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A Jurisdictional Review: Wildlife and Solar and Geothermal Energy Development

Kelly Learned and Holly Kinas

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**A Jurisdictional Review: Wildlife and Solar and
Geothermal Energy Development - Draft**

Prepared by Kelly Learned and Holly Kinas
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Miistakis Institute
Rm U271, Mount Royal University
4825 Mount Royal Gate SW
Calgary, Alberta T3E 6K6

Phone: (403) 440-8444
Email: institute@rockies.ca
Web: www.rockies.ca

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Executive Summary

This report reveals that solar and geothermal impacts on wildlife and wildlife habitat are not yet widely documented and tend to be approached on a case-by-case basis. In the context of energy development, the utility scale solar and geothermal sectors are the least developed globally and as such, so is science based research on the impacts to wildlife and wildlife habitat (Northrup & Wittemyer 2013).

The jurisdictional reviews reflect the findings of Northrup and Wittemyer in that solar and geothermal projects were new in comparison to other energy development types (oil and gas, wind). This study found that jurisdictions used existing overarching legislation to regulate the impacts of solar and geothermal development on wildlife and wildlife habitat. In essence, Alberta is entering into fairly uncharted territory by developing solar and geothermal directives directly related to wildlife and wildlife habitat.

Background

The Alberta Climate Leadership Plan has a goal of “by 2030, renewable sources like wind and solar will account for up to 30% of electricity generation.” To meet this goal there will likely be an increase in large scale solar and geothermal energy projects. As with any new development, there will be impacts on wildlife and wildlife habitat. Alberta Environment and Parks (AEP) Fish and Wildlife Policy division is in the process of developing wildlife directives for Alberta solar and geothermal energy projects. The directive will be focused on wildlife and wildlife habitat and will apply to all solar and geothermal energy projects that require AUC approval. The directive has been designed to assist industry in minimizing impacts to wildlife and habitat.

To support the development of this directive AEP is looking to understand how other key jurisdictions have considered wildlife populations and wildlife habitats relative to solar and geothermal energy developments. Of particular interest (and a present gap) is in relation to pre-construction surveys and how the data gathered prior to construction can be related to population level impacts and/or inform mitigation prior to construction.

Methodology

AEP identified a number of areas where a jurisdictional review would be helpful including understanding how different jurisdictions regulate solar or geothermal,

establish project siting, undertake pre-construction surveys and post-construction surveys and if there are overall lessons learned that can be shared on solar or geothermal development and wildlife. AEP staff from Fish and Wildlife Policy Division developed a list of questions for each category, which provided the basis for the creation of standardized interview questions (appendix A).

Jurisdictions that had participated in the wind and wildlife jurisdictional review were contacted to see if they were willing to participate in the solar and geothermal review. The initial list (Ontario, British Columbia, California, New Brunswick, Scotland and Australia) was reviewed with AEP staff and Ontario, British Columbia, California and Australia were identified as the jurisdictions to pursue. Unfortunately, Australia declined participation after several contacts were pursued. For California, interviews focused on projects from Imperial County. For information on the other jurisdictions contacted but did not participate in an interview, please see appendix C: Additional Contacted Jurisdictions.

Participants were given the option to provide input by completing a survey or a phone interview that lasted between an hour to hour and a half. See appendix B for a detailed contact list. Some jurisdictions required discussions with more than one person. Phone calls with interviewees were recorded and transcribed and findings were summarized in tables. As time allowed, supporting documents were reviewed to address gaps in information.

Common Elements

A summary of common elements from each section are provided for quick reference.

Legislation

- Existing regulatory frameworks guide solar and geothermal project development in jurisdictions reviewed. Projects are reviewed and approved on a project-by-project basis.

Project Siting

- Lands identified as habitat for endangered species and ecological reserves/conservation reserves are typically no-go areas but there are exceptions (political involvement, mitigation, etc.)
- Development is allowed on public lands
- Maps are available for proponents to reference where suggested areas of avoidance are located.

Pre-Construction Surveys

- Project specific
- Third party conducts the surveys that are required
- No thresholds have been established for solar or geothermal mortality rates.

Post-Construction Surveys and Mitigation

- There are no common elements between the jurisdictions reviewed.

Focus Section

Recent studies examining effects of renewable energy development on mortality of migratory birds have primarily focused on wind energy (California Energy Commission (CEC) & California Department of Fish and Game (CDFG) 2007), and in 2012 the FWS published guidance for addressing wildlife conservation concerns at all stages of land-based wind energy development (U.S. Fish and Wildlife Service 2012). As yet, no similar guidelines exist for solar development, and no published studies have directly addressed the methodology needed to accurately estimate mortality of birds and bats at solar facilities. In the absence of such guidelines, ad hoc methodologies applied to solar energy projects may lead to estimates of wildlife mortality rates that are insufficiently accurate and precise to meaningfully inform conversations regarding unintended consequences of this energy source and management decisions to mitigate impacts. Although significant advances in monitoring protocols for wind facilities have been made in recent years, there remains a need to provide consistent guidance and study design to quantify mortality of bats, and resident and migrating birds at solar power facilities (Walston, Jr. et al. 2015).

The Solar 'Lake Effect'

It is unclear how many bird deaths have actually been caused by solar panels and other electrical infrastructure when doing mortality counts for solar facilities. Currently there are no consistent guidelines for how to scour solar plants for dead birds making it difficult to estimate the overall number of deaths based on the number of birds actually found, in part because scavengers sometimes make off with bird carcasses.

To address that gap, Thomas Smith, director of the Center for Tropical Research at UCLA is heading up the Avian-Solar Work Group, organized a team of scientists, led by Smith, to develop a rigorous scientific plan for studying the relationship between solar farms and birds.

The "lake effect" theory, which posits that waterbirds might crash into solar panels after

confusing them with lakes, is one of the topics they will research. Critics of solar farms have pointed to the alleged lake effect as a major cause for concern, but experts say it isn't yet a proven phenomenon and is still a theory, based on incidental observations (Roth 2016).

Post Construction Monitoring and Mitigation

As discussed in the Focus Section above, established protocols have not been developed to address solar impacts on wildlife. Geothermal energy development can involve the emission of pollutants (Pimentel 2008) and will likely involve small scale habitat alteration and related impacts; literature on empirical studies regarding impacts from this sector was lacking globally.

Length of Survey

- For British Columbia and Ontario, post construction surveys are done on a case-by-case basis.
- Imperial County bases post construction survey requirements on the conditional use permit so it is a case-by-case basis but typically, surveys are done annually for the life of the project.

Survey Area

- Survey areas were dependant on project, species and any permits issued.
- Imperial County surveys entire project area.

Thresholds

- Thresholds were not identified for either solar or geothermal.

Options for mitigation

- Mitigation is based on a case-by-case basis for each project.

Jurisdictional Findings

All jurisdictions interviewed have some solar energy development but only Imperial County had significant geothermal development.

- In Imperial County, all industrial solar projects have been developed on agricultural land. Geothermal projects have been permitted on agricultural land and what they term open space lands.
- All jurisdictions interviewed said that solar and (if applicable) geothermal projects are allowed on public lands if they meet requirements (see requirements/items in summary tables below).

- Imperial County has developed pre-construction survey protocols for burrowing owls for solar and geothermal projects. Surveys must be completed 15 – 30 days prior to construction.
- Due to project scope, the California (Imperial County) jurisdictional review was not able to cover a comprehensive review of legislation, regulation and information related to utility scale solar and geothermal developments.

Acronym List

Table 2 defines the acronyms that are used throughout this document. They are alphabetized accordingly under each region.

Table 2: Acronym list

Acronym	Full Name	Jurisdiction
FRPA	Forest and Range Practices Act	British Columbia
GAR	Government Actions Regulation	British Columbia
MOU	Memorandum of Understanding	British Columbia
NRO	Natural Resource Officer	British Columbia
OCP	Official Community Plan	British Columbia
R.P.Bio	Registered Professional Biologist, College of Applied Biology	British Columbia
RDEK	Regional District of the East Kootenay's	British Columbia
SHEM	Sensitive Habitat Inventory Mapping	British Columbia
WHA	Wildlife Habitat Areas	British Columbia
WSA	Water Sustainability Act	British Columbia
CEQA	California Environmental Quality Act	Imperial County
BLM	Bureau of Land Management	Imperial County
DRECP	Desert Renewable Energy Conservation Plan	Imperial County
KGRA	Known Geothermal Resource Areas	Imperial County
MMRP	Mitigation Monitoring and Reporting Program	Imperial County
EEMP	Environmental Effects Monitoring Plan	Ontario
EIS	Environmental Impact Study	Ontario
ESA	Endangered Species Act	Ontario
MOECC	Ministry of Environment and Climate Change	Ontario
OMNRF	Ministry of Natural Resources and Forestry	Ontario
ORMCP	Oak Ridge Moraine Conservation Plan	Ontario
REA	Renewable Energy Approval	Ontario

Summary tables

Seven summary tables were developed representing jurisdictional responses to key questions in relation to:

- Regulation of solar and geothermal energy development (table 3); to provide an understanding of legislative tools that protected wildlife and wildlife habitat as well as an understanding regulations relating to compliance and reclamation;
- Site selection (table 4); to provide an understanding of recommended features to avoid, no-go areas, tools to help identify critical and established setbacks for significant ecological features;
- Pre-construction surveys (table 5); to provide an understanding of what is surveyed for and when, where and how pre-construction surveys are undertaken and if there are metrics that would constrain or prevent development;
- Post-construction surveys (table 6); to provide an understanding of what is surveyed for, and when, where and how post construction surveys are undertaken and appropriate survey length;
- Thresholds and mitigation (table 7); to provide an understanding of thresholds relating wildlife mortality and types of mitigation options implemented; and
- Miscellaneous questions (table 8); to provide a comparison of solar and/or geothermal energy development rules and regulations on public land verses private land, and whether solar and geothermal facilities are located in an urban and rural land use.
- Lessons learned (table 9); to provide an understanding of successes and challenges relating to wildlife and solar and geothermal energy development.

Table Details

Table 3: Legislation

Table 3: Legislation			
Jurisdiction	Tools to help guide protection of wildlife	Reclamation Requirements	Compliance
British Columbia	<p>○ There are no legislative tools specific to solar. British Columbia does have a Geothermal Resources Act however there are no specific references to wildlife or wildlife habitat. http://www.bclaws.ca/civix/document/id/complete/statreg/96171_01 (Government of British Columbia 2017e)</p> <p>Tools to protect wildlife and habitat:</p> <p>○ Wildlife Act (Government of British Columbia 2013) includes provisions to protect wildlife and habitat</p> <p>○ Forest and Range Practices Act (FRPA) (Government of British Columbia 2017d)</p> <ul style="list-style-type: none"> • Government Actions Regulation (GAR) (Government of British Columbia 2004) under FRPA enables establishment of wildlife habitat areas (WHAs) for species on the identified wildlife species list (a subset of endangered species). • Applies to the Oil and Gas Activities Act as well when GAR orders established. • Anybody or any person or company that acquires or is a license holder under FRPA has to abide by the GAR orders. (This includes ungulate winter range, WHAs, and wildlife habitat features specific to things like mineral licks, wallows, dens of badgers or bears. • For wildlife habitat features see FRPA Section 11 (1) (Government of British Columbia 2004). <p>○ Environmental Assessment Act (Government of British Columbia 2017a) addresses endangered species during reviews identified as valued components.</p> <p>○ Environmental Management Act (Government of British Columbia 2017b) deals more with contaminated sites and not specific to wildlife.</p> <p>○ Land Act (Government of British Columbia 2017f).</p> <ul style="list-style-type: none"> • 85% of BC is Crown Land. The Land Act authorizes use on Crown Land. • Temporary tenures or licenses of occupation go through a referral process which provides opportunity to recommend provisions to protect wildlife or wildlife habitat within that referral. <p>○ Water Sustainability Act (WSA) (Government of British Columbia 2017g): does have provisions for protecting wildlife habitat especially aquatic habitat.</p> <ul style="list-style-type: none"> • If there are impacts to fish habitat then the federal Fisheries Act actually does apply. • When a project gets authorization under the WSA, FLNRO staff can impose conditions to protect wetlands or water fowl species, etc., within their authorization. • Within WSA, groundwater is included. • In the case of geothermal, if water is being extracted from subsurface water then a permit will more than likely be required. (have not issued this requirement yet). 	<p>○ No legislation regarding reclamation requirements for solar and geothermal projects.</p>	<p>○ For projects on Crown Land proponents issued authorization under the Land Act</p> <ul style="list-style-type: none"> • Conditions are attached to the license or permit • The staff under the Authorization Division in Ministry of Forests, Lands and Natural Resource Operations would conduct monitoring of project compliance • If there is any noncompliance the natural resource officers conduct an investigation into noncompliance. <p>○ On private land in BC jurisdiction is the responsibility of local government - a municipality or a regional district.</p> <p>○ It is the local jurisdiction's responsibility to address impacts to wildlife and wildlife habitat.</p> <p>○ The province is limited in what they can do on private land so it falls within local jurisdiction.</p> <p>○ Official community plans or bylaws are the legislative tools they use to enable the protection of wildlife habitats. Province provides input and guidance to OCPs with the goal of establishing environmentally sensitive areas, etc., within OCPs.</p> <p>○ Compliance effectiveness:</p> <ul style="list-style-type: none"> • Do not have solar or geothermal specific legislation yet however it was estimated related authorizations are somewhat effective. <p>○ Enforcement Actions:</p> <ul style="list-style-type: none"> • Monitoring, site visits • Mandatory or voluntary reporting is dependent on the authorization provided and is a condition of the permit. • Investigations: if there's a noncompliance observed then natural resource officers get involved. • If there are impacts to fish habitat then the federal Fisheries Act does apply. Conservation officer service would then be involved because they deal with the Fisheries Act.

Table 3: Legislation

Jurisdiction	Tools to help guide protection of wildlife	Reclamation Requirements	Compliance
	<ul style="list-style-type: none"> • The WSA applies to private and public lands. ○ Non-legislative tools: Typically, would use guidelines or best management practices but none have been established yet to guide solar or geothermal projects in BC. • BC looks to other jurisdictions for guidance. 		
<p>Ontario</p>	<p><u>Applicable to Solar:</u></p> <ul style="list-style-type: none"> ○ PROVINCIAL <ul style="list-style-type: none"> • The Green Energy Act, 2009 (Government of Ontario 2016) • Regulation 359 under the Environmental Protection Act (Government of Ontario 2017c) - details the legislative requirements for a Renewable Energy Approval (REA) <ul style="list-style-type: none"> ▪ Technical Guide to Renewable Energy Approvals (Ministry of the Environment 2013) fall under the mandate of Ontario Ministry of the Environment and Climate Change https://dr6j45jk9xcmk.cloudfront.net/documents/915/3-3-1-guide-to-renewal-energy-approvals-en-pdf.pdf ▪ Natural Heritage Assessment Guide (Ontario Ministry of Natural Resources 2012) guides the Natural Heritage Assessment (NHA) requirements under the REA https://dr6j45jk9xcmk.cloudfront.net/documents/2716/stdprod-101413.pdf • OMNRF's Renewable Energy on Crown Lands Policy (Renewable Energy Program: Biodiversity Branch 2014) https://www.ontario.ca/document/renewable-energy-crown-land-policy • Endangered Species Act (ESA), 2007 (Government of Ontario 2017b) <ul style="list-style-type: none"> ▪ Permitting provisions under section 17(2)(c) of the ESA allow for activities to occur that would otherwise negatively impact a species at risk. An 'Overall Benefit' permit is often required which includes undertaking actions that contribute to improving the circumstances for the species. ▪ Additionally, species and activity specific regulations under Ontario Regulation 242/08 of the ESA may be utilized when constructing a solar farm. Proponents must register the activity and follow the rules in regulation, which includes, but is not limited to, mitigation and monitoring. • Fish and Wildlife Conservation Act, 1997 (Government of Ontario 2017d) • Provincial Parks and Conservation Reserves Act, 2006 (Government of Ontario 2017e) ○ LOCAL <ul style="list-style-type: none"> • Local "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" regulations formed under Section 28 of the Conservation Authorities Act (if applicable) (Government of Ontario 2017a). <p><u>Applicable to Geothermal</u></p> <ul style="list-style-type: none"> ○ N/A 	<ul style="list-style-type: none"> ○ The Renewable Energy Approvals (REA) (Regulation 359 of the Environmental Protection Act)(Government of Ontario 2017c) administered by Ministry of Environment Climate Change requires the submission of a 'Decommissioning Plan Report' that details how the site will be restored. ○ Linkage to wildlife habitat objectives for solar projects: <ul style="list-style-type: none"> • Removal of non-native plants and reseeding is a requirement and a benefit to wildlife. • Additionally, other requirements could be included depending on the results of the Natural Heritage Assessment and associated studies. 	<ul style="list-style-type: none"> ○ REA APPROVAL <ul style="list-style-type: none"> • Ontario Ministry of Environment and Climate Change (MOECC) oversees the REA process and associated compliance. • OMNRF reviews the Natural Heritage Assessment. OMNRF would also review any Environmental Impact Studies and Environmental Effects Monitoring Plans that may be required under the Natural Heritage Assessment. ○ OTHER WILDLIFE APPROVALS (if relevant) <ul style="list-style-type: none"> • OMNRF oversees approvals under the Provincial Parks and Conservation Reserves Act, 2006, the ESA, 2007, the Fish and Wildlife Conservation Act, 1997, and approvals for testing projects and crown land disposition. • Local Conservation Authority for the legislation formed under the Conservation Authorities Act (S. 28) ○ Non-compliance: <ul style="list-style-type: none"> • Site inspections - REA inspections by compliance officers, MOECC • Mandatory reporting • If a facility is found failing to comply with the conditions of its REA, MOECC may use abatement strategies and if necessary enforcement tools under the Environmental Protection Act (Government of Ontario 1990), as appropriate, to bring the facility into compliance. • NOTE: Other enforcement measures apply for the legislation outside of the REA (Overall Benefit Permits under the ESA, etc.)
<p>Imperial County</p>	<ul style="list-style-type: none"> ○ California Environmental Quality Act (CEQA) (State of California 2016) For private projects, CEQA applies when a government permit or other entitlement for use is 	<ul style="list-style-type: none"> ○ Yes. Surface mining and reclamation act requires land 	<ul style="list-style-type: none"> ○ Imperial County is the enforcer for provisions. <ul style="list-style-type: none"> • Mitigation monitoring and reporting program (MMRP).

Table 3: Legislation

Jurisdiction	Tools to help guide protection of wildlife	Reclamation Requirements	Compliance
	<p>necessary and applies to more than renewable energy projects.</p> <ul style="list-style-type: none"> Counties are required to administer the provisions of CEQA – includes impacts on wildlife, noise, water, etc. California Energy Commission has regulatory authority and oversight for the siting of thermal energy generation facilities in the State that are 50 MW or larger. <p>○ Bureau of Land Management, Environmental Impact Assessments. Sample EIS for a solar project: (see 2-52 for Designated Biologist duties regarding pre- construction site mobilization and construction, commissioning, or other activities that may impact biological resources) (United States Department of the Interior: Bureau of Land Management 2014)</p> <p>○ LOCAL</p> <p>○ Renewable Energy and Transmission Element, County of Imperial General Plan, outlines agencies with regulatory and environmental oversight on renewable energy generation http://www.icpds.com/CMS/Media/Renewable-Energy-and-Transmission-Element-2015.pdf</p> <p>○ Zoning Ordinances</p> <p>State and federal agencies are circulated to: State Fish and Wildlife Services and other agencies.</p> <p>○ The County, through the Planning and Development Services Department, regulates the use of land for renewable energy purposes through zoning and Conditional Use Permits (CUPs). A Renewable Energy (RE) Overlay Zone was added to the County Land Use Ordinance, Division 17, which following a recommendation by the County Planning Commission, was approved by the Board of Supervisors. The County acts as “lead agency” in the preparation of environmental documents for renewable energy projects within its jurisdiction.</p> <p>○ The following agencies, among others, are also involved in permitting or regulating renewable energy projects: Federal Energy Regulatory Commission; California Energy Commission; Army Corps of Engineers; California Public Utilities Commission; Department of the Navy; State Lands Commission; State Water Resources Control Board; State Department of Fish and Wildlife; Regional Water Quality Control Board; County Air Pollution Control District; and Imperial Irrigation District.</p>	<p>must be reclaimed to its original state. Not much specific to wildlife.</p> <p>○ Most projects (80%) has been on land actively farmed on at the time it was converted to solar farms. Farms do have habitat value and therefore mitigate requirements such as going out an renting similar land to offset the conversion. Whatever habitat value was lost had to be mitigated for then after project done it had to be returned to its original state of farmland.</p> <p>○ Geothermal had significantly smaller impact in terms of surface disturbance. 5:1 ratio compared to solar. Still have to mitigate.</p>	<ul style="list-style-type: none"> Developer or County or third party has to monitor. Approval documents on website. Federal agencies that have a primary role of protecting habitat also can get involved – not only what mitigation is required but also the enforcement part of things. <p>○ Is compliance effective?</p> <p>There have been some complaints raised about the effectiveness and monitoring that has been going on so they have tightened up on that (NB. This was an observation provided by Imperial County however at this time the researchers were unable to find documentation for background information). Developer had the obligation to report bird mortality related to solar projects (lake effect) but they haven’t documented that. Changed that and the County is now hiring a third party monitor now responsible for doing surveys and writing reports because there were questions as to whether the developers were reporting accurately.</p>

Table 4: Project Siting

Jurisdiction	Absolute ‘No-Go’ Areas	Features to Avoid	Tools of High-risk Areas	Avoidance Areas for Other Industries (same or different)	Are there setbacks for features (wetland, species...)
British Columbia	<p>○ On Crown Land, known habitat for endangered species.</p> <ul style="list-style-type: none"> The majority are established under FRPA Ungulate winter ranges established under FRPA through a capability class system where one is highest. Note: class 1 winter ranges probably coincides directly with very high value 	<p>○ South southwest aspect slopes that typically exhibit natural grassland areas. Native grasslands are limited; within the Kootenay’s for instance, only 1% of land base contains these</p>	<p>○ iMapBC shows all WHAs, winter ranges, etc.</p> <p>○ ECOCAT an online resource for inventories and research, publications</p>	<p>○ Typically the same.</p> <p>○ Flathead Watershed Area Conservation Act (Government of British Columbia 2014) does not</p>	<p>○ Wildlife Act contains species specific provisions for occupied or unoccupied nests. This also falls under the Migratory Birds Act.</p>

Table 4: Project Siting

Jurisdiction	Absolute 'No-Go' Areas	Features to Avoid	Tools of High-risk Areas	Avoidance Areas for Other Industries (same or different)	Are there setbacks for features (wetland, species...)
	<p>solar power, solar capability, so there are likely concerns within those areas from a wildlife perspective.</p> <ul style="list-style-type: none"> • Mineral lick areas ○ Class A parks ○ Ecological reserves ○ Wildlife Management Areas under the Wildlife Act (Government of British Columbia 2013). ○ Characteristics of a no-go area: <ul style="list-style-type: none"> • Habitat that is essential to wildlife, and endangered species ○ Justification of no-go areas: <ul style="list-style-type: none"> • Science-based inventories, species inventories. (note: this also requires political input if a park or protected area is being established so it is not a guarantee) 	<p>grasslands and they are typically associated with a plant community that is identified at risk: Blue bunch wheat grass, June grasses, etc.</p> <ul style="list-style-type: none"> ○ Evidence used for avoiding these areas: Inventories and associated research on the importance of them 	<p>in the province.</p> <ul style="list-style-type: none"> ○ Front Counter: the conduit for any applications on Crown Land. <ul style="list-style-type: none"> • Provide advice to proponents for: any existing guidelines or mapping. ○ Sensitive Habitat Inventory Mapping (SHEM), mapped out and zoned significant areas of the foreshore for lakes. <ul style="list-style-type: none"> • Is not completed or adopted across the province. 	<p>allow oil or gas in this watershed area.</p>	<ul style="list-style-type: none"> ○ Named lakes and wetlands setbacks: <ul style="list-style-type: none"> • It depends on the activity but under FRPA there are setbacks for wetlands and streams. ○ And if it is fish habitat then there's the Fisheries Act (Government of British Columbia 2017c) that does apply. But no specific named lakes are included.
<p>Ontario</p>	<ul style="list-style-type: none"> ○ Regulation 359 under the Environmental Protection Act prohibits development in provincially significant wetlands, provincial parks, and conservation reserves. ○ These areas are protected through legislation (e.g., the Provincial Parks and Conservation Reserves Act, 2006) or deemed significant, as per the definitions outlined in the REA Regulation. ○ See Natural Heritage Assessment Guide (https://www.ontario.ca/document/natural-heritage-assessment-renewable-energy-projects) for further details as to the specific methodologies for identifying Significant Natural Heritage Features. ○ Justification <ul style="list-style-type: none"> • As noted above, this is due to already existing legislation and planning policies which were originally science-based and agreed to politically. 	<ul style="list-style-type: none"> ○ As detailed in the Natural Heritage Assessment (NHA) guide (https://www.ontario.ca/document/natural-heritage-assessment-renewable-energy-projects) ○ Certain features are under general prohibition. Specifically this means that, should a project be proposed within these features or their setbacks, further studies such as an Environmental Impact Study or an Environmental Effects Monitoring Plan would need to be included in the NHA report. These features are: <ul style="list-style-type: none"> • Provincially Significant natural heritage features, as defined in the REA, and their associated setbacks (see setbacks question), including: <ul style="list-style-type: none"> ▪ Provincially Significant Wetlands (southern, coastal, and northern) ▪ Significant Woodlands ▪ Significant Wildlife Habitat ▪ Provincially Significant Areas of Natural and Scientific Interest (ANSI) – Life Science and Earth Science categories • Fish and wildlife habitat as per the 	<ul style="list-style-type: none"> ○ Risk maps <ul style="list-style-type: none"> • Maps provided for individual species at risk locations: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list (click on each species). ○ Online tool <ul style="list-style-type: none"> • Significant Wildlife Habitat Mitigation Tool https://dr6j45jk9xcmk.cloodfront.net/documents/4773/mnr-swhmist-accessible-2015-03-10.pdf • Natural Heritage Information Centre – Must ask OMNRF for access. The database contains maps of all historical information about protected features and species at risk https://www.ontario.ca/page/get-natural- 	<ul style="list-style-type: none"> ○ The features to avoid are the same for all industries. The setbacks for Solar Power Projects (see below) are different than for other industries (50m vs. 120m). ○ This was determined through the experience of field staff and project reviewers on the ground who determined that a setback of 50m was low risk and acceptable for these projects. 	<ul style="list-style-type: none"> ○ NOTE: Additional studies (Environmental Impact Study (EIS) and potentially an Environmental Effects Monitoring Plan (EEMP)) need to be done should the project be proposed within the setbacks. Other requirements may be required under other legislation (e.g., Endangered Species Act, 2007). ○ Wetlands (Class I, II, III, IV, V, VI) <ul style="list-style-type: none"> • Provincially Significant Wetlands – 50 metres • Wetlands (non-provincially significant) within the Oak Ridges Moraine Conservation Plan Area or Natural Heritage System of the Greenbelt Plan – 50 metres ○ Name Lakes <ul style="list-style-type: none"> • Dependent on the features of the lake. If wetland or significant fish habitat - 50 metres. ○ Nest Structures

Table 4: Project Siting

Jurisdiction	Absolute 'No-Go' Areas	Features to Avoid	Tools of High-risk Areas	Avoidance Areas for Other Industries (same or different)	Are there setbacks for features (wetland, species...)
		<p>Fish and Wildlife Act, 1997</p> <ul style="list-style-type: none"> • Endangered species and threatened species habitat as per the Endangered Species Act, 2007 • Additional features with their setbacks are protected on lands subject to the Oak Ridges Moraine Conservation Plan (ORMCP) and on lands designated a part of the Natural Heritage System within the Greenbelt Plan. These include sand barrens, savannahs, tallgrass prairies, non-provincially significant wetlands, ANSI life science, and Alvars (ORCMP area outside of settlement areas only). <p>○As noted above, these features were chosen to be protected due to previously determined regulatory requirements and planning policies.</p>	<p>heritage-information</p> <ul style="list-style-type: none"> • Land information Ontario provides access to mapping of different layers. https://www.ontario.ca/page/land-information-ontario • Ontario Herp Atlas https://www.ontarionature.org/protect/species/herpetofaunal_atlas.php • Ontario Breed Birding Atlas - http://www.birdsontario.org/atlas/index.jsp • eBird: http://ebird.org/content/ebird/ <p>○Shared shape files</p> <ul style="list-style-type: none"> • https://www.ontario.ca/page/get-natural-heritage-information • https://www.ontario.ca/page/land-information-ontario 		<ul style="list-style-type: none"> • Significant wildlife habitat - 50 metres. • Additional setbacks may be required under Endangered Species Act, 2007. <p>○Species at Risk features (house, nest or den)</p> <ul style="list-style-type: none"> • Dependent on species, feature and monitoring <p>○Other</p> <ul style="list-style-type: none"> • Significant Woodland, Significant Wildlife Habitat, or ANSI - Life Science or Earth Science - 50 metres • Sand barrens, savannahs, tallgrass prairies, and Life Science ANSI's within the Oak Ridges Moraine Conservation Plan Area or Natural Heritage System of the Greenbelt Plan - 50 metres • Alvars located within the Natural Heritage System of the Greenbelt Plan only - 50 metres • Provincial parks and conservation reserves - 50 metres
<p>Imperial County</p>	<p>Renewable Energy and Transmission sections of General Plan was done in conjunction with an overlay of planning maps to show where projects can be located and where they can not. Less concerned about geothermal because of the small footprint occupied by these projects. Siting of these projects are to be done in conjunction with where the geological resources are - Known Geothermal Resource Areas (KGRAs), where resources are determined to be (map). One species of concern is the burrowing owl so avoidance of the owl is prominent especially during nesting season. Most dramatic impact of map was basically redlining no-go areas (Imperial County Planning & Development Services n.d.). For the most part irrigated lands are not allowed for solar development. State laws require county to protect farmland from conversion.</p>	<ul style="list-style-type: none"> ○Certain farmland ○Critical habitat (Federal designations), wilderness areas, military lands (400,000 ac) ○DRLCP restricts any further wind development on Federal land in Imperial County. ○Saltan Sea – largest lake in California and has habitat value. Mostly geothermal developments but it doesn't have much impact and co-exists pretty well. ○Rivers (creeks) old channels that carry mostly ag drain water but they 	<ul style="list-style-type: none"> ○DRECP website (has it broken down with maps showing areas where habitat areas are located) ○General Plan Update: the renewable and conservation open space sections. 	<ul style="list-style-type: none"> ○No difference between how it would be applied. No oil and gas. ○Broad exemptions built in for agriculture. Not a lot of monitoring or reporting required for agricultural practices. 	<p>○To date:</p> <ul style="list-style-type: none"> • All utility scale solar projects have been permitted on agricultural land. • Geothermal plans have been permitted on agricultural land and open space lands but no setbacks apply.

Jurisdiction	Absolute 'No-Go' Areas	Features to Avoid	Tools of High-risk Areas	Avoidance Areas for Other Industries (same or different)	Are there setbacks for features (wetland, species...)
	<p>The Renewable Portfolio Standard was in conflict with protecting farmland. State said they can be permitted on a temporary basis as long as it is converted back to farmland and restored to agricultural use. DRECP Desert Renewable Energy Conservation Plan has been finalized. Federal, State and county gov'ts to identify areas most suitable for renewable energy development and those that are not. BLM identified areas of critical environmental concern, areas of critical habitat so there are large areas within the county that will be difficult to build solar projects on. Imperial County has developed their own overlay that restricts solar development to certain areas. 500,000 ac in farmland in production. It is becoming far more difficult to permit farmland to build solar.</p> <p>Ag land is more of a political decision making process because they are in an agricultural county. People were uncomfortable seeing the trend to more solar and losing the farmland and habitat value.</p>	<p>are blue lined on resource maps for National Fish and Wildlife Services .</p> <ul style="list-style-type: none"> o County has 3million acres and most of it is desert. Some people think the best place to put these projects is out in the desert. However, it is a thriving ecosystem. Cultural resources (i.e. First Nations) are increasingly becoming more sensitive to development impacts. o Plants with protected status. 			

Table 5: Pre-Construction Surveys

Jurisdiction	Survey Protocols/ Requirements	Length of Surveys (year)	Species/Habitat Surveyed for	How reported back	Risk to wildlife – Metric and Thresholds	Data Expiry Date
British Columbia	N/A	<ul style="list-style-type: none"> o Length of surveys required: <ul style="list-style-type: none"> • One year but essentially it can change based on project-by-project assessment 	<ul style="list-style-type: none"> o It can change based on project-by-project assessment. 	<ul style="list-style-type: none"> o It would be included in their application, management plan component. 	<ul style="list-style-type: none"> o The higher the species is at risk, the less we're going to accept damage to that species or habitat. o Mitigation offsets depending on the species at risk. o Risk level is outlined in the Environmental Mitigation Policy for BC (Province of British Columbia: Ministry of Environment 2017). o Specific threshold for solar or geothermal projects: <ul style="list-style-type: none"> • Unlikely. 	<ul style="list-style-type: none"> o Species specific. If it's an endangered species, relatively old data could be used but we may require proponents update through more surveys. o No official expiration date.
Ontario	<ul style="list-style-type: none"> o Pre-construction field surveys are only applicable if there is a natural heritage feature or 	<ul style="list-style-type: none"> o If a pre-construction survey is required, the required length of the 	<ul style="list-style-type: none"> o Whatever is found in the inventory requires in the NHA report and requires evaluation (Natural Heritage 	<ul style="list-style-type: none"> o Through the Natural Heritage Assessment and associated EIS and 	<ul style="list-style-type: none"> o No predetermined thresholds apply. Thresholds would be examined and determined on a 	<ul style="list-style-type: none"> o No expiration date is set in the policy but in general do not receive data later than

Table 5: Pre-Construction Surveys

Jurisdiction	Survey Protocols/ Requirements	Length of Surveys (year)	Species/Habitat Surveyed for	How reported back	Risk to wildlife – Metric and Thresholds	Data Expiry Date
	<p>species that may be impacted by the project and, in the case of a feature, the significance of that feature has yet to be evaluated.</p>	<p>survey is defined in the Natural Heritage Assessment guide (https://www.ontario.ca/document/natural-heritage-assessment-renewable-energy-projects).</p> <p>Species specific habitat guides available at: https://www.ontario.ca/environment-and-energy/species-risk-guides-and-resources</p>	<p>features, Species at Risk habitat, etc.)</p>	<p>EEMP (if applicable). This report is reviewed prior to obtaining a REA. If an ESA Overall Benefit Permit is required, additional studies and reporting may also be required.</p>	<p>case by case basis. If an “Overall Benefit Permit” is required for impacts to endangered or threatened species, the associated mitigation and benefit actions would reflect the impact of the project on the specie(s) and/or their habitat.</p>	<p>two years old. Applications and approvals occur on a tight deadline; as such there has not been a need to set a data expiration date.</p>
<p>Imperial County</p>	<ul style="list-style-type: none"> ○ Proponent pays for the survey but County hires a third party ○ There are protocols developed for solar and geothermal projects for burrowing owls 	<ul style="list-style-type: none"> ○ 1-year pre-construction is required. ○ Surveys are required for new construction in open space or agricultural lands. ○ Survey completion is required 15-30 days prior to construction 	<ul style="list-style-type: none"> ○ Endangered species ○ Species of concern (primarily burrowing owl – not listed as endangered) ○ Migratory birds that use farmland as habitat (plover, Yuma clapper, etc.) ○ Burrowing owl, flat tail horn lizard, and desert pupfish 	<ul style="list-style-type: none"> ○ As part of the CEQA analysis this would be reported back showing map and plotting where burrows are located, head count. 	<ul style="list-style-type: none"> ○ Interviewees were not sure. Reports/survey done by certified consultants ○ Endangered Species Act uses a ‘take’ permit where you can only kill a certain amount of birds. ○ Example from the Blythe EIS: if more than six injured or dead birds or bats are located onsite at one time, and collect all data necessary to document such events, such as GPS location, photographs, and observations necessary to develop a comprehensive report; ○ During review period, proponents required to treat a species as if it were endangered until it was confirmed whether or not that species was in fact endangered (flat tail horn lizard). 	<ul style="list-style-type: none"> ○ If a study is more than a couple years old, it will not be accepted (however this was an assumption of the interviewee and he could not provide a resource). ○ 3-6 months for general survey, 30-45 days for pre-construction survey

Table 6: Post-Construction Surveys

Table 6: Post-Construction Surveys					
Jurisdiction	Survey Protocols/ Requirements	Length of Surveys (year)	Survey Area	Species/Habitat Surveyed for	Surveys Conducted by:
British Columbia	○ Nothing specific to solar or geothermal	N/A	N/A	N/A	○ For pre-construction surveys on other projects: professional biologist, hired by the proponent. It would typically be a registered professional biologist (R.P.Bio) under our College of Applied Biology.
Ontario	○ None provided	○ None, unless an Overall Benefit Permit or an EEMP was required and determined this was necessary. This would be determined on a case by case basis.	○ Dependent on the project, species, and the terms of the Overall Benefit Permit (if applicable). ○ Dependent on the content of the EEMP if applicable.	○ Dependent on the project, species, and the terms of the Overall Benefit Permit (if applicable). ○ Dependent on the content of the EEMP if applicable.	○ Third Party ○ Other ● Generally post construction surveys are completed by a consultant working for the company. Post-construction surveys conducted under the terms of an Overall Benefit Permit must be done by a qualified individual, as determined by MNRF.
Imperial County	○ Based on conditional use permit annual monitoring.	○ For the life of the project. ○ Based on conditional use permit annual monitoring.	○ Likely entire project area	○ Base of solar panels for mortality ○ Endangered species ○ Species of concern (primarily burrowing owl - not listed as endangered) ○ Migratory birds that use farmland as habitat (plover, Yuma clapper, etc.) ○ Burrowing owl, flat tail horn lizard, and desert pupfish	Third party that County hires

Table 7: Mitigation

Table 7: Mitigation					
Jurisdiction	Mortality Unit	Mitigation Thresholds Related to Mortality	Justification of Threshold	When is Mitigation Applied	Options for Mitigation
British Columbia	○ None provided	○ None known	○ None established	○ N/A	○ Under the Fisheries Act habitat enhancement is a requirement and will likely apply to solar or geothermal projects.
Ontario	○ N/A	○ Dependent on permits required. ○ Evaluated on a case-by-case basis.	○ N/A	○ N/A	○ None are mandated. The Overall Benefit Permit would have agreed upon mitigation techniques depending on the circumstances. There are also mitigation options that may be required depending on the features located in the project area and the results of the

Table 7: Mitigation					
Jurisdiction	Mortality Unit	Mitigation Thresholds Related to Mortality	Justification of Threshold	When is Mitigation Applied	Options for Mitigation
					Environmental Impact Study (e.g., if a wetland intrusion is to occur, a compensation project may be required). Again, this would be determined on a case by case basis.
Imperial County	o N/A	o N/A	o N/A	o N/A	<ul style="list-style-type: none"> o Ag easement could be placed on another similar area of land that allows for the area to be farmed as the original portion of land is under solar production. o Agricultural benefit program. Every project for solar pays into a fund administered by the County designed to improve the agricultural economy in other sectors of the ag industry – packaging, specialty products, value added products, etc.

Table 8: Miscellaneous Questions

Table 8: Miscellaneous Questions		
Jurisdiction	Public Lands	Urban/Rural
British Columbia	<ul style="list-style-type: none"> o Yes, they likely will be because local government or the regional district are responsible for private development and the Province is responsible for public lands. 	<ul style="list-style-type: none"> o Not tracked
Ontario	<ul style="list-style-type: none"> o If solar/geothermal are located on public lands – are requirements for surveys, monitoring, avoidance, mitigations etc. different than for solar/geothermal development on private lands? <ul style="list-style-type: none"> • No (with the exception of the already explained 50m setback) N/A for Geothermal 	<ul style="list-style-type: none"> o MNRF does not track this. Suggested more information could be found by contacting MOECC.
Imperial County	<ul style="list-style-type: none"> o Same on private and public lands 	<ul style="list-style-type: none"> o Utility scale solar found 100% in rural areas o Only rooftop solar found in urban areas o Geothermal was not confirmed

Table 9: Lessons Learned

Table 9: Lessons Learned		
Jurisdiction	Successes	Failures/Challenges
British Columbia	<ul style="list-style-type: none"> o None provided as there has not been a significant amount of solar or geothermal development in the Kootenays other than in Kimberly municipal boundaries. 	<ul style="list-style-type: none"> o N/A
Ontario	<ul style="list-style-type: none"> o Aligning Crown land site access with the procurement process has allowed MNRF to focus its efforts on projects deemed economically viable by the system operator. A crucial part of this aligned process is a high level pre-screening completed by project proponents (see Crown Land Site Report at http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&SRCH=1&ENV=WWE&TIT=crown+land+site+report&NO=018-0462E) 	<ul style="list-style-type: none"> o When developing Ontario’s original Feed-In-Tariff (FIT) system for renewable energy, Ontario first employed a “first come-first serve” policy on Crown Lands. This policy caused significant implementation issues due to the high number of applications for Crown land. As such, Ontario transitioned to the procurement process noted above. o See Page 5 of the below link: http://files.ontario.ca/environment-and-energy/crown-land/mnr_e000095.pdf
Imperial County	<ul style="list-style-type: none"> o Imperial county gets compliance 	<ul style="list-style-type: none"> o None provided

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Appendix A: Standardized Interview questions

Legislative

1. In general, what legislative tools (Acts, guidelines, standards etc.) does your jurisdiction have to guide the protection of wildlife, wildlife features, and wildlife habitat?
2. Legislatively, what tools (Acts, guidelines, standards etc.) does your jurisdiction use to protect wildlife, wildlife features and wildlife habitat when reviewing solar/geothermal energy project proposals? If different from what was listed in question 1, please list below under the appropriate section:
 - a. Specific to solar
 - b. Specific to geothermal
3. Does your jurisdiction have legislation governing reclamation requirements in regards to solar and geothermal projects? If so, what are they?
4. If there are reclamation requirements, are they linked to wildlife habitat objectives? If so, what are the objectives:
 - a. For solar projects?
 - b. For geothermal projects?
5. What agency ensures compliance with wildlife conditions? And, is compliance effective?
 - a. For solar projects
 - b. For geothermal projects
6. If there is non-compliance, what is the mechanism(s) to ensure enforcement actions are taken? Please check all that apply:
 - Site visits
 - Mandatory reporting
 - Voluntary reporting
 - Other (please specify in comments below)Comments:

Project Siting

1. Are there areas where development would not be permitted (no-go areas)?
 - i. For solar projects
 - ii. For geothermal projects

- b. What characterizes these areas to deem them a no-go area?
 - i. For solar projects
 - ii. For geothermal projects
 - c. How is this justified (science-based, agreed to politically, or other)?
 - i. For solar projects
 - ii. For geothermal projects
- 2. What high-level geographical or ecosystem features are proponents asked to avoid (i.e., valleys, large lakes, eastern slopes or mountain ranges) when choosing a project location. What is the evidence used for avoiding these areas?
 - a. For solar projects
 - b. For geothermal projects
- 3. Are there tools available to the public or proponent that help identify areas of higher risk related to wildlife protection and/or habitat? Please check all that apply and provide reference material or link if applicable:
 - Risk maps
 - Online tool
 - Shared shape files
 - Other (please specify in comments below)
 Comments:
- 4. Are avoidance areas different in comparison to other industries operating in that jurisdiction (ex. Oil and Gas development)? If so, what is the justification for the differences?
 - a. For Solar projects
 - b. For Geothermal projects
- 5. Are there solar array/geo-drilling setbacks used for (and if so, what is the setback):
 - a. Wetlands (Class I, II, III, IV, V, VI)
 - i. Solar:
 - ii. Geothermal:
 - b. Named Lakes
 - i. Solar:
 - ii. Geothermal:
 - c. Nest structures
 - i. Solar:
 - ii. Geothermal:

- d. Species at Risk features (house, nest or den)
 - i. Solar:
 - ii. Geothermal:
- e. Other?
 - i. Solar:
 - ii. Geothermal:

Pre-Construction Surveys

1. For how long are the pre-construction surveys required (i.e., 1 year of surveys, 2 years, etc.)?
 - a. For solar projects
 - b. For geothermal projects
2. What species or habitat features are surveyed for?
 - a. For solar projects
 - b. For geothermal projects
3. How is the survey data reported back to the responsible jurisdiction?
 - a. For solar projects
 - b. For geothermal projects
4. Is there a **metric** used to determine **risk level to wildlife** (birds, mammals, other) from pre-construction survey data (i.e. a **threshold** that would be considered too high risk for development to proceed, or triggers for mitigations)? What is the justification for the use of this metric and threshold (science-based, agreed to politically, or other)?
 - a. For solar projects
 - b. For geothermal projects
5. Is there an expiry date to the wildlife data that is to be used to make an application?
 - a. For solar projects
 - b. For geothermal projects

Post-Construction Surveys/Monitoring and Mitigation

1. For how many years are post-construction surveys required?
 - a. For solar projects

- b. For geothermal projects
- 2. How large of an area is surveyed? (i.e. a percentage of the solar arrays)
 - a. For solar projects
 - b. For geothermal projects
- 3. What species or habitat features are surveyed for post-construction?
 - a. For solar projects
 - b. For geothermal projects
- 4. What level of mortality triggers mitigation for any species group this applies to (e.g. bats, birds, reptiles)? How is this defined and justified (science-based threshold, agreed to political threshold, or other)?
 - a. For solar projects
 - b. For geothermal projects
- 5. Is mortality reported relative to solar array number, or per MW or something else?
- 6. Is mortality reported relative to geothermal facility energy production or something else?
- 7. Who conducts the surveys?
 - Third Party
 - Government
 - Experienced biologists
 - Project maintenance crew
 - Other
 Comments:
- 8. What options exist for mitigation in your jurisdiction?
 - a. For solar projects (ex. tilting solar panels, removal)
 - b. For geothermal projects (ex. facility removal)

Lessons Learned

1. Do you have any major successes to share?
2. Do you have any major failures or challenges that should be avoided?

Other

1. If solar/geothermal are located on public lands – are requirements for surveys, monitoring, avoidance, mitigations etc. different than for solar/geothermal development on private lands?
 - a. Yes
 - b. No
 - c. If yes, please explain the different requirements:

2. What proportion of solar power generation is urban vs. a rural?

General Questions

1. Can we share your name and contact information with the Government of Alberta staff?
2. Would you be ok with this document being shared?

3. Are there other jurisdictions that you recommend we talk to?

Appendix B: Contact list

Jurisdiction	Name	Title	Contact Information	Comments
British Columbia	Peter N. Holmes	Ecosystem Biologist, Habitat Management – Kootenay, Ministry of Forests, Lands and Natural Resource Operations, Government of British Columbia	Peter.N.Holmes@gov.bc.ca 250-342-4269	Phone interview participant and primary contact. Information limited to Kootenay area.
Ontario	Hal Leadlay	Coordinator, Resource Development Section Natural Resources Conservation Policy Branch, Ontario Ministry of Natural Resources and Forestry	705-755-1827	Hal was the key contact for Ontario, additional staff were communicated with for written survey completion.
California	James (Jim) A. Bartridge	Senior Transmission Program and Policy Specialist, California Energy Commission	Jim.Bartridge@energy.ca.gov 916- 654-4169	Provided limited information
	Andy Horne	County of Imperial, Deputy County Executive Officer, Natural Resources Development	andyhorne@co.imperial.ca.us 442-265-1005 (Office)	Primary contact and phone interview participant

Appendix C: Additionally Contacted Jurisdictions

Jurisdiction	Contact Name	Title	Comments
British Columbia	Kerry Harvey	Senior Ecosystems Biologist, Northeast Region, Ministry of Forests, Lands and Natural Resource Operations, Government of British Columbia	Informed us that their region has no solar or geothermal projects and recommended we contact other regions that have these projects.
Tasmania, Australia	Kate Düttmer	Senior Environmental Officer, EPA Tasmania, Department of Primary Industries, Parks, Water and Environment	They have no large scale commercial solar projects in Tasmania and no Geothermal projects. They recommended we talk to New South Wales for solar and to New Zealand for geothermal.
New South Wales, Australia	Peter Christie	A/Director North West, Regional Operations Division, Office of Environment and Heritage	Primary contact. Unable to complete interview.
	Steven Cox	Senior Team Leader –Planning, North West Branch, Regional Operations Division, Office of Environment and Heritage	Second contact and provided limited information.
Montana	Renee Lemon	Land Use Planner, Responsive Management Unit, Montana Fish, Wildlife & Parks	Recommended that we reach out to U.S. Fish and Wildlife Service
Scotland	Kenny Taylor	Renewable Energy Policy and Advice, Scottish Natural Heritage	Indicated they may be able to provide contacts in Scotland.
New Brunswick	Hubert Askanas	Biologist Species At Risk, Fish and Wildlife Branch, Energy and Resource Development, Government of New Brunswick	Not aware of any solar power or geothermal in New Brunswick.

Appendix D: Additional Notes

Jurisdiction	Geothermal	Solar
British Columbia	No additional notes	No additional notes
Ontario	No additional notes	<p>○ Are there other jurisdictions that you recommend we talk to?</p> <ul style="list-style-type: none"> • MOECC are in charge of the Renewable Energy Approvals in Ontario. Also consider speaking to Nova Scotia and Quebec. <p>○ NOTES:</p> <ol style="list-style-type: none"> 1. There is no geothermal potential in Ontario. As such, we have replied N/A to all questions related to geothermal energy. 2. There is federal wildlife legislation that we have not covered in this survey (e.g., Migratory Bird Convention Act, Species at Risk Act, etc.). See page 34 of Ministry of the Environment and Climate Change Renewable Energy Approvals technical guide for further details of the relevant agencies to contact for this legislation at the following link https://dr6j45jk9xcmk.cloudfront.net/documents/915/3-3-1-guide-to-renewal-energy-approvals-en-pdf.pdf
Imperial County	No additional notes	No additional notes