# Audubon

## WASHINGTON

**Clean Energy Screening Tool**

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# INTRODUCTION

Audubon strongly supports renewable energy – including solar, wind, and geothermal power – that is properly sited in ways that avoid, minimize, and mitigate negative impacts on birds and other wildlife. The Clean Energy Screening Tool was created to provide the resources needed by Audubon Washington and Audubon chapters to assess the potential environmental impacts of utility-scale photovoltaic solar projects (PV projects) in the shrub-steppe and agricultural lands of Eastern Washington and to engage in proactive conversations with clean energy developers.

# 1. ACCESSING THE TOOL

The Clean Energy Screening Tool is currently available to any Audubon member that requests access, but first an ArcGIS Online (AGOL) account is required. To request an account, send an email to **GIS_help@audubon.org**. Once you have an account, send a follow up request to **cleanenergy@audubon.org** to gain access to the toolkit. Once both of those things are done, you are ready to start using the tool.

Your AGOL account home page is **https://audubon.maps.arcgis.com/home/index.html**. You can always find the tool by searching the content in the Organization tab, and all the layers that are in the mapper are accessible separately here as well.

Audubon has a unique and long-standing relationship with ESRI, the world's leading Geographic Information Systems software provider. We appreciate this ongoing collaboration, the virtual mapping framework they've provided, and their support during this project. We, in turn, are testing the limits of their internet-based mapping systems and you are a part of that, so welcome to the software development team! Please email Clean Energy at the address above should you have any difficulties—we're happy to help.

# 2. LAYERS USED FOR SCREENING

| BIRDS | | | |
|---|---|---|---|
| **Species** | **Description** | **Data Type** | **Source** |
| Columbian Sharp-tailed Grouse | Generalized lek density | Bird Observations | WDFW |
| Columbian Sharp-tailed Grouse | Nest locations | Bird Observations | WDFW |
| Columbian Sharp-tailed Grouse | Biotic detections | Bird Observations | WDFW |
| Columbian Sharp-tailed Grouse | Activity areas | Bird Observations | WDFW |
| Greater Sage-Grouse | Generalized lek density | Bird Observations | WDFW |
| Greater Sage-Grouse | Nest locations | Bird Observations | WDFW |
| Greater sage-Grouse | Biotic detections | Bird Observations | WDFW |
| Greater Sage-Grouse | Activity areas | Bird Observations | WDFW |
| Ferruginous Hawk | Generalized nest locations | Bird Observations | WDFW |
| Ferruginous Hawk | Nesting areas | Bird Observations | WDFW |
| Ferruginous Hawk | Biotic detections | Bird Observations | WDFW |
| Golden Eagle | Generalized nest locations | Bird Observations | WDFW |
| Golden Eagle | Nesting areas | Bird Observations | WDFW |
| Golden Eagle | Biotic detections | Bird Observations | WDFW |
| Golden Eagle | Predicted high/very high nest density | Bird Models | Link |
| Brewer's Sparrow | Predicted habitat suitability | Bird Models | WDFW |
| Sagebrush Sparrow | Predicted habitat suitability | Bird Models | WDFW |
| Sage Thrasher | Predicted habitat suitability | Bird Models | WDFW |
| Raptors | Ridges used for soaring and migration | Bird Models | Link |
| Washington State Listed Birds | 2017-2020 community science observations | Bird Observations | eBird |
| Audubon Clean Energy Birds | 2017-2020 community science observations | Bird Observations | eBird |

| LAND MANAGEMENT AND LAND USE | | | |
|---|---|---|---|
| **Layer Type** | **Description** | **Data Type** | **Source** |
| Important Bird Area | Audubon-administered IBAs | Conservation planning | National Audubon Society |
| Shrub-steppe Core | Sagebrush ecosystem core | Conservation planning | Arid Lands Initiative |
| Shrub-steppe Linkage | Sagebrush ecosystem linkage | Conservation planning | Arid Lands Initiative |
| Shrub-steppe Vegetation | Vegetation types | Conservation planning | US Geological Survey |
| Low Percent Cover of Invasive Annual Grasses | Vegetation types | Conservation planning | US Geological Survey |
| Audubon Chapters | Boundaries of Audubon chapters | Conservation planning | US Geological Survey |
| Protected Areas | Protected Areas Database of the US | Protected areas | US Geological Survey |
| Conservation Easements | National Conservation Easement Database | Protected areas | Ducks Unlimited/TPL |
| ACECs | Areas of Critical Environmental Concern | Protected areas | Bureau of Land Management |
| Land Converted 2001-16 | Lands taken out of food production | Agriculture | American Farmland Trust |
| Low Agricultural Value | Below median Productivity-Versatility-Resilience | Agriculture | American Farmland Trust |
| Land Use & Land Cover | Refined land cover that accounts for low-density residential development | Agriculture | American Farmland Trust |

| ENERGY | | | |
|---|---|---|---|
| **Layer Type** | **Description** | **Data Type** | **Source** |
| Transmission Lines | Existing transmission | Energy/Infrastructure | Homeland Security Administration |
| Wind Turbines | Existing wind turbines | Energy/Infrastructure | National Renewable Energy Lab |
| Wind Resource | Wind resource at 80 meters | Energy/Infrastructure | National Renewable Energy Lab |
| Solar Resource | Solar resource for photovoltaics | Energy/Infrastructure | National Renewable Energy Lab |

## Bird Observations and Predicted Habitat

This set of layers includes species observations, some of which are sensitive and must have exact locations generalized, as well as predicted habitat based on modeling observations to predict across the landscape. Species data from the

WDFW Priority Habitats and Species datasets are featured. For Ferruginous Hawk and Golden Eagle nest density, areas important for nesting over time, and point observations are mapped. For Columbian Sharp-Tailed Grouse and Greater Sage-Grouse lek density, nest points, and important habitat areas of different types are included. Predicted habitat for Sage Thrasher, Sagebrush Sparrow, and Brewer's Sparrow, three iconic species of the state's shrub-steppe, were modeled by Washington Department of Fish and Wildlife using data collected by Audubon volunteers. Ridgelines most likely to be used by raptors for soaring and migration were identified by analyzing elevation data, and Golden Eagle nest density was from a recently published study was also used.

Community science point observations from 1/1/2017 to 1/1/2020 extracted from the eBird dataset of point observations provide an indication of what has been seen on the ground in any given area recently. Although biased to roadsides and popular areas and often lacking in areas with private property, these observations do provide a look into recent bird activity in an area. Clean Energy Initiative Priority Species, defined based on population status and vulnerability to impacts, as well as state listed birds are included in these layers.

## Land Management and Land Use

Important Bird Areas (IBA) and Audubon chapter boundaries are included in this group to assess potential biological conflicts with IBAs as well as to identify the chapter that would potentially be involved with a given project. Arid Lands Initiative layers from a multi-criteria analysis that defined key core habitat areas and habitat connectivity linkages provide a "coarse filter" view of habitat quality that goes beyond bird habitat, and American Farmland Trust layers showing areas of high and low agricultural value, recently converted land, and land cover adjusted for the relatively low agricultural and habitat value that low density residential land uses provides a more accurate view at fine scales, particularly in proximity to urbanized areas. Shrub-steppe and National Wetlands Inventory layers are also included to indicate potential conflicts with these important cover types. The USGS Protected Areas Database provides coverage of federal, state, county, municipal and privately held conservation lands and the Ducks Unlimited and Trust for Public Lands sponsored National Conservation Easement Database layer delineates conservation easements.

## Energy

This group includes a National Renewable Energy Laboratory layer of wind potential at 50 meters and solar potential from the National Solar Radiation Database as a rough indicator of areas where development is most likely. The Homeland Security transmission line dataset is included to show existing development as well as potential power pathways for proposed projects. The USGS Wind Turbine Database is included to show existing development. Footprints of various proposed solar projects, provided by Washington Department of Fish and Wildlife, are included for demonstration purposes.

# 3. USING THE TOOL

The workflow that follows is recommended as the most efficient way to analyze projects. That said, information can be extracted in multiple ways to accommodate the needs and preferences of different users: by creating reports, generating maps, and exploring pop-up information.

When the tool starts up, a splash screen will display listing the layers available. Once you have familiarized yourself with these layers, you can prevent the splash screen from appearing by clicking the box in the lower left of that screen.

If you have used the tool before, a prompt will appear in the lower right corner asking if you would like to restore the previous map extent and layers activated. This will save you time as you explore a project over multiple visits.

## A.   CREATING REPORTS

The general workflow for evaluating a project starts with defining the area of interest. This can be done in three ways:

- Uploading a zipped GIS layer in ESRI shapefile format, when available.
- Using the polygon tool to draw a polygon directly on screen
- Using the point tool to place a point directly on screen and buffering that point
- Clicking and dragging to define a box

Sometimes GIS layers can be requested from the developer or are available on the websites of the permitting agencies. In other cases, only online map images are available. If you would like an online project map converted to a GIS layer for analysis, please email cleanenergy@audubon.org

Using the Badger Mountain Solar project as an example, start by loading the GIS project footprint file from Box.

## I. DEFINING THE ANALYSIS AREA

1. Click on the binoculars icon 🔭 to open the Analysis window
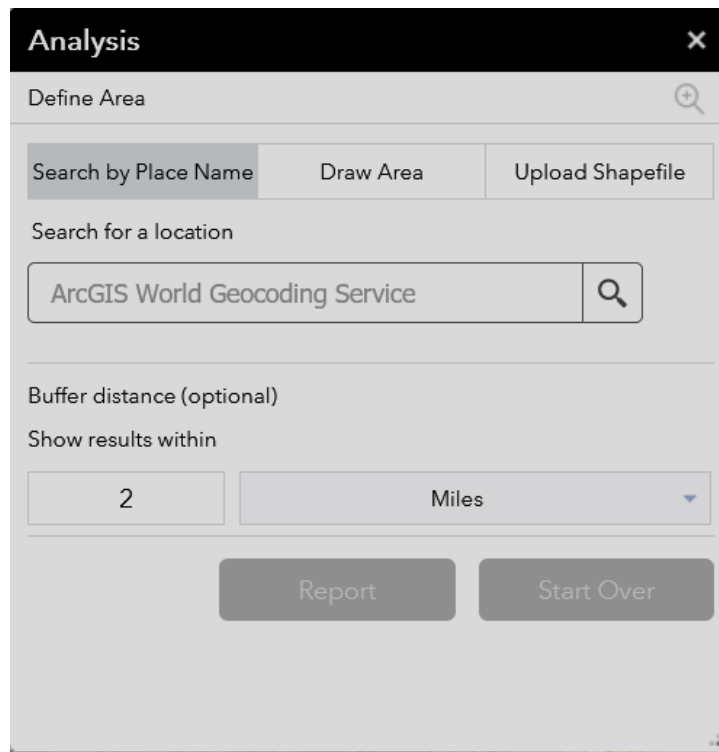
2. Click on the button in the upper right labeled "Upload Shapefile," then the second button that will appear labeled "Upload," then navigate to a directory that contains a zipped shapefile.
3. Once the file is loaded, the map should automatically pan and zoom to the project, but if it doesn't click the magnifying glass in the upper right of this window.
4. To use one of the other methods to define an area of interest, or if you want to start over for any other reason, click the "Start Over" button in the lower right of the Analysis window.
5. Pressing the "Draw" button makes a point and a polygon tool available below the button that can be used to draw similar to the tools in Google Earth.
6. Pressing "Search by Place Name" causes a window to appear below that can be queried for place names and will zoom to the closest match.

# II. DEFINING A BUFFER DISTANCE

1. Once the area of interest is defined, the next step is to choose a buffer for the analysis. Currently, photovoltaic (PV) cells like those used for home solar

dominate utility-scale solar development and are expected to in the future. For these projects we recommend a two-mile buffer, the default value. To change this, enter a new value under "Show results within" and press return.

2. To make sure the project frames appropriately in the report map, zoom out using the mouse wheel or the plus and minus widget in the upper left until the buffered project area is centered in the browser window and occupies roughly a third of the vertical space, as shown below.



# III. CREATING A REPORT

1. Clicking the "Report" button causes the Analyze window to change content. Now, a list of all the different layers being analyzed replaces the previous items, as shown below. This first analysis can take several minutes depending on the buffer size and the number of overlaps. Progress for each layer is evident by the presence of either a round, spinning progress icon if the layer is still being analyzed, a number in parentheses after the layer name that indicates the number of features that overlapped, or a red exclamation point if there were no layers that overlapped.

2. The number of features that overlap shown next to the layer name is an indicator of potential conflicts to be evaluated. Keep in mind that some layers are made up of many small polygons, though; the value itself may not be meaningful. Scroll down this list and note which layers might be of

interest to show in the report map, keeping in mind that adding all could make the map illegible.

3. View each layer that you're interested in by going to the icons in the upper right of the viewer window and dropping down the layer list by clicking on the appropriate icon. Turn on each of the layers individually and decide which you would like to leave on to be displayed in the report map. Note that this only changes the map; the tables that follow the map report all overlaps with features of potential interest and cannot be modified.
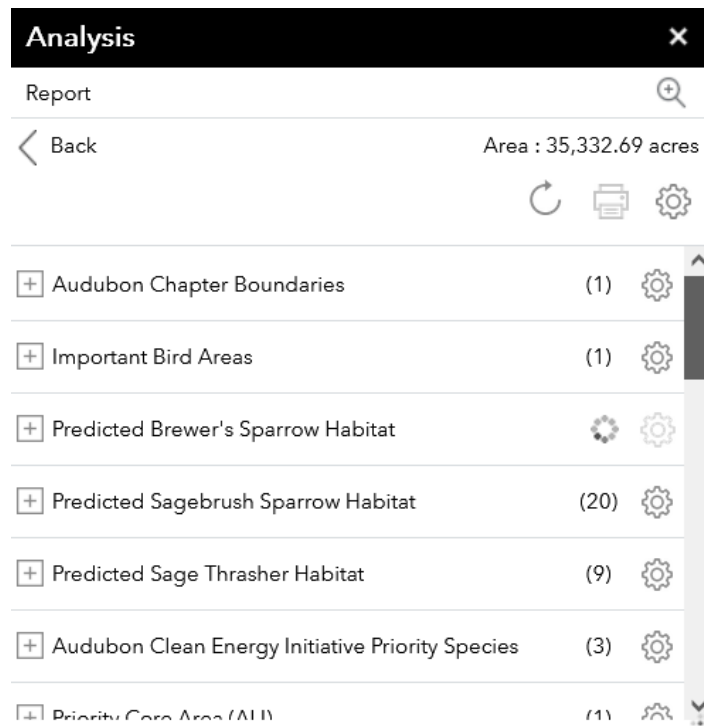


4. Once the layers you want in the final map are displaying correctly with the project area centered as shown in the previous section, press the printer icon button in the Analysis window, then the "Print" button in the window that pops up. This will cause the browser to open a new window with a .pdf version of the report map followed by a tabular summary of overlaps.

# IV. EDITING THE REPORT

1. To download the report, click the "Print" button in the upper left corner of the browser and the print button at the lower left of the box that pops up.

This will prompt you for a location to save to and a filename for the .pdf file. Be sure to include the project name and the date the report was generated for tracking purposes.

2. The project name field that appears above the map can be modified and the comment field below the map can be populated now if desired (later they cannot be changed).

3. If the project is not centered in the map or if additional layers need to be displayed this window can be closed and the .pdf regenerated by repeating steps 5-7.

# V. PRINTING ADDITIONAL MAPS

1. As noted above, the report map is easily overloaded when too many layers are displayed, report results may point out the need for additional maps. The print button in the upper right of the viewer window can be used to create as many maps as needed. Once pushed, another print button becomes available, and he finished print shows up below as a link. Clicking on this link allows the user to save the output to a location of their choice.

2. To reset and start the analysis process over, press "Back" from the report detail GUI to get to the initial screen, and press the "Start Over" button, which removes both the area of interest and its buffer from the view and allows a new area to be defined.

3. Once the initial report and any extra maps have been generated there's often a need to explore more. This can be done directly through exploring and querying the map layers.

*Note: closing the reporting window causes the project polygon and buffer to disappear, but they can always be brought back by opening the window again in case this needs to be shown in additional maps.*

# 4. INTERPRETING RESULTS

Each of the layers curated for the tool was chosen and modified as needed to make them most relevant to defining potential siting issues, specifically for solar energy, but they should be used and interpreted carefully. The direct impacts of utility-scale solar PV projects on birds (mortality) are not well understood. For this reason, we focus on potential loss of habitat and prey base unless bird data indicate there are high concentrations of specific birds and/or key habitats present that could be close enough to be affected by solar project development and operation.

It's also important to note that species model predictions and community science observations should be considered evidence that potentially highlights the need for further investigation rather than standalone justification to object to a project. By the same token, they are not conclusive support that the species represented in analysis layers are or are not present, or that other species of interest may not have conflicts with the proposed site. The results are a starting point rather than a conclusion.

# 5.  NEXT STEPS FOR ENGAGEMENT

The National Audubon Society Clean Energy Initiative actively engages on renewable energy projects less than 100 MW that set a precedent or stand to affect Audubon Clean Energy priority species or state listed species. For smaller projects we rely on state and chapter offices. This tool was created to provide you the information needed for informed outreach for smaller projects as well as to provide a basis for engagement with CEI on larger projects. Audubon supports projects that don't impact birds and the places they live. For projects that do have conflicts, we prioritize finding ways to improve them if possible to avoid, minimize, and mitigate impacts. Opposition should be a last resort justified based on well-founded concerns. The tool presented here provides the means to start the investigation. Should you have any questions or problems that require help, please email cleanenergy@audubon.org