Horse Heaven Wind Project EFSEC Review
Data Request No. 1 – Habitat Field Survey
May 27, 2021

Applicant Responses
June 30, 2021

Data Request 1 Item ID	ASC Section	Item	Question or Information request	Applicant Response (bold text indicates response conclusion and Applicant commitments, including commitments to provide supplemental materials)
Hab-1	Section 3.4.1.1 Appendix K	The Badger Canyon Site Characterization Study (West, 2018) indicated 7.59 acres of riverine habitat (riparian) and 0.49 acres of wetland habitat (emergent wetland in the SE of the project area). West recommended these areas be field confirmed as part of the application field studies. The riparian areas are likely to have deciduous trees, but this habitat type is not discussed in any of the later reports. No deciduous tree habitat types are identified in the Tetra Tech Botany and Habitat Survey Report (2020). Background: The deciduous tree group was selected on the SEPA checklist; however, none of the habitat subtypes match that group.	Confirm whether deciduous trees occur within the Project Lease Boundary. Clarify the habitat subtype that corresponds to deciduous tree group selected in the SEPA checklist.	The referenced riverine/riparian and wetland "habitat" areas are National Wetlands Inventory data summarized by WEST (2018); the analysis in the Application for Site Certification (ASC) relies on more accurate field data within the Micrositing Corridor and Solar Siting Areas, which is where impacts will occur (see Appendix I to the ASC as well as Sections 3.3 and 3.5 of the ASC). Therefore, areas that may be impacted have been field confirmed as part of the ASC field studies, as recommended by WEST (2018). A few deciduous trees were documented during field surveys and were typically single trees with raptor nests (e.g.,the tree located along Coyote Canyon Road, approximately 0.5 mile from Project disturbance, that was used by ferruginous hawks for nesting in 2017, 2018, and 2019; see Section 3.4.2.3 of the ASC) that did not warrant delineation as a separate habitat subtype. **Therefore, "deciduous tree" is selected in section 4a of the SEPA checklist because deciduous trees are known to occur within the Project Lease Boundary, but this is not reflected in the habitat subtypes that would be impacted by the Project because individual deciduous trees were noted as features rather than a separate habitat subtype with a habitat polygon.**
Hab-2	3.3.1.1 Appendix I Appendix L	The Badger Canyon Site Characterization Study (West, 2018) indicated 7.59 acres of riverine habitat (riparian) and 0.49 acres of wetland habitat (emergent wetland in the SE of the project area). West recommended these areas be field confirmed as part of the application field studies. In addition, the Four Mile Site Characterization Report indicates there are 279.43 acres of riparian habitat (which may be outside the proposed footprint of the application due to footprint change). Background: Portions of the solar siting area along Sellards Road not previously surveyed for wetlands were identified for survey in 2021. Appendix I Wetlands and Other Waters Delineation Report study area includes only the turbines, solar siting areas, and micrositing corridor.This information request will inform the impact discussion.	Confirm whether there are any wetlands or riparian areas located in the portions of the Project Site not yet surveyed. Confirm wetlands present in the vicinity that may be impacted (downgradient water flow) by construction.	See response to Hab-1. **Surveys were conducted in 2021 within the previously unsurveyed portions of the Micrositing Corridor (i.e., along Sellards Road) and the results of these surveys will be provided to EFSEC.** One wetland was identified during field surveys in the vicinity of but outside the Micrositing Corridor. This wetland is Class IV and thus according to the Benton County Critical Areas Ordinance (CAO; Benton County Code 09/20/18) the standard buffer width is 40 feet, which is still well outside the Micrositing Corridor. **Therefore, no wetlands are anticipated to be impacted either directly or as a result of downgradient water flow.**
Hab-3	Section 3.4 Appendix K	Unsurveyed areas and ground-truthing of habitats.	Conduct additional special status plant surveys within the unsurveyed areas and provide updated data. Provide updated mapping for the ground-truthing of the turbine footprints, associated corridors, and the solar panel facility footprints.	**Surveys were conducted in June 2021 within unsurveyed areas within the Micrositing Corridor and Solar Siting Area and updated mapping will be provided as requested** once it is processed and has undergone quality assurance/quality control (QA/QC) review.
Hab-4	Section 3.4 Appendix K	Native plants.	Provide relative cover, density, distribution, and health and vigor information for native plants. This applies to past surveys as well as the 2021 habitat survey.	**See Section 3.4.1.1 of the ASC, which describes native and non-native plants present within each habitat subtype, including general cover and density. See Figure 3.4-1 for the distribution of each habitat type and subtype within the Project Lease Boundary, Micrositing Corridor, and Solar Siting Areas**. Project classifications also generally follow Johnson & O'Neil (2001) and the 2009 Wind Power Guidelines, which define ecological function, typical plant density, etc., for each habitat subtype.**The Applicant is developing a table more explicitly listing the general percent cover of dominant shrubs, grasses, and forbs**, but is also awaiting additional details and/or examples from EFSEC/Golder Associates

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				(Golder) on the type of information being requested per call with EFSEC and Golder on June 17, 2021. **The table will be provided along with the 2021 habitat survey report.**
Hab-5	Section 3.4.1.1	The number of threatened and endangered species with potential to occur at or around the site is limited to vascular plants.	Identify all threatened and endangered species with potential to occur at or around the site including non-vascular plants. This applies to past surveys as well as the 2021 habitat survey.	**The Applicant conducted a supplemental review in June 2021 and identified only one threratened or endangered non-vascular species that has the potential to occur at the Project: woven spore lichen (*Texosporium sancti-jacobi*; DNR 2021a, DNR 2021b, WNHP 2019).** This species is typically found in semi-arid shrub-steppe or grassland communities, usually influenced by moisture from a river or lake (Root & McCune 2012). It is generally found in communities that are considered late-successional because they have been free of disturbance for more than 20 years (McCune and Rosentreter 1992; Riefner and Rosentreter 2004). The species is generally considered to occur on flat ground or slightly north-facing slopes that are free from weeds; however, a study published in 2018 found some occurrences of this species in the Horsen Heaven Hills area (outside the Project Lease Boundary) on south-facing microsites on north-facing slopes (Stone et al. 2018). DNR (Washington Department of Natural Resources). 2021a. Field Guide to the Rare Plants of Washinton. Online Guide. Available at: https://www.dnr.wa.gov/NHPfieldguide. Accessed June 2021. DNR. 2021b. Washington Natural Heritage Program List of Mosses. Available online at: https://www.dnr.wa.gov/publications/amp_nh_mosses.pdf. Accessed June 2021. McCune, B., and R. Rosentreter. 1992. *Texosporium sancti-jacobi,* a rare western North American lichen. The Bryologist 95: 329-333. Riefner, R. E. Jr., and R. Rosentreter. 2004. The distribution and ecology of *Texosporium* in southern California. Madroño 51: 326-330. Root, H., and B. McCune. 2012. Surveying for biotic crust lichens of shrub steppe habitats in the Columbia Basin. North American Fungi 7(7): 1-21. Stone, D., A. Hardman, and K. Beck. 2018. Going for the Gold: A Search for *Texosporium sancti-jacobi* in Washington. Report submitted to Spokane District Bureau of Land Management (BLM). December 2018. WNHP (Washington Natural Heritage Program). 2019. 2019 Washington Lichen Species of Special Concern and Review Lists. December 17, 2019. Draft updated 2021 version provided by Walter Fertig (State botanist, WNHP) to Tetra Tech via email June 21, 2021.
Hab-6	Section 3.4.1.1 Section 3.4.1.3 Appendix K	The 2018 site characterization report by West, Inc. in Appendix K indicates woven-spore lichen (*Texosporium sancti-jacobi*) as occurring within 5 miles of the Project.	Conduct surveys for non-vascular special status plants, which do not appear to be included in the 2020 Tetra Tech surveys. Include the woven-spore lichen in Section 3.4.1.1. (Currently Section 3.4.1.1 is restricted to discussions on vascular plants).	Woven-spore lichen is the only listed non-vascular species with potential to occur at the Project. The locations of previously identified woven-spore lichen in the vicinity of the Project are described in Tetra Tech's 2020 Botany and Habitat Survey Report (Appendix K to the ASC). **In lieu of non-vascular species surveys, as discussed on a June 17, 2021 call with EFSEC/Golder, the Applicant is conducting a habitat suitability assessment for this species to quantify potentially suitable habitat at the Project** (see habitat description in response to Hab-5). **The results of this habitat suitability assessment will be provided along with the 2021 habitat survey report.** The Applicant has provided a draft mitigation plan as part of the ASC that addresses impacts to shrub-steppe, and thus may mitigate impacts to woven-spore lichen, if the species is present, by conserving similar habitats to those impacted by the Project.
Hab-7	Section 3.4.1.1	Invasive species and revegetation. Background: This information request will inform discussion on revegetation efforts, including noxious weed and non-native invasive species.	Collect field data on non-native invasive species.	**See Section 3.4.1.1 of the ASC, which describes native and non-native plants present within each habitat subtype. See Figure 3.4-1 for the locations of each habitat type and subtype within the Project Lease Boundary, Micrositing Corridor, and Solar Siting Areas**. Noxious weeds documented during field surveys are also presented in Table 3.4-2, Tetra Tech's 2020 Botany and Habitat Survey Report (e.g., see Figure 3) and further described in the Revegetation and Noxious Weed Management Plan (Appendix N to the ASC). **The Applicant is developing a table more explicitly listing the general percent cover of dominant shrubs, grasses, and forbs,** but is also awaiting additional details and/or examples from EFSEC/Golder on the type of information being requested.**The table will be provided along with the 2021 habitat survey report.**

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Hab-8	Section 3.4.2	Shrub-steppe and dwarf shrub-steppe habitat. Background: This information request will inform the shrubsteppe and dwarf shrubsteppe impact discussion in a broader context of the surrounding area (i.e., in areas adjacent to the Project site, do other shrubsteppe ecosystems occur or does the loss constitute some of the last remaining areas around the Project).	Verify the shrubsteppe ecosystems in the field. Add any areas that were not included in the earlier habitat surveys.	**Surveys in 2021 (as well as 2020) included verification of shrub-steppe ecosystems in the field.** Intact shrub-steppe occurs on the Horse Heaven Hills ridgeline, located primarily north of the Project (as mapped in the WDFW Priority Habtiats and Species [PHS] database), and several areas of shrub-steppe were mapped within the Project Lease Boundary but have been avoided by Project impacts (see Figure 3.4-4 of the ASC). Thus, t**he limited impacts to shrub-steppe habitat from the Project do not constitute impacts to some of the last remaining shrub-steppe in the Project vicinity.**
Hab-9	Section 3.4.2	Plant species at risk (vascular and non-vascular) in the remaining unsurveyed areas. Background: This information request will inform the impact discussion of at risk plant species within the plant population.	Complete surveys for plant species at risk (vascular and non-vascular) in the remaining unsurveyed areas.	See response above to Hab-3, Hab-5, and Hab-6. Tetra Tech reviewed the Washington Natural Heritage Program (WNHP) list of rare plants prior to conducting surveys. In Washington, plants are tracked and ranked by the WNHP; although WNHP is not a regulatory agency, the program's list and rankings help inform conservation decisions relating to rare plants. As described in Tetra Tech's 2020 Botany and Habitat Survey Report (in Appendix K to the ASC), special status plant species targeted during the surveys included federally and state listed endangered, threatened, and candidate vascular plant species and sensitive vascular plant species as defined by WNHP. Following the June 17, 2021 call with EFSEC/Golder, EFSEC clarified that the request to identify "plant species at risk" was meant to include plant species designated threatened, endangered, or special status. Following this discussion, **the Applicant reviewed the WNHP lists of threatened and endangered mosses and lichens and determined only one threatened non-vascular species (woven-spore lichen) has potential to occur at the Project. The Applicant is conducting a habitat suitability assessment for this species in lieu of non-vascular species surveys.**
Hab-10	Section 3.4.3	The habitat mapping is a combination of 2020 habitat classification field work, 2018 habitat mapping, and aerial imagery/government data sources.	Update the habitat mapping based on results of additional surveys in the proposed mitigation sections.	**Surveys were conducted in June 2021 within unsurveyed areas within the Micrositing Corridor and Solar Siting Areas and updated mapping will be provided as requested once it is processed and has undergone QA/QC review.**
Hab-11	Appendix K Section 3.4.1.3	Wildlife Baseline data	Conduct surveys to provide additional information on the occurrence of Special Status Wildlife within the Site and buffer area, specifically small mammals, herptiles, and bird species not adequately addressed through the aerial and point count survey method. Include data on presence, distribution, and habitat availability within the project lease boundary and buffer area.	**The ASC describes the presence, distribution, and habitat availability within the Project Lease Boundary for special status wildlife based on a review of desktop resources (e.g., PHS data), the results of habitat surveys, and field observations during other field surveys conducted from 2017 through 2020 (e.g., see Section 3.4.1 and Tables 3.4-3 and 3.4-4 in the ASC).** The Applicant coordinated with WDFW regarding survey methods and results and Project permitting in 2017, 2020, and 2021 (and with USFWS in 2017 and 2020). The Applicant has not conducted species-specific surveys for special status species (e.g., small mammals, herptiles) within the Project Lease Boundary because surveys are not required on private land and were not recommended by WDFW during agency coordination for the Project. **Additional context for the potential for special-status wildlife is provided in Attachment 1**, which provides modeled predicted habitat based on Gap Analyis Program (GAP) data for the following special-status small mammals, herptiles, and bird species with the potential to occur in the vicinity of the Project: American white pelican (*Pelecanus erythrorhynchos*); black-tailed jackrabbit (*Lepus californicus*); burrowing owl (*Athene cunicularia*; also see response to Hab-14 below); ferruginous hawk (*Buteo regalis*); great blue heron (*Ardea Herodias*); ring-necked pheasant (*Phasianus colchicus*); striped whipsnake (*Masticophis taeniatus*; also see response to Hab-13 below); Townsend's big-eared bat (*Coryhorhinus townsendii*); Townsend's ground squirrel (*Urocitellus townsendii townsendii*; also see response to Hab-12 below); tundra swan (*Cygnus columbianus*); white-tailed jackrabbit (*Lepus townsendii*); loggerhead shrike (*Lanius ludovicianus*; also see response to Hab-14 below); sagebrush sparrow (*Artemisiospiza nevadensis*), and sage thrasher (*Oreoscoptes montanus*). Because Vaux's swift (*Chaetura vauxi*) had no predicted habitat in the area, no map is provided.

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				Modeled predictions of suitable species habitat should be combined with the site-specific habitat surveys conducted for the Project, and other desktop resources discussed in the ASC, to assess the potential for each species to occur at the Project because the models are intended for use at the landscape scale rather than as precise predictions of species occurrence/absence at local scales. For example, GAP models predicted habitat for striped whipsnake within the Project Lease Boundary (Attachment 2); however, according to WDFW (as described in the ASC), only two populations of this species are verified still existing, neither of which are located in the vicinity of the Project Lease Boundary, and the habitat of the still existing populations includes basalt outcrops and relatively undisturbed shrubland with grasses and a low cover of invasive cheatgrass, which is absent from the Project Lease Boundary. Similarly, GAP models limited predicted habitat for Townsend's ground squirrel within the Project Lease Boundary, primarily at the northern and southern edges of the Project Lease Boundary; however, the ASC conservatively describes that approximately 1,554 acres of suitable habitat (consisting of shrubland and grassland) would be impacted during construction, and proposes compensatory mitigation to offset these impacts. Additional discussion of the potential for special-status mammals, herptiles, and bird species to occur within the Project Lease Boundary is provided on pp. 3-103 through 3-127 and 3-134 through 3-140 of the ASC.
Hab-12	Appendix K Section 3.4.1.3	Wildlife Baseline data	Conduct colony surveys for Townsend's ground squirrel to cover the full Lease Area. Alternatively, share with EFSEC before the last survey window why colony surveys and habitat surveys for Townsend's ground squirrel, which were conducted in 2018 within a portion of the Project, were not extended over the full Lease Area. Provide clarification on methods applied and discuss in the context of the wider project area.	See response to Hab-11 above. **A habitat assessment site visit was conducted in 2018 for Townsend's ground squirrel at the location of the proposed substation only because this was requested by Bonneville Power Administration in relation to their interconnection agreement and associated National Environmental Policy Act (NEPA) review.The ASC quantifies impacts to Townsend's ground squirrels based on PHS data as well as habitat data collected during habitat field surveys.** As stated in the ASC, if impacts to suitable habitat cannot be avoided during final design or fully mitigated through the Washington Department of Fish and Wildlife (WDFW) compensatory mitigation process, the Applicant will consult with WDFW regarding the need for Townsend's ground squirrel surveys prior to construction. Although not a substitute for site-specific habitat survey results, an additional perspective on suitable habitat for Townsend's ground squirrel is provided in the attached modeled predicted habitat based on GAP data. GAP modeling predicts limited, patchy suitable habitat within the Project Lease Boundary, with the majority of larger areas of potentially suitable habitat more likely to occur to the north and south of the Project. See also p. 3-104 of the ASC.
Hab-13	Section 3.4.1.3	Wildlife Baseline data	Conduct surveys and map habitat suitability for Special Status herptiles. Alternatively, share with EFSEC before the last survey window why no species-specific studies were conducted for special status reptiles.	See response to Hab-11 above. **The ASC identifies potential habitats for special status herptiles (sagebrush lizard and striped whipsnake) based on PHS data as well as habitat data collected during habitat field surveys.** Additional context regarding the potential for these species to occur within the Project Lease Boundary is provided in the attached modeled GAP predicted habitat map for striped whipsnake (Attachment 1), as well as the ASC discussions on p. 3-135.
Hab-14	Section 3.4.1.3	Wildlife Baseline data	Conduct surveys and map habitat for Special status species. Alternatively,share with EFSEC before the last survey window why no species-specific studies were conducted for burrowing owls, or loggerhead shrike, which have potential or have been recorded within the Project area.	See response to Hab-11 above. **The ASC identifies potential habitats for burrowing owls and loggerhead shrike based on PHS data as well as habitat data collected during habitat field surveys.** Additional context is provided in the attached modeled GAP predicted habitat map for burrowing owls and loggerhead shrike (Attachment 1), as well as the ASC discussions on p. 3-104 to 3-106.
Hab-15	Section 3.4.1.3	Wildlife Baseline data	Provide information on the presence of jackrabbit and jackrabbit habitat. Alternatively, share with EFSEC before the last survey window why species specific studies for jackrabbit were not conducted.	See response to Hab-11 above. **The ASC identifies potential habitats for jackrabbits based on PHS data, personal communication with WDFW (see Chatfield and Brown 2018a,b) as well as habitat data collected during habitat field surveys (see Section 3.4.2.3 of the ASC).** Additional context is provided in the attached modeled GAP predicted habitat maps for

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				black-tailed jackrabbit and white-tailed jackrabbit (Attachment 1), as well as the ASC impact discussion on p. 3-134.
Hab-16	Section 3.4.1.2. Section 3.4.1.3	Buffer Background: The project footprint in the 2017 and 2017-2018 studies is smaller than the proposed footprint in the Application and does not include the western edge of the footprint. The aerial surveys for raptors buffered the 2017 footprint by 2 miles for most raptors, and buffered 10 miles for eagles in 2018. As such, these survey areas covered most of the project footprint.	Conduct aerial raptor surveys on the western edge of the proposed project footprint. Explain how information was collected beyond the project footprint described in the application (i.e. 2 miles for raptors, and 10 miles for eagles).	**Aerial raptor nest surveys have been conducted on the western edge of the Project.** See the Raptor Nest Survey Area Figure included as **Attachment 2** to this response, which displays the various Raptor Nest Survey Areas in relation to currently proposed Project infrastructure, summarized based on data presented in the Project's Bird and Bat Conservation Strategy. The area added to the western portion of the Project since surveys were conducted is primarily solar infrastructure (not turbines). WDFW typically requests, at a minimum, one raptor nest survey during the breeding season be conducted within 1 miles of ground disturbance associated with wind projects, and within 0.5 miles of ground disturbance associated with solar projects. Additionally, the U.S. Fish and Wildlife Service (USFWS) recently revised its eagle survey recommendations for wind projects, reducing the 10-mile nest survey buffer to a 2-mile nest survey buffer. Because of the potential occurrence for sensitive species in the area, the Applicant increased the survey area to 2 miles from proposed turbines during each survey year (proposed turbine locations shifted over the three years during which surveys were conducted). **Therefore, the surveys conducted to date meet or exceed agency recommendations for both wind and solar facilities**. **Information was collected beyond the Project footprint in the same manner it is was collected within areas proposed to be impacted by the Project, as described in Section 3.4.1.3 of the ASC, Section 5.2.3 of the Bird and Bat Conservation Strategy (Appendix M to the ASC), as well as in the individual survey reports (Appendix K to the ASC).**
Hab-17	Section 3.4.3	The habitat mapping is a combination of 2020 habitat classification field work, 2018 habitat mapping, and aerial imagery/government data sources.	Update the habitat mapping based on the results of additional surveys conducted in 2021. Include the ground truthing level of effort.	**Surveys were conducted in June 2021 within unsurveyed areas within the Micrositing Corridor and Solar Siting Area and updated mapping will be provided as requested once it is processed and has undergone QA/QC review. The ground-truthing level of effort will be described in the survey report.**
Hab-18	Section 3.4.3 Appendix L	Section 2.20 Table 2.20-1 Planned Environmental Studies indicate habitat and rare plant surveys for solar areas of interest only. Solar facilities and micrositing corridors not surveyed were proposed to be surveyed pre-construction, but only the solar facilities were listed in mitigation. Appendix L indicates mitigation for additional rare plant surveys at all unsurveyed areas of the micrositing corridor and the solar siting area.	Update the rare plant survey mitigation to include additional surveys conducted in 2021.	Surveys were conducted in June 2021 within unsurveyed areas within the Micrositing Corridor and Solar Siting Area and **updated rare plant survey results will be provided once the data are processed and have undergone QA/QC review.** Although these surveys primarily occurred within the Solar Siting Areas, they also included other portions of the Project Micrositing Corridor that were not surveyed in 2020, as described in Section 3.4.3 (Mitigation Measures) and Appendix L of the ASC. **No rare plants were observed during 2021 surveys and, as a result, no rare plant mitigation is needed.**
Hab-19	Appendix L	Habitat function assessment.	What were the scientifically based methods and surveys used to assess habitat function in the impacted areas (e.g. Washington Natural Heritage Program Upland Environmental Integrity Assessment).	**Surveys for habitat were based on the habitat types and classfications in the *Washington Department of Fish and Wildlife Wind Power Guidelines* (WDFW 2009) as well as *Wildlife-habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001), as discussed with WDFW.** Habitats were characterized by recording the dominant plant species and general condition of the habitat. **Field data collected to assess habitat function included many of the metrics described in the Washington Natural Heritage Program Upland Environmental Integrity Assessment, including level of disturbance (e.g., agricultural and grazing activity), general percent cover of native versus non-native species, species diversity and composition, and presence of noxious weeds (see Tetra Tech's 2020 Botany and Habitat Survey Report). Additional ecological attributes reviewed during the development of the ASC included level of habitat connectivity and fragmentation.**

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Hab-20	Section 3.4 Appendix K	Wildlife Baseline data	What is the presence and habitat use of non-aerial species including small mammals, herptiles, and invertebrates?	**See responses to Hab-11 through Hab-15.**
Hab-21	Section 3.4.1.2 Section 3.4.1.3	Wildlife Baseline data	What is the potential for the project site to support bat hibernacula or potential for hibernacula to be disturbed during construction and operation?	**The Project has a low likelihood of supporting bat hibernacula and thus disturbance to bat hibernacula is not expected during construction or operation.** No bat hibernacula were identified in PHS data requests within 3 miles of Four Mile and Badger Canyon, which includes large portions of the current Project Lease Boundary. Caves, lava tubes, mines, old buildings, and bridges are absent from the Project Lease Boundary, and a query of the PHS database did not return any results for cliffs, caves, talus, or bat concentration areas in the Project vicinity. Additionally, during discussions with WDFW and USFWS since 2017, specifically with respect to bird and bat survey protocols and species presence, bat hibernacula were not identified as a biological resource of concern. The large majority of bat species identified during multi-year acoustic monitoring stations located throughout the Project were migratory tree- and leaf-roosting bats, which do not aggregate in hibernacula and are absent from the Project during winter. Please see technical bat acoustic monitoring reports (Appendix K to the ASC) for more information.
Hab-22	Section 3.4.1.2 Section 3.4.1.3	Wildlife Baseline data	What are the anthropogenic features (i.e. dugouts) that could be used by wildlife (i.e. amphibians)?	**No dugouts were observed during surveys and none have been documented within the Project Lease Boundary.**

Attachment 1. Wildlife Habitat Modeling

SUPPORTING DATA

Response to Hab-11 through Hab-15

As discussed in the response to comments above, the Applicant believes they have sufficiently addressed impacts to special status species through years of consultation with WDFW, thorough site-specific surveys and discussion in associated technical reports (i.e, habitat mapping, bat acoustic monitoring, etc.), and resulting impact assessments in the ASC that meet the Standards. Per the EFSEC request, maps of predicted habitat were developed using GAP to supplement the analysis and data presented in the ASC. Predicted habitat was mapped for the following 14 species in the Project vicinity:

- American white pelican
- black-tailed jackrabbit
- burrowing owl
- ferruginous hawk
- great blue heron
- loggerhead shrike
- ring-necked pheasant
- sage thrasher
- sagebrush sparrow
- striped whipsnake
- Townsend's big-eared bat
- Townsend's ground squirrel
- tundra swan
- white-tailed jackrabbit

GAP Predicted Habitat Maps

GAP habitat maps are predictions of the spatial distribution of suitable environmental and land cover conditions within the United States for individual species. Mapped areas represent places where the environment is suitable for the species to occur (i.e., suitable to support one or more life history requirements for breeding, resting, or foraging), while areas not included in the map are those predicted to be unsuitable for the species. While the actual distributions of many species are likely to be habitat limited, suitable habitat will not always be occupied because of population dynamics and species interactions. Furthermore, these maps correspond to midscale characterizations of landscapes, but individual animals may deem areas to be unsuitable because of presence or absence of fine-scale features and characteristics that are not represented in our models (e.g., snags, vernal pools, shrubby undergrowth). These maps are intended to be used at a 1:100,000 or smaller map scale.

These habitat maps are created by applying a deductive habitat model to remotely-sensed data layers within a species' range. The deductive habitat models are built by compiling information on species' habitat associations into a relational database. Information is compiled from the best available characterizations of species' habitat, which included species accounts in books and databases, as well as primary peer-reviewed literature. The literature references for each species are included in the "Species Habitat Model Report" and "Machine Readable Habitat Database Parameters" files attached to each habitat map item in the ScienceBase repository[1]. For all species, the compiled habitat information is used

[1] https://www.sciencebase.gov/catalog/item/527d0a83e4b0850ea0518326

by a biologist to determine which of the ecological systems and land use classes represented in the National Gap Analysis Project's (GAP) Land Cover Map Ver. 1.0[2] that species is associated with. The name of the biologist who conducted the literature review and assembled the modeling parameters is shown as the "editor" type contact for each habitat map item in the repository.

For many species, information on other mapped factors that define the environment that is suitable is also entered into the database. These factors included elevation (i.e., minimum, maximum), proximity to water features, proximity to wetlands, level of human development, forest ecotone width, and forest edge; and each of these factors corresponded to a data layer that is available during the map production. The individual datasets used in the modeling process with these parameters are also made available in the ScienceBase repository. The "Machine Readable Habitat Database Parameters" JSON file attached to each species' habitat map item has an "input_layers" object that contains the specific parameter names and references (via Digital Object Identifier) to the input data used with that parameter. The specific parameters for each species were output from the database used in the modeling and mapping process to the "Species Habitat Model Report" and "Machine Readable Habitat Database Parameters" files attached to each habitat map item in the repository.

Data Limitations

It should be noted that all ranges and distribution models are predictions about the occurrence of a species within the U.S. GAP ranges and distribution models and are intended for use at the landscape scale (i.e., areas the size of square kilometers). They are not intended to be precise predictions of species occurrence/absence at local scales (areas the size of square meters). It is important for GAP data users to evaluate the suitability of the data for their intended purpose.

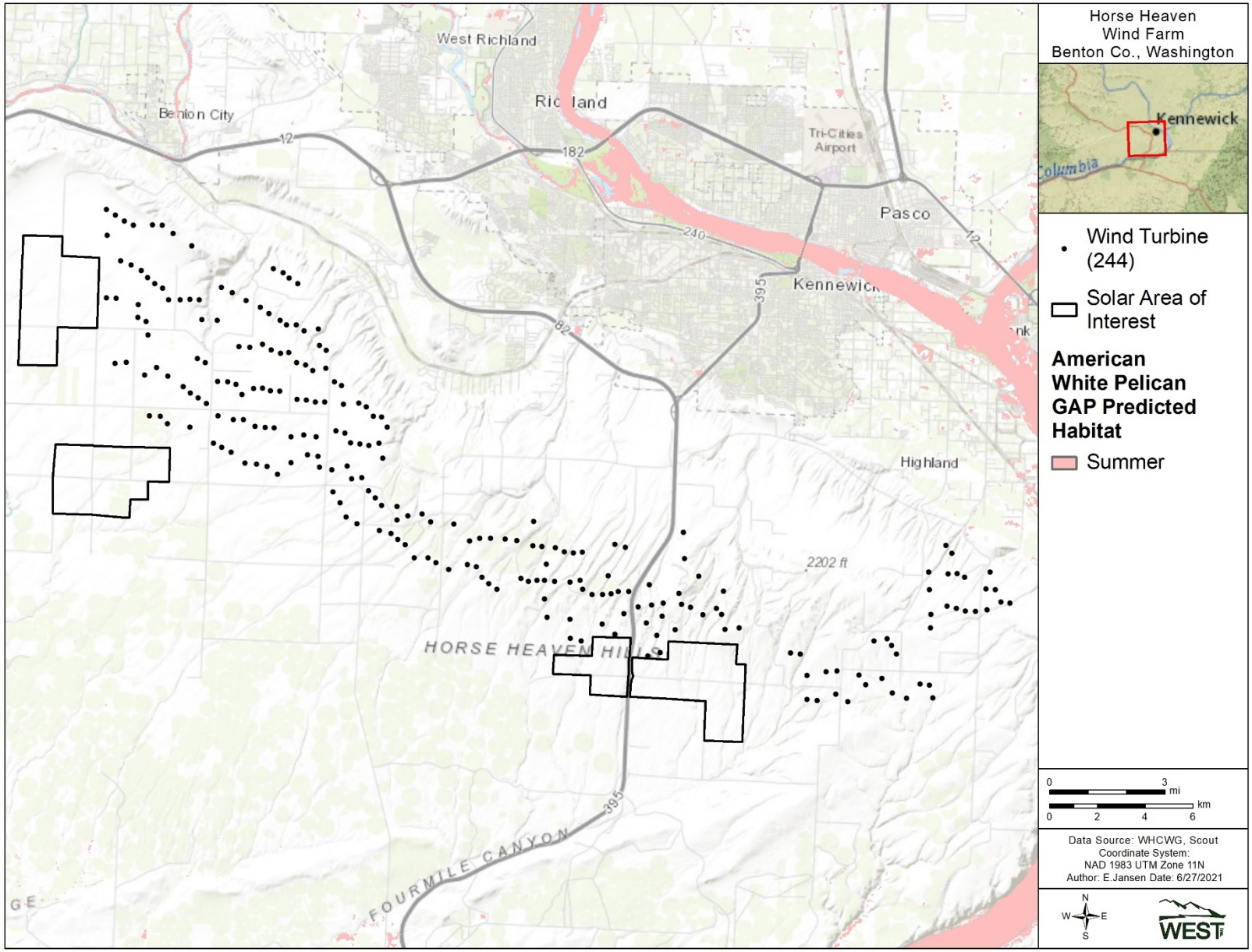
GAP aims to use the best available information to create species ranges and distribution models. GAP relies on existing data and expert opinions from partners and collaborators (e.g., State Natural Heritage Programs).

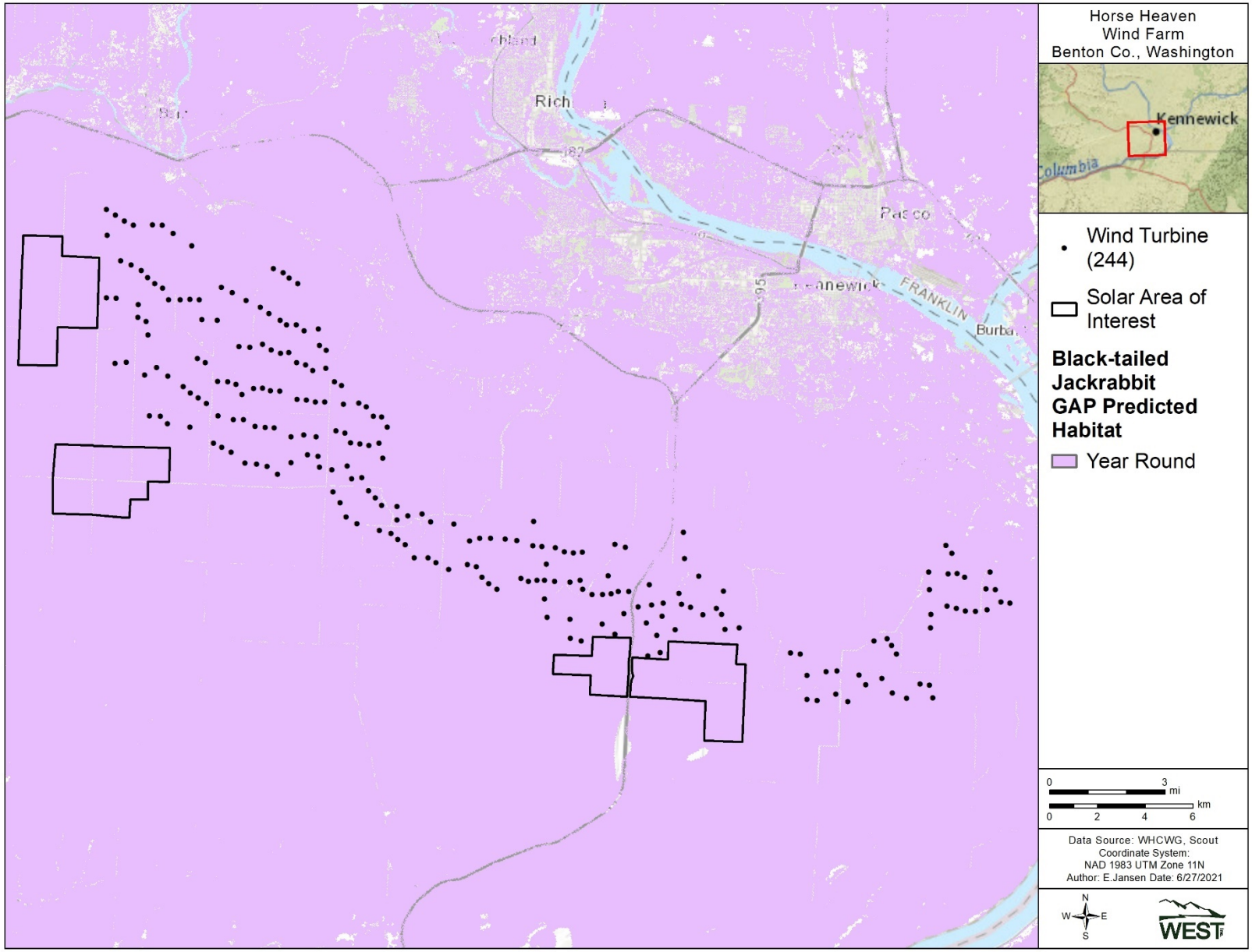
Species range maps and distribution models are viewed as a single iteration based on the best available information. We encourage biologists and data users to assess GAP's species ranges and distribution models, and to give us feedback so that we can continually improve our models and ultimately our ability to conserve biodiversity.

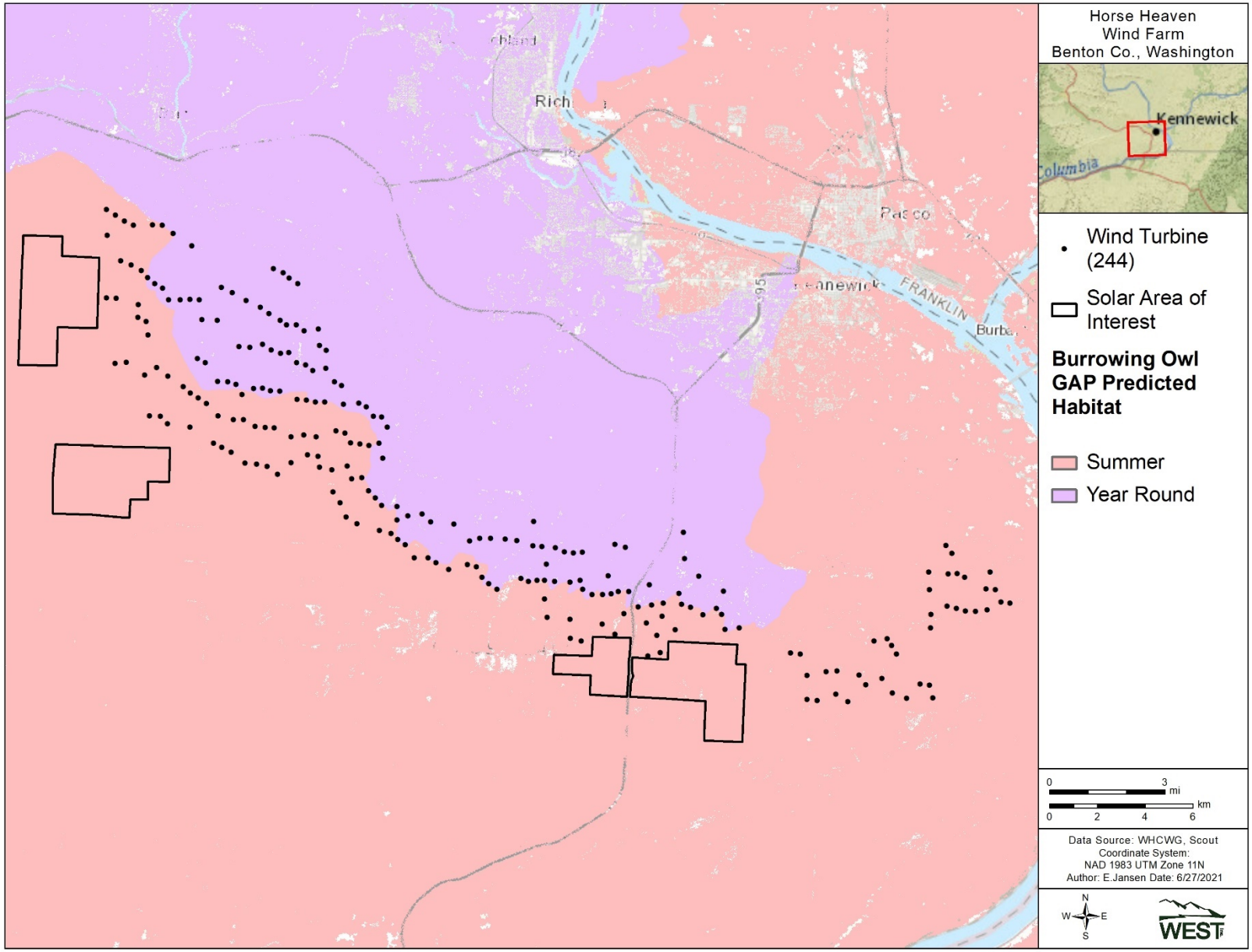
All of GAP's ranges and distribution models have been reviewed by experts and compared to other data sources for accuracy. The accuracy of the species ranges and distribution models varies from species to species in part because habitat preferences and behaviors vary seasonally and annually (Edwards et al. 1996). However, those species for which thorough knowledge of habitat preferences exists are better represented than those for which little is known (i.e., rare or small populations) or vary widely both spatially and temporally. Species with highly restrictive distributions are very difficult to model accurately because their habitat cannot be predicted within the 30 m resolution of our land cover data and distribution maps. We accept the uncertainty within some ranges and distribution models because we believe these data provide basic information and serve an important purpose by highlighting where more data are needed.

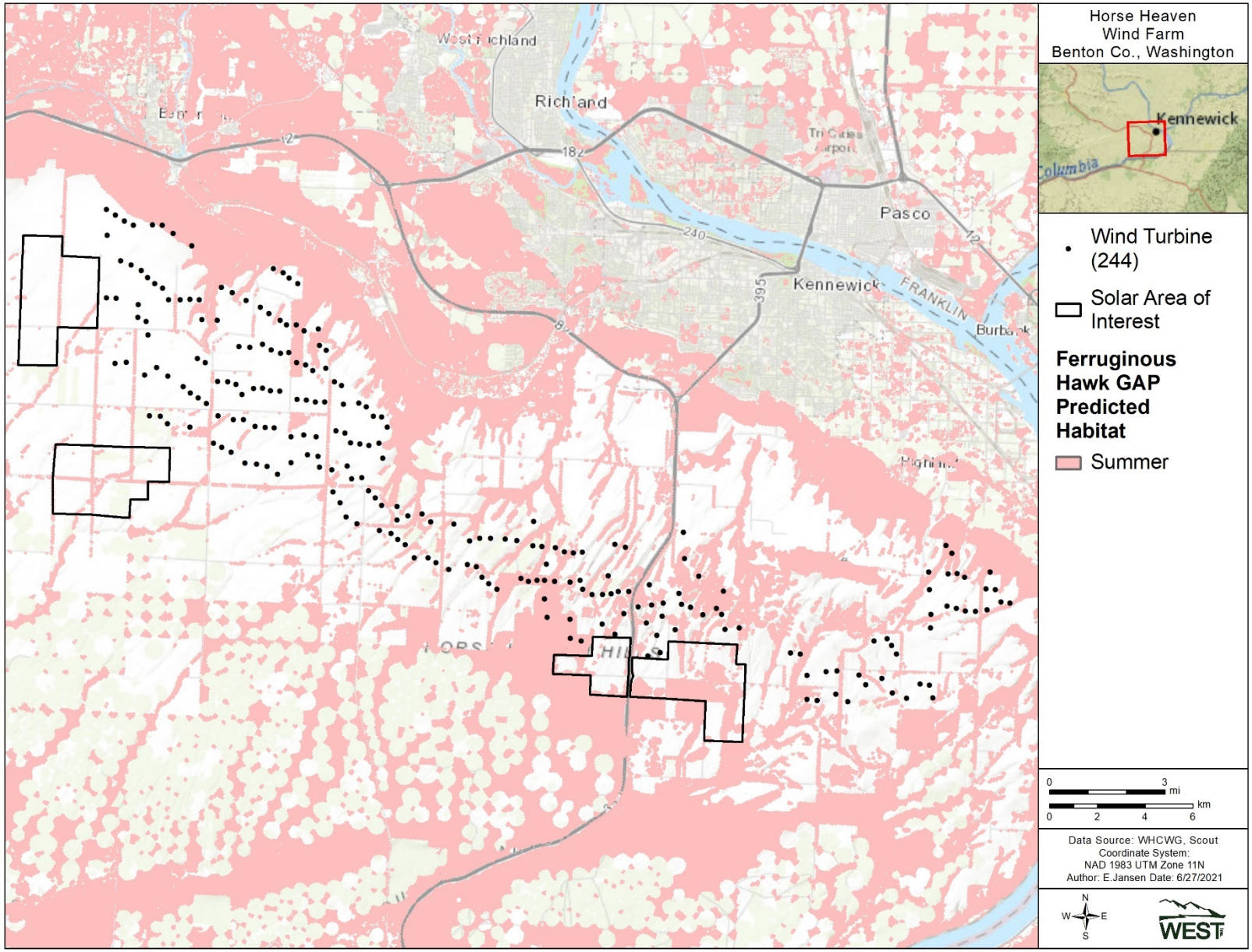
Despite these limitations, we believe GAP species ranges and distribution models are valuable and relevant for addressing broad landscape level conservation questions.

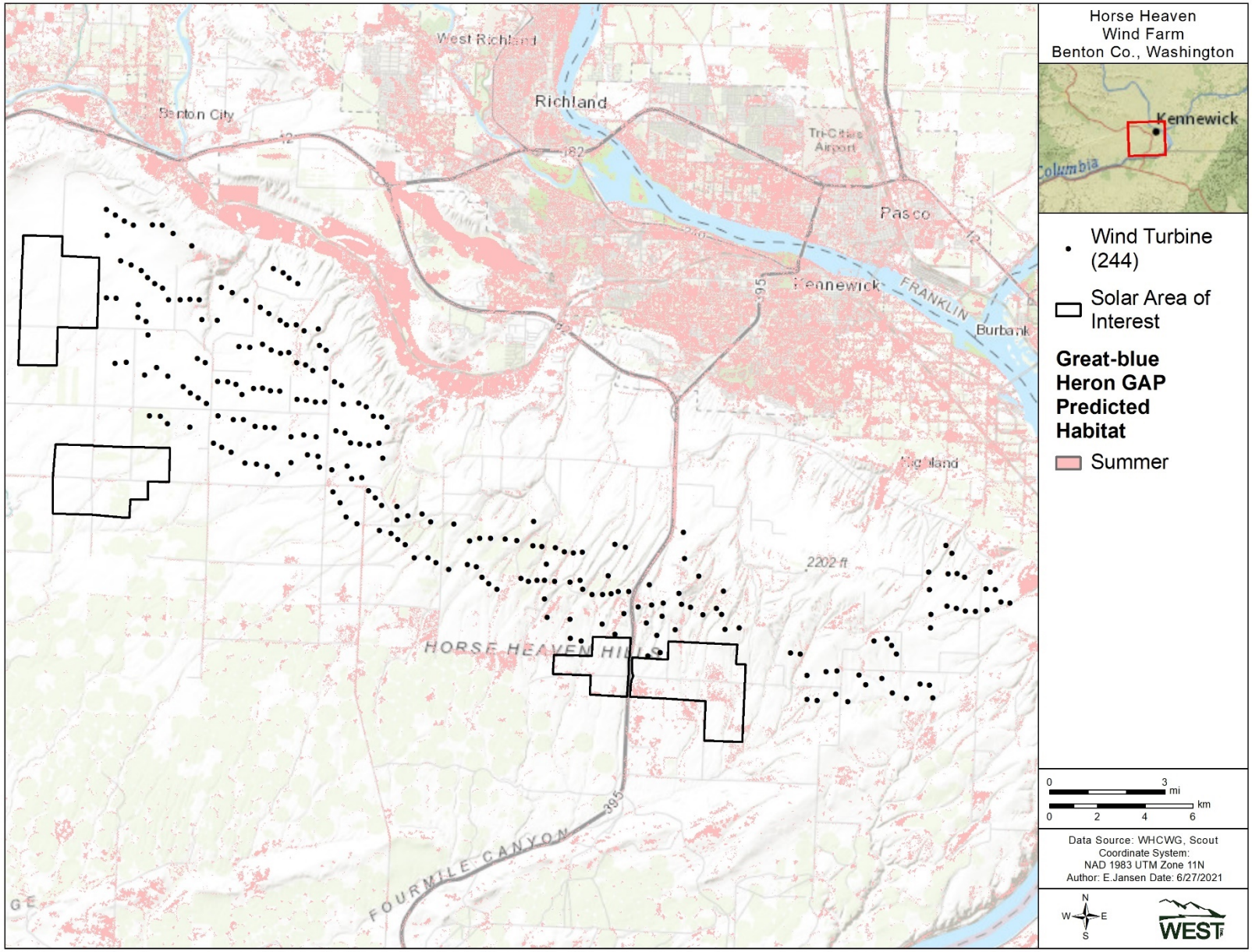
[2] https://www.sciencebase.gov/catalog/item/5540e2d7e4b0a658d79395db

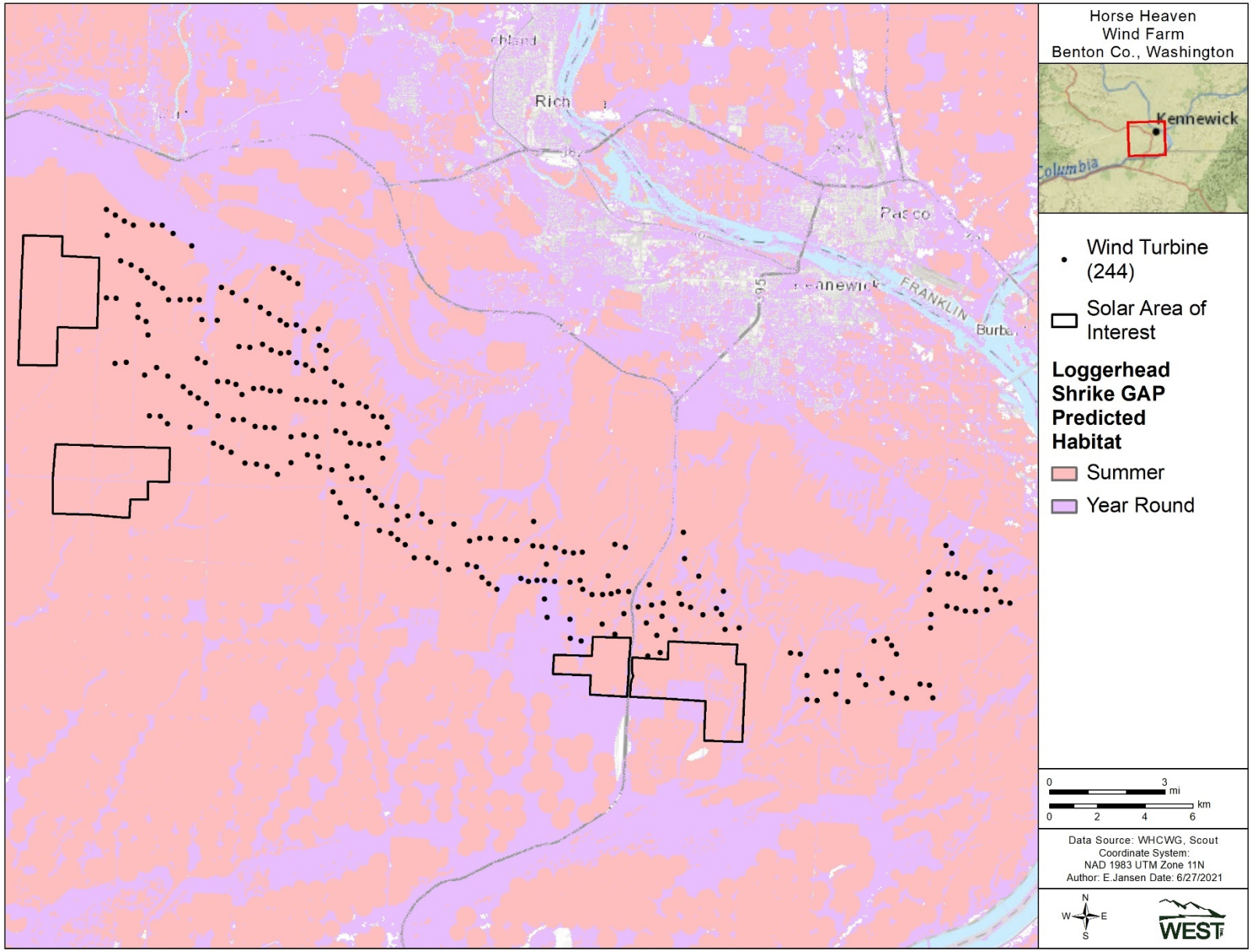

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
American White Pelican GAP Predicted Habitat
Summer
West Richland
Richland
Benton City
Tri-Cities Airport
Pasco
Kennewick
Highland
2202 ft
HORSE HEAVEN HILLS
FOURMILE CANYON
12
182
240
82
395
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST

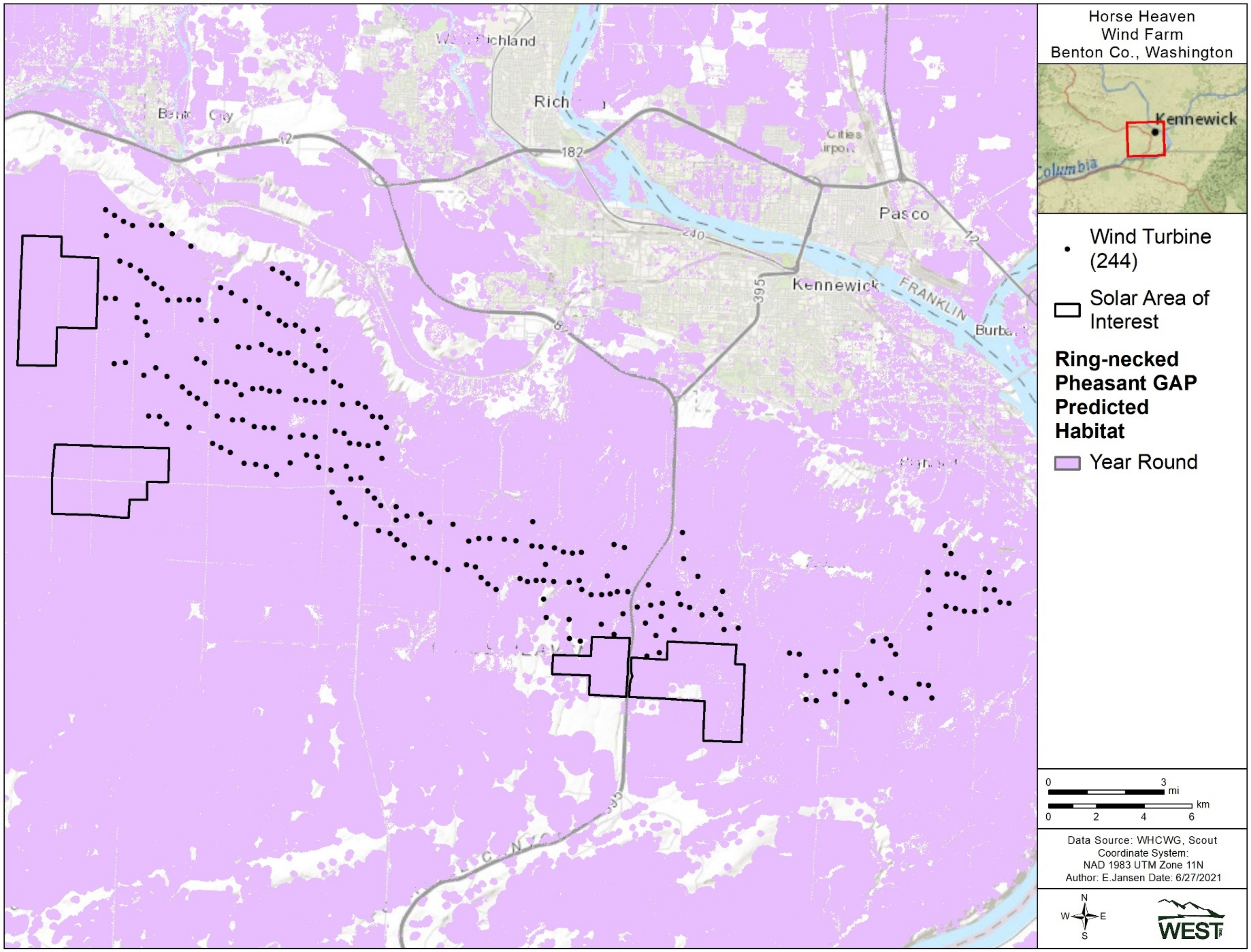

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine
(244)
Solar Area of
Interest
Black-tailed
Jackrabbit
GAP Predicted
Habitat
Year Round
0
3
mi
km
0
2
4
6
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W
E
S
WEST
Rich
Pasco
FRANKLIN
Burba

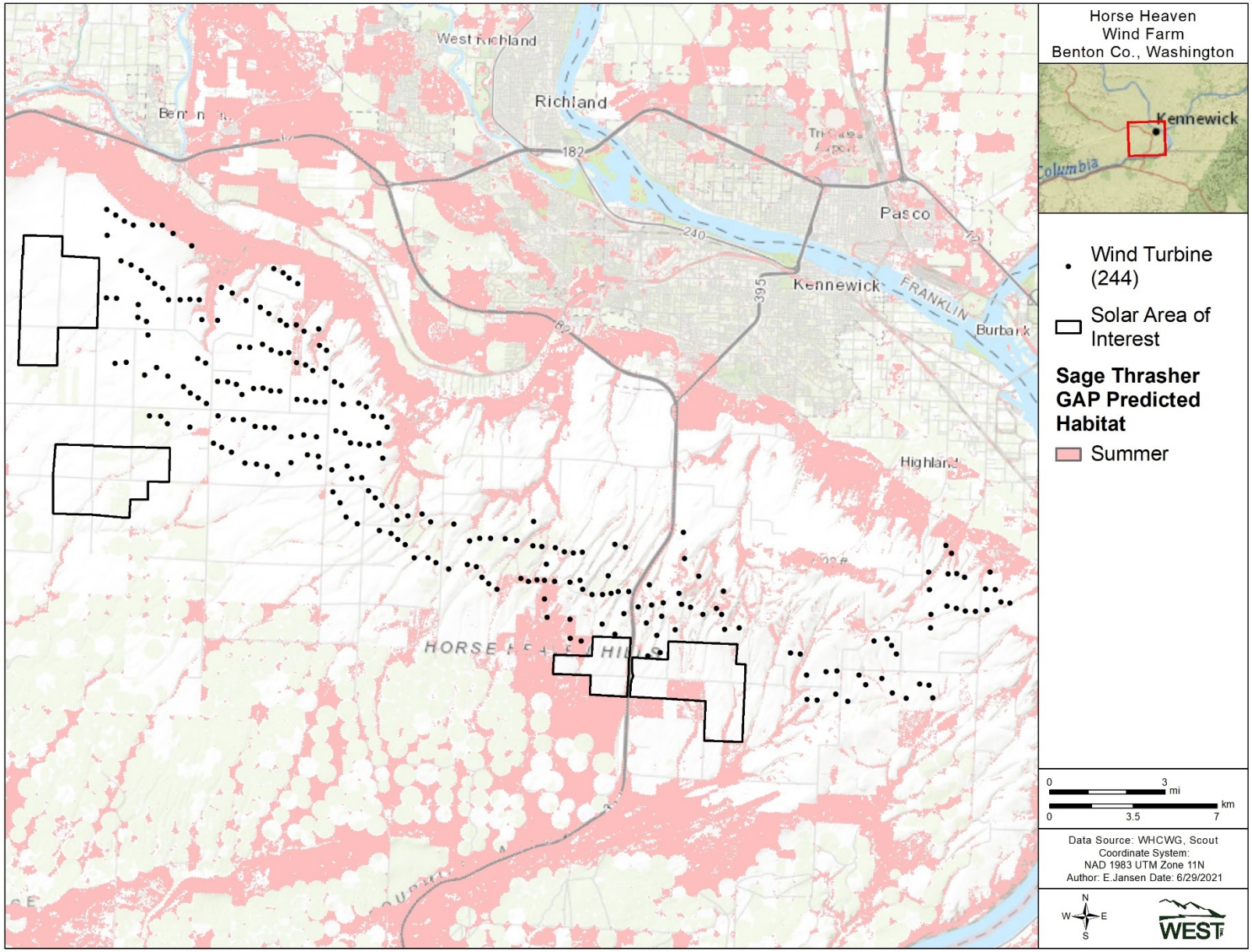

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine
(244)
Solar Area of
Interest
Burrowing Owl
GAP Predicted
Habitat
Summer
Year Round
0
3
mi
0
2
4
6
km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W
E
S
WEST
Rich
Pasco
FRANKLIN

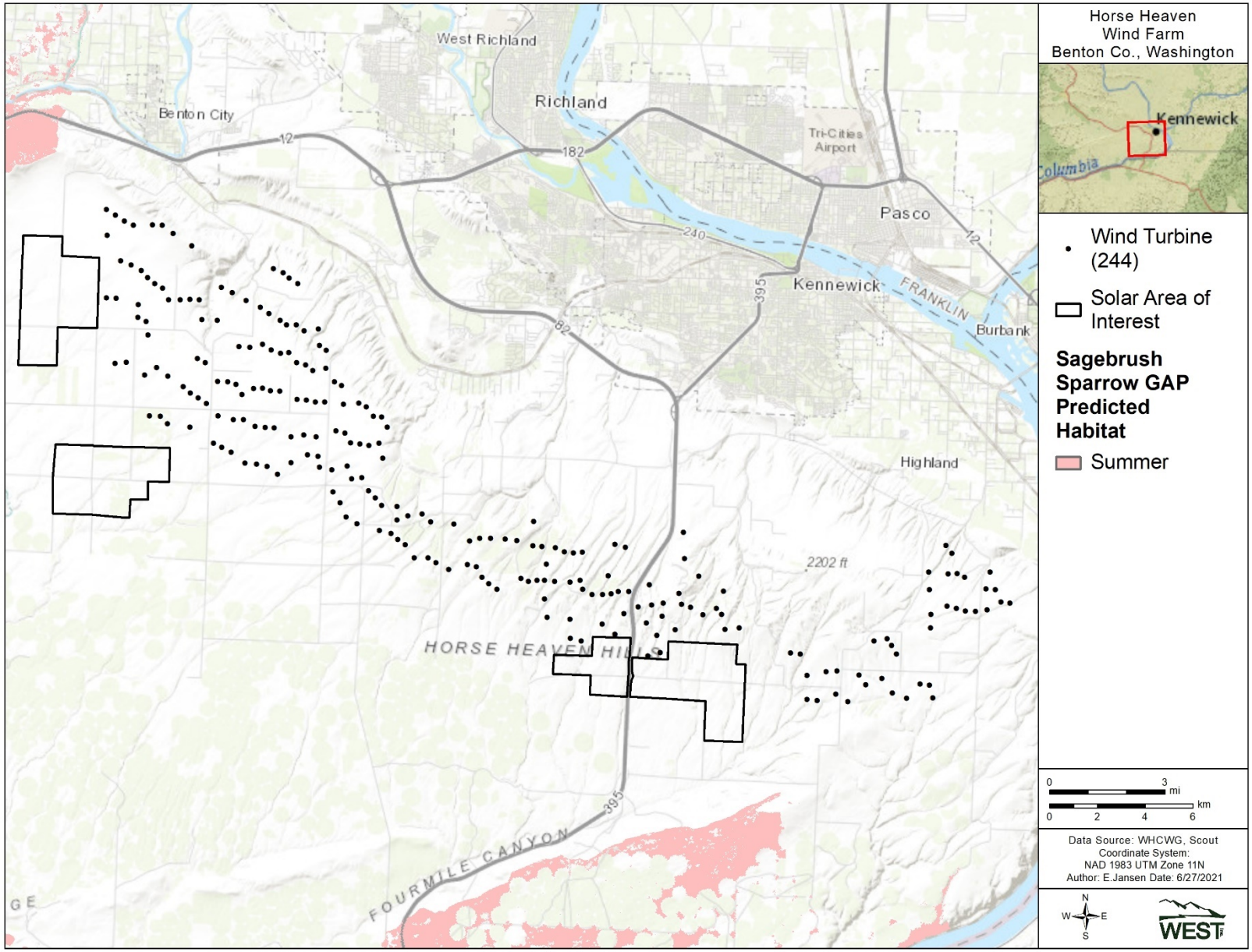

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Ferruginous Hawk GAP Predicted Habitat
Summer
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST
West Richland
Richland
Pasco
Kennewick
FRANKLIN
Burbank
12
182
240
395
82

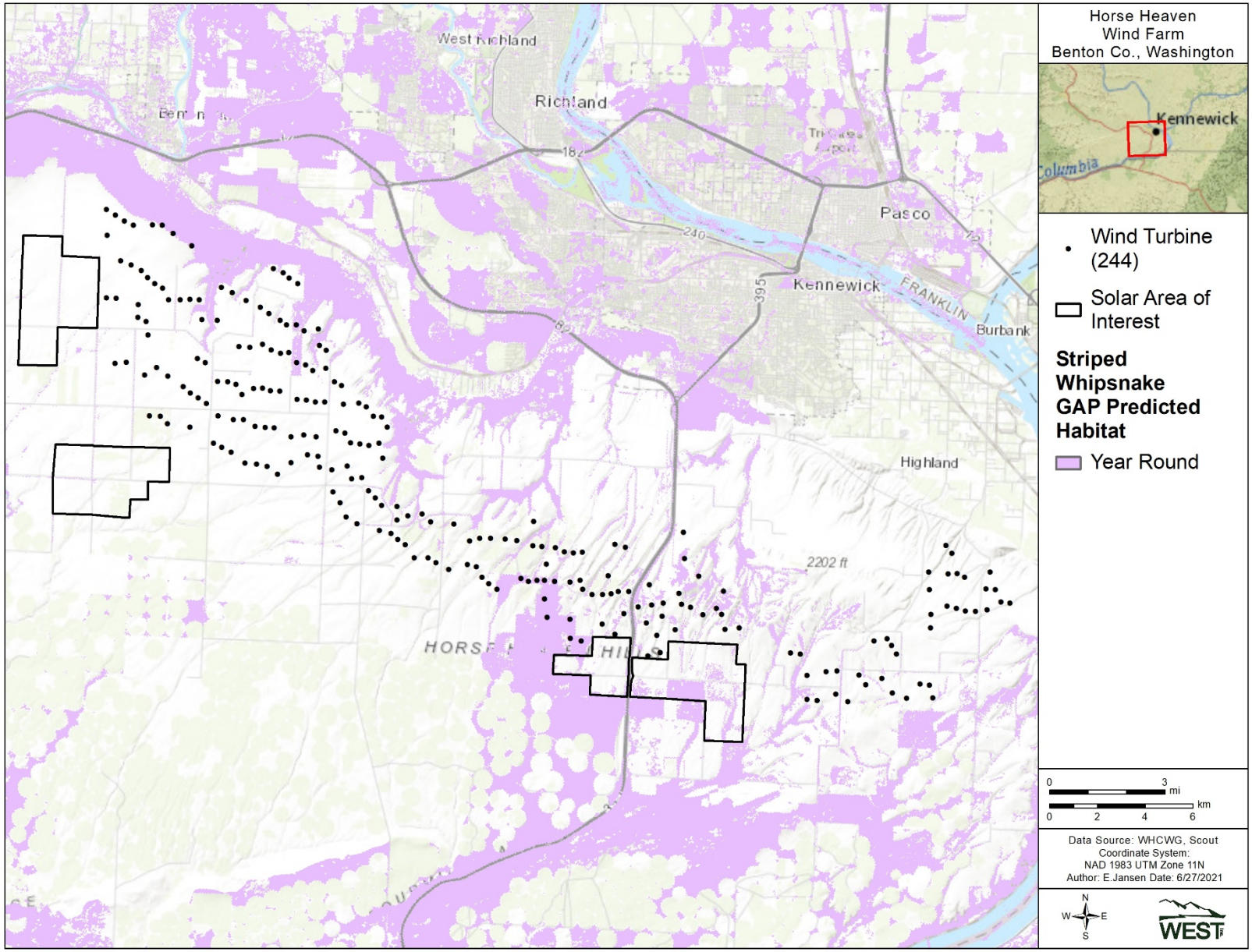

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Great-blue Heron GAP Predicted Habitat
Summer
West Richland
Richland
Benton City
Tri-Cities Airport
Pasco
Kennewick
FRANKLIN
Burbank
2202 ft
HORSE HEAVEN HILLS
FOURMILE CANYON
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST

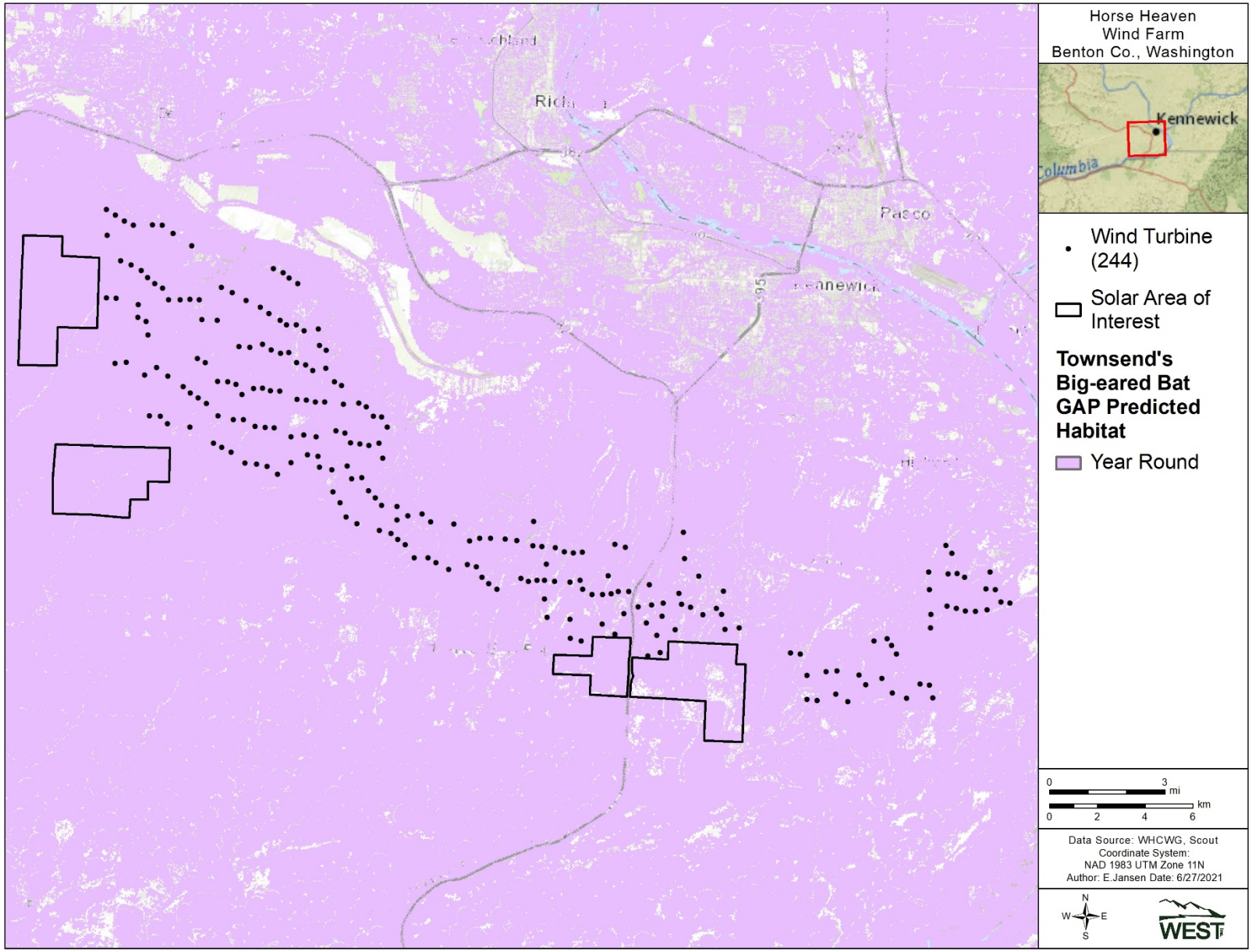

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Loggerhead Shrike GAP Predicted Habitat
Summer
Year Round
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST
Rich
Pasco
FRANKLIN

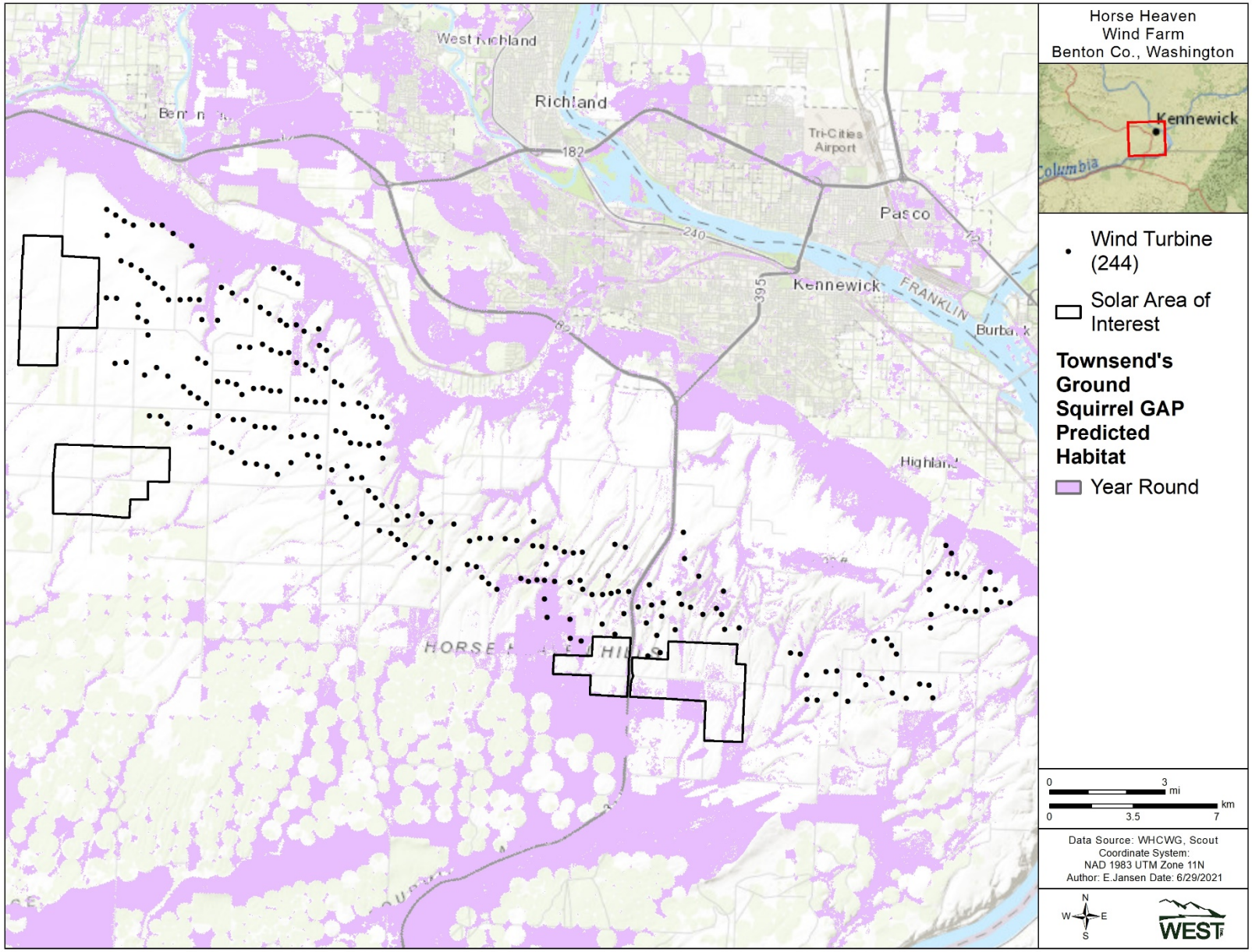

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Ring-necked Pheasant GAP Predicted Habitat
Year Round
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N W E S
WEST
Pasco
Kennewick
FRANKLIN
182
240
395
12

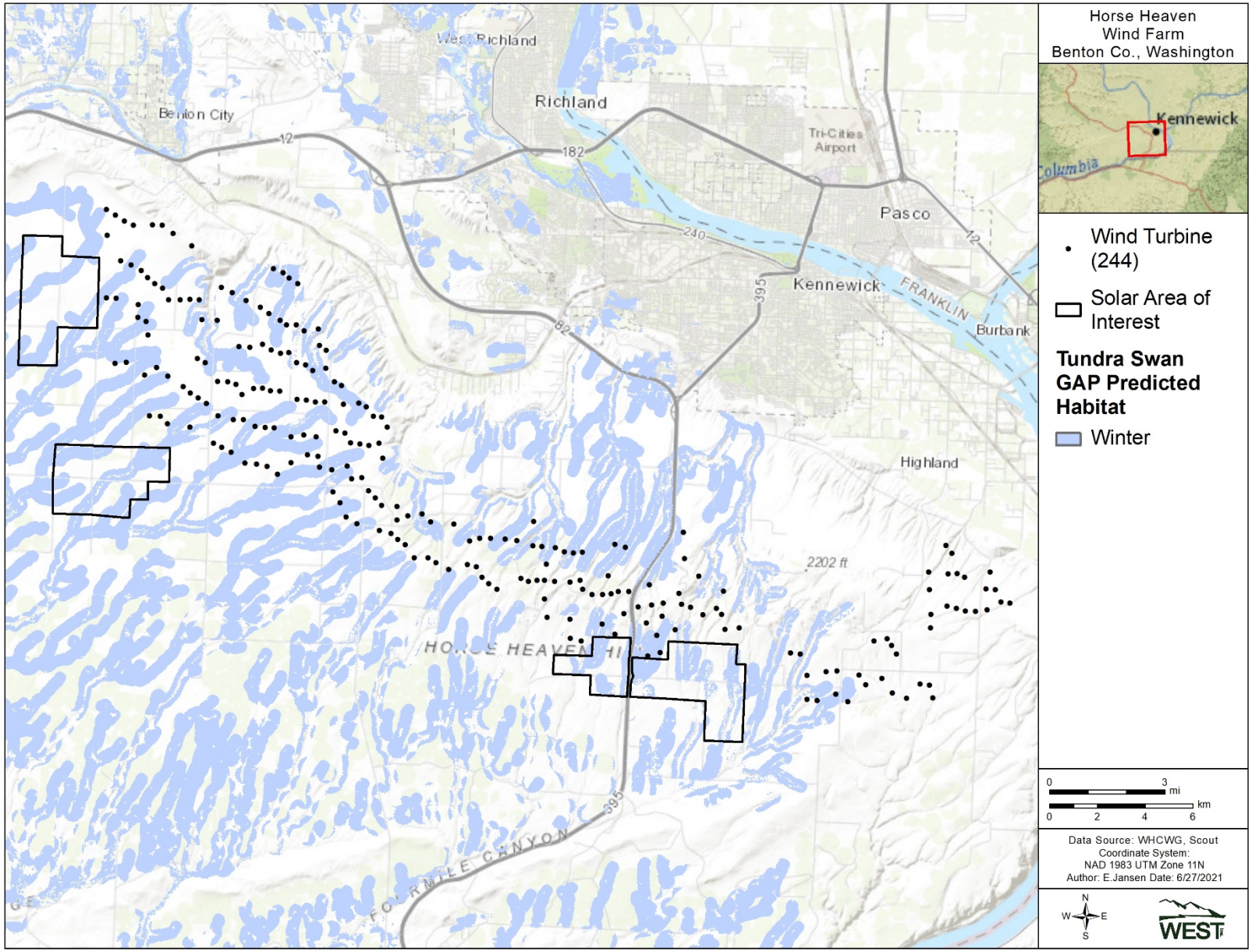

Horse Heaven
Wind Farm
Benton Co., Washington
West Richland
Richland
Pasco
Kennewick
Burbank
Highland
182
240
395
82
FRANKLIN
Columbia
Wind Turbine (244)
Solar Area of Interest
Sage Thrasher GAP Predicted Habitat
Summer
0 3 mi
0 3.5 7 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/29/2021
N
W E
S
WEST

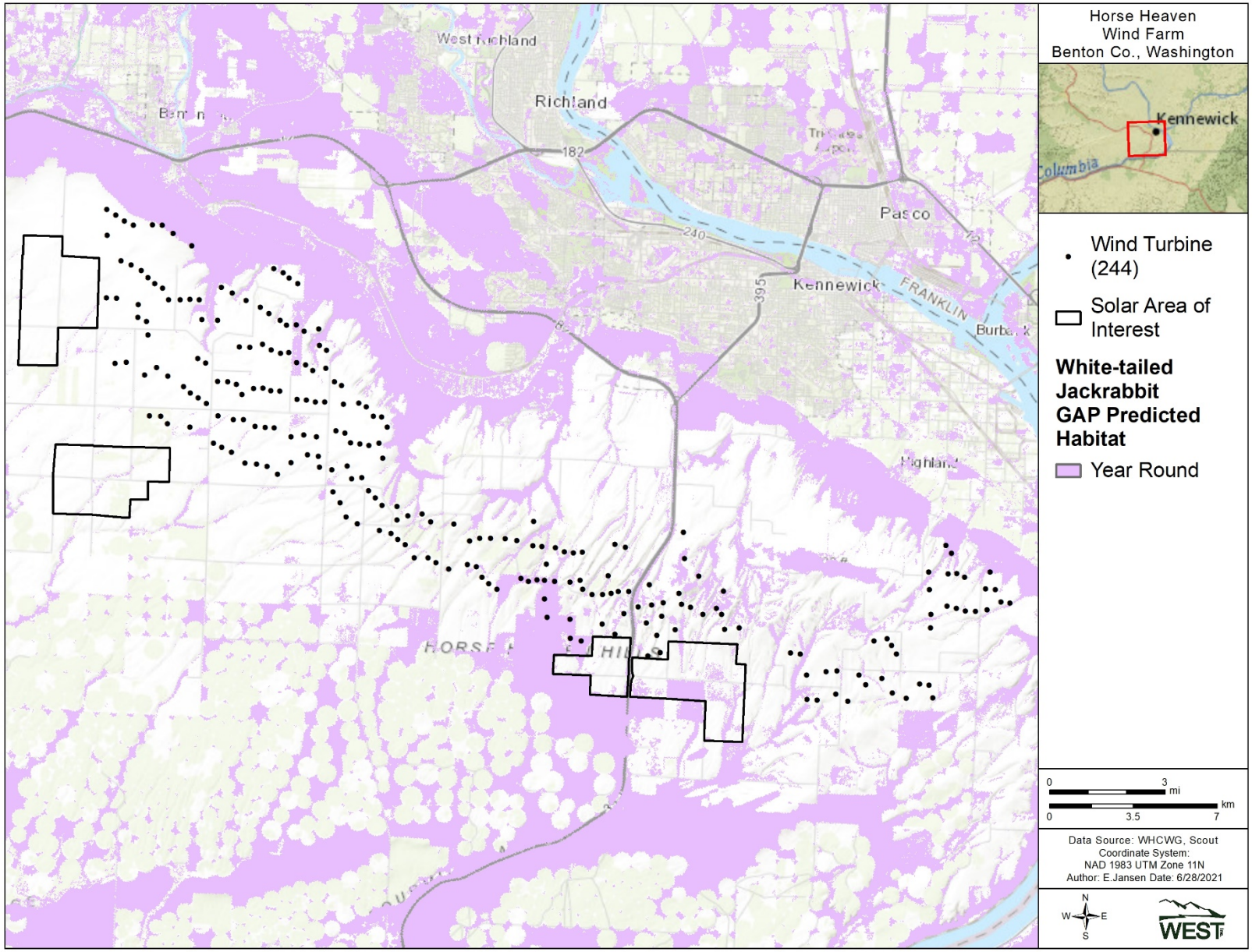

Horse Heaven
Wind Farm
Benton Co., Washington
West Richland
Richland
Benton City
Tri-Cities
Airport
Pasco
Kennewick
Burbank
Highland
FRANKLIN
Columbia
12
182
240
395
82
2202 ft
HORSE HEAVEN HILLS
FOURMILE CANYON
Wind Turbine
(244)
Solar Area of
Interest
Sagebrush
Sparrow GAP
Predicted
Habitat
Summer
0
3
mi
0
2
4
6
km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W
E
S
WEST


Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Striped Whipsnake GAP Predicted Habitat
Year Round
West Richland
Richland
Pasco
Kennewick
Burbank
Highland
FRANKLIN
182
240
395
82
2202 ft
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST

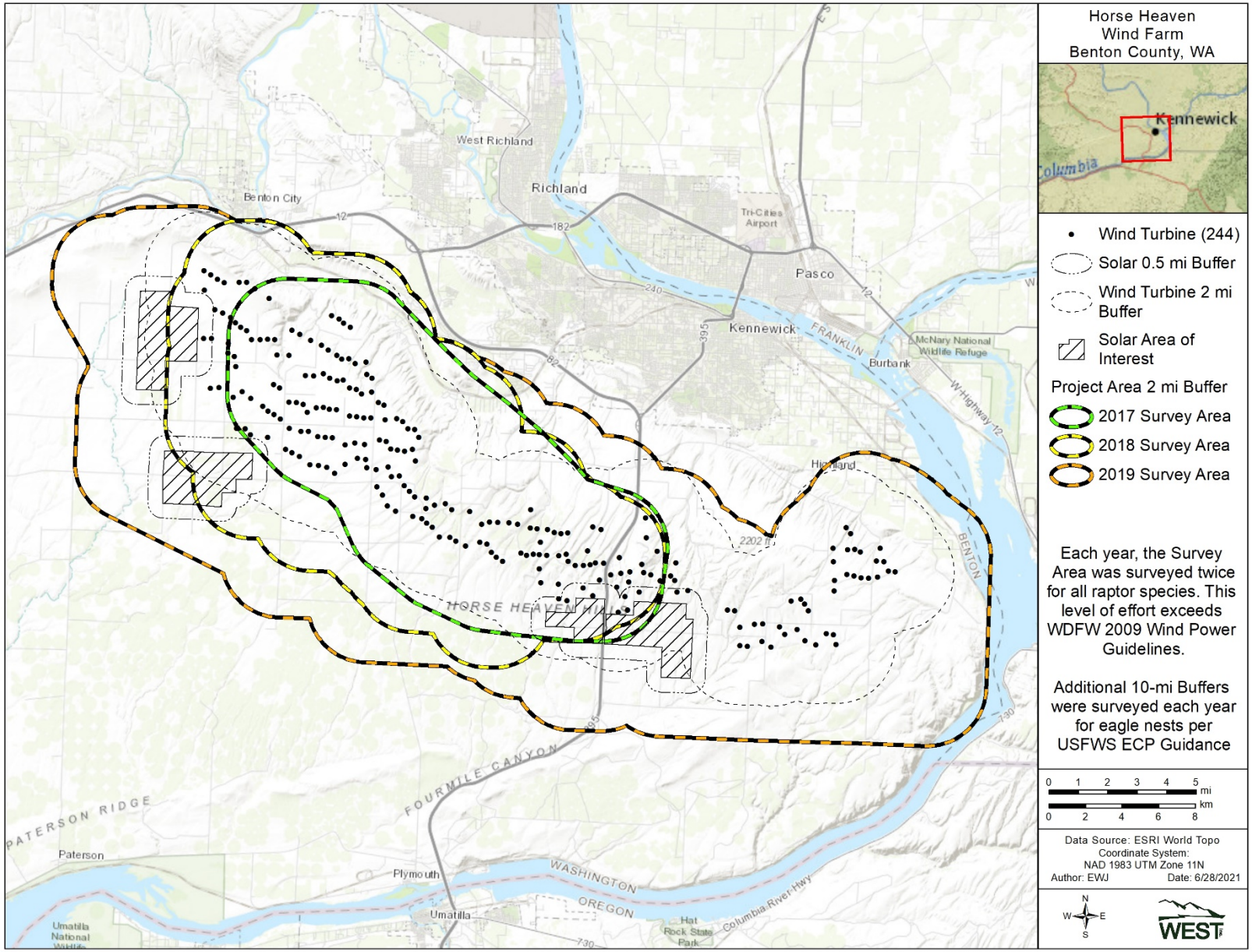

Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Pasco
Wind Turbine (244)
Solar Area of Interest
Townsend's Big-eared Bat GAP Predicted Habitat
Year Round
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W E
S
WEST


Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Townsend's Ground Squirrel GAP Predicted Habitat
Year Round
West Richland
Richland
Tri-Cities Airport
Pasco
Kennewick
FRANKLIN
Burbank
Highland
HORSE HEAVEN HILLS
182
240
395
82
0
3
mi
0
3.5
7
km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/29/2021
N
W
E
S
WEST


Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
Tundra Swan GAP Predicted Habitat
Winter
West Richland
Richland
Benton City
Tri-Cities Airport
Pasco
Kennewick
FRANKLIN
Burbank
Highland
2202 ft
HORSE HEAVEN HI
FOURMILE CANYON
12
182
240
395
82
0 3 mi
0 2 4 6 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/27/2021
N
W
E
S
WEST


Horse Heaven
Wind Farm
Benton Co., Washington
Kennewick
Columbia
Wind Turbine (244)
Solar Area of Interest
White-tailed Jackrabbit GAP Predicted Habitat
Year Round
0 3 mi
0 3.5 7 km
Data Source: WHCWG, Scout
Coordinate System:
NAD 1983 UTM Zone 11N
Author: E.Jansen Date: 6/28/2021
N
W E
S
WEST
West Richland
Richland
Pasco
Kennewick
182
240
395
FRANKLIN

Attachment 2. Raptor Nest Survey Areas


Horse Heaven
Wind Farm
Benton County, WA
Kennewick
Columbia
Wind Turbine (244)
Solar 0.5 mi Buffer
Wind Turbine 2 mi Buffer
Solar Area of Interest
Project Area 2 mi Buffer
2017 Survey Area
2018 Survey Area
2019 Survey Area
Each year, the Survey Area was surveyed twice for all raptor species. This level of effort exceeds WDFW 2009 Wind Power Guidelines.
Additional 10-mi Buffers were surveyed each year for eagle nests per USFWS ECP Guidance
0 1 2 3 4 5 mi
0 2 4 6 8 km
Data Source: ESRI World Topo
Coordinate System:
NAD 1983 UTM Zone 11N
Author: EWJ
Date: 6/28/2021
N
W
E
S
WEST
West Richland
Richland
Benton City
Tri-Cities Airport
Pasco
Kennewick
Burbank
McNary National Wildlife Refuge
FRANKLIN
BENTON
Highland
HORSE HEAVEN HILLS
FOURMILE CANYON
PATERSON RIDGE
Paterson
Plymouth
Umatilla
Umatilla National Wildlife
WASHINGTON
OREGON
Columbia River Hwy
Hat Rock State Park
W Highway 12
12
182
240
395
82
2202
730