

This Draft HMP, in addition to the analysis provided in Sections 4.3, 4.8, and 4.9 of the Project's EFSEC ASC, supports the finding that, with the implementation of proposed mitigation, probable significant adverse environmental impacts can be reduced to a level of non-significance as defined and understood in SEPA.

2.4 WDFW Wind Guidelines

The Washington Department of Fish and Wildlife (WDFW) published the Wind Power Guidelines in 2009 to provide consistent statewide guidance for the development of land-based wind energy projects that avoid, minimize, and mitigate impacts to fish and wildlife habitats in Washington state (WDFW 2009). The permitting authority (e.g., EFSEC) is responsible for SEPA review before issuing a project permit. However, WDFW is considered an agency with environmental expertise through SEPA and provides review and comments on environmental documents. Solar power-specific guidelines for solar energy developers to utilize in consideration of mitigation in the state of Washington are not available. Absent this guidance, and consistent with approved mitigation plans for other solar projects in Washington, the Applicant used the Wind Power Guidelines to develop this HMP where applicable, including the mitigation considerations listed below, which summarize the priorities for the habitat selected to replace the functions and values of habitat impacted by the Project (i.e., replacement habitat):

- Like-kind (e.g., shrub-steppe for shrub-steppe, grassland for grassland) and/or of equal or higher habitat value than the impacted area, noting that an alternative ratio may be negotiated for replacement habitat that differs from impacted habitat;
- Given legal protection (through acquisition in fee, a conservation easement, or other enforceable means);
- Protected from degradation, including development, for the life of the project to improve habitat function and value over time;
- In the same geographical region as the impacted habitat; and
- At some risk of development or habitat degradation and the mitigation results in a net habitat benefit.

2.5 WDFW Policy M-5002

WDFW established Policy M-5002 requiring or recommending mitigation in 1999. This policy applies to all habitat protection assignments where WDFW is issuing or commenting on environmental protection permits, documents, or violation settlements; or when seeking commensurate compensation for impacts to fish and wildlife resources resulting from oil or other toxic spills. The Applicant reviewed Policy M-5002 to support the development of this HMP, including the following considerations:

- The goal is to achieve no loss of habitat functions and values. Mitigation credits and debits will be based on a scientifically valid measure of habitat function, value, and area.
- WDFW uses the following definition of mitigation in which avoiding impacts is the highest mitigation priority: actions that shall be required or recommended to avoid or compensate for impacts to fish, wildlife, or habitat from the proposed project activity. The type(s) of mitigation required shall be considered and implemented, where feasible, in the following sequential order of preference:

  - Avoid the impact altogether by not taking a certain action or parts of an action.
  - Minimize impacts by limiting the degree or magnitude of the action and its implementation.
  - Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
  - Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
  - Compensate for the impact by replacing or providing substitute resources or environments.
  - Monitor the impact and take appropriate corrective measures to achieve the identified goal.
- On-site in-kind mitigation is preferred.
- Mitigation plans will include the following: baseline data; estimate of impacts; mitigation measures; goals and objectives; detailed implementation plan; adequate replacement ratio; performance standards to measure whether goals are being reached; maps and drawings of proposal; as-built drawings; operation and maintenance plans (including who will perform); monitoring and evaluation plans (including schedules); contingency plans, including corrective actions that will be taken if mitigation developments do not meet goals and objectives; and any agreements on performance bonds or other guarantees that the proponent will fulfill the mitigation, operation and maintenance, monitoring, and contingency plan.
- Mitigation measures will be completed before or during project construction.
- Mitigation site will be protected for the life of the project.
- Mitigation banking may be an acceptable form of mitigation.

3.0 Agency Consultation History

The Applicant met with representatives of WDFW on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the habitat and wildlife survey timing and survey approach, as well as gave a verbal description of special-status wildlife that may occur in the Project vicinity. The input from WDFW provided during this meeting was used to inform the habitat and wildlife background review and field surveys.

The Applicant met with representatives of WDFW again on February 16, 2022, to discuss the findings of wildlife, habitat, and rare plant surveys conducted within the Project Lease Boundary, as well as to describe the Project's permitting approach and anticipated Project size and components. WDFW noted that the general area where the Project is located has a history of being overgrazed (sheep grazing). In addition, the area has experienced several fires in the last 20 years and there are very few resources available to fight fires in this area of the state. WDFW noted that fire would be a

concern for this Project and offered to advise on fire prevention measures during a subsequent meeting. WDFW also noted that if the Project was able to control for wildfire and grazing in the Project Lease Boundary, it would provide an opportunity to see what would return to the landscape, possibly with limited revegetation given that the area is dry with limited annual rainfall (approximately 8 inches per year). WDFW noted that if ground disturbance is kept to the bare minimum during construction of the solar arrays, active revegetation in these areas may not be required (i.e., following construction, wait and observe what type of vegetation colonizes naturally within the solar arrays once grazing and fire have been removed). If passive revegetation is not successful, adaptive management (e.g., active seeding) could be implemented for revegetation. The discussion of using sheep to control vegetation within the solar arrays was also discussed, and WDFW noted that this should be considered. WDFW also noted that rabbitbrush shrubland habitat should be considered "early stage succession for shrub-steppe" and should be treated as equivalent to shrub-steppe for mitigation. Section 4.0 describes how the Project addresses rabbitbrush shrubland.

4.0 Habitat Mapping

The Applicant conducted field surveys to map and characterize habitat within the Project Area in 2021, as described in Sections 3.8 and 4.8 of the EFSEC ASC as well as the Habitat and General Wildlife Survey Report (Tetra Tech 2022). In general, habitat types were adapted from habitat descriptions in the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009) and Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001), with some modifications as described below. Descriptions of habitat types mapped within the Project Area are provided in the Habitat and General Wildlife Survey Report (Tetra Tech 2022). Table 1 provides a crosswalk between habitats mapped at the Project, Johnson and O'Neil (2001) Habitat Types, and WDFW Habitat Types and Classifications (WDFW 2008, 2009). Vegetation within much of the Project Lease Boundary has been heavily modified by historic and current agricultural use as well as extensive grazing by cattle and sheep, resulting in decreased habitat function. Non-native invasive grasses and forbs are common throughout much of the Project Lease Boundary as a result of historic and current farming and grazing activity.

Three WDFW Priority Habitats were mapped within the Project Lease Boundary: shrub-steppe, eastside steppe (i.e., eastside [interior] grassland), and talus (WDFW 2008). Of the nine upland habitat types mapped within the Project Lease Boundary, two were not readily classified based on existing habitat descriptions from the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009): rabbitbrush shrubland and non-native grassland and forbland. The rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types. Rabbitbrush (*Chrysothamnus viscidiflorus* and *Ericameria nauseosa*), which is the primary shrub found in rabbitbrush shrubland habitat mapped at the Project, readily colonizes disturbed sites such as abandoned agriculture lands, previously grass-

Table 1. Project Habitat Type Crosswalk with WDFW Habitat Type and Classification

Project Habitat Type	Johnson and O'Neil (2001) Habitat Type	WDFW (2008) Priority Habitat	WDFW (2009) Wind Power Guidelines Habitat Type	WDFW (2009) Wind Power Guidelines Classification
Rabbitbrush shrubland[1/]	Not a defined habitat type	Not a Priority Habitat	Not a defined habitat type	Class II
Shrub-steppe	Shrub-steppe	Shrub-steppe	Shrub-steppe	
Talus	Talus	Talus	None	
Eastside (interior) grassland	Eastside (Interior) Grasslands[2/]	Eastside Steppe	Eastside (Interior) Grasslands	Class III
Rabbitbrush shrubland	Not a defined habitat type	Not a Priority Habitat	Not a defined habitat type	
Planted grassland	Agriculture, Pastures and Mixed Environs	Not a Priority Habitat	Conservation Reserve Program (CRP) Lands	
Irrigated hedgerows				
Agricultural land			Croplands, Pasture, Urban and Mixed Environs	Class IV
Non-native grassland and forbland				
Developed/disturbed	Urban and Mixed Environs		Urban and Mixed Environs	

1/ As discussed in the text below this table, the rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types. However, the Project is voluntarily including rabbitbrush shrubland habitat as Class II habitat (i.e., the equivalent of shrub-steppe) for the purposes of this Draft HMP.

2/ In Johnson and O'Neil (2001), this habitat type is also called eastside grasslands.

dominated areas disturbed by overgrazing or fire, or rangelands that have been replanted (Faber-Langendoen et al. 2013; Tirmenstein 1999; USDA 2017). All of these factors have occurred within the Project Area and have likely facilitated the colonization of rabbitbrush shrubs in the area. These factors would likely continue at the site and would likely continue to hinder the succession of rabbitbrush shrubland into shrub-steppe habitat. However, per consultation with the WDFW (see Section 3.0), rabbitbrush shrubland habitat is considered early stage succession for shrub-steppe and was therefore treated as equivalent to shrub-steppe (Class II) habitat for the purposes of this Draft HMP.

The non-native grassland and forbland habitat type corresponds most closely with pasture and mixed environs (Class IV) WDFW habitat. Per WDFW (2009), unimproved pastures are "*predominately non-native grassland sites, often abandoned fields that have little or no active management*…". Per Johnson and O'Neil (2001), modified grasslands, a subcategory of the Agriculture, Pastures and Mixed Environs habitat type, are "generally overgrazed habitats that formerly were native eastside grasslands or shrub-steppe but are now dominated by annual plants with only remnant individual plants of the native vegetation". Modified grasslands, per Johnson and O'Neil (2001) are dominated by non-native grasses, including cheatgrass (*Bromus tectorum*) and other annual bromes, bulbous bluegrass (*Poa bulbosa*), and knapweeds (*Centaurea* spp.), such as the non-native grasslands and forblands mapped at the Project.

Planted grassland most readily falls into the "Unimproved Pasture" subtype of the "Agriculture, Pastures, and Mixed Environs" habitat type (Johnson and O'Neil 2001). Per Johnson and O'Neil (2001), unimproved pastures include *"…rangelands planted to exotic grasses that are found on private land, state wildlife areas, federal wildlife refuges and U.S. Department of Agriculture Conservation Reserve Program (CRP) sites*." Areas mapped as planted grassland in the eastern portion of the Project Area are currently enrolled in the CRP program. Areas mapped as planted grassland in the central and western portions of the Project Area are not enrolled in the CRP program; however, these areas are likely restoration plantings to restore areas burned during past wildfires. Although not currently enrolled in the CRP, these areas were also considered Class III grassland habitat per the WDFW Wind Power Guidelines (WDFW 2009) because these areas appear to have been planted with non-native grasses and native grasses, and are therefore the functional equivalent of typical CRP lands. Similarly, the irrigated hedgerow habitat was considered the functional equivalent of Class III CRP habitat because, per WDFW (2009), habitats classified as CRP includes not only areas planted with grasses, but also "wildlife plantings, trees, filterstrips, or riparian buffers".

5.0 Project Impacts

Construction and operation of the Project would result in both permanent and temporary impacts on vegetation, as well as permanent alterations of vegetation within the solar array's perimeter fence lines. Table 2 provides the anticipated acres of impact to each habitat type from construction and operation of the Project, including acres of temporary, permanent, and altered impacts. The following defines the terms used when discussing the various habit impact types considered in this HMP:

- Permanent impacts include locations where permanent Project components would occur (e.g., solar array panel posts, inverter pads, new permanent access roads, O&M building, Project substation, poles for overhead transmission lines). Vegetation in these areas would be removed for the life of the Project and constitute a permanent habitat loss.
- Temporary impact areas include work areas located outside the solar array perimeter fence that would be disturbed during construction and revegetated following construction, such as laydown areas and pulling areas for the transmission line, a corridor for trenching to install collector lines, and temporary access roads. Temporarily disturbed areas would be revegetated in accordance with a Revegetation and Weed Management Plan that will be developed and agreed upon by EFSEC, with input from Benton County Noxious Weed Control Board and WDFW, prior to construction.
- Altered habitat impacts include lands within the solar array perimeter fence, minus any areas occupied by permanent Project structures. These areas would either be passively or actively revegetated. Passive revegetation would involve waiting to see what plant species colonize naturally following construction (see Section 3.0 above). If passive revegetation is not successful (e.g., native species fail to colonize and site is dominated by non-native

species), active revegetation could then occur. If necessary, active revegetation would include revegetating with low-growing vegetation consisting of native species and/or a mix of native and desirable non-native, non-invasive species. Inclusion of non-native, non-invasive species may be desirable in some instances. For example, some non-native, non-invasive species may provide more rapid soil stabilization and vegetative cover than slower-growing native species. Rapid vegetative cover of these species may also reduce the fuel load created by proliferation of non-native species such as cheatgrass. Following construction and revegetation, these areas would contain an altered vegetation community compatible with solar arrays and support an altered wildlife community that is able to pass over, under, or through the perimeter fence, but would retain value to wildlife as described in Section 6.0 of this HMP.

Table 2. Anticipated Impacts to Habitat Types from the Project

Habitat Type	Temporary Impacts (Acres)[1/]	Altered Habitat Impacts (Acres)[2/]	Permanent Impacts (Acres)[3/]	Total[4/]
Planted grassland	66.4	1,438.8	80.9	**1,586.1**
Agricultural land	5.2	729.4	28.9	**763.5**
Non-native grassland and forbland	34.6	563.0	25.7	**623.3**
Rabbitbrush shrubland	2.7	84.7	4.4	**91.8**
Developed/disturbed	0.6	9.9	0.7	**11.2**
Irrigated hedgerow	0.2	7.3	0.9	**8.3**
Eastside (interior) grassland	2.9	3.1	0.1	**6.1**
Shrub-steppe	2.0	<0.1	0.1	**2.1**
Total[4/]	**114.7**	**2,836.2**	**141.6**	**3,092.5**

1/ Temporary impacts include: collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.

2/ Altered habitat impacts consists of all lands within the perimeter fence lines, minus any areas occupied by permanent Project features/structures.

3/ Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.

4/ Totals may not sum exactly due to rounding.

6.0 Scientific Basis

WDFW (2009) defines permanent impacts to habitat as those impacts that are anticipated to persist and cannot be restored within the life of the project, which may include "new permanent roads, operations and maintenance facilities, turbine pads, impervious and/or areas devoid of native vegetation resulting from project operations." Areas that would be revegetated under the solar arrays following construction of the Project would not be impervious, would not be devoid of native vegetation, and would be revegetated within the life of the Project; therefore, these areas are not considered permanently impacted habitat. Following completion of construction, areas under the solar arrays would be revegetated with either low-growing native vegetation or a mix of native and non-native, non-invasive vegetation.

A recent study demonstrated that successful revegetation under solar panels is possible, even with native grass species adapted to full-sun conditions (Beatty et al. 2017). This study demonstrated that revegetation under solar panels was able to "achieve ground cover sufficient to control erosion and begin to restore wildlife habitat" (Beatty et al. 2017). Research in Oregon (Hassanpour Adeh et al. 2018) quantified changes to the microclimatology, soil moisture, water usage, and biomass productivity due to the presence of solar panels. In this study, areas under PV panels maintained higher soil moisture, showed a significant increase in late season biomass (90 percent more biomass), and were significantly more water efficient (328 percent more efficient), although caution should be used in applying these results from west of the Cascade Mountains to the drier Columbia Plateau (Hassanpour Adeh et al. 2018). Similarly, pre- and post-construction biological monitoring data at a PV solar facility in California indicated similar to higher vegetation productivity on-site compared to reference sites (Sinha et al. 2018). As a result, areas under solar panels that would be revegetated are considered altered habitat impacts rather than temporary or permanent impacts.

Habitat within the solar fence line would remain available to wildlife such as small mammals, birds, reptiles, and invertebrates in an altered condition. Limited research is available regarding the effects of PV array development (including the effects of fencing and shading) on residual wildlife habitat value; however, preliminary studies indicate residual habitat value remains for various species of birds, and the value may differ based on restoration and vegetation management practices. For example, DeVault et al. (2014) studied avian abundance at PV array fields and paired airport grassland areas using transect surveys. The results indicated that airport grasslands generally had greater species diversity and PV arrays generally had more total birds observed; however, overall bird mass was comparable at airport grasslands and PV arrays, suggesting smaller birds tended to use the PV arrays rather than the airport grasslands. Similarly, Visser et al. (2018) measured bird abundance and diversity at a PV array facility in South Africa using point counts within and outside the facility. The primary conclusion of the study was that bird diversity and density were higher outside of the facility, but the facility was not absent of birds. Visser et al. (2018) found that the bird community inside the facility comprised birds that were generalist species or those that use grassland habitat. Thus, the species composition appeared to be associated with a change from a shrub/woodland habitat to a grassland habitat within the facility. H.T. Harvey and Associates (2015) studied avian abundance and behavior using point count methods at a PV array in grassland habitat. Counts were conducted inside the facility and in undeveloped reference areas over a 3-year period before, during, and after construction. The results were highly variable, with some species (e.g., horned lark [*Eremophila alpestris*]) showing increases in abundance over time and within the facility, while others (e.g., mourning doves [*Zenaida macroura*] and raptors) showed decreases during construction and increases in use upon transitioning to operations, but overall higher use in reference areas compared to the facility. This limited research demonstrates that while bird species use may change at PV arrays, use of the area is not eliminated; instead, the altered habitat supports an altered avifaunal community.

Similarly, post-construction biological monitoring data at a PV solar facility in California documented the presence of dozens of wildlife species, including California horned lark (*Eremophila alpestris actia*), ferruginous hawk (*Buteo regalis*), loggerhead shrike (*Lanius*

ludovicianus), prairie falcon (*Falco mexicanus*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), San Joaquin kit fox (*Vulpes macrotis mutica*), and coast range fence lizard (*Sceloporus occidentalis bocourtii*) (Sinha et al. 2018). This California site was reseeded with native flora species to allow vegetation to grow beneath the solar panels, creating new habitats, providing sources of food for various wildlife species, and providing dust control (Sinha et al. 2018). The results of monitoring indicated that although solar facility construction activities do involve short-term disturbance, responsibly developed solar facilities can provide shelter, protection, and stable use of land to support biodiversity (Sinha et al. 2018).

7.0 Proposed Avoidance, Minimization, and Mitigation Measures

The final Project layout will be designed to avoid and minimize impacts on vegetation and wildlife to the extent possible. For impacts that cannot be avoided, mitigation is proposed. As described in WDFW's Policy M-5002 (see Section 2.4), avoidance of impacts is the highest mitigation priority. When impacts cannot be avoided, they should be minimized, restored, reduced, or compensated for, in that order of priority. Benton County's CAO describes mitigation requirements that are consistent with Policy M-5002. The plan presented here is consistent with both the Benton County CAO mitigation guidelines and the WDFW mitigation policy.

7.1 Avoidance and Minimization

Avoidance and minimization measures would be implemented during design, construction, and operation. The following avoidance and minimization measures were either applied during Project development or are proposed for Project construction and operations:

- To minimize impacts to wildlife and habitat, baseline studies were conducted at the Project in coordination with the WDFW and consistent with the WDFW Wind Power Guidelines (WDFW 2009). In order to minimize impacts to and avoid wildlife resources and habitat, the Applicant used the results of these baseline studies to inform the layout design.
- Project facilities were sited on previously disturbed (e.g., cultivated agricultural land, non-native grassland and forbland) areas as feasible to avoid impacts to native habitats and associated wildlife species.
- Project facilities that were sited avoided talus slopes (i.e., a Priority Habitat) by at least 125 feet and burrowing owl nests by 2,800 feet, and impacts to shrub-steppe habitat were minimized to the extent feasible.
- The Project will use industry standard BMPs to minimize impacts to vegetation, waters, and wildlife.
- To the extent feasible, the solar array fence lines have been designed to enclose smaller solar arrays within the Project Area rather than enclosing one large fenced array, which will minimize habitat fragmentation and allow wildlife passage through the area.

- With the exception of fencing around the Project substation, which will extend to the ground, perimeter fencing will be designed to be at least 4 inches above ground. No barbed wire will be used on perimeter fencing around the solar arrays.
- The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area that are used by mule deer and elk for movement corridors as well as for water sources.
- The Applicant is also in discussions with WDFW and affected landowners to see if existing artificial water sources (primarily developed for livestock) can be moved outside of the fenced areas in order to maintain wildlife access to these water sources (including access for elk and mule deer).
- Evening and nighttime construction activities will be avoided to the extent practicable, which will limit the impacts of construction noise to wildlife.
- Vehicle speeds will be limited to 25 mph on internal Project access roads to avoid wildlife collisions. Existing posted speed limits on county and private roads will be followed outside of the Project Area.
- If construction occurs during the bird nesting season, nest clearance surveys will be conducted prior to site disturbance.
- Prior to construction, construction personnel will be instructed on wildlife resource protection measures, including: 1) applicable federal and state laws (e.g., those that prohibit animal collection or removal); and 2) the importance of these resources and the purpose and necessity of protecting these resources. Construction personnel will be trained in the following areas when appropriate: awareness of biological resources (including Priority Habitats and special status species), potential bird nesting areas, and general wildlife issues.
- Overhead power lines are required to connect the Project to the grid. These lines will be designed and constructed to minimize avian electrocution, according to guidelines outlined in Avian Power Line Interaction Committee standards (APLIC 2012).
- The Applicant may also establish and maintain fire and fuel breaks in key areas and have been in discussion with WDFW staff to continue green-stripping areas along the boundaries of the leased parcels. In addition, access roads will be developed and maintained with an approximate 24-foot width to provide sufficient access for fire fighters to the area as well as provide additional fire breaks.
- Fire hazards from vehicles and human activities will be reduced via use of spark arrestors on power equipment, avoiding driving vehicles off roads, and allowing smoking only in designated areas per the requirements of WAC 463-60-352. The Applicant will prepare an Emergency Management Plan that contains fire safety measures, which will be developed with input from applicable agencies.
- During construction, recommended seasonal buffers for all raptor nests would be observed to avoid disturbing nesting activities.

- The Applicant does not anticipate using pesticides during Project construction or operation; if unforeseen circumstances arise that require the use of pesticides, the Applicant will consult with WDFW and EFSEC regarding the use of pesticides to avoid and minimize impacts to burrowing owl (per Larsen et al. 2004).
- Unnecessary lighting will be turned off at night to limit attraction of migratory birds to the area. This includes using lights with timed shutoff, downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights.
- The Project was sited outside of wetlands and waters to the extent feasible to avoid and minimize impacts to these resources as described in Sections 4.3 and 4.5 of the EFSEC ASC, which will also avoid and minimize impacts to species that use these habitats.
- The Applicant will obtain a Hydraulic Project Approval and Nationwide Permit prior to construction.
- Special status plant surveys will be conducted in the spring of 2022 within the portions of the Project Area that were not surveyed in 2021. If special status plant species are observed during these surveys, individuals and populations will be avoided to the extent possible. If avoidance is not possible, mitigation measures for impacts would be developed in consultation with the applicable agencies.
- The Applicant will limit construction disturbance by flagging any sensitive areas (e.g., wetlands, rare plant populations, if present) and will conduct ongoing environmental monitoring during construction to ensure flagged areas are avoided.

7.2 Restoration

A Vegetation and Weed Management Plan would be developed in consultation with the Benton County Weed Control Board and WDFW prior to construction. The Vegetation and Weed Management Plan would include measures designed to ensure successful revegetation, including measures for re-establishing vegetation where appropriate, controlling the establishment or spread of invasive species, weed control, monitoring; it may also include, in coordination with WDFW, adaptive management within the fenced areas (see Section 3.0). Additionally, the Vegetation and Weed Management Plan would include benchmarks and timelines to ensure revegetation success, which incorporate components of the mitigation proposal.

7.3 Fire Protection

During consultation with the WDFW (see Section 3.0), the WDFW informed the Applicant that vegetated “green strips” (i.e., areas planted with grasses and forbs that germinate early and stay green late enough into the season to reduce the spread of wildfires) that serve as fire breaks have been planted in the vicinity of the Project in conjunction with private landowners. WDFW recommended that green strips be incorporated into the Project as a fire prevention measure. The Applicant will work with the WDFW to determine if there are areas within the Project Lease

Boundary or in the vicinity where the use of green strips would be beneficial. If green strips are selected as a fire protection measure, the Applicant would work with WDFW to determine an appropriate width, linear distance, and seed mix for the green strips.

7.4 Compensatory Mitigation

After avoidance and minimization measures have been implemented, some impacts to wildlife habitat would remain. This section describes the options being considered for compensatory mitigation to account for the effects of unavoidable impacts to habitat, in compliance with the regulations and guidelines described in Section 2.0.

Table 3 provides the estimated acres of mitigation based on the acres of each habitat type anticipated to be impacted by the Project as currently designed. In Table 3, the acres of impact are multiplied by the appropriate mitigation ratio, depending on impact type/duration as well as habitat type, in order to determine the necessary mitigation. The mitigation ratios related to temporarily and permanently lost habitats shown in Table 3 are based on the WDFW (2009) Wind Power Guidelines. In the absence of solar-specific guidelines, the Wind Power Guidelines are used here to help achieve WDFW's Policy M-5002 goal of "protecting the productive capacity and opportunities reasonably expected of a site in the future." The altered habitat impact mitigation ratios were developed in the absence of solar development guidelines and considering that revegetated habitat under solar arrays does not meet the definition of temporary or permanent impacts from WDFW (2009) (see Section 6.0). As noted in Section 4.0, the rabbitbrush shrubland habitat at the Project corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types. However, in consultation with the WDFW (see Section 3.0), the Applicant is voluntarily considering rabbitbrush shrubland habitat as early stage succession for shrub-steppe and including rabbitbrush shrubland as Class II habitat (equivalent to shrub-steppe) for the purposes of establishing compensatory mitigation in this Draft HMP.

Table 3 depicts anticipated impacts and mitigation ratios based on the layout described in the Project's EFSEC ASC. These impacts and resulting mitigation acreages will be updated as appropriate once the final design has been completed. As discussed above and in Part 2 of the ASC, the Applicant is considering various design layouts within the Project Area. The preliminary layout of the PV solar system and supporting components accounts for Project size, topography, and other constraints; however, the precise equipment and layout have not yet been finalized and the Applicant seeks to permit a range of technology to preserve design flexibility. The exact locations of Project components may be revised during final Project design, and impacts from the Project could occur anywhere within the Project Area up to the acreage identified in Table 2. The Applicant seeks the ability to scale mitigation identified in Table 3 accordingly. Additionally, per WDFW (2009), alternative ratios may be negotiated for replacement habitat that differs from impacted habitat.

Table 3. Anticipated Impacts by Habitat and Impact Type and Estimated Mitigation Need

Habitat Type	WDFW Classification	Impact (Acres)	Mitigation Ratio	Estimated Mitigation (Acres)
Temporary Impacts[1/]				
Rabbitbrush shrubland[2/]	Class II	2.7	1:1	2.7
Shrub-steppe		2.0		2.0
Eastside (interior) grassland	Class III	2.9	0.1:1	0.3
Irrigated hedgerows		0.2		<0.1
Planted grassland		66.4		6.6
Agriculture	Class IV	5.2	0:1	0.0
Developed/disturbed		0.6		
Non-native grassland and forbland		34.6		
Altered Habitat Impacts[3/]				
Rabbitbrush shrubland[2/]	Class II	84.7	1:1	84.7
Shrub-steppe		<0.1		<0.1
Eastside (interior) grassland	Class III	3.1	0.5:1	1.6
Irrigated hedgerows		7.3		3.6
Planted grassland		1,438.8		719.4
Agriculture	Class IV	729.4	0:1	0.0
Developed/disturbed		9.9		0.0
Non-native grassland and forbland		563.0		0.0
Permanent Impacts[4/]				
Rabbitbrush shrubland[2/]	Class II	4.4	2:1	8.8
Shrub-steppe		0.1		0.2
Eastside (interior) grassland	Class III	0.1	1:1	0.1
Irrigated hedgerows		0.9		0.9
Planted grassland		80.9		80.9
Agriculture	Class IV	28.9	0:1	0.0
Developed/disturbed		0.7		0.0
Non-native grassland and forbland		25.7		0.0
Total[5/]				**911.8**

1/ Temporary impacts include collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.

2/ The rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types (see Section 4.0). However, as discussed above, the Project is voluntarily including rabbitbrush shrubland habitat as Class II habitat (i.e., the equivalent of shrub-steppe).

3/ Altered habitat impacts consists of all lands within the perimeter fence lines, minus any areas occupied by permanent Project features/structures.

4/ Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.

5/ Total may not sum exactly due to rounding.

Mitigation would be achieved by one of the following options, pending concurrence from EFSEC and with further input from WDFW:

- Conservation Easement Option: A conservation easement would be put in place on land acceptable to EFSEC to preserve the acreage noted in Table 3. Mitigation land will be chosen with an emphasis on mitigating those functions and values being impacted by the Project. The actual mitigation acres may be adjusted to account for these functions and values. For example, fewer acres of mitigation land may be required if that land is higher functioning (e.g., provides higher quality habitat, supports WDFW priority species) relative to the Project site or provides a beneficial expansion of high-value habitat (e.g., adjacent to existing or assumed future protected land).
- Conservation Project Funding Option: The Applicant would provide funding to a conservation project to be designated by EFSEC, in an amount to be calculated based on the cost of an easement for the acreage noted in Table 3.

As noted above, the Applicant may also establish and maintain fire and fuel breaks in key areas and have been in discussion with WDFW staff about green-stripping areas along the boundaries of the leased parcels outside of the fenced solar array. Establishment of green-strips, which if planted with a predominantly native seed mix, would not only reduce potential fires in the area, but would also provide beneficial habitat if established in currently disturbed ground dominated by non-native species. If this option is pursued, the Applicant would work with WDFW to determine the number of acres credited as compensatory mitigation to the Project from implementation of this option.

This HMP would be updated and/or supplemented prior to construction to identify the mitigation option selected, and the mitigation would be implemented concurrently with Project construction and continue through the life of the Project. Prior to construction, the Applicant would confirm the selected mitigation option and update or supplement this HMP to describe the mitigation area, as well as provide documentation of a conservation easement and/or a long-term financial commitment, depending on the option selected.

7.5 Monitoring and Reporting

Once the Project design has been finalized, and prior to construction, Table 3 above would be revised to reflect actual habitat impacts and associated mitigation acres as appropriate. The Applicant would provide a memorandum to EFSEC with the updated acreage impact calculations and proposed conservation easement location or conservation project funding (as applicable) for approval by EFSEC. Once the conservation easement has been put in place, a copy of the deed restriction would be provided to EFSEC.

If the conservation easement option is chosen, the mitigation area would be protected from degradation, including development, for the life of the Project, and thus, habitat function and value would likely improve over time as degrading forces are removed. The Applicant would also monitor the habitat impacts following construction to verify the extent of impacts and document post-construction recovery of areas disturbed temporarily or altered as a result of the Project. The

Applicant would report the results of monitoring annually for the first 5 years following construction to EFSEC.

For the conservation project funding option, part of the payment would likely fund a stewardship endowment that would cover costs for the conservation project steward to monitor and report on how they have implemented the funding to meet the mitigation needs of the Project. The Applicant would not be directly involved in this effort, beyond providing the funding necessary to conduct the effort.

7.6 Success Criteria

Mitigation of the impacts to wildlife habitat from the Project may be considered successful if the Applicant 1) protects sufficient habitat to meet the estimated habitat replacement requirements as described in Table 3, allowing for some variance based on functions and values and benefits to wildlife and wildlife habitat provided by the chosen mitigation area, as described in Sections 2 and 7.3 or 2) provides commensurate funding to a conservation project. For the funding option, mitigation would be considered successful at the time of payment to EFSEC.

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