Guidelines for Industrial Solar & Wind Power Development

DRAFT FOR REVIEW

Washington Department of FISH & WILDLIFE

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Wild Horse Wind & Solar Facility. Photo by Michelle Huppert.

Executive Summary

The Washington Department of Fish and Wildlife (WDFW) has developed these guidelines to assist developers of industrial-scale solar and wind energy projects in avoiding and minimizing impacts on Washington's fish, wildlife, and habitat resources while planning, permitting, and operating their projects. The development of industrial wind and solar projects is critical for achieving Washington State's clean energy goals, as outlined in the Clean Energy Transformation Act (CETA) of 2019. However, these projects must be carefully planned to avoid, minimize, and mitigate impacts on the state's diverse and valuable ecological resources. WDFW is not responsible for approval of siting permits (county; local permitting) or site certifications (state permitting) but serves as a technical expert and provides recommendations to these regulatory authorities for ways to avoid, minimize, and mitigate impacts from development and land use changes. The goal of these guidelines is to align state conservation priorities with Washington's clean energy targets.

Washington's landscapes provide essential habitats that support the state's rich biodiversity. As wind and solar energy development expands, it's critical to balance these development needs with the protection of sensitive habitats and species. These guidelines provide developers with a clear framework for avoiding areas of high conservation value and implementing best practices to avoid, minimize, and mitigate potential environmental impacts. The guidelines are organized into six key steps that correspond to the different phases of project planning and development.

- The first step is Exploratory Planning, which encourages early engagement with WDFW and the use of available planning tools to identify low-conflict areas for development, considering factors such as wildlife connectivity, and landscape-level conservation priorities. Tribal engagement is also critical at this stage to understand what cultural natural resources could be impacted.
- The Preliminary Project Planning step focuses on the site-specific considerations once a project site has been identified. This step provides guidance on conducting preliminary desktop and biological assessments and understanding the types of information needed for further consultation with WDFW.
- The third step focuses on Assessing Wildlife and Habitat on the Project Site. At this stage, developers are expected to conduct detailed field surveys and prepare biological and vegetation reports that fully characterize the site's wildlife and habitat values. These assessments will inform the project design and layout to minimize impacts.
- The fourth step is Mitigation. For any unavoidable impacts to wildlife and habitats, developers must implement mitigation strategies recommended by WDFW. These strategies are based on the latest management policies and are designed to ensure that mitigation efforts are viable and effective.
- The fifth step, Spatiotemporal Buffers for Construction and Operation, provides guidance for developers to minimize impacts on habitat and wildlife during construction and operation of solar and wind projects.
- The final step is Operational Monitoring and Adaptive Management, which provides recommendations for post-construction monitoring and data collection throughout the project's operation phase.

Key information on best management practices, mitigation and technical survey requirements is in the appendices. Appendix A outlines Best Management Practices (BMPs) for minimizing environmental impacts during project siting, construction, and operations. These BMPs include recommendations on erosion control, habitat preservation, and species protection. Appendix B details Biological Field Survey Protocols, specifying the methodologies required for assessing wildlife presence, habitat conditions, and vegetation types, ensuring data collection is consistent and scientifically robust. Appendix C focuses on Mitigation Strategies, providing detailed tables on acceptable mitigation types, levels for various impact scenarios, and strategies to align with WDFW's conservation goals. Appendix D addresses Spatiotemporal Buffers for Construction and Operation, providing guidance on establishing protective buffers around sensitive habitats and species during critical periods. Appendix E outlines the framework for Cumulative Impacts Assessment, highlighting the importance of evaluating landscape-level effects of multiple projects and maintaining ecological connectivity. Together, these appendices offer a comprehensive set of tools to help project proponents meet WDFW's recommendations, ensuring that wind and solar energy projects are planned and implemented in ways avoid, minimize, and mitigate impacts on Washington's fish, wildlife, and habitats.

These guidelines are designed to be flexible and adaptive and will be updated as new scientific information becomes available. WDFW encourages collaboration and input from all interested parties to continuously improve the effectiveness of these guidelines in balancing solar and wind development with the conservation of Washington's ecological resources.

Introduction

Purpose

The purpose of these guidelines is to provide solar and wind developers with detailed guidance to responsibly site, construct, and operate wind and solar facilities to avoid and minimize impacts to the State of Washington's fish and wildlife resources. The Washington Department of Fish and Wildlife (WDFW) is dedicated to preserving, protecting, and perpetuating fish, wildlife, and ecosystems while providing sustainable recreational and commercial opportunities for the public.

The development of industrial wind and solar projects is critical for achieving Washington State's clean energy goals, as outlined in the Clean Energy Transformation Act (CETA) of 2019. However, these projects must be carefully planned to avoid, minimize, and mitigate impacts on the state's diverse and valuable ecological resources. The six steps included in this document outline WDFW's recommended process for assessing potential fish, wildlife, and habitat impacts associated with wind and solar energy development.

This document attempts to balance the following four components with the need for increased carbon-free energy production in Washington:

1. The increased need for maintaining and restoring ecological functions and connections across landscapes;
2. Conservation and restoration of native habitats;
3. Recovery and management of wildlife populations;
4. Addressing the broad interests of the public.

Authority and mission

WDFW serves as Washington's principal agency for species protection and conservation through its mission "*to preserve, protect, and perpetuate fish, wildlife, and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities."* Authority comes from the Fish and Wildlife Code, Title 77 of the Revised Code of Washington.

WDFW relationship with Tribes in review of solar and wind energy projects

The State of Washington and WDFW support the protection of federally recognized tribes and their inherent rights. It is crucial that tribal governments are involved throughout the process of siting solar and wind projects to ensure that project assessments are comprehensive and reflect the true impact on archeological and cultural resources and what is necessary to avoid and mitigate the impacts. Tribes possess unique knowledge and historical data critical to identifying potential impacts that others might not recognize in the process. Acknowledging and incorporating this information can lead to more sustainable development practices that respect tribal resources.

WDFW recognizes there is overlap between the species and habitats the agency is charged to protect and natural resources important to the tribes. Moreover, resources important to tribes encompass much more than the WDFW species and habitats of concern. Where there is overlap between the WDFW species and habitats of concern and tribal resources, WDFW will engage directly with tribes to take their input into account and use any information they provide that overlap with WDFW's mission throughout the process. Early and ongoing engagement by project proponents and relevant state agencies, including WDFW, helps ensure that tribal rights are understood and considered well before final decision-making, allowing for a collaborative approach to environmental protection and cultural preservation.

Living document

These guidelines are intended to be a living document, reflecting the evolving understanding of the impacts of industrial wind and solar energy development on Washington's fish and wildlife habitats. As new research, data, and interested party feedback become available, WDFW will update these guidelines to ensure they remain current and effective. This ongoing adaptive process allows the guidelines to stay relevant and responsive to both emerging scientific insights and the dynamic nature of renewable energy development. WDFW welcomes and encourages continued feedback from tribes and interested parties to help refine and improve future revisions of the guidelines. This document replaces WDFW guidance originally published in the 2009 WDFW Wind Power Guidelines.

Wild Horse Wind & Solar Facility. Photo by Michael Ritter.

Permitting Options

State and local permitting

In Washington state, the developer of a new industrial solar or wind facility has the option of pursuing a permit through the local jurisdiction (city and county) or through the state's Energy Facility Site Evaluation Council (EFSEC). The Department of Ecology's Coordinated Clean Energy Permit Process offers a pathway supported by their Programmatic Environmental Impact Assessments (PEIS) for projects to consider prior to selecting a final permitting authority. The State Environmental Policy Act (SEPA) provides the framework for project permitting but each permitting path has its own set of requirements, processes, and authorities involved. See Table 1 for a comparison of optional pathways for industrial solar and wind projects.

Table 1. Permitting pathways for renewable energy projects adapted from the Washington Department of Ecology's Pathway options for environmental review and permitting clean energy projects (2024). Ecology's Coordinated Clean Energy Permit Process (green column) may be used prior to selecting one of the other two permitting pathways (gray and blue columns).

Actions and Roles	Ecology's Coordinated Clean Energy Permit Process	Energy Facility Site Evaluation (EFSEC) Council Process	Local Government-Led SEPA and Permitting Process
Applies to new projects or facility modifications	Yes	Yes	Yes
Agency coordinating overall process	Ecology coordinates the environmental review and permitting work with participating state and local agencies	EFSEC coordinates the environmental review and permitting work with participating state and local agencies	No single agency lead
SEPA lead agency	Determined based on project and location	SEPA review is incorporated into the EFSEC process and the EFSEC Director is the responsible official	Determined based on project and location
Permitting	Each of the project's permits has a state or local agency with legal responsibility	EFSEC makes decisions and issues all state and local permits as part of the Site Certification Agreement	Each of the project's permits has a state or local agency with legal responsibility
Decision-maker(s)	• For each permit, the agency responsible makes the decision • All permits needed for a project must be approved	The EFSEC Council makes a recommendation to the governor, who makes the decision on a project	• For each permit, the agency responsible makes the decision • All permits needed for a project must be approved
Responsibility for Tribal engagement and consultation	Ecology is responsible for offering Tribal engagement and consultation for the coordinated permit process	EFSEC is responsible, in coordination with Department of Archaeological and Historic Preservation (DAHP)	• State agencies would offer Tribal consultation for environmental reviews as the SEPA lead agency and/or for their permits • Local governments can offer to engage with Tribes
Engagement with overburdened communities	Ecology verifies engagement has been done in timely manner and comments have been considered	EFSEC leads engagement	Each agency leads their own engagement process
Cost reimbursement required	Yes	Yes	May be required
Pre-application process	Yes	Yes (required for transmission lines)	Yes
Complete application required	Yes, it will be used for development of the work plan and to begin SEPA review	Yes, and if pre-application is done, the SEPA review can begin before the final application is submitted	Yes, it is used to begin SEPA review
Local ordinances	Local ordinances apply	EFSEC can preempt county and local ordinances	Local ordinances apply
Appeals	Permits each have their own requirements for appeals	Appeals are limited to the final decision and are not done for individual permits	Permits each have their own requirements for appeals

SEPA compliance

All solar and wind energy projects in Washington, regardless of the permitting path chosen, must comply with SEPA. SEPA requires a thorough environmental review of proposed projects to assess their potential impacts on the environment, including fish and wildlife habitats. (SEPA guidance - Washington State Department of Ecology)

SEPA review process:

- **Documentation:** SEPA documentation typically covers existing conditions and potential impacts on wildlife, habitats, water resources, and other environmental factors. SEPA rules require that an "Environmental Checklist" be submitted unless it is already known that an Environmental Impact Statement (EIS) will be prepared. It is also possible to adopt a National Environmental Policy Act (NEPA) EIS (or Environmental Assessment (EA)) in lieu of preparing a new SEPA EIS or other determination, if the NEPA EIS adequately analyzes the probable significant adverse environmental impacts of the project.

- **WDFW's Role:** WDFW provides expert review and comments on environmental documents prepared by other agencies that have been sent out for public comments. WDFW's input is crucial for ensuring that the project has avoided and minimized impacts and mitigation has been addressed.

Project Process

All project steps outlined in this document should be guided by the principles of *avoid* impacts first, *minimize* impacts as much as possible, and mitigate unavoidable impacts through compensatory offsets. Developers are encouraged to engage early and directly with WDFW staff to guide site selection and project planning and to assess and plan for mitigating biological resource concerns. Once the initial consultation occurs, six steps outline WDFW's recommended process for assessing potential fish and wildlife habitat impacts associated with solar and wind energy development.

Project consultation with WDFW

To ensure renewable energy projects address biological resource concerns as efficiently as possible, projects should consult with WDFW early and frequently during all stages of project development and continue communication throughout the length of the project permit. The consultation points below are generally consistent across projects, but consultation will be tailored based on individual project needs. All communication should go through the WDFW Solar and Wind Team unless otherwise specified to ensure quick and efficient consultation. The Solar and Wind Team can be reached through the general email, solarandwind@dfw.wa.gov, or by contacting one of the team staff members.

Initial consultation

The first consultation with WDFW should occur before a site is selected and leases are signed so that wildlife and habitat issues can be avoided. Details about selecting sites for development in WA are outlined in **Step 1: Exploratory Planning**. When contacting WDFW for the first time, please provide:

1. Geographic information system (GIS) data (e.g., KML, KMZ, shape files) of the proposed site,
2. Project description that includes type of renewable energy, expected acreage, expected energy generation capacity, proposed project timeline, and transmission tie-in information,
3. Basic site ownership (i.e. is the land privately owned, state managed, or federal?).

This information will allow WDFW to provide feedback about biological resources on and near the project site.

Priority habitats and species data request

Following the initial consultation, the project proponents should contact the WDFW Priority Habitats and Species (PHS) Team for a Sensitive PHS Data Request. This process can be found here Sensitive PHS Data Request | Washington Department of Fish & Wildlife and is described in more detail in **Step 2: Preliminary Project Planning**. The WDFW staff responsible for completing this request are different than

those who coordinate communication during other steps outlined in this section (WDFW Solar and Wind Team).

Field survey discussion

Once desktop assessments for biological resources are completed **(Step 2: Preliminary Project Planning**), the project should contact WDFW to review results and discuss biological field surveys (**Step 3: Assessing Wildlife and Habitat on the Site;** Appendix B).

Biological report review

Following completion of the biological field surveys, the project should share results with WDFW for feedback. This will likely result in a meeting request to discuss potential concerns, features to avoid, and project next steps.

Best management practices discussion

Best management practices to protect habitat and wildlife during siting, pre-construction, construction, and operation should be discussed with WDFW throughout the siting and permitting process. See Appendix A for BMPs that a project implements to protect habitat and wildlife during siting, pre-construction, construction, and operation. BMPs are subject to periodic updates based on best available science.

Habitat management and mitigation plan collaboration

Once surveys are completed and the project has begun micro siting (the process through which specific location of all infrastructure is determined), avoidance measures, vegetation management, and mitigation discussions with WDFW should begin (Appendix C). These discussions should include vegetation, habitat management, and mitigation plan development to ensure the final layout is considered while planning for mitigation. This can lead to one or more meetings about micro siting and infrastructure locations.

Step 1: Exploratory planning

This section outlines recommendations for selecting a project site in Washington State that minimizes impact to biological resources on both local and landscape levels.

The initial selection of a project site is critical to reducing the potential impacts of wind and solar energy projects on fish, wildlife, and habitat. The best opportunity to avoid these impacts is during the early stages of site exploration when various locations are assessed on a regional or landscape level. During this phase, it's important to consider wildlife and conservation priorities as well as other factors such as physical site characteristics, cultural and legal considerations, and social factors. By doing so, developers can identify areas that pose fewer conflicts while still meeting the essential requirements for wind and solar energy development. Developers are strongly encouraged to consider wildlife implications before any formal land agreements are made.

Project location

WDFW recommends that developers should seek to use previously disturbed areas or lower value wildlife habitat (WDFW Mitigation Policy Habitat Categories 4 and 5; Appendix C) preferentially. Acknowledging that many factors are considered by developers, consultation with WDFW as early as possible in project scoping can assist with identifying conflicts within potential project sites. This consultation, in addition to the planning tools listed later in this section, is an initial step in avoiding conservation issues.

Favorable sites

Favorable sites for solar and wind development are identified through a combination of best available science, tribal engagement, and collaborative processes with the interested parties. Developing these sites can minimize impacts to wildlife resources and align with WDFW conservation goals. Development on favorable sites could result in little to no mitigation requirements depending on the results of pre-assessment wildlife and vegetation surveys.

Favorable sites include:

- **Sites identified as low conflict through Least-Conflict Solar Siting (LCSS;** Columbia Plateau Least-Conflict Solar Siting Gateway (databasin.org)**)**: These sites are determined through a collaborative process involving various interested parties to minimize conflicts and impacts on natural resources, ranchlands, and agriculture lands. These sites may contain culturally significant resources that require tribal consultation.
    - The LCSS **Conservation Value Map** (Conservation Value Map | Least-Conflict Solar Siting (databasin.org)) is the most accurate map to assess conservation value in this dataset.
- **Sites outside important, sensitive, or essential habitat**: These habitats are identified based on best available science and collaborative processes such as the Arid Lands Initiative (aridlandsinitiative.org) and Washington Shrubsteppe Restoration and Resiliency Initiative (WSRRI).
- **Brownfields, industrial sites, rooftops, degraded sites, landfills, surface mines, over irrigations canals, and above parking lots**: These previously disturbed sites offer opportunities for solar or wind development with minimal additional environmental impact.

Unfavorable sites

WDFW does not consider high-value conservation areas as favorable for development. The WDFW PHS List is a source of best available science per Washington Administrative Code (WAC) 365-190-130. Habitats and species on this list are priorities for conservation and management due to their population status, geographic distribution, sensitivity to habitat alteration, etc. Washington's State Wildlife Action Plan (SWAP; WDFW 2015), revised every 10 years, is a comprehensive plan for conserving the state's fish and wildlife and the natural habitats on which they depend. There is considerable overlap between the PHS and SWAP, and both contribute to WDFW's efforts to conserve and manage wildlife and habitats.

Sites identified as Priority Habitats per PHS or Habitats of Greatest Conservation Need (HGCN) per the SWAP could be considered unfavorable sites. These sites support year-round or seasonal/migratory

populations of Priority Species or Species of Greatest Conservation Need (SGCN). Siting a renewable energy project in these areas could present many challenges and may result in WDFW not supporting the project location and recommending more stringent mitigation to the permitting authority.

Unfavorable sites include:

- **Lands with slopes greater than 5%:** This habitat is susceptible to erosion and habitat disruption.
- **Essential, limited, or irreplaceable habitat for** listed, SGCN, or PHS listed species as identified in state or federal management plans and databases
- **Critical ungulate habitat:** Winter and summer range and migration corridors
- **State lands identified within habitat and wildlife connectivity corridors:** The Washington Connected Landscape Project (WHCWG 2010) has identified these.
- **State lands identified in the Arid Lands Initiative** (aridlandsinitiative.org): Shared Priorities for Conservation
- **All WDFW lands:** This includes wildlife areas, conservation easements, and other WDFW managed lands
- **Washington State Shrubsteppe Restoration and Resiliency Initiative (WSRRI) land:** Areas identified as core areas and corridors

Previously disturbed sites do not include fire disturbed shrubsteppe habitats, or other fire-prone native habitats, that still maintain relatively undisturbed soil profiles and characteristics upon which natural successional processes or successful native habitat restoration could occur. Fire disturbance is an ecological component of shrubsteppe that may wipe out slow growing sagebrush, compromise cryptobiotic crust and other sensitive vegetation, and fragment habitat. While fire alters the habitat condition, it does not eliminate shrubsteppe habitat despite the lack of defined vegetative components during periods of post-fire recovery.

Wild Horse Wind & Solar Facility. Photo by Michelle Huppert.

Exploratory planning tools

There are numerous renewable energy planning tools and mapping systems available to assist with solar or wind project siting, some of which are listed in Tables 2 and 3. These include sources of best available science for renewable energy siting and biological resources in Washington State that should be used for siting purposes, in desktop assessments, and referenced when planning field surveys. These resources are subject to change and are not all-inclusive. Please consult with WDFW to determine if you are using the most up-to-date sources.

Table 2. Exploratory planning tools for siting industrial scale renewable energy projects in WA.

Resource	Link	Description
Least Conflict Solar Siting	WSU Energy Program > Renewable Energy > Least Conflict Solar Siting	This project aims to highlight areas in the Columbia Plateau with potential conflict for utility-scale solar development regarding conservation, farmland, and ranchland. Cultural and tribal resources are not included.
Least Conflict Solar Siting: Conservation Value Map	Conservation Value Map | Maps | Least-Conflict Solar Siting (databasin.org)	LCSS Conservation Value Map that depicts relative conservation value for landscapes across the Columbia Plateau. This map accurately highlights conservation concerns. Farmland Value Map, Ranchland Value Map, Solar Development Suitability, and the Composite Map do not accurately represent conservation concerns.
WA Department of Ecology Programmatic Environmental Impact Statement	Programmatic EIS - Washington State Department of Ecology	Non-decisional documents for broad-scale and state-wide assessments for areas in the state suitable for green projects and evaluation of potential significant environmental impacts.
US Bureau of Land Management Programmatic Environmental Impact Statement	2023/2024 Solar Programmatic EIS Information Center (anl.gov)	This Programmatic EIS updates the Bureau of Land Management (BLM) 2012 Western Solar Plan to support current and future national clean energy goals, long-term energy security, climate resilience, and improved conservation outcomes on BLM managed lands.
WA Department of Natural Resources Clean Energy Parcel Viewer	Department of Natural Resources Clean Energy Program Parcel Viewer	Created to determine whether state lands may be worthwhile to include in proposed energy project footprints. DNR has pre-screened thousands of state trust properties considering criteria such as electricity generation capability; limiting potential conflicts (e.g., environmental and cultural resources); and consulting with interested parties where existing uses may otherwise be incompatible with potential clean energy siting.
WA Department of Commerce Compatible Energy Siting Assessment Tool	Washington State Compatible Energy Siting Assessment (CESA) Site Consultation Prototype Map Tool	This Prototype is designed to promote early and ongoing communication between renewable-energy developers and governmental entities (civilian, military, and tribal) in support of successful site-selection for new facilities.

Biological information

The resources listed in Table 3, in coordination with the siting tools in Table 2, can assist with preliminary assessment of biological resources concerns in a project vicinity.

Table 3. Biological resource information that can be used during the exploratory planning phase for industrial scale renewable energy projects in WA.

Resource	Link	Description
WA Wildlife Habitat State-wide Connectivity Analysis	Washington Wildlife Habitat Connectivity Working Group » Statewide Analysis (waconnected.org)	Modeled habitat analysis showing landscape connections and resistance corridors for selected wildlife species
WA Wildlife Habitat Connectivity Working Group: Columbia Plateau Ecoregion	https://waconnected.org/columbia-plateau-ecoregion/	A series of detailed connectivity analyses using 11 focal species and 6 vegetation classes of the Columbia Plateau ecoregion that depict areas of relatively low human disturbance and broad landscape connectivity patterns.
Ecological Risk Assessment for Wind Energy Development in Eastern WA	Eastern Washington Wind Power Conservation Blueprint Report | My Documents | Data Basin	The Nature Conservancy's modeled habitat and targeted avian species report and spatial catalogue for low, medium, and high-risk wind development areas.
Priority Habitats and Species	Priority Habitats and Species (PHS) | Washington Department of Fish & Wildlife	WDFW's primary means of sharing fish, habitat, and wildlife information. The state supreme court has held that PHS is a valid source of best available science in WA State.
Arid Lands Initiative	https://aridlandsinitiative.org/	Priority conservation areas in arid shrubsteppe eastern Washington
U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC)	IPaC: Home (fws.gov)	Mapping tool to identify if any species listed under the Endangered Species Act, critical habitat, migratory birds, or other natural resources may be impacted by a project.
USGS Ungulate Migrations of the Western US	pubs.usgs.gov/sir/2024/5006/sir20245006.pdf	This report details known ungulate migration routes throughout the Western US and can be used to assess impacts of potential developments.
WDFW Game Management Plans	Game management plans | Washington Department of Fish & Wildlife	A comprehensive list of all game management plans developed by WDFW.
WDFW 2015-2021 Game Management Plan	Washington Department of Fish & Wildlife 2015-2021 Game Management Plan | Washington Department of Fish & Wildlife	This Game Management Plan (GMP) will guide the Washington Department of Fish and Wildlife's management of hunted wildlife for the next six years. The focus is on the scientific management of game populations, harvest management, and other significant factors affecting game populations.
Energy Development Guidelines for Mule Deer	Energy Development Guidelines for Mule Deer – WAFWA	This document establishes guidelines for energy development to proceed in a manner that is compatible with habitat requirements of mule and black-tailed deer.

Table 3. Biological resource information that can be used during the exploratory planning phase for industrial scale renewable energy projects in WA.

Resource	Link	Description
WDFW Mule Deer Management Plan	Washington State Mule Deer Management Plan | Washington Department of Fish & Wildlife	The plan provides background information on the natural history, biology, and status of mule deer herds in Washington State, describes current management issues, and establishes objectives and strategies to guide future management.
WDFW White-tailed Deer Management Plan	Washington State Deer Management Plan: White-tailed Deer | Washington Department of Fish & Wildlife	The purpose of this plan is to prescribe near-term direction for managing white-tailed deer in Washington.
Washington Shrubsteppe Restoration and Resiliency Initiative	Washington Shrubsteppe Restoration and Resiliency Initiative | Washington Department of Fish & Wildlife	WSRRI Map Portal identifies Spatial Priorities for conservation across the Columbia Plateau and high-quality "core areas" of shrubsteppe that should be preserved.
Site-specific Management: Shrubsteppe	Site-Specific Management: How to Avoid and Minimize Impacts of Development for Shrubsteppe (wa.gov)	Supplemental information on incorporating shrubsteppe impacts into habitat management plans.
Shrubsteppe Management and Assessment Protocol	Management Recommendations for Washington's Priority Habitats: Shrubsteppe	Management guidance for shrubsteppe habitat. This guide contains a shrubsteppe Ecological Integrity Assessment protocol: Appendix 9.
PHS Local Government User Guide: Shrubsteppe and Eastside Steppe Map	PHS User Guide - Shrubsteppe and Eastside Steppe Map (wa.gov)	This document contains information about the classification of shrubsteppe and eastside steppe habitat in the Columbia Plateau and provides general maps to show the extent of these habitat types.
Shrubsteppe and Grassland Restoration Manual	https://wdfw.wa.gov/sites/default/files/publications/01330/wdfw01330.pdf	Technical manual focused on shrubsteppe and grassland restoration in the Columbia Plateau.
Western Association of Fish and Wildlife Agencies Range-wide Guidelines for Seeding Mule Deer and Black-tailed Deer Habitat	wafwa.org/wpdm-package/range-wide-guidelines-black-tailed-mule-deer-seeding-booklet-2022/?wpdmdl=24677&refresh=66db7f954bd621725661077	Guidelines for the reseeding and restoration for ungulate habitat in the Western U.S.
WA Department of Natural Resources Natural Heritage Program	https://www.dnr.wa.gov/NHPlists	Lists of vascular plants and nonvascular species of conservation concern in WA.
	Online Field Guide to the Rare Plants of Washington | WA - DNR	Field guide to rare plants of Washington. Provides information on conservation status, range, phenology, identification, and more.
State Wildlife Action Plan (SWAP)	State Wildlife Action Plan (SWAP) 2015 | Washington Department of Fish & Wildlife	This document is updated approximately every 10 years and is a comprehensive plan for conserving WA state's fish and wildlife and their habitats, particularly Species of Greatest Conservation Need (SGCN).

Table 3. Biological resource information that can be used during the exploratory planning phase for industrial scale renewable energy projects in WA.

Resource	Link	Description
Ferruginous hawk	Periodic Status Review for the Ferruginous Hawk (2021) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Ferruginous hawk in Washington.
	Management Recommendations for Washington's Priority Species: Ferruginous Hawk (2024) | Washington Department of Fish & Wildlife	Natural history information, limiting factors, and management recommendations for Ferruginous hawk in Washington.
Raptors	Global Raptor Information Network (globalraptors.org)	Database and catalog of raptor resources created and managed by The Peregrine Fund.
Marbled murrelet	Periodic Status Review for the Marbled Murrelet in Washington (2016) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Marbled murrelet in Washington.
Pygmy rabbit	Periodic Status Review for the Pygmy Rabbit in Washington (2018) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Pygmy rabbit in Washington.
Western gray squirrel	Periodic Status Review for the Western Gray Squirrel (2023) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Western gray squirrel in Washington.
Sharp-tailed grouse	Periodic Status Review for the Columbian Sharp-tailed Grouse in Washington (December 2017) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Columbian sharp-tailed grouse in Washington.
Greater Sage-grouse	Periodic Status Review for the Greater Sage-grouse in Washington (Apr 2021) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Greater sage-grouse in Washington.
Monarchs	Managing for Monarchs in the West | Xerces Society	Guidance on how to manage existing monarch breeding and migratory habitat developed by the Xerces Society for Invertebrate Conservation.
Inland dunes	Conservation Strategy for Washington State Inland Sand Dunes (2007) | Washington State Department of Natural Resources	Management recommendations, conservation, and ecology of Inland dune ecosystems in Washington.
Oregon white oak	Best management practices for mitigating impacts to Oregon white oak priority habitat | Washington Department of Fish & Wildlife	Management and mitigation guidance for Oregon white oak in WA.
Oregon vesper sparrow	Status Report for the Oregon Vesper Sparrow | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Oregon vesper sparrow in Washington.
Mazama pocket gopher	Mazama Pocket Gopher Recovery Plan and Periodic Status Review (2020) Washington Department of Fish and Wildlife	Status, distribution, conservation concerns, and management activities of the Mazama pocket gopher in Washington.

Table 3. Biological resource information that can be used during the exploratory planning phase for industrial scale renewable energy projects in WA.

Resource	Link	Description
Streaked horned lark	Washington State Periodic Status Review for the Streaked Horned Lark (2016) | Washington Department of Fish & Wildlife	Status, distribution, conservation concerns, and management activities of the Streaked horned lark in Washington.

The Exploratory Planning step is complete once a developer has successfully selected a project site utilizing the tools and principles described above.

Step 2: Preliminary project planning

At this stage, a developer has selected a site and is beginning to design elements of the project. Often, when a project developer selects an area, the initial selection encompasses a broader area than the final project footprint. During this stage, it's important to consider the entire area under review and assess it thoroughly for biological resources to ensure that the final project design avoids and minimizes environmental impacts. This section outlines recommendations for assessment of biological resources to inform the design and layout of the project.

Desktop assessment

The primary purposes of desktop assessment studies are to collect information suitable for predicting the potential impacts of the project on wildlife, habitat, and vegetation and to design the project layout so that impacts on biological resources are avoided and/or minimized. The results of the desktop assessment, and any potential impacts identified, should be reported to the state and federal wildlife agencies well in advance of the final project design and construction planning in order to guide development of the facilities to avoid and minimize impacts to natural resources.

Priority Habitat and Species sensitive data request

PHS data requests are initiated by project proponents with WDFW (https://wdfw.wa.gov/species-habitats/at-risk/phs/maps/data-request-sensitive) to obtain sensitive wildlife and habitat data for the proposed project site and surrounding area. As part of this data request, projects will also have to complete a Sensitive Fish and Wildlife Release Agreement. These requests are typically made after a project has completed a formal agreement with the landowner for potential project development.

Data provided through a PHS request is presence-only data and should not be used to determine absence of a species or habitat on any given site. Project sites frequently occur on private lands where no PHS data has been recorded and therefore PHS data is lacking for these areas.

Data provided by WDFW will aid the project to better understand the biological resources on and adjacent to the proposed project site, will aid in the development of biological field surveys based on

the protocols in Appendix B, provide a platform for discussions with WDFW about additional surveys, and provide fine-scale information to site the project components to avoid and minimize impacts.

PHS Sensitive Data is exempt from public disclosure under the Public Records Act; this term is defined in RCW 42.56.430. To obtain PHS sensitive data for the proposed project area, please contact WDFW PHS to ensure data sharing requirements are met; Priority Habitats and Species: Maps | Washington Department of Fish & Wildlife.

Lund Hill Solar Facility. Photo by Stefanie Bergh.

Biological assessments

A preliminary desktop assessment of wildlife, habitats, plants, and associated landscape-level impacts should be completed by the project proponents before a project site is officially (lease agreement with landowner is finalized) selected and should be used before field surveys are planned. All Priority Habitats and Species should be listed explicitly, along with likelihood of occurrence on the project site. Additionally, the landscape-level concerns below should be incorporated into the analysis. The results of the desktop assessment will be used in discussion with WDFW to inform the project layout to best avoid and minimize impacts and to identify appropriate methods before field surveys are implemented. **Tables 2** and **3** list resources that should be used for this analysis, but using additional sources of best available science, including peer-reviewed literature, is encouraged. The following should be included in the desktop assessment:

A. **Wildlife Habitat Connectivity.** Documents such as the Washington Wildlife Habitat State-wide Connectivity Analysis, Columbia Plateau Ecoregion Analysis, Arid Lands Initiative, WSRRI, and management plans for SGCN should be consulted early in the project scoping analysis to determine if the project is within a connectivity corridor. In 2025 the WA Habitat Connectivity Action Plan will be released.
B. **Habitat and Vegetation Mapping**. Habitat types and acreage should be mapped using PHS habitat types, though other sources of best available science, such as National Land Cover Database, can be used in addition to PHS. This desktop assessment should be completed before field surveys are conducted to verify accuracy. Although there are many sources of reliable habitat mapping, WDFW PHS habitat types should be used when characterizing the project site. The WDFW PHS is considered a source of best available science in Washington State.

Step 3: Assessing wildlife and habitat on the project site

WDFW does not approve siting permits (county; local permitting) or site certifications (state permitting) but serves as a technical expert and provides recommendations to these regulatory agencies for ways to avoid, minimize, and mitigate impacts from development and land use changes. Both county permitting and EFSEC site certification follow SEPA rules that provide the regulatory framework for projects to demonstrate that; (1) wildlife and habitat resources are fully considered and described; (2) actual, potential, and cumulative impacts are identified; (3) avoidance and minimization of important resources have been incorporated; and (4) any mitigation is satisfied. To support this assessment, project proponents must prepare detailed biological and vegetation reports, along with weed management, restoration, and mitigation plans, or any other plan requested by the permitting authority. WDFW will review this information to determine if the identified impacts and mitigation has been adequately identified.

Biological field surveys

Field surveys, outlined in Appendix B, should be composed of; A. Wildlife Surveys, B. Rare Plant Surveys, and C. Habitat/Vegetation Surveys. All *General* wildlife surveys listed in the appendix should be completed on all project sites and *Supplemental* surveys for bats or threatened, endangered, or sensitive wildlife will be needed as determined by WDFW based on desktop assessments or other consultation details. Additional supplemental surveys for specific plants or habitats may also be requested. Walking transect surveys may not be needed across the entire project site (i.e., entire area leased) but will always be requested for the actual project footprint (i.e., areas selected for development of a substation, solar array, or turbine construction) to confirm appropriate avoidance measures and mitigation requirements are met. All methods, particularly species-specific surveys, are subject to change based on best available science and should be verified with WDFW before field surveys begin. Suggested methodology for field surveys is outlined in **Appendix B: Biological Field Survey Protocols**.

Developers may be requested to address several other critical issues. These may include conducting wetland delineations as required by the Washington Department of Ecology and adhering to Hydraulic Project Approval (HPA) requirements or local county regulations. Collaboration with local WDFW habitat biologists is advised to effectively navigate these requirements. Other important considerations include

implementing erosion control measures, soil stabilization strategies, and assessing downstream effects. Additionally, vegetation and habitat management plans should be developed using WDFW's PHS habitat definitions, although other recognized vegetation and habitat categories may also be included. These plans should address noxious and invasive weed control, specify appropriate and locally sourced seed mixtures, and dual-use opportunities. Management of vegetation through grazing or mowing practices should be described as part of the overall site management strategy.

Step 4: Mitigation

WDFW provides mitigation recommendations to permitting authorities based on current policies and guidelines designed to protect and conserve Washington's biological resources. These recommendations aim to foster collaboration between developers, permitting authorities, and WDFW to effectively avoid, minimize, and mitigate impacts to wildlife and habitat. WDFW will support county codes or local regulations that prescribe stricter mitigation requirements than outlined in these guidelines.

WDFW's mitigation approach includes impacts on both wildlife and habitat, incorporating updated mitigation levels, and mitigation strategies outlined in Appendix C. For example, mitigation strategies for sensitive habitats like Oregon white oak and shrubsteppe have been revised to reflect their ecological importance, with higher mitigation levels and stronger emphasis on avoidance (Nolan and Azerrad 2024). Cumulative impacts (defined in Appendix E) are also considered and may require additional mitigation measures. Mitigation should be "in-kind," and it may be conducted either "on-site" or "off-site". Mitigation must occur on property that is protected through a conservation easement or perpetual deed restriction and must be managed to prevent further development or degradation. Developers are responsible for ensuring the long-term preservation of the mitigation area.

Developers must demonstrate sufficient scientific expertise, supervisory capability, and financial resources to successfully implement the mitigation project. This includes the ability to monitor the site and make necessary corrections if the project does not meet its intended goals. The standard mitigation levels set forth in Appendix C, Table 6 provide baseline guidance, but these levels may be adjusted on a case-by-case, site-specific basis. Such determinations will be based on best available science and the specific conditions of the site, considering both the impacted and mitigation areas.

Mitigation types

- **Acquisition by project:** WDFW will recommend acquisition of specific parcels based on biological resources and connectivity. WDFW will recommend the project to work with landowners directly.
- **Conservation easement:** WDFW will recommend specific parcels be placed into a conservation easement based on biological resources and connectivity. Conditions of an easement should include habitat improvements, less grazing, less access, revegetation, and stewardship (ensure funding for monitoring capabilities) for an easement time period that may be length of the project permit (30+ years) or into perpetuity. Overall, these terms should result in habitat improvements and no net loss of habitat functions.

- **Deed restrictions:** Changes to the deed to protect land as wildlife habitat in perpetuity. The project should coordinate with a landowner to create deed restrictions and communicate with WDFW to determine if proposed land meets mitigation needs.
- **In-lieu fee:** This option is only recommended if a clear process has been established by the permitting authority. This process should include: who receives the in-lieu fee, timeframe in which the in-lieu fee must be used, what the in-lieu fee will be used for, and where that project will be implemented (i.e. an exact restoration, preservation, or other conservation measure needs to be decided on prior to permitting).

Step 5: Spatiotemporal buffers for construction and operation

Construction and operation of solar and wind facilities may result in significant adverse impacts to special-status habitats and species. Impacts may result in several deleterious effects such as degradation, loss, or conversion of suitable habitat that is critical to species viability; disturbance that disrupts successful breeding and rearing behaviors; disruption of habitat continuity along migration routes or mortality of individuals. Table 4 shows time periods during which disturbance should be avoided for certain species. Specific spatial and temporal buffers recommended for these, and other species are in Appendix D. Projects should engage with WDFW for site-specific seasonal timing limitations and buffers.

Table 4. Time periods during which disturbance should be avoided for select wildlife species highlighted in orange. Consult with WDFW for other species and more specific information.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
EASTSIDE												
Eagles	X	X	X	X	X	X	X	X	X	X	X	X
Other Raptors			X	X	X	X	X	X	X	X	X	X
Burrowing Owl			X	X	X	X	X	X	X	X	X	X
Shrubsteppe Songbirds			X	X	X	X	X	X	X	X	X	X
Sharp-tailed Grouse				X	X	X	X	X	X	X	X	X
Greater Sage Grouse			X	X	X	X	X	X	X	X	X	X
Bat Migration				X	X	X	X	X	X	X	X	X
Striped Whipsnake					X	X	X	X	X	X	X	X
WESTSIDE												
Eagles	X	X	X	X	X	X	X	X	X	X	X	X
Other Raptors			X	X	X	X	X	X	X	X	X	X
Northern Spotted Owl				X	X	X	X	X	X	X	X	X
Forest Songbirds		X	X	X	X	X	X	X	X	X	X	X

	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
Marble Murrelet							X	X	X	X	X	X	X	X	X	X	X							
Western Gray Squirrel					X	X	X	X	X	X	X	X	X	X	X	X								
Mazama Pocket Gopher							X	X	X	X	X	X												
Bat Migration					X	X	X	X	X	X							X	X	X	X				

Step 6: Operational monitoring and adaptive management

Operational monitoring

WDFW recommends a tailored approach to operational monitoring for both solar and wind projects that results in meaningful data that can be used to determine if adaptive management should be initiated on a project site and to aid with future projects.

Technical advisory committees (TACs) review results of operational monitoring surveys and are consulted regarding fatalities of listed species or major fatality events that are incidentally observed outside of regular operational monitoring. These TACs are often required by the permitting agency. In the absence of a TAC, results of operational monitoring surveys should be provided to WDFW so that an adaptive management strategy can be developed, if necessary.

Protocols

WDFW will generally recommend that operational monitoring continue for the first three years of operation for wildlife and revegetation within the project site. This data will serve as an initial step in understanding the responses of wildlife and vegetation to the industrial energy site and may inform future adaptive management strategies. Operational monitoring protocols will be determined based on results of the desktop assessment and field surveys. Generalized post-construction mortality monitoring may not be needed, though surveys for certain species may be requested. Some of these surveys may include raptor nest use, bat mortality, bat acoustic monitoring, burrow occupancy, and on-site vegetation response, but will vary by site. After the first three years, periodic surveys should be completed throughout the life of the project to monitor and adaptively manage wildlife, habitat, or vegetation that have been identified during pre-permitting biological data collection (see Step 2: Preliminary Project Planning), SEPA review (see Permitting Options section), through a cumulative impacts assessment (see Appendix E), or based on results of the first three years of monitoring, including any major impacts incidentally observed. The types of monitoring and species to be monitored could change based on input from the project, WDFW, or accepted recommendations from a TAC Frequency of the periodic surveys may vary based on monitoring goals determined at time of permitting or based on recommendations from a TAC that have been accepted by the permitting authority.

Field protocols will be based on best available science for industrial solar and wind facility monitoring. If published methods are outdated or not applicable to Washington State, the project should work with WDFW and other biological professionals to determine appropriate protocols. All protocols should be shared with WDFW before implementation to ensure concerns are being addressed.

Generalized wildlife mortality surveys will likely not be recommended unless the project site has documented use or could potentially be used by threatened, endangered, or sensitive wildlife and that operations of the project could potentially result in a mortality events.

Adaptive management

The results of the operational monitoring surveys should be shared with any permitting authority appointed TAC and WDFW yearly. If results indicate that unexpected and unaccounted for negative impacts to habitat or wildlife have occurred that have not been mitigated during the permitting process, adaptive management techniques may be requested. The goal of the specific adaptive management technique will vary based on species or habitat impacted and should be determined through conversations between WDFW, the permitting authority, and the project.

Some adaptive management techniques could include: alteration of mowing schedule to accommodate wildlife that colonize the project site, alteration of materials proven to be a risk to wildlife (i.e., netting or straw wattles), application of curtailment measures (temporary shutdown of certain turbines or implementation of cut-in speeds) to address bird or bat impacts, and adjustment of weed management to improve vegetation conditions.

Data sharing

Under the data sharing agreements between WDFW and project proponents, WDFW recommends that any data and reports generated from desktop assessments, field surveys, and project monitoring be shared with WDFW. This collaboration helps both developers and the agency fill data gaps on habitat types and species occurrences. WDFW will make a request directly to the project, and make a formal recommendation to the permitting authority, that data sharing from the project to WDFW occurs.

Appendix A: Best Management Practices

The following Best Management Practices (BMPs) are generally applicable to most project sites. A project should implement these BMPs to protect habitat and wildlife during siting, pre-construction, construction, and operation. BMPs are subject to periodic updates based on the best available science.

Wildlife

In the event of an immediate public safety issue, wildlife violation, or an injured or dangerous animal, please call the WDFW Enforcement office at 360-902-2936 or email WILDCOMM@dfw.wa.gov, or call 911.

Environmental awareness training

1) Provide biological resource protection training to all personnel working on a project site and host multiple briefings if needed. Environmental awareness training should include:
    a. Federal and state laws (e.g., those that prohibit animal collection or removal),
    b. Awareness of sensitive habitats and bird species, potential bird nesting areas, potential bat roosting/breeding habitat, and general wildlife issues,
    c. How to identify and demarcate sensitive habitats with appropriate avoidance buffers if next to a project site or staging area.

Avoid ecologically sensitive areas

1) Site project facilities and activities, including associated roads and utility corridors, during the construction, operation, and decommissioning/reclamation phase, out of occupied habitats and wildlife corridors (e.g., migratory, habitat connectivity, hibernacula) of listed/sensitive wildlife and plants to protect species and their habitats. If siting occurs within these areas, specific spatial and seasonal buffers (flowering timing limitations, nesting/rearing season, etc.), permanent buffers, construction and operational timing restrictions that WDFW will recommend based on the desktop assessment and field surveys, as well as compensatory mitigation.
2) If construction of a proposed project occurs in or near stream channels or rivers, a Hydraulic Project Approval (HPA) may be required (Chapter 77.55 RCW; Chapter 220-.660 WAC, Washington State Hydraulic Code). Consult the local WDFW Habitat Biologist for site specifics clarification.
3) Avoid all disturbance of aquatic habitats during construction and siting activities.
4) Avoid the use of stream channels, steep slopes, sensitive soils, and other sensitive environmental areas for equipment or materials storage or stockpiling; construction staging or maintenance activities; field offices; hazardous material or fuels storage; solid waste hauling; or placement of temporary access roads.
5) Avoid disturbances within minimum distances established in local codes for riparian habitats, wetlands, and other aquatic habitats. Implement larger buffers depending on soils, slopes, and wildlife and listed/sensitive habitat needs.

6) Avoid excessive disturbance of aquatic habitats during surveys and follow proper decontamination protocols if surveying in these habitats to prevent spread of amphibians and other aquatic diseases.
7) Use appropriate erosion control measures where applicable in construction, operation, and decommissioning/reclamation to eliminate or minimize unnatural soil deposition and erosion into offsite aquatic habitats.

Entrapment

1) Ensure that any open trenches have escape ramps at an appropriate angle and/or are covered to prevent trapping wildlife.
2) Ensure that any vertical pipes are capped and that any other open containers are properly closed/sealed to prevent trapping wildlife.
3) Remove any netting (e.g., associated with straw wattles) as soon as possible once erosion measure is no longer need or revegetation is deemed successful to prevent trapping and killing wildlife, especially lizards, snakes, and birds.
4) Avoid excessive accumulation and long-term storage of construction materials and debris on the project site that may attract wildlife, putting them at risk of being crushed.
5) Avoid use of glue boards for pest management.

Fencing

1) Design and install fences that reduce impacts to wildlife and habitats and allow for wildlife passage when appropriate (TNC 2023). Fencing design should incorporate best available science and technological advances and be approved by WDFW and other relevant agencies (e.g., local reclamation districts) to ensure species needs are considered.
2) Fence in solar arrays to avoid creating dead ends and gate roads between arrays to reduce chances of wildlife being trapped or cornered.
3) Avoid the use of razor, barbed wire, or a single strand of any type of wire at top of fence.
4) Consider fencing solar arrays separately for wildlife corridors vs. a single large, fenced area depending on wildlife concerns. In some instances, a single large, fenced area is preferred. Please work with WDFW to determine the best approach.
5) Allow for small-to-medium sized animals to move in and out of the site by lifting fencing 4-6 inches above the ground or using other techniques that facilitate movement (TNC 2023).
6) Fencing should be at least 8 feet tall to avoid trapping deer, elk, and pronghorn in a site. Consider installing wildlife escape measures such as jump-outs for these animals if needed.

Lighting

1) Unnecessary lighting should be turned off at night to limit attraction and disturbance of migratory birds and bats.
2) Install downward-directed lighting to minimize horizontal or skyward illumination, and avoid steady-burning, high-intensity lights.

Toxic materials and waste management

1) Ensure that there is a spill response plan and containment strategy during construction and operation.
2) Avoid the use of rodenticides and insecticides.
3) All project-related trash and food waste should be disposed of properly.
4) Place drip pans, containers, or plastic sheeting with absorbent materials beneath all vehicles and equipment staged onsite.

Transmission lines

1) Above-ground collector or transmission lines should be designed and constructed to minimize avian electrocution, per the guidelines outlined in Avian Power Line Interaction Committee (APLIC) standards (APLIC 2012).

Collision

1) Limit vehicle speeds to 25 miles per hour or less on internal access roads and watch for less mobile species (e.g., snakes and amphibians) to avoid wildlife collisions or fatalities.
2) Provide diverter markers or other proven deterrents on fencing or metrological evaluation tower (MET) guy wires to deter wildlife collision.

Vegetation management

Soil and vegetation retention

1) Only clear/grade as necessary and retain as much soil and vegetation as possible. For solar projects, conduct vegetation removal by hand-cutting/mowing rather than removing entirely (i.e. grading) if possible, to maintain some ecological functions of remaining habitat and to retain high percentages of native vegetation and biological soil crusts under panels and within arrays. For wind projects, limit areas of native soil disturbance around turbine pads and any other construction activities that may remove native soils.
2) In areas where grading occurs, separately retain topsoil so that it can be used during revegetation and restoration actions.

Re-seeding

1) Only use native seed mixes from the appropriate source (i.e. Columbia Basin if revegetating shrubsteppe) and consult with WDFW before selecting a seed mix.
2) Where necessary, irrigate until plants are established.

Weed and fire management

1) Retain control of a buffer outside of solar array fences for fire management and weed control.
2) Maintain site/lease control of habitat corridors between solar arrays and maintain these areas for habitat conservation and fire management.

3) Prevent the establishment and spread of invasive species and noxious weeds within the site (including transmission line corridors) and carry out integrated weed management actions during all phases of the project. Follow county and state regulations regarding herbicide use.
4) During operations, avoid grazing or mowing during sensitive seasonal periods for wildlife and plants (Appendix D). Consult with WDFW on site-specific species mowing and vegetation management plans.
5) Consider establishing a firebreak around solar arrays/project to address wildfires.

Appendix B: Biological Field Survey Protocols

A. Wildlife surveys

1. General wildlife surveys

At a minimum, two general wildlife surveys should be conducted in the Spring (April and May; one in each month) to record Priority Habitats and Species. These surveys should be conducted for a minimum of three years (preferably five years) prior to construction, in order to account for annual variability in weather, habitat, and wildlife presence. Prior to field surveys, existing PHS data products and other reliable data sources should be consulted and analyzed as described in Step 2: Preliminary Project Planning. The most recent data submitted to the permitting authority for consideration should be current (i.e., less than one year). This ensures that data for the project site is recent and reliable.

Line transect surveys will consist of a biologist(s) familiar with local wildlife walking transects no greater than 60 meters apart for habitat considered generally unsuitable for local wildlife and no greater than 10 meters apart for habitats considered suitable for local wildlife or in areas where cryptic/ smaller species may occur (e.g. herpetofauna, invertebrates, or rodents of concern). The project proponents should work with WDFW to identify areas within the project site that should be surveyed using 10 meter transects or other species-specific surveys (e.g. for ground squirrels, jackrabbits, grouse, monarchs, or others). Surveys should be performed during suitable weather conditions (average temperature for time of year, low-moderate wind, and little or no precipitation). Information recorded should include all wildlife observations, wildlife sign (e.g., scat, tracks, remains, burrows, nests, roosts, etc.), weather conditions (temperature, cloud cover, precipitation, and wind speed), notable behavior (e.g. nesting, foraging, etc.), time of observations, and exact GPS location of all species observations.

Avian point count surveys are specific to wind projects and should be coordinated with WDFW. These surveys may be required for solar as a supplemental survey.

Geospatial positioning data (tracks or point count locations) from line transect surveys should be submitted to WDFW as part of the biological survey report.

2. Raptor nest surveys

At a minimum, one raptor nest survey that covers the entire project area along with the appropriate buffer, should be completed during the appropriate seasons listed below. Multiple surveys may be necessary if more than one PHS species is suspected to occur on the project site. Nest surveys should target all relevant raptor species based on PHS data and discussions with WDFW biologists, and include burrowing, cliff, or tree nesting habitats. These surveys should be repeated during the breeding season prior to construction to document current territory occupancy of raptors, other common raptor species, and common ravens. Appropriate timing and survey distances vary depending on species.

Geospatial positioning data for nest locations should be submitted to WDFW as part of the biological survey report.

A. **Golden eagles, ferruginous hawks, and bald eagles:** All historical nests on territories and suitable habitats should be visited from the ground and/or air depending on terrain and visibility. Surveys for ferruginous hawks should be conducted between April 1 and April 15, for golden eagles between March 15 and April 5, and for bald eagles from February 25 and March 20 (WDFW unpubl. data).
B. **Burrowing owl:** Nest surveys should extend out to 0.5 miles beyond the project area boundary and occur between May 1 and May 20. All usable burrows and burrowing owl sign should be documented. These surveys should be conducted from the ground where landowner permission can be obtained.
C. **Remaining raptor species:** Surveys should extend out to 0.5 miles from outer project area boundary for solar projects and 2 miles for wind projects. Generally, these surveys should occur between March 15 and April 15. Swainson's hawks should be surveyed May 1 to May 20 for occupancy.
D. **Common ravens**: Surveys should extend out to 0.5 miles from outer project area boundary for solar projects and 2 miles for wind projects. Generally, these surveys should occur between March 15 and April 15.
E. **Winter occupancy surveys (if applicable):** Surveys for both golden eagles and bald eagles are best conducted December through January. Wintering short-eared owls and burrowing owls may also be present in some areas December to January. Survey methods may vary depending on region and should be verified with WDFW.

3. Supplemental bat surveys

Appropriate methods, including species-discriminating bat detectors and radar, and survey periods depend on local habitat, environmental conditions, elevation, and vary by species and/or life stage. Site-specific bat surveys are recommended when use of the site by bat species is estimated to be high based on known data and/or consultation with WDFW biologists. If the site is known to have bat activity, the project will be asked to complete acoustic monitoring. Seasonal acoustic monitoring should cover the spring migration, summer activity, and fall migration windows for species suspected to be on site.

4. Supplemental surveys for threatened, endangered, and sensitive species

The project proponents should develop a list of threatened, endangered, and sensitive species that may currently be present or were historically present in the project area (Step 2: Preliminary Project Planning) and consult with WDFW regarding species-specific surveys and methods. If existing information suggests the probable occurrence of state and/or federally threatened or endangered or special-status species on the project site, focused surveys are necessary during the appropriate seasons to determine the presence of the species and must be conducted for multiple years to confirm absence. Many of these species may be detected during general surveys, but additional surveys may be needed for reliable detection.

B. Rare plant surveys

State and Federal listed plant species should be included in pre-project review of a site. Review should include a query of known populations of rare plants and whether the existing habitat contains potential for the species if the area has not been surveyed previously. This information is available through the Washington Department of Natural Resources (WDNR) Natural Heritage Program. For areas that have not been previously surveyed but contain suitable habitat, field surveys should be done at the appropriate time of year for that species.

C. Habitat/vegetation surveys

The area under consideration for development should be mapped as to vegetation type and acres. Information about general vegetation and land cover types, wildlife habitat, habitat quality, extent of noxious weeds, and physical characteristics within the project area should be collected and compiled. Habitat field surveys should align with phenology of species likely to be present on site. This is typically from April to June, but the WDNR Natural Heritage Program should be consulted to confirm (Table 3). Habitats should be characterized using WDFW PHS habitat definitions for consistency. Additional site-scale analysis of habitat may be requested depending on initial desktop assessment and field survey results. This could include a qualitative assessment of current habitat conditions using established protocols such as the shrubsteppe Ecological Integrity Assessment (EIA) protocol outlined in Appendix 9 of WDFW Management Recommendations for Washington's Priority Habitats: Shrubsteppe (Table 3). This is a systematic, repeatable method for identifying, mapping, and assessing shrubsteppe habitat quality.

Appendix C: Mitigation

WDFW mitigation policy and strategy

WDFW policy POL-M5002 (1999) states that ratios shall be greater than 1:1 to compensate for temporal losses, uncertainty of performance, and differences in functions and values and uses the following definition of mitigation. WDFW will recommend to the permitting authority mitigation levels that may be increased or decreased on a case-by-case, site-specific basis based on best available science and on site-specific and project-related conditions. WDFW shall consider the functions and values of, and the variety of habitats provided by the proposed mitigation and the impacts at the project site. Mitigation goals, strategies, and levels are described in more detail in Table 6.

WDFW Policy POL-M5002 defines "mitigation" as 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

A. Avoiding the impact altogether by not taking a certain action or parts of an action.
B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
E. Compensating for the impact by replacing or providing substitute resources or environments.
F. Monitoring the impact and taking appropriate adaptive management measures to achieve the identified goal.

PHS and the State Wildlife Action Plan (SWAP) were used to develop a framework to avoid, minimize, and mitigate impacts from terrestrial industrial solar and wind projects. Species and habitats were assigned to 5 categories (i.e. classes) and Table 6 below outlines WDFW's recommended mitigation strategies.

There are 127 SWAP (2015) ecological systems in the state; 37 of those are ecologically imperiled and 27 are particularly important to Species of Greatest Conservation Need (SGCN). Those that are ecologically imperiled and are particularly important to SGCN and identified as HGCNs. Many of the PHS terrestrial and aquatic habitats, and habitat features are covered within the 64 HGCN currently recognized in WA. Due to these overlaps, many Priority Species are SGCN. Priority Species are ranked one class higher than SGCN (Table 4) since many of the Priority Species are in Class 1 or Class 2 habitats (Table 5). These numbers are likely to change when SWAP is updated in 2025.

Biodiversity Areas and Corridors (terrestrial), Herbaceous Balds (terrestrial), Juniper Savannah (terrestrial), Instream (aquatic) and cave, cliffs, and talus (habitat features) are not covered in HGCN.

Rare plants with a state rank of S1, S2, and S3 can occur within the habitat classes and avoidance (and minimization) is recommended along with buffers and the development of conservation strategies that protect, restore, and increase local ecological functions that support these plants.

The two tables below provide a quick reference for habitat and wildlife in classes 1-5.

Table 4. Species in Classes 1-5

Species	Federal or State Listed	SWAP SGCN	WDFW PHS Species	Important Species
Class 1	X			
Class 2			X	
Class 3		X		
Class 4				X
Class 5				

Table 5. Habitat in Classes 1-5

Habitat	SWAP HGCN	WDFW PHS Habitat	Important Habitat
Class 1	X	X	
Class 2		X	
Class 3	X		
Class 4			X
Class 5			

The following definitions of habitat and species classes apply to mitigation classes discussed above.

Class 1 habitat

- Essential, limited, and irreplaceable habitat: Any Habitat of Greatest Conservation Need
- These habitats may have their own PHS Management Recommendations for mitigation sequencing and those recommendations should be followed.
- Examples include: Shrubsteppe, Riparian, Oregon White Oak, Freshwater wetlands

Class 1 species

- Federal or State listed (Candidate, Sensitive, Threatened, Endangered) and obligate wildlife species or species with limited range (e.g., striped whipsnake).
- These species may have their own PHS Management Recommendations for mitigation sequencing and whichever is more protective of the species should be followed.
- Examples include: Greater sage-grouse, Ferruginous hawk, pygmy rabbit, marbled murrelet

Class 2 habitat

- PHS habitats that are not a SWAP Habitat of Greatest Conservation Need. Class 2 Habitat also includes big game migration corridors and wintering/calving areas. Class 2 Habitat frequently includes Class 1 Habitat important to Class 1 Species.
- Examples include: Biodiversity Areas and Corridors, Instream

Class 2 species

- PHS species (Priority Habitats and Species (PHS) | Washington Department of Fish & Wildlife).
- Examples include: Mule deer, Elk, Bighorn sheep, Fish, Mussels

Class 3 habitat

- SWAP Habitat of Greatest Conservation Need that are not PHS habitat. There are less than five Class 3 ECOS in the State.
- Examples include: Inter-Mountain Basins Greasewood Flat, Northern Rocky Mountain Ponderosa Pine Woodland and Savanna, Northern Rocky Mountain Western Larch Savanna

Class 3 species

- Species of Greatest Conservation Need not identified in Class 1 (SWAP) and Class 2 (PHS).
- Examples include: Hoary bat, Silver-haired bat, American badger, Side-blotched lizard, Pygmy horned lizard, Tiger salamander, Monarch butterfly, Bumblebees

Class 4 habitat

- "Working lands" such as row crops, tree crops, other active and fallow agricultural lands that may be intermixed with higher Class habitats, and from a landscape perspective, be part of a Habitat of Greatest Conservation Need or Biodiversity Areas and Corridors.
- If Class 4 habitat is utilized by higher Class wildlife, then use corresponding Mitigation Goal and Strategy

Class 4 species

- Not Listed, Non-PHS, Non-SCGN. Important species that are not Class 1-3. Important recreationally or commercially important species not included in higher class levels.

Class 5 habitat

- Areas where no HGCN, SGCN, or PHS habitat or species are known to occur and outside of core restoration/conservation areas such as WSRRI cores and corridors and WDFW PHS Biodiversity Areas and Corridors.

Table 6. Mitigation goals, strategies, and general levels based on habitat and species class.

Habitat/Species Class	Goal for Mitigation	Mitigation Strategy	Mitigation Level for Permanent Impacts	Mitigation Level for Temporary impacts
Class 1	No net loss. Preservation is the goal because any loss of these resources would represent a significant impact to habitat/wildlife. There is no practical way to replace or restore a Class 1 resource if it is lost.	Avoid all impacts. Follow specific WDFW Management Recommendations for mitigation sequencing (i.e. Oregon White Oak, Shrubsteppe, Ferruginous Hawk) Mitigation habitat must be in similarly functional habitat (in-kind) and in secure conservation status prior to project development.	High to highest mitigation level up to avoid	There are no temporary impacts to Class 1 or Class 2: only permanent.
Class 2	No net loss. Preservation is the goal because any loss of these resources would represent a significant impact to habitat/wildlife.	Avoid all impacts. Mitigation habitat must be functional habitat and in secure conservation status prior to project development.	Medium to high mitigation level up to avoid	There are no temporary impacts to Class 1 or Class 2: only permanent.
Class 3	Conserve and sustain those species and habitats present and provide avenues for overall enhancement of key habitat components through management and stewardship of the site's biological resources.	In-kind. Where mitigation is required for impacts to Class 3-4, then consider restoration in species core areas or corridor areas.	Low to medium mitigation level	Temporary impacts are mitigated on site and in-kind
Class 4	Conserve and sustain those species and habitats present and provide avenues for overall enhancement of key habitat components through management and stewardship of the site's biological resources.	In-kind. Where mitigation is required for impacts to Class 3-4, then consider restoration in species core areas or corridor areas. If Class 4 habitat is utilized by higher Class wildlife, then use corresponding Mitigation Goal and Strategy.	Low to medium mitigation level	Temporary impacts are mitigated on site and in-kind.
Class 5	Assess on a case-by-case basis based on results of biological surveys and site assessments. .	Assess on a case-by-case basis.		

Appendix D: Spatiotemporal Buffers for Construction and Operation

The spatial and temporal buffers listed in Table 7 should be used by renewable energy developers after a project has been permitted and is ready to begin construction; buffers herein are to be used for construction and operational maintenance activities only. Some wildlife resources may be difficult to find, so the entire site should be protected during nesting season depending on the site location.

Construction activities are highly variable but may include: the use of heavy equipment, new road construction, existing road improvements, trenching to bury underground electrical connecter lines, and targeted cut, fill, and grading to reduce slope and address drainage and erosion. A single O & M building and collector substation may also be constructed. Construction of a transmission line corridor is usually required to tie into the grid. These corridors can be anywhere from less than a mile to many miles long (the longest proposed corridor is currently 10 miles long).

A construction activity unique to solar projects is the installation of steel beams to support the solar panels. These beams are installed using a vibratory hammer, but drilling may be used. Thousands of posts are installed over a one- to two-year period. Some solar projects may also include the construction of a battery storage facility. National Electric Code requires the construction of parameter fencing around solar arrays (A New Look At PV Supply Stations - Electrical Contractor Magazine (ecmag.com)). Fence construction can consist of driving poles into the ground and vegetation clearing activities.

Table 7 outlines spatial buffers and temporal windows to avoid during construction (roads, turbines, solar installation, substations, etc.) and maintenance activities (mowing, herbicide application, etc.) at industrial wind and solar projects. Species resources may include nests, burrows, hibernacula, roosts, migration corridors, or other resources identified as important and that could be impacted by on-site activities.

Table 7. Spatial buffers and temporal windows to avoid during construction and maintenance activities at industrial wind and solar projects.

Species	Species' resources being protected from disturbance	Recommended temporal window to avoid disturbance	Recommended spatial buffer to avoid disturbance	Notes
EASTERN WA & SHRUBSTEPPE				
Raptors				
Eagles, all	Nest Communal roosts	Jan 1 – July 31 Nov 1 - April 1	1.0 mile 0.5 miles	Spaul and Heath 2017 Suter et al. 1981 Watson et al. 2014
Falcons	Nest	March 1 – July 15	0.5 miles	Carlisle et al. 2018 Suter et al. 1981

Table 7. Spatial buffers and temporal windows to avoid during construction and maintenance activities at industrial wind and solar projects.

Ferruginous hawk	Nest	March 1 – July 31	2 miles (nesting territory)	Year-round buffer Hayes and Watson 2021 Suter et al. 1981 Watson et al. 2023 Watson and Azerrad 2024
Burrowing owl	Burrow	Feb 15 – Sep 30	500 feet – 0.5 miles	Conway et al. 2008 Gervais et al. 2003 USFWS 2020
Other raptors	Nest	Feb 15 – July 31	0.25 miles	Carlisle et al. 2018
Birds				
Shrubsteppe songbirds (e.g., sage thrasher, sagebrush sparrow, loggerhead shrike)	Nest	Feb 15 – July 31	Entire project site	These nests are difficult to find, so seasonal buffer applied to entire site. Rodrick and Milner 1991
Sandhill crane	Nest	March 1– Sep 30	0.25 – 0.5 miles	Rodrick and Milner 1991
Long-billed curlew	Nest	March 15 – June 15	Entire project site	These nests are difficult to find, so seasonal buffer applied to entire site. Rodrick and Milner 1991
Sharp-tailed grouse	Lek Core habitat	March 1 – June 30 Year-round buffer	1.5 miles	WDFW unpubl. data
Greater sage-grouse	Lek Core habitat	Feb 15 – June 15 Year-round buffer	5.0 miles	Rodrick and Milner 1991
Mammals				
Ground squirrels	Colonies/ burrows	Feb 1 – July 15	300 feet	Case-by-case basis, may depend on soil assessment. WDFW unpubl. data
Pygmy rabbit	Colonies/ burrows			Case-by-case basis, may depend on soil and vegetation assessments. Hayes and Gallie 2024

Table 7. Spatial buffers and temporal windows to avoid during construction and maintenance activities at industrial wind and solar projects.

Bats, all	Hibernacula Maternity roost Fall migration Spring migration	Dec 1 – March 30 May 1 – Aug 31 Sep 1 – Oct 31 March 1 – May 31	Case by case based on species and region	WDFW unpubl. data
Mule deer	Fawning Fall migration Winter range Spring migration	May 1 – July 31 Aug 1 – Nov 30 Nov 1 – April 30 April 1 – June 30		Lutz et al. 2011 WDFW 2016
White-tailed deer	Fawning Fall migration Winter range Spring migration	May 1 – July 31 Aug 1 – Nov 30 Nov 1 – April 30 April 1 – June 30		Present year round WDFW 2010
Bighorn sheep	Home range			If within home range, more consultation needed.
Elk	Calving Fall migration Winter range Spring migration	May 1 – July 31 Aug 1 – Nov 30 Nov 1 – April 30 April 1 – June 30		
Pronghorn	Known seasonal range or movement corridors		0.2 miles (solar only)	Case-by-case by region. Sawyer et al. 2022 Facka et al. in prep
Western gray squirrel	Nest tree Nest	March 1 – Aug 31 Year-round	400 feet 50 feet	Rodrick and Milner 1991
Reptiles/ Amphibians				
Snakes, all	Hibernacula	March 1 – May 31 Sep 1 – Oct 31	0.3 – 0.6 miles	Case-by-case depending on region.
Western pond turtle	Inhabited wetlands	Year-round	0.25 – 0.3 miles	Rodrick and Milner 1991
Northern sagebrush lizard			Buffer around their habitat, inland dunes	
Amphibians, all	Spring migration Summer migration	Feb 1 – April 30 July 1 – Aug 31		Movement to and from breeding ponds, watch for road crossings and avoid if present.

Table 7. Spatial buffers and temporal windows to avoid during construction and maintenance activities at industrial wind and solar projects.

Invertebrates				
Monarch	Host plant (Milkweed)	May 1 – Sep 30		Avoid any use of pesticides on host plant. Xerces Society 2018
WESTERN WA & FORESTED				
Raptors				
Bald eagles	Nest Communal roosts	Jan 1 – July 31 Nov 1 – March 31	0.3 miles 0.5 miles	Spaul and Heath 2017 Suter et al. 1981 Watson et al. 2014
Golden eagles				Consult with WDFW.
Peregrine falcons	Nest	March 1 – July 15	0.5 miles	Carlisle et al. 2018 Suter et al. 1981
American goshawk	Nest	March 1 – Sep 30	0.25 – 0.5 miles	Rodrick and Milner 1991
Flammulated owl	Nest	April 1 – Aug 31	0.3 miles	1 km if helicopter, logging, or blasting. Rodrick and Milner 1991
Western screech owl	Nest	March 1 – June 30	200 feet	Rodrick and Milner 1991
Northern spotted owl	Nest	March 1 – Sep 30	0.25 -- 1 mile	WAC 222-10-041 and WAC 222-16-085 USFWS 2020 Rodrick and Milner 1991
Other raptors	Nest	Feb 15 – July 31	0.25 miles	Carlisle et al. 2018 Rodrick and Milner 1991
Birds				
Forest songbirds	Nest	Feb 1 – Sep 30	15 – 100 feet	Rodrick and Milner 1991
Woodpeckers	Nest	March 1 – Aug 31	100 feet	Rodrick and Milner 1991
Band-tailed pigeon	Nest Mineral site	April 15 – Sep 15 May 1 – Sep 30	50 -100 feet 0.3 miles	Rodrick and Milner 1991
Vaux's swift	Nest, Roost	May 1 – Sep 30	50- 100 feet	Maintain large hollow trees and snags used for nesting and roosting.
Oregon vesper sparrow	Nest	May 1 – Sep 30	360 feet radius around nest to account for flush distance required for less mobile juvenile birds	Rodrick and Milner 1991
Streaked horned lark	Nest	May 1 – Sep 30	600 feet	Rodrick and Milner 1991 Wolf et al. 2016

Table 7. Spatial buffers and temporal windows to avoid during construction and maintenance activities at industrial wind and solar projects.

Marbled murrelet	Nest	April 1 – Sep 15	0.5 miles	USFWS 2020
Mammals				
Western gray squirrel	Nest tree Nest	March 1 – Aug 31 Year-round	400 feet 50 feet	Rodrick and Milner 1991
Bats, all	Hibernacula Maternity roost Fall migration Spring migration	Dec 1 – March 31 May 1 – Aug 31 Sep 1 – Oct 31 March 1 -- May 31	Case by case based on species and region	WDFW unpubl. data
Mazama pocket gopher	Tunnels, mounds	April 1 – June 30	55 feet radius (occupied area from mound)	Must confirm presence using proper protocol (USFWS) if preferred soils are found on site. USFWS 2018 USFWS 2022 WDFW 2011
Black-tailed deer	Spring migration Fall migration	April 1 – June 30 Oct 1 -- Nov 30		Summers et al. 2022
Columbian white-tailed deer				Case by case
Elk	Calving Winter range	May 1 – July 31 Nov 1 – April 30		WDFW unpubl. data
Reptiles/ Amphibians				
Western pond turtle	Inhabited wetlands, hibernacula	Year-round	0.25 – 0.3 miles	Rodrick and Milner 1991
Snakes, all	Hibernacula	March 1 – May 31 Sep 1 – Oct 31	0.3 – 0.6 miles	Case by case depending on region.
Amphibians, all	Fall migration	Oct 1 – Nov 30		Watch for road crossings and avoid if needed.
Invertebrates				
Monarch	Host plant (Milkweed)	May 1 – Sep 30		Avoid any use of pesticides on host plant. Xerces Society 2018

Appendix E: Cumulative Impacts Assessment

Cumulative environmental effects are changes to the environment which result from the incremental impact of past, present, and reasonably foreseeable future human actions and environmental processes. A single project may have a negligible cumulative effect due to mitigation actions once avoidance and minimization measures are implemented. However, the compounding effects of different impacts (fire, disease, land conversion to agriculture or development, including other industrial energy projects) within an area over a given time period can result in detrimental cumulative effects to a particular species or habitat. In Washington State, WDFW data indicates that several species and habitats are at a population level or geographic distribution that cannot withstand further impacts. Any additional impacts should be avoided.

The cumulative impact assessment (CIA) could be based on site specific wildlife or habitat data collected for the project or from WDFW data and completed before a permit is issued. In cases where sensitive wildlife is known to or could occur in the areas, but were not recorded by the project, this wildlife will likely be used to assess cumulative impacts. For example, many listed species (i.e. Greater sage-grouse, Ferruginous hawk, Striped whipsnake) occur at such low numbers that detections are unlikely during standard biological survey on the project site. As such, WDFW recommends that one of these specific species or habitats be used for the CIA. Sensitive habitats such as shrubsteppe, inland dunes, and westside prairie, are easier to address since the project will map these areas during their vegetation surveys.

The framework within which to address cumulative impacts for industrial solar and wind projects will rely on best available science with the understanding that current baseline data may not be ideal. For utility-scale solar and wind projects, cumulative impact assessments will be based on the following definitions and five step approach. Overall, the analysis should provide a general direction to determine whether the project could result in an additive cumulative (negative) impact to the specific habitat or species, and if the proposed mitigation measures offset the cumulative impact, or if additional mitigation should be imposed on the project.

Definitions

- **Specific Habitats and Species** – the habitat or species that may be affected by the project.
- **Spatial boundary** – the boundary within which each specific habitat and species is evaluated for cumulative impacts.
- **Temporal boundary** – the timeframe within which to evaluate cumulative impacts.
- **Stressors** – actions that have (past), could (impacts from the project), or may (future) impact each specific habitat and species with its spatial and temporal boundaries. For example, land conversion and fire are common stressors for shrubsteppe habitat.

Five step approach

Step 1.

Identify Specific Habitats and Species. These are features that have been identified by WDFW, the project, the scientific community, tribes, or the public. While the list could contain many entries, specific habitats and species used for cumulative impacts should be those of highest conservation value (i.e. listed species, imperiled habitats). It may be that only one is selected for cumulative impact assessment.

Step 2.

WDFW will determine the special boundary for the cumulative impact assessment for each species and habitat identified in step 1. For example, the spatial boundary around a project might be 3.2 km if the project boundary intersects one or more Ferruginous hawk nesting territories.

Step 3.

The temporal boundary is the time length of the permit being sought by the project which is typically 30 years for industrial solar and wind projects.

Step 4.

Identify stressors (past, present, and future) such as fire and loss of habitat that can be quantified to some degree.

Step 5.

Analysis. Separate analysis is conducted for each specific habitat and species and its' stressor(s). The analysis is based on quantitative data, which may be lacking for both the specific habitat and species and stressor(s). In these cases, it will be imperative to present the best available data and science, noting any assumptions.

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