

Appendix F-Environmental Resources

Memorandum



To: Spencer Martin (M&N)
CC:
From: Sheri Murray Ellis (Certus)
Date: 3/16/2020
Re: Cultural Resources File Search for Dinosolar Project, Wyoming

On March 16, 2020, Certus Environmental Solutions, LLC (Certus) conducted a file search and literature review for the area of the Dinosolar Project. This file search included a search of project and site files held by the Wyoming State Historic Preservation Officer (SHPO) through the Wyoming Cultural Resources Information System (WYCRIS) as well as a review of historical General Land Office (GLO) maps, topographic maps, and air photos to identify known or potential cultural resources in the project area. The search of the SHPO files was conducted using online records available through the WYCRIS website.

The limits of the overall lease area and the location of the Bar Nunn Substation, as provided to Certus by Martin & Nicholson, were used to define the area in which the records search was conducted (see **Figure 1**, attached).

WYCRIS FILE SEARCH

WYCRIS records indicate that no previous cultural resource surveys have been conducted in the project area and that no cultural resource sites or historical structures have been documented therein. While several projects have been conducted in the surrounding area, none were comprehensive enough to provide a clear picture of cultural resource site types and distributions in the Dinosolar Project area.

HISTORICAL MAP AND AIR PHOTO REVIEW

As noted above, Certus also reviewed historical GLO maps, topographic maps, and aerial images for the assessment area. The results of these reviews are shown in **Figure 1**, attached.

GLO maps are available for the relevant townships and ranges for the years 1883 and 1934/35. The maps show snippets of early roads scattered around the assessment area. Because of the locational inaccuracies of GLO maps for specific linear features, Certus did not plot these resources on the attached figures. That said, most of the road segments shown in GLO maps also appear in the historical topographic maps of the area, which were plotted on the attached maps.

Seven historical topographic maps were found for the assessment area. These maps date to 1951, 1952, 1955, 1958, 1960, 1961, and 1962 and included both 1:24,000 and 1:250,000 scale maps. These map sources indicate several historical dirt roads (some still in use today) likely are present or are known to be present in the project area and would require documentation and evaluation for the National Register. A gravel pit and a utility line (possibly a pipeline or overhead electrical line) were also located in the project area during the historical period, and evidence of them may yet be present.

Aerial photographs for the historical period were found online via the USGS EarthExplorer system for the years 1947, 1954, and 1971. The images show the aforementioned roads and gravel pit that also appear on the historical GLO and topographic maps. The 1947 image shows a large area of ground disturbance that appears as several discrete areas similar to furrowed agricultural fields; however, the image is sufficiently indistinct to not be clearly identifiable as to the function of the disturbance. The disturbance is far less visible in the 1954 image, suggesting the activity at these locations had been abandoned by that time. Remnant scars from the past disturbance remain visible in modern air photos. No other notable historical man-made features are visible in any of the air photos.

SUMMARY

Little information is available through the WY SHPO regarding cultural resources in the project area due to a lack of previous surveys for such resources. Historical maps and air photos suggest the project area was lightly used during the historic period and that most sites from this period will be unimproved roads that lack historical significance. These records do not provide a good sense of prehistoric period uses of the project area. Several (now) dry lakes are present in and adjacent to the area. If these lakes were wet during the prehistoric period of human occupation in the general area (i.e., as far back as the Paleoindian Period) they likely would have been attractive locations for temporary to long-term habitation associated with the use and collection of marsh and water food sources. That said, it appears that at least during the historical period, the lakes have had no freshwater inflow. If these conditions also existed during the prehistoric period, this would have limited the development of marshes and other natural resources there that could have been used by prehistoric peoples. Beyond the lakes and their immediate environs, the broader project area appears to have lower desirability for prehistoric occupation compared to other nearby areas that could have provided a richer supply of food, freshwater, habitation, and other necessary resources.

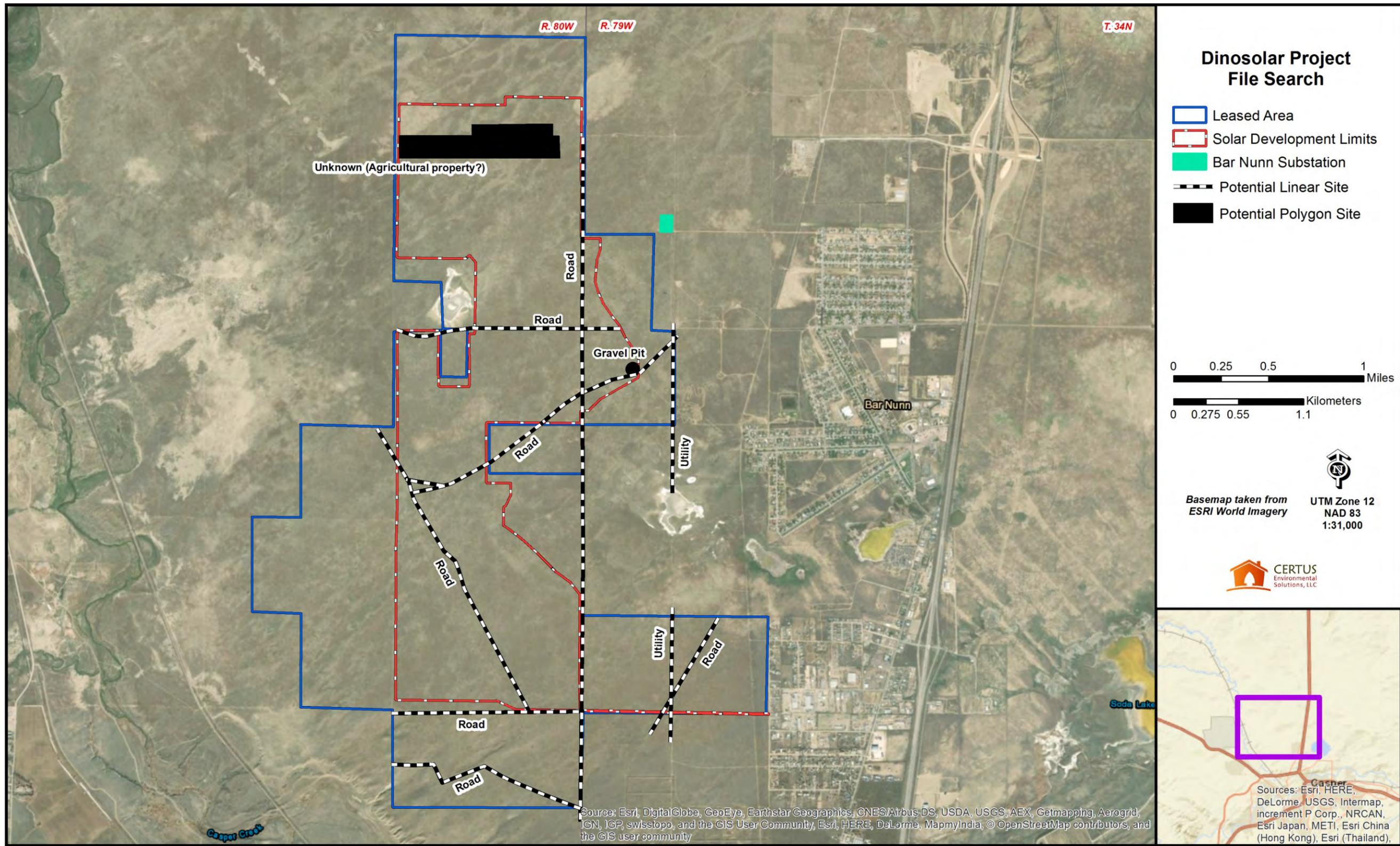


Figure 1. Project area and file search results

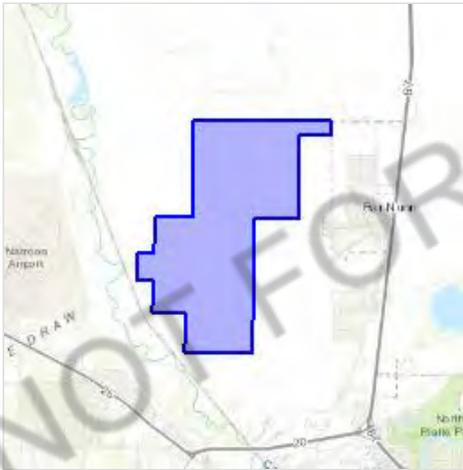
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Natrona County, Wyoming



Local office

Wyoming Ecological Services Field Office

☎ (307) 772-2374

📅 (307) 772-2358

5353 Yellowstone Road, Suite 308a
Cheyenne, WY 82009-4178

<http://www.fws.gov/wyominges/>

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME

STATUS

Least Tern *Sterna antillarum* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/8505>

Piping Plover *Charadrius melodus* Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6039>

Whooping Crane *Grus americana* Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/758>

Fishes

NAME

STATUS

Pallid Sturgeon *Scaphirhynchus albus* Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/7162>

Flowering Plants

NAME

STATUS

Ute Ladies'-tresses *Spiranthes diluvialis* Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2159>

Western Prairie Fringed Orchid *Platanthera praeclara* Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1669>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#), and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities,

should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

[PUSA](#)

[PUJC](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use

of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



WYOMING GAME AND FISH DEPARTMENT

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March 4, 2020

WER 14337.01 (replaces WER 14337.00)

Enyo Renewable Energy

Dinosolar Solar Project

Natrona County

R. Spencer Martin

Principal Ecologist/Project Manager

Martin & Nicholson Environmental Consultants

spencer@menvironmental.com

Dear Mr. Martin,

The staff of the Wyoming Game and Fish Department (Department) has reviewed the proposed Dinosolar Solar Project located in Natrona County. We offer the following comments for your consideration.

Commercial solar energy development is relatively new to Wyoming, and little is known regarding predictable impacts to the State's wildlife. However, solar energy development does share many characteristics with other industrial-scale developments, the impacts of which are better understood.

Industrial-scale developments result in the loss and degradation of wildlife habitat due to new infrastructure, increased human activity, and industrial noise and lighting. Wildlife mortality may also increase due to collisions with traffic, fencing, power lines, and other infrastructure. Additionally, the large-scale disturbance of soil can allow invasion by non-native plants and weeds. Construction can also result in changes in topography that contribute to run-off and erosion that can affect stream and river morphology and water quality.

Photovoltaic (PV) facilities are unique, however, due to the potential for death, injury, or stranding of birds resulting from collisions with PV panels. It's been hypothesized that birds may mistake the surface of the panels for water (called the "lake effect"). Although the underlying cause of this phenomenon is not well understood, a broad array of bird species have been found dead, injured, or stranded at PV facilities in other states following collisions with panels. PV facilities can also result in a complete loss of use by many species of wildlife, given the configuration of fencing, panels, vegetation management, and the expected lifespan of such projects.

The Department appreciates that the proponent has sited the proposed facility in proximity to existing exurban development and outside of big game crucial range and sage-grouse core

population areas. We recommend the following measures to further minimize potential impacts to wildlife species and habitats.

Avian Species

- The >1,600 acre project area provides potential nesting habitat for many species of native birds. We recommend beginning construction activities prior to April 1 or after July 31 to minimize the potential for loss of nests during the nesting season.
- Raptors may nest in the area, including ferruginous hawk and burrowing owl, and can require up to a 1-mile spatial buffer from construction activities during nesting. The proponent should coordinate with the U.S. Fish and Wildlife Service's Wyoming Ecological Services Office for guidelines on raptor nest seasonal and spatial buffers.
- Sage-grouse, raptors, and waterbirds are susceptible to death by collision with fences. Bird diverters are low-cost but highly effective markers that make fences more visible to birds and thereby reduce deaths. The Department recommends installing bird diverter markers on all Dinosolar fences.
- Many species of birds are at risk of death by collision with or electrocution by power lines. We commend the proponent on siting this project in such close proximity to a substation, which will help to reduce these risks. We recommend burying transmission lines between solar facilities and substations to further reduce these risks, particularly for the longer power line connecting to the Casper substation. If burying isn't feasible, we recommend following the Avian Power Line Interaction Committee's guidelines for minimizing electrocution and collision risk for birds, which simultaneously minimizes power outages and fire risk associated with bird use (available at aplic.org).

Big Game

Big game, such as pronghorn, can become trapped inside chain link fencing. In such cases, having gates on multiple sides of the fenced perimeter can allow for easier egress. We recommend including an adequate number of gates along the perimeter in the final siting plans to facilitate big game egress.

R. Spencer Martin
March 4, 2020
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Nongame Species

The project area falls within the predicted distribution of several Tier I and Tier II Species of Greatest Conservation Need (SGCN). To minimize impacts to these species, we recommend:

- For reptiles, minimizing the compaction of soils, particularly sandy soils, and avoiding the destruction of potential denning sites.
- Minimizing disturbance to active prairie dog colonies, particularly if prairie dog colony associated species are observed in the project area.
- Avoiding surface occupancy within 0.25 miles of active swift fox den sites, if documented.

Stranded, Injured, or Dead Wildlife

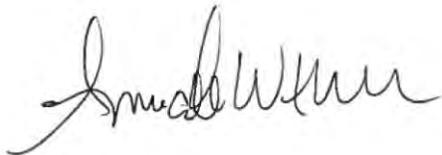
We recommend the operator of the Dinosolar Solar Project notify the Department of any stranded, injured, or dead wildlife within the project area, and coordinate with the Department for the removal of such wildlife.

Reclamation and Invasive Weed Management Plan

Reclamation following construction should re-establish native grasses, forbs, and shrubs to achieve cover, species composition, and life form diversity commensurate with the local native plant community. Landowners should be consulted on a desired plant mix on private lands. The project proponent should develop and implement a plan to control noxious and invasive weed species.

Thank you for the opportunity to comment. If you have any questions or concerns please contact Anika Mahoney, Habitat Protection Biologist, at 307-335-2623.

Sincerely,



Amanda Withroder
Habitat Protection Supervisor

AW/am/ap

cc: U.S. Fish and Wildlife Service
Trish Chavis, Natrona County Planning and Development

R. Spencer Martin

March 4, 2020

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