Report to the National Renewable Energy Laboratory

on Southwest Alaska Small Wind Wildlife Site Investigations

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By

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Introduction

The National Renewable Energy Laboratory (NREL) wind powering America small wind program is providing technical assistance to native communities and Coast Guard facilities in southwest Alaska. Providing wind as a supplemental power source adds renewable energy sources to reduce reliance on fossil fuels. Part of this technical assistance is to provide an evaluation of potential risks to wildlife from construction and operation of small wind generators at isolated locations.

Methods

The methods used in this study included obtaining and reviewing existing information, site visits by two wildlife biologists experienced in evaluation and siting of wind power facilities, and an assessment of probable impacts on birds and bats, based on the available information. Existing information included available published and unpublished information and databases, and identifying and interviewing local and regional state and federal wildlife biologists and other knowledgeable individuals familiar with the sites under consideration. The methods used by the biologists were the same as those used by Northwest Wildlife Consultants, Inc. (2003) in a similar study in Southeast Alaska in the spring of 2003.

Site Visits

During the site visits, which typically lasted 1 to 2 hours at each site, all wildlife species (or their recognizable signs) observed were recorded in field notes, photos were taken, and the habitats present were described. The assessment process looked for site characteristics and probable use by wildlife that might constitute higher risk than other potential areas. Obvious potential conflicts were discussed on site with the wind meteorologist while determining sites best suited for wind measuring towers. At some villages in the Bristol Bay area, local native residents were asked about wildlife. Coast Guard staff were interviewed about their potential sites.

Information Review

The U.S. Fish and Wildlife Service (USFWS) Anchorage office, migratory bird management section (Shawn Stephenson) maintains the North Pacific Seabird Colony Catalogue in digital form. This catalogue can be obtained and the data plotted using GIS. This was not done for this project because GIS was not within the scope of work. The workshop summary entitled "Supporting wind energy projects in Alaska: developing a strategy for minimizing loss of migratory birds" (Matsuoka and Laing 2003) was reviewed and general concepts incorporated into the approach used in this investigation. A more general protocol that could be used by others in future evaluation of small wind

projects in Alaska was developed. Other sources of information were gleaned for references on wildlife use of specific areas. The January 2003 Region II Briefing Book produced by the Alaska Department of Fish and Game, Division of Wildlife Conservation provided general information and for some areas, also described the wind resources.

USFWS staff interviewed were Ellen Lance in Anchorage, Rob MacDonald in Bristol Bay, Michael Swaim, Bethel, and Denny Zwiifelhofer in Kodiak. Two individuals with extensive knowledge of Kodiak Island, Jack Doyle of the U.S. Coast Guard (USCG), and Rich MacIntosh of NOAA Fisheries, were also interviewed.

Ellen Lance, USFWS (Anchorage) can provide contact information on knowledgeable people in other regions of Alaska.

Contact information for these individuals is provided in the References section.

Results

Narrow Cape

Site Visit

This site includes a USCG guyed Loran antenna approximately 1,200 feet tall, with buried radials that extend out in all directions beyond the guys. A short distance away is the Alaska Aerospace Launch Corporation's launch facility. The area is grazed by cattle and American bison within the Burton Ranch grazing lease. Few trees are present in this predominately meadow and low shrub habitat.

Figure 1, below, is a view looking to the southeast showing the typical habitat near the Loran antenna, with the antenna in the background.

There are cliffs topped with grassland on the west side of the cape, and a narrow beach below. Kelp beds are extensive in the bay area to the west of this cape. The cliffs extend along the south shoreline of the cape, and on the east side the shoreline is more gradual and there is a protected lagoon along the east shoreline.

There were at least 30 birds (too far away to identify, but the shape and size of ducks or cormorants) loafing on floating patches of kelp in this area. The only other species observed in the uplands at the site were chickadees and magpies. The low herbaceous habitat is probably nesting and migration stopover habitat for passerines and shorebirds. Gulls likely patrol the shoreline. The lagoon areas on the sides of the cape may be attractive to waterfowl and waterbirds. The topography of the cape drops off at the southern end and there are some east-west trending wetlands and open water in the Twin Lakes.

Information Review

Rich MacIntosh (pers. comm. 2003) is familiar with the Narrow Cape area. He indicated that he has not seen evidence of any pronounced daytime migration over the land comprising this Cape. He has seen raptors moving through the area, but not in large numbers. The species he most commonly observed include the rough-legged hawk, northern harrier, peregrine falcon, and merlin. Large numbers of waterbirds and waterfowl do pass through the Ugak Straits, but would not be affected by land-based

wind turbines. He does not have any information on potential night migration species or numbers. There were small numbers of terns that nested at the site of the Loran tower before it was constructed; the terns no longer nest there. Aleutian terns nest on the beach at Burton Ranch (to the east of the potential wind sites). He is not aware of any seabird or colonial nesting birds in the vicinity. There are cormorants roosting at the end of the Cape, and bald eagles nesting in the vicinity. Bald eagles are common nesters throughout Kodiak Island.

Denny Zwiefelhofer (pers. comm. 2003) is also familiar with Narrow Cape. He indicated that the south and east sides of the island are generally used more by migrating birds than the Shelikof Strait side of the island. Some Steller's eiders (listed as Endangered by the USFWS) do winter in the Narrow Cape area, usually arriving around the end of October and staying through late April and early May (depending on weather conditions). He indicated that most sea ducks (including eiders) are typically oriented to flying only over water, unless there is low visibility or frozen seas where the boundary between land and sea is obscured. He also expressed concern that lighting could affect the attractiveness of an area to birds.

Results Summary

The presence of the lagoons and lakes may cause birds traveling in an east-west direction to cut across the land part of the cape, but this is not likely to be a problem because all of the proposed facility sites are north and uphill from this low area. Based on the site visit and available information, it does not appear that a met tower and one or two small wind turbines near the Loran site or the Launch facility would have a significant adverse effect on birds in the area.

Spruce Cape

Site Visit

This site is a short peninsula on the eastern end of the City of Kodiak, and the headquarters for a Navy Seals training facility. The USCG has a small facility located there. Just east of the training facility buildings, there is a beach area with rocky outcrops in the intertidal zone, which supports large patches of *Fucus* and probably other algae. A short cliff face (about 10 to 20 feet high) of varying slope is vegetated with a mixture of herbaceous, shrub, and forest vegetation. Gulls were observed patrolling the shoreline during the site visit. There are a number of islands to the south and east of this cape.

Figure 2 shows the rocky coastline habitat at Spruce Cape.

Farther east, to the north of the chain link fence that parallels the coastline, there is a patch of emergent wetland , patches of Sitka spruce, and a more upland meadow and willow shrub complex. In the middle of this upland meadow (which has been partially filled with gravel to improve vehicle access) is a small beacon of some kind approximately 8 feet tall, which appears to be connected to the Navy facility through a conduit. There is sufficient meadow area available for a met tower. A forest of Sitka spruce is located to the north of the meadow.

Figure 3 shows this meadow with the forest in the background.

Information Review

MacIntosh (pers. comm. 2003) indicated that oystercatchers may nest in the area; oystercatchers are widespread nesters, preferring small islands. Other species using the Spruce Cape area include kittiwakes, mew and glaucous-winged gulls. Beyond the area occupied by the Navy Seals base, the beach and shoreline is open to the public and is a popular hiking area.

Zwiefelhofer (pers. comm. 2003) indicated that Steller's eiders were rare in the vicinity of Spruce Cape, and that when present, they usually occurred around the islands to the east. The vicinity of these islands is a feeding area for murrelets, auklets, puffins, and murres, but this area is not used as much for winter feeding as the Narrow Cape and Chiniak areas. He indicated that marbled murrelets nest in the Spruce Cape area, but their numbers are unknown.

Results Summary

The beach area does not appear to be a good location for a wind turbine because gulls patrol the beach area, the outcrop habitat in the intertidal zone would provide foraging and nesting habitat for shorebirds such as oystercatchers and turnstones, and visual

impacts could be an issue with the public using the shoreline and beach to the east. A turbine in the meadow area would put fewer birds at risk from collisions than one closer to the beach, unless the site was directly on the flight path used by marbled murrelets commuting between their nests and the ocean.

Pillar Mountain

Site Visit

The habitat is tundra with a very few low windswept Sitka spruce (Figure 4). There is a good access road, and nearby transmission line and substation located further down on the slope of the mountain in forest habitat. There are also a number of existing communication towers, so the addition of turbines would not constitute an intrusion into a pristine area. The birds observed during the site visit included small groups of common ravens flying north from the area below near the City of Kodiak (perhaps from a communal winter night roost). The ravens passed over the top and sides of the mountaintop and appeared to be spreading out over the area to forage. The ravens were flying at elevations above ground of between 10 and 100 feet. Two common snipe were flushed from a puddle in the tundra near the first communications towers along the road, and a flock of redpolls or pine siskins flew southward over the site, probably within an elevation above ground that would be within the rotor swept area of a 225-kW or larger machine. This area is probably used by ground-nesting passerines and shorebirds during the summer. A northern shrike was observed perched on a small spruce next to the road a few hundred yards downhill from this site.

Figure 4 shows a view of typical habitat on the top of Pillar Mountain.

Information Review

MacIntosh (pers. comm. 2003) indicated that he visits Pillar Mountain, including the high elevation tundra areas, during the fall. He indicated that there is an alpine shorebird and passerine migration through Kodiak Island, including Pacific golden plovers, water pipits, and Lapland longspurs, and that he has observed golden plovers at the Pillar Mountain site. He indicated that he had heard that the golden plovers feed at night as well as the day.

Zwiefelhofer (pers. comm. 2003) indicated that in addition to the resident population, there is an influx of wintering bald eagles to Kodiak, particularly the landfill area near Kodiak. The cliff face above the City of Kodiak is a good thermal area used by eagles for soaring during good weather conditions. He indicated that there are approximately 300 to 400 eagles in the vicinity of the City during the winter. He indicated that because of this influx, risk to bald eagles could be higher during the winter. He indicated that occasionally gyrfalcons and peregrine falcons occur during the winter in the Kodiak area, and can be seen in the vicinity of the top of Pillar Mountain. During a discussion of bird behavior during fog or low visibility, he indicated that he did not think that bald eagles or other raptors flew much during low visibility conditions. He also indicated that migrating storm petrels, albatross, marbled murrelets and fulmars encountering low visibility conditions in the area occasionally mistakenly land on wet pavement areas in Kodiak.

Results Summary

From a bird use standpoint, it appears that the risk to birds at this site would be relatively low. Since many of the towers at this site are guyed, the existing risk of fatalities from the guyed towers could be higher than that from wind turbines, unless the turbines were also guyed. Lapland longspurs and Pacific golden plovers are night migrants, and migrating longspurs and neotropical migrants have occasionally been killed in large numbers by collisions with lit communication towers. Therefore it is possible that night migrants could be attracted to and collide with the communication towers (or wind turbines if they were lighted) during poor visibility conditions.

If wind power development is seriously considered for the Pillar Mountain site, we recommend that standardized carcass searches be conducted at the existing communications towers to determine whether this site already causes bird (and possibly bat) fatalities, and the estimated number of those fatalities.

Chiniak Lagoon

This site was not visited in the field. Al Boudreau of the USCG was interviewed the second day we were in Kodiak, and indicated that the small native community at Chiniak Lagoon might be a good candidate for a small wind turbine.

Information Review

The map in Wade's (2003) Southwest Alaska Wind Survey report to the NREL shows a number of open water features around this small promontory, which could result in birds patrolling the coastline "cutting the corner" and flying through the area where a wind turbine may be located. Zwiefelhofer (pers. comm. 2003) indicated that there is abundant shallow intertidal habitat in the Cape Chiniak area from Cape Greville (to the south) to Kalsin Bay, and that this is prime foraging habitat for wintering Steller's eiders, which are listed as Threatened under the Endangered Species Act. He indicated that marbled murrelets may also nest in this area, but their numbers are unknown.

MacIntosh (pers. comm. 2003) indicated that the Chiniak Lake area is too sheltered to be a good wind turbine site, but that there are higher areas in the vicinity that might be suitable. He indicated that there is more local bird movement in the area, and possibly higher numbers and variety due to the mixture of grassland, spruce forest, shrub, ponds, streams, beaches, and rocky coastline habitats. There are thousands of tufted puffins nesting on the rocks offshore; he is unsure whether any puffins nest on the mainland bluffs. He indicated that the pigeon guillemot may be the only seabird nesting on this coastline. Guillemots do fly over the tops of cliffs, but generally not far inland in this area. They could be at risk from a wind turbine located too close to the coastline. In addition, the Chiniak River has large runs of pink and silver salmon, and attracts bald eagles during the spawning season. A wind turbine at this site could pose a risk to

marbled murrelets if it was located in flight paths used by murrelets commuting between ocean feeding areas and nest sites.

Results Summary

Given the abundance of water near the end of this cape and the presence of wintering Steller's eiders, wind turbines would have the least impact if they were set back as far as possible from the coastline, possibly to the south or southeast of the landing strip.

Togiak, New Stuyok and Dillingham Site Visit

Site details and photos are provided in Wade (2003).

Togiak

Habitat at this site is not unique to the area and the preferred site is located along a road traveled by residents living at a nearby housing development and by people traveling to the school. No unique wildlife or high value nesting habitat was noted or could be expected to occur at this location due to the existing disturbance.

Figure 5 showing an aerial view of Togiak

New Stuyok

As described in Wade's (2003) report, the preferred location for the met tower (ANS Met 1) and subsequent wind tower(s) is an area that is already disturbed from previous human activity (aircraft landing, etc.). It is being used as a staging area for some construction equipment related to the new airstrip. Utilizing areas already disturbed should result in lower direct impact to wildlife from the construction of wind towers because the area is of lower quality than nearby undisturbed habitat. There were no features that would attract birds to the site such as open surface water or trees for perching. ANS MET 2 and 3 are in higher quality habitat but 2 appeared to have some human activity on a regular basis. Met 3 is open native grassland with trees in the drainages. This site may have higher wildlife use and could result in more impacts than Met 1 or 2.

Figure 6 shows the approximate location of the "future met tower" ridgeline at New Stuyok

Dillingham

China Cap and Wood River Road are described by Wade (2003). Habitat photos are provided in his report. China Cap is more exposed on the landscape than the Wood River Road site. Night migrating passerines may fly closer to the ground here than at Wood River Road but avian use is not expected to be high according to MacDonald (pers. comm.. 2003, see information review section below). Local residents were asked about bats and no one has seen any in the area. There are no trees on the ridgetop but there are some low shrubs and trees near the Wood River Road site. There were no unique features at either site that might indicate the need for protection of a resource or any unique wildlife activity.

Figure 7 shows an aerial view near the Wood River Road site.

Information Review

Rob MacDonald (pers. comm. 2003) and Ellen Lance of the USFWS visited three possible wind power sites: China Cap, a VORTAC, and Wood River, during October 2003. China Capwas also visited by wildlife consultant Karen Kronner during early October 2003. MacDonald (pers. comm. 2003) indicated that he did not have any real concerns about risk to birds from small wind turbines at any of these three sites. He indicated that glaucous-winged and mew gulls move through passes on either side of Snake Lake Mountain, but that their flight paths do not go anywhere near China Cap. He indicated that rough-legged hawks and short-eared owls were present but were more numerous in lower terrain. There is dense forest in all directions around the meadow comprising China Cap. Rob MacDonald conducts breeding bird surveys during late June in this area and indicated that populations of rough-legged hawks and short-eared owls in this area were relatively low.

Michael Swaim (pers. comm.. 2003) commented that the wind turbines should be sites away from migratory corridors, and that turbine sites near rivers and the coastal shoreline should be avoided. He noted that the local birds are hunted in villages such as Togiak which could mean the avian density may not be as high as areas of no or low human habitation. He recommended avoiding wetlands, muskegs and spruce forests for turbine placement because these areas generally have higher use by high-flying birds engaged in courtship displays. He said that in general, the vast majority of birds are not present for 6 to 8 months of the year and that if there are avian concerns, the "wind generators could be used in a seasonal manner. He noted that in Bethel, the wind blows constantly during the winter but slackens significantly in the summer" when the breeding birds are present.

Results Summary

Based on the available information, it appears that wind turbine placement at any of these sites would not represent a significant risk to birds.

Recommendations

As previously discussed informally with several of the site assessment members, placing bird flappers on the met tower (and eventually, turbine) guy wires is highly recommended to help divert or deter birds from flying too close to the wires and causing injury or fatal collisions. The devices were discussed during the demonstration and ordering information was provided.

Sites which are known to be used by listed species such as the Steller's eider should be carefully evaluated as to placement of turbines if the met data indicate a viable wind resource is present.

The sites reviewed by the two wildlife biologists are assumed to be the areas which may eventually support wind turbines. If other areas are selected, we recommend that the biologists review the site remotely (by reviewing existing information, photographs, and interviewing knowledgeable individuals), or visit the area to conduct a review of potential concerns. In areas of Alaska that may support, rare or listed plant species, preconstruction surveys are recommended in areas that would be within the project footprint.

Acknowledgements

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