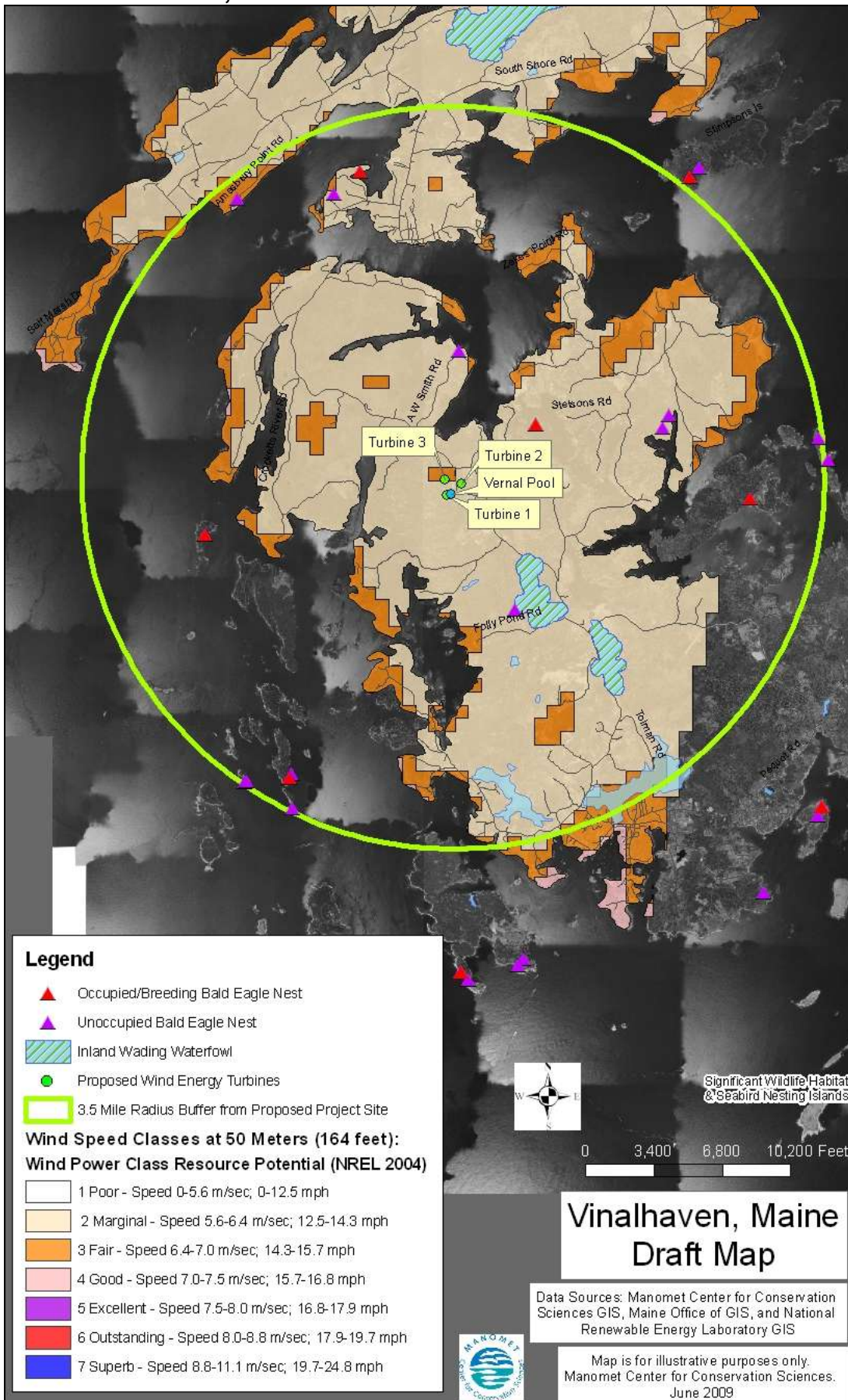


VINALHAVEN, MAINE WIND ENERGY PROJECT CASE STUDY



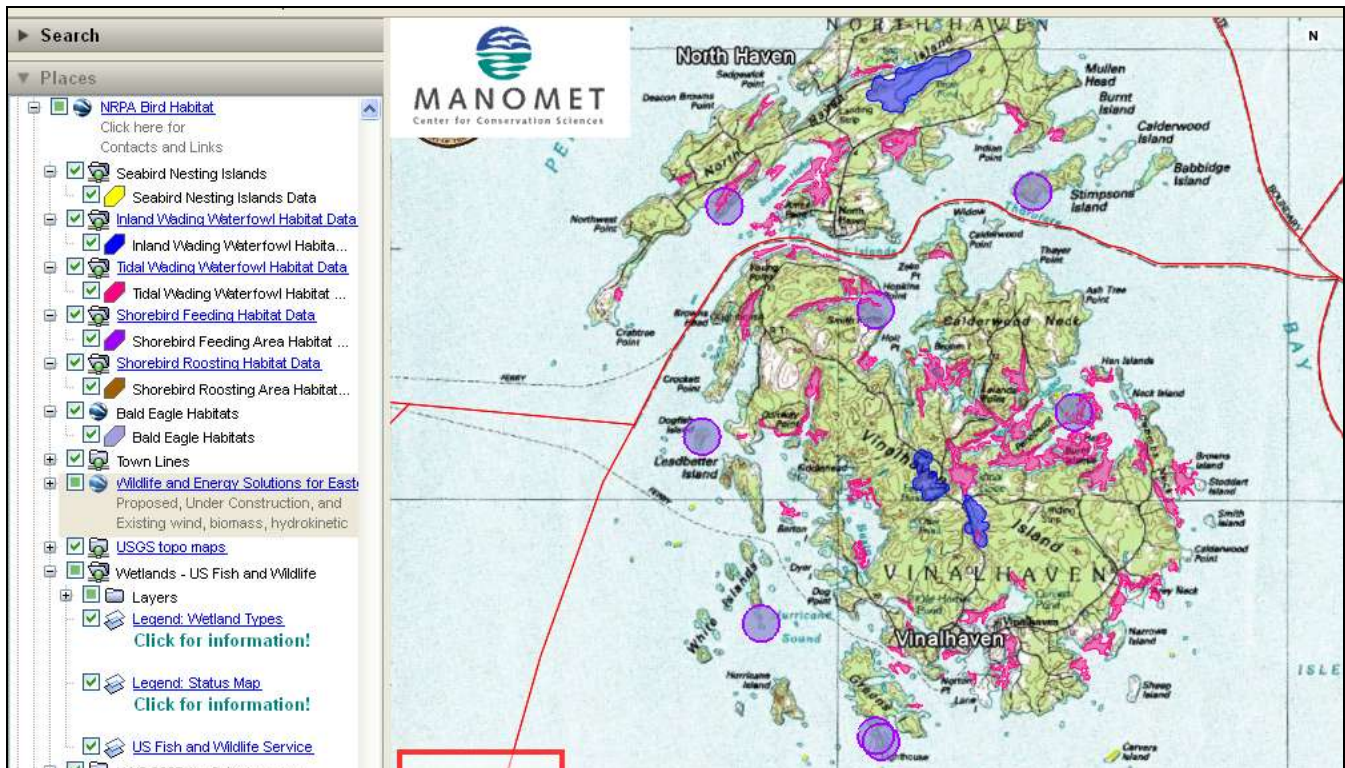
BACKGROUND

Vinalhaven and North Haven are year-round island communities along the Maine coast. The Vinalhaven wind energy project site is just west of North Haven Road and south of Seal Cove. The project will consist of three General Electric 1.5 MW turbines. Fox Islands electric rates are two to seven times higher than the national average; however, once operational, the wind energy project is forecast to supply all of Fox Islands electricity needs each year.¹ The project's organizational partners are: Fox Islands Electric Cooperative, the Island Institute, Cianbro, EOS Ventures, and Diversified Communications.

The project website provides an overview of the project history:

“Fox Islands Electric’s interest in developing wind as a source of energy began in 2001, when staff and board members began to explore the possibility of pursuing wind-power development on the islands...[As a tax investment was not] available to the nonprofit Fox Islands Electric Cooperative, a separate for profit Fox Islands Wind LLC (FIW) was formed to take advantage of the tax credits...the Island Institute secured the commitment of a Maine company for an approximately \$5 million investment in exchange for the tax credits the federal government allows to encourage investments in alternative energy projects. Permanent financing was obtained via a loan from the RUS, a division of the USDA and descended from the Rural Electrification program...FIW has partnered with the Island Institute to raise pre-development capital for attorney fees, interconnection and environmental studies, to complete necessary local, state and federal permitting, and to secure permanent financing for insurance, operations and maintenance...The Fox Islands project will be the largest coastal wind-power facility in New England.”²

MAP OF PRIORITY WILDLIFE AND HABITATS³



¹ Fox Islands Wind Project. <<http://www.foxislandswind.com/background.html>>. Accessed 8/24/09.

² Ibid.

³ Maine Department of Environmental Protection GIS. <<http://www.maine.gov/dep/gis/datamaps/index.htm#OtherGEProjects>>. Accessed 8/18/09.

EXAMPLES OF PRIORITY WILDLIFE AND HABITATS IN VICINITY

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles tend to roost communally and it is not uncommon to see two or more bald eagles in the area; this number can actually be as high as 100 bald eagles during high use periods. Areas with high human traffic are typically avoided. Habitats are usually located close (within 4 km) to bodies of water where food (e.g. fish, waterfowl and seabirds) is more abundant.⁴ They tend to feed mostly on fish, injured waterfowl and seabirds, as well as small mammals and food pilfered from other birds. Bald eagles tend to use the same nest or alternate between two nests year after year for roosting and breeding. Breeding usually occurs in tall trees or on cliffs.

Bald eagle pairs mate for life. Preparation for nesting occurs months before the female lays eggs. The female produces 1-3 eggs; the overall annual fledging rate is typically one chick per nest.⁵ The male and female eagles are both involved with the incubation duties. The eaglets hatch following a 35-day incubation period and after 10-12 weeks, the eaglets depart the nest.

Human activities can be disruptive to eagles and affect their behavior. For example, eagles may not build or maintain adequate nests, they may lack the energy to care for their offspring due to defense of their nests, or they may ultimately abandon the nest. If adult eagles are absent for extended times from their nest due to disturbances, eggs or offspring can be jeopardized. Juveniles will range approximately ¼ mile from their nests, typically to sites with minimal human activity. Juveniles rely on the adults to feed them, and this continues until six weeks after they depart their nest.⁶

The U.S. Fish and Wildlife's Gulf of Maine Study Bald Eagle Habitat Model, August 2002 states,

"Tolerance of disturbance varies among individual eagles and with season; 500 m is approximately the closest that humans (Fraser et al. 1985) or other eagles (Mahaffy and Frenzel 1987) can approach a nesting eagle before disturbing it. This distance is typically converted to a one-quarter mile radius for management purposes. Functional nesting habitat is generally considered to encompass a minimum of 640 acres, including foraging and nesting habitat, and should be contiguous acreage unless the habitat elements are known to be separate (USFWS 1983). Nesting habitat management guidelines prohibit most activities within a primary management zone of 750 to 1500 feet from the nest, and particularly prohibits unauthorized human entry during the nesting season (USFWS 1987). Activities which alter the site such as logging, land clearing, development, construction, mining and low-level aircraft should be prohibited within a radius of 1 mile (1.6 km) of nest sites (USFWS 1987)."⁷

⁴ Nature Serve. <<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=bald+eagle>>. Accessed 8/19/09.

⁵ National Bald Eagle Management Guidelines, May 2007, pg. 7. USFWS

⁶ Ibid. pg. 8

⁷ Bald Eagle Habitat Model, August 2002. <http://www.fws.gov/r5gomp/gom/habitatstudy/metadata/bald_eagle_model.htm> Accessed 8/19/09.

Nesting Bald Eagle Sensitivity to Human Activities

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

Source: National Bald Eagle Management Guidelines, May 2007, USFWS.

Distribution of Raptors in Maine

Species	Most of State	Coastal	South	North	East	West	Central	Spotty
American Kestrel	X							
Bald Eagle	X							
Broad-winged Hawk	X							
Cooper's Hawk	X							X
Golden Eagle								X
Merlin	X							X
Northern Goshawk	X							
Northern Harrier	X							
Osprey	X							
Peregrine Falcon								X
Red-shouldered Hawk	X							X
Red-tailed Hawk	X							
Rough-legged Hawk				X	X			
Sharp-shinned Hawk	X							
Turkey Vulture		X	X				X	

Source: Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 19. September 2005.

Inland Waterfowl/Wading Bird Habitat (IWWH)

Waterfowl Habitat:

Harlequin Duck (*Histrionicus histrionicus*)

According to Maine's Comprehensive Wildlife Conservation Strategy,

“The Harlequin Duck is listed as a Threatened species in Maine (McCollough et al. 2003). During winter, Maine supports a significant portion of the eastern North American population of Harlequin Ducks, which is found primarily around Isle au Haut and surrounding islands in Jericho and Penobscot Bays (Wickett 1999). Maine's wintering population of Harlequin Ducks is estimated at 1,150 – 1,300 birds.”⁸

Harlequin ducks tend to nest in fast-moving waters and streams near rocky banks and islands. They nest and breed in areas with woody debris and prefer to be located near shores and rivers with medium-level currents. They winter along rocky shores and reefs. Their nests are usually found in bush hollows or within rock crevices within 30 meters of water, and they tend to use the same nest through successive years.⁹ They feed primarily on mollusks, insects and small fish that are found in strong currents. They usually appear in compact flocks during non-breeding seasons. Breeding productivity is relatively low and extremely variable year to year, ranging from 5-10 young.

⁸ Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 25. September 2005.

⁹ Nature Serve. <<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=bald+eagle>>. Accessed 8/19/09.

Distribution of Waterfowl in Maine								
Species	Most of State	Coastal	South	North	East	West	Central	Spotty
American Black Duck	X							
American Widgeon								X
Atlantic Brant		X						
Barrow's Goldeneye		X					X	X
Black Scoter		X						
Blue-winged Teal	X							
Bufflehead		X						
Canada Goose	X							
Canada Goose (NAP) (non-breeding)	X							
Common Eider		X						
Common Goldeneye	X							
Common Merganser				X	X	X	X	
Gadwall			X	X				X
Greater Scaup (non-breeding)		X						
Green-winged Teal	X							
Harlequin Duck		X						X
Hooded Merganser	X							
King Eider		X						X
Lesser Scaup		X						
Long-tailed Duck		X						
Mallard	X							
Mute Swan		X	X					
Northern Pintail	X							
Northern Shoveler				X				
Red-breasted Merganser (breeding)		X		X		X		
Ring-necked Duck	X							
Ruddy Duck	X							
Snow Goose	X							
Surf Scoter		X						
White-winged Scoter		X						
Wood Duck	X							

Source: Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 25. September 2005.

Wading Bird Habitat:

Maine's Comprehensive Wildlife Conservation Strategy states,

“Many of the wading birds are covered under the Island-nesting Colonial Waterbird section. The three that are not are the American and Least Bitterns and the Green Heron. The American Bittern is secure in Maine, and data indicate the population is stable; but there is anecdotal evidence of a decline in Southern Maine and in Southern New England. The Least Bittern is listed as a species of Special Concern in Maine (Appendix 4). There are no population trend data, but there is anecdotal evidence of local declines. Green Herons appear to be doing well, though few data exist.”¹⁰

¹⁰ Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 25. September 2005.

Distribution of Wading Birds in Maine								
Species	Most of State	Coastal	South	North	East	West	Central	Spotty
American Bittern	X							
Green Heron	X							
Least Bittern			X		X		X	X

Source: Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 21. September 2005.

Coastal Seabird Nesting Islands Habitat (SNI):

Great Cormorant (*Phalacrocorax carbo*)

Great cormorants tend to be found on seacoasts and sheltered areas of large rivers. They prefer to nest on cliffs or flat tops of rocky islands and have a diet consisting mainly of fish, for which they will travel up to 32 km away to find. Colonies usually consist of less than 200 pairs and the clutch size is normally 4-5 birds. Great Cormorants returned to Maine as a breeding species in 1983 (Bird Group 1993) and their population had increased to 150 pairs at six locations in 2004; they are listed as species of Special Concern in Maine.¹¹

Distribution of Island-nesting Colonial Waterbirds in Maine								
Species	Most of State	Coastal	South	North	East	West	Central	Spotty
Arctic Tern		X						
Atlantic Puffin		X						
Black-crowned Night Heron		X	X	X	X			
Black Guillemot		X						
Cattle Egret		X	X					
Common Eider		X						
Common Murre	Extirpated	X						
Common Tern		X	X	X	X			
Double-crested Cormorant		X						
Glossy Ibis		X	X					
Great Black-backed Gull		X						
Great Blue Heron	X							
Great Cormorant (breeding)		X						
Great Egret		X	X					
Herring Gull		X						
Laughing Gull		X						
Leach's Storm-petrel		X						
Little Blue Heron		X	X					
Razorbill		X						
Roseate Tern		X						
Snowy Egret		X	X					
Tri-colored Heron		X	X					

Source: Maine's Comprehensive Wildlife Conservation Strategy Chapter 3 – Distribution and Abundance of Wildlife, page 23-24. September 2005.

¹¹ Ibid.

**Maine Department of Environmental Protection and Inland Fisheries and Wildlife
Natural Resources Protection Act (NRPA) Vernal Pool**

NRPA POOL ID: 557

TOWN: Vinalhaven

NRPA SURVEY DATE: 5/22/2009

NRPA STATUS: SIGNIFICANT

NRPA STATUS DESCRIPTION: SIGNIFICANT

NRPA BUFFER ACRES: 5

LATITUDE: 44.092794

LONGITUDE: -68.865799

(see map on page 1)

ENVIRONMENTAL STUDIES

The Fox Island Wind Project website notes the environmental studies undertaken thus far regarding potential impacts from the three General Electric 1.5 MW turbines:

“The co-op and the Island Institute jointly funded a study of potential impacts of the project to birds and rare plants. The bird survey, conducted by Richard Podolsky and Norm Famous, has been underway since April 14, 2008. The spring migration study concluded, ‘The site hosted very few migrants and breeders – due to the fact that it is so dominated by granite outcroppings and is essentially therefore marginal habitat for all birds. Also, the airspace above the outcrops does not host a lot of high-flying transiting birds. Because the outcrops are permanent features of the site, we do not think it likely that the mid-summer or fall bird data will alter our preliminary conclusion that exposure to all bird species from 2-3 wind turbines at this site should be extremely low.’ Additional bird studies will be conducted through construction and for one year of post-construction monitoring. The Podolsky-Famous study found no rare plants, habitats or wildlife at the site. Some wetlands were noted and one vernal pool was located. The site design takes care to minimize impact to wetlands and avoid the vernal pool entirely. The visual impacts have been analyzed by Woodard & Curran with digital images from surrounding vantage points to simulate the appearance of 250-foot towers and 120-foot blades on the landscape. Detailed sound studies for the proposed project have been conducted by Acentech Incorporated, a multi-disciplinary acoustical consulting firm of Cambridge, Massachusetts. The Maine Department of Environmental Protection is reviewing the project's sound impact as part of the Application for Certification for Siting Small-Scale Wind Energy Developments, a new state permitting process for small wind projects.”¹²

¹² Fox Islands Wind Project. <<http://www.foxislandswind.com/background.html>>. Accessed 8/24/09.

VINALHAVEN PROJECT PERMITTING STAKEHOLDERS

