Twin Energy LLC
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November 15, 2023

Mrs. Beth Callahan
State of Maine
Department of Environmental Protection
17 State House Station
Augusta, ME 04333

Sent via electronic mail.

Beth,

On behalf of Twin Energy LLC (the "Applicant"), please accept this statement of avoidance and minimization for the Twin Energy project proposed in Rumford, Maine, with associated infrastructure in Roxbury, Maine (the "Project"). This statement is being filed in support of the Project's Natural Resources Protection Act application to Maine's Department of Environmental Protection.

The primary objective of this Project is to maximize renewable energy generation in a manner that minimizes impacts. Over the past several years, the Applicant has worked extensively with numerous consultants and agencies to design a plan that accomplishes this goal.

In the design process, the Applicant focused heavily on minimizing the impact that the project had on freshwater wetlands in and around the property. The Applicant consulted with multiple experts in the field of wetland conservation, including the Maine Department of Wildlife and Fisheries ("MDIFW"), U.S. Army Corps of Engineers ("ACOE"), the U.S. Fish and Wildlife Services ("USFWS"), Sewall Company and Flycatcher LLC, to ensure that the design avoided alterations to freshwater wetlands to the greatest extent possible.

On the Project site, over 450 acres of land were surveyed, and 140 non-contiguous wetlands were delineated. After analyzing multiple locations within these 450 acres, the Applicant eliminated locations that had greater environmental impacts and selected a location that would minimize wetland impacts, only impacting 18 out of the 140 wetlands surveyed and less than 15,000 square feet of wetland impact.

Not only did this design have fewer wetlands, but it is also proximate to an existing wind project. Therefore, the Project has access to existing infrastructure, the private access

road, that reduces the impact the Project has on the environment while following a similar transmission path to decrease overall habitat fragmentation.

In regard to the 18 wetlands that are impacted by the design, the Applicant worked carefully to limit the extent of this impact or improve the wetlands that were most heavily impacted. To accomplish this objective, the Applicant worked with MDIFW, ACOE, and USFWS via discussions and on site reviews. For details on the wetland impact, see the Project Description, Section 2 of this filing.

In addition to the wetlands, the Project design includes six stream crossings. MDIFW reviewed two stream crossings (S-KMN-41 and S-KMN-38) in the Project site and the Applicant responded to MDIFW's questions about the proposed crossings. In addition, the Applicant reviewed two other streams that were previously impacted by historic forestry activity and proposed plans to improve the flow of these streams. The flow of Stream S-KMN-40 is diverted from the original streambed, so the Applicant proposes to re-align the flow to the assumed former drainage path. This proposal was made with the help of MDIFW via plan reviews and site visits. Finally, the Applicant, following MDIFW guidance, is proposing a large open box culvert and restoration to Stream S-KMN-7 to improve habitat quality. The Project plans to cross the stream in the location of the previous impact and will stabilize and improve this portion of the stream. This design will avoid opening the canopy of surrounding trees in areas that are not currently impacted. The Applicant, through Sewall, submitted a cross section of this crossing to MDIFW on January 4, 2023. For more detailed information on these restoration plans, please find the referenced cross sections as submitted to MDIFW earlier this year attached to this letter and the Project Description, Section 2 of this filing.

The Applicant considered alternative locations and ultimately selected this site and technology in part of its limited wetland impacts.

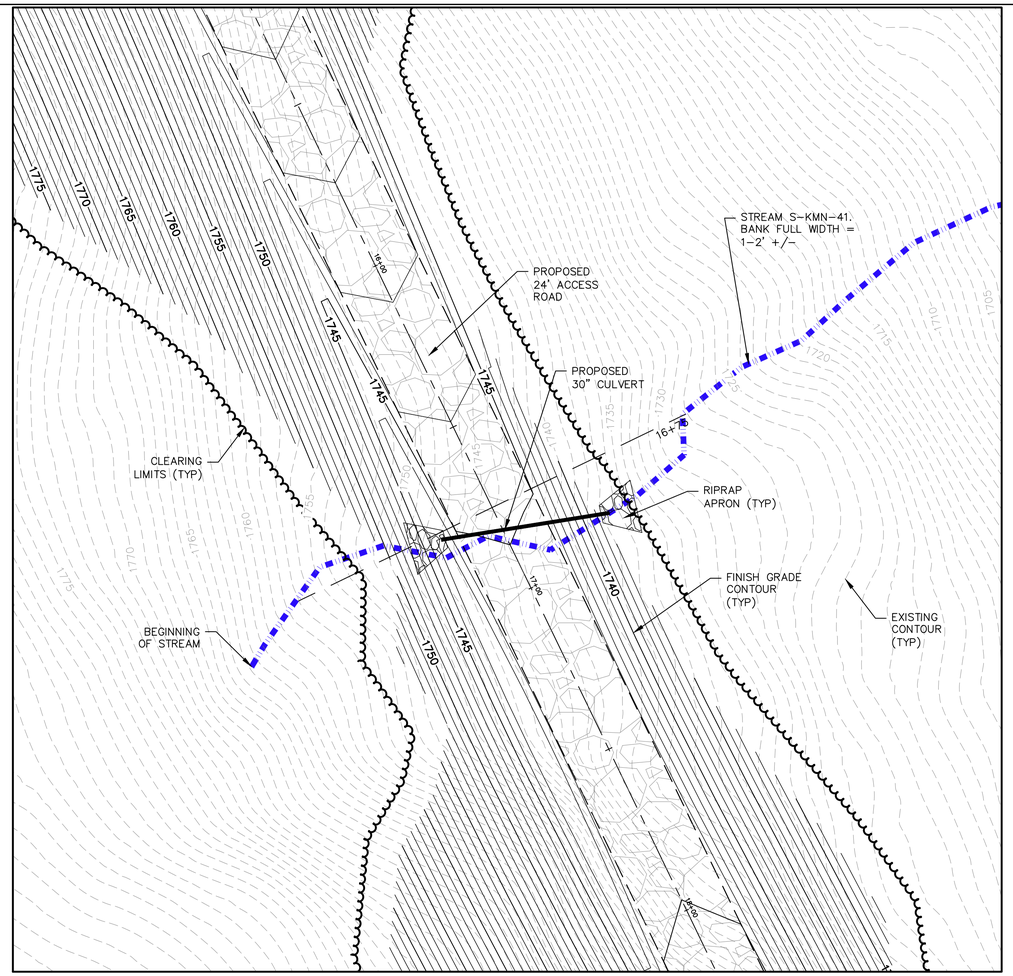
In addition to the requirements for a Tier 1 NRPA filing, the Applicant is also providing a wetland functional assessment and an alternatives analysis to further support its design. These are included as attachments to this letter.

The Applicant's signature below indicates that Twin Energy LLC has avoided and minimized wetland impacts to the greatest extent possible.

Thank you,

Lindsay Deane

Attachment 1: Stream crossing cross sections, submitted 1/4/23
Attachment 2: Wetland Functional Assessment
Attachment 3: Alternatives Analysis



ROAD IMPACTS A "DEAD-END" STREAM WITHIN 50' OF ITS BEGINNING POINT. TRADITIONAL CULVERT PROPOSED. STEEP CULVERT SLOPE AND LARGE RESULTANT ROADWAY FILL SLOPE WOULD COMPLICATE OTHER ALTERNATIVES SUCH AS AN OVERSIZED EMBEDDED CULVERT.

GRAPHIC SCALE

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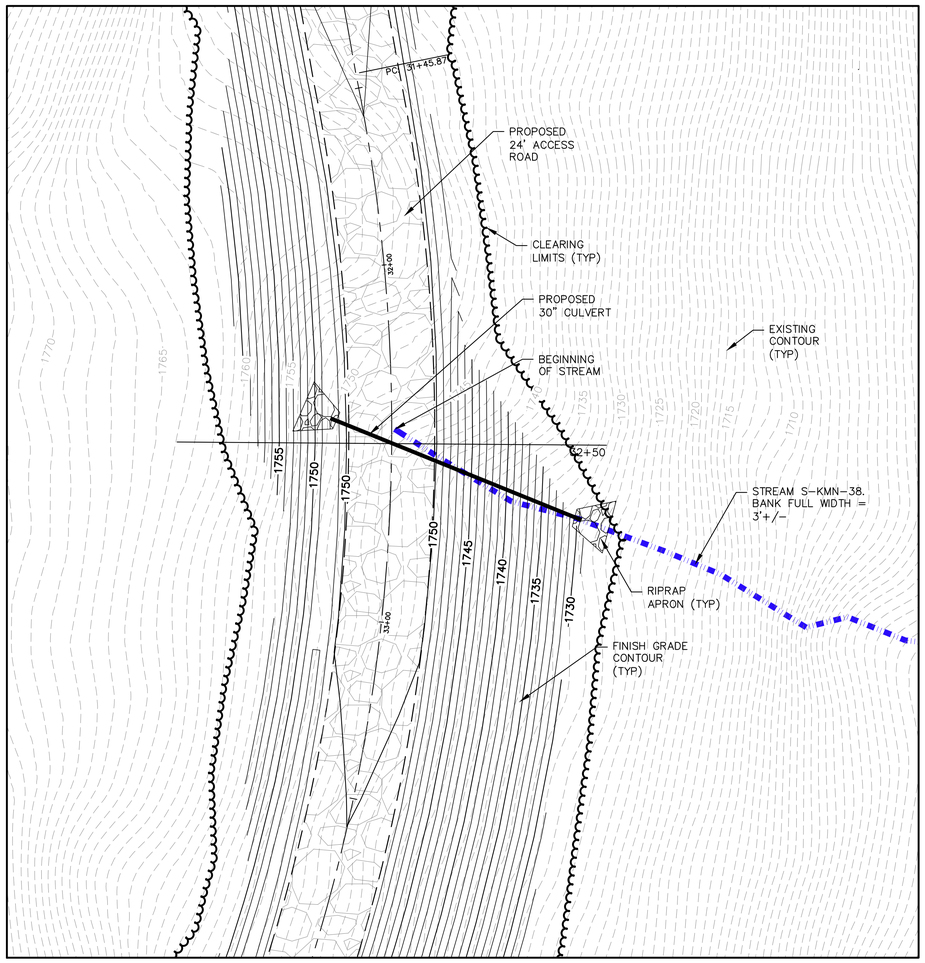
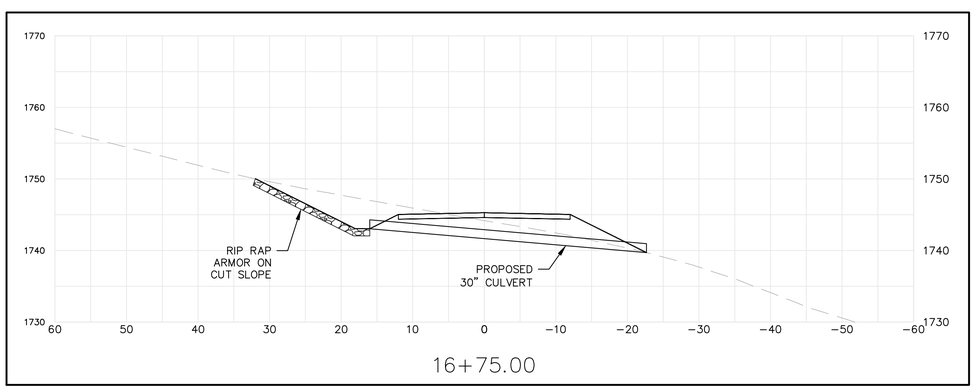
(IN FEET)
1 inch = 20 ft.



ROAD IMPACTS THE VERY END OF A "DEAD-END" STREAM. TRADITIONAL CULVERT PROPOSED. STEEP CULVERT SLOPE AND LARGE RESULTANT ROADWAY FILL SLOPE WOULD COMPLICATE OTHER ALTERNATIVES SUCH AS AN OVERSIZED EMBEDDED CULVERT.



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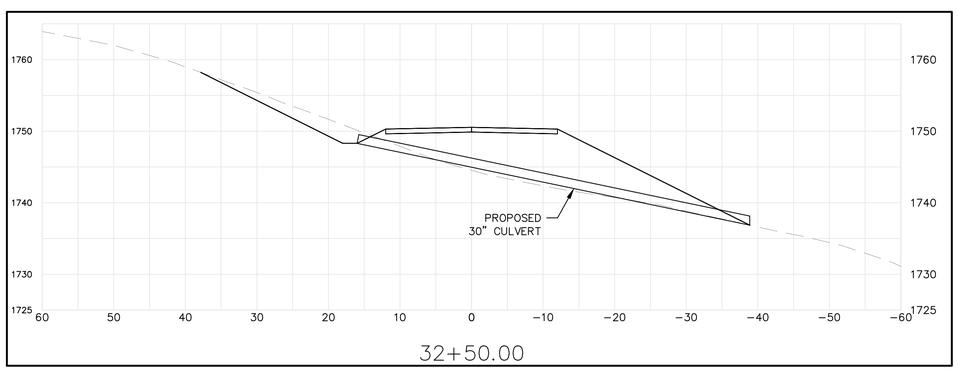

SCALE: 1 INCH = 10 FT

DRAFT NOT FOR CONSTRUCTION

Rev. #	Dsgn. By	Description	Date

Designed By
Drawn By
Date 11/28/2022
Scale AS SHOWN
Approved .
Checked .

TWIN ENERGY LLC

RUMFORD, MAINE

Project Location
RUMFORD, MAINE

Drawing Description

Sheet

Project No. 381.21.01

Engineer

77 EXCHANGE ST
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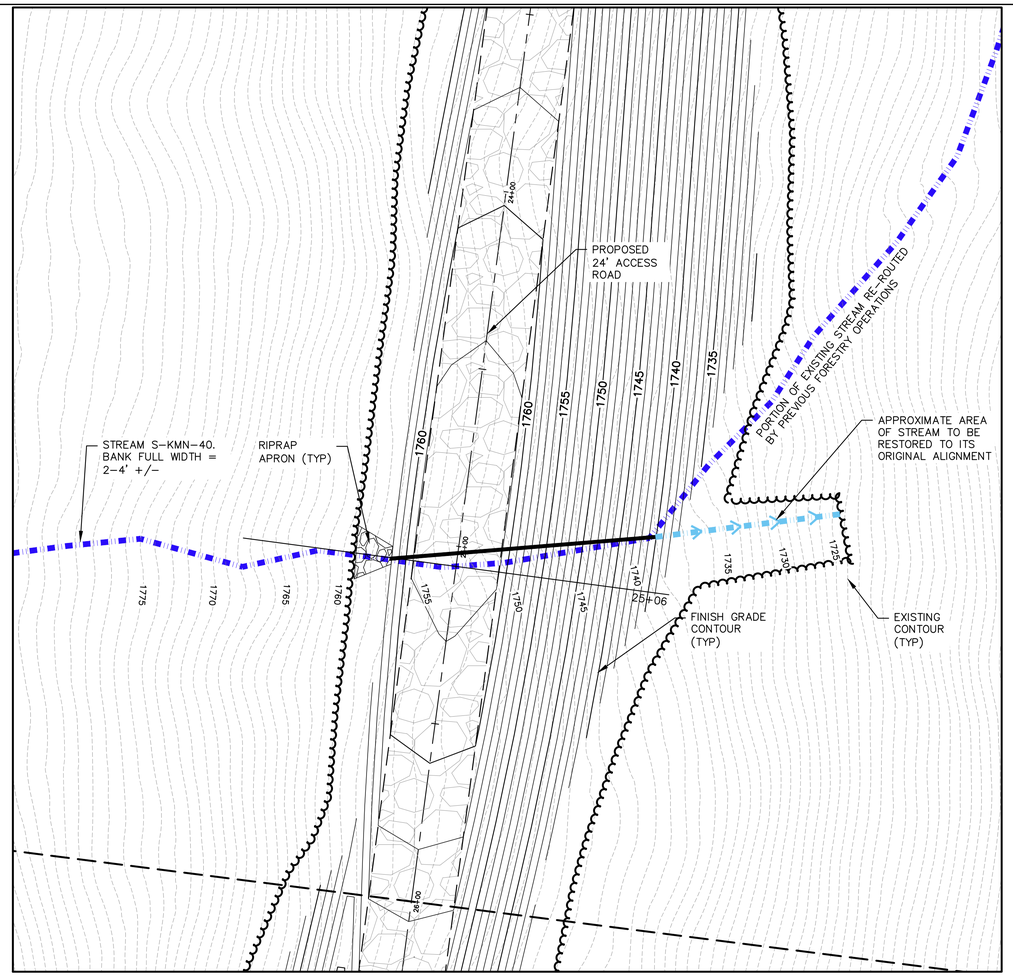
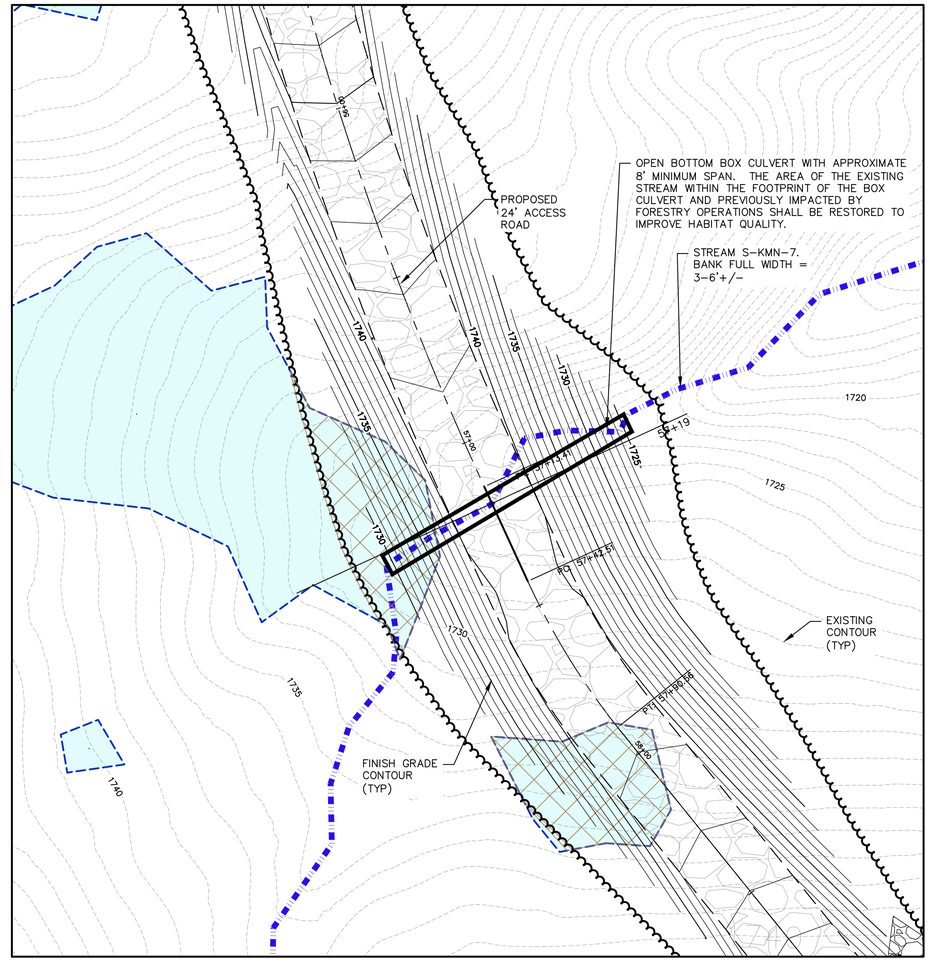
Sheet No.
X-SECS



5' CULVERT WITH 2.5' OF EMBEDMENT IS PROPOSED AT THIS CROSSING



8' MINIMUM SPAN, OPEN-BOTTOM CULVERT PROPOSED AT THIS CROSSING

GRAPHIC SCALE

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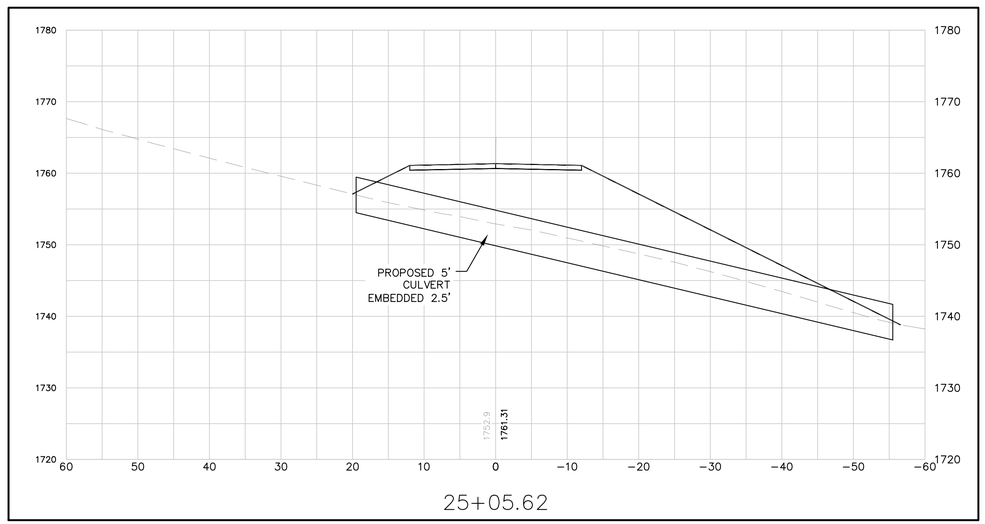
(IN FEET)
1 inch = 20 ft.



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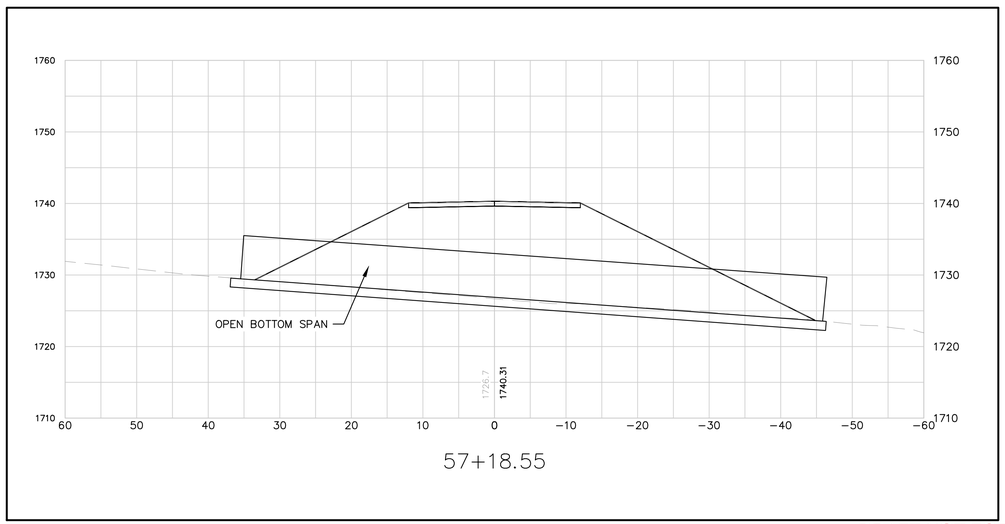

SCALE: 1 INCH = 10 FT

DRAFT NOT FOR CONSTRUCTION

Rev. #	Dsgn. By	Description	Date

TWIN ENERGY LLC

RUMFORD, MAINE
Project Location
RUMFORD, MAINE

Drawing Description

Designed By
Drawn By
Date 12/16/2022
Scale AS SHOWN
Approved
Checked

Seal

Project No. 381.21.01
Engineer

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Sheet No.
X-SECS.

Wetland Functional Assessment

Date: November 13, 2023

To: Lindsay Deane-Mayer (Palmer)

From: Katelin Nickerson (Flycatcher LLC)

CC: Rue Thurrell (Flycatcher)

Subject: Twin Energy Project, Oxford County, ME

This Wetland Functional Assessment is a supplement to the January 2022 *Wetland and Watercourse Delineation and Potential Vernal Pool Survey Report* by Flycatcher LLC (Flycatcher) for the proposed Twin Energy Wind Project located in Oxford County, Maine. The following provides a summary of proposed impacts to freshwater wetlands and a description of each wetland's functions and values.

Survey Area

General Description: The Survey Area is approximately 458 acres, located west of the Swift River, and north of Scotty Stream in Oxford County, Maine. The Survey Area encompasses the peak of South Twin Mountain, and then extends another 7,000 feet north, flanking the peak of North Twin Mountain to the west. The site is largely forested and is accessible via logging roads and recreational vehicle trails. The forest is a mix of hard and softwood trees and shrubs, with evidence of past logging such as skidder trails, landing areas, haul roads, and early to late successional growth.

Survey Methods

During the Fall 2021 wetland delineation and the spring of 2022 vernal pool survey, Flycatcher collected information on soils, hydrology, vegetation and on the functions and values of each wetland located within the Survey Area.

This functional assessment focuses on a smaller subset of wetlands that are proposed to be impacted by the Project. The assessment was performed pursuant to the approach described by the Army Corps Highway Methodology Workbook Supplement: Wetland Functions and Values[1] (Workbook). In this "Descriptive Approach" to functional assessment, the evaluators first determine if functions and values are present and why, followed by a determination of what functions and values are principal and why. **Functions and values can be considered "principal" if they are an important physical component of a wetland ecosystem (function only), and/or are considered of special value to society, from a local,**

[1] United States Army Corps of Engineers. 1999. The Highway Methodology Workbook Supplement. NAEEP-360-1-30a, New England District.

regional and/or national perspective. When making determinations on the wetland, evaluators are encouraged to determine whether the wetland has the potential to serve the functions and values as well.

Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and that result from both living and non-living components of a specific wetland resource. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary productivity and nutrient cycling, among others. Therefore, functions relate to the ecological significance of wetland properties without regard to subjective human values.

Values are benefits that derive from one or more functions and the physical characteristics associated with a wetland. Most wetlands have corresponding societal value. The value of a particular wetland function, or combination of functions, is based on human judgment of the worth, merit, quality or importance attributed to those functions. Functions and values are listed below and are further described in **Appendix A.**

- **Groundwater Recharge/Discharge -** This function considers the potential for the wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.
- **Floodflow Alteration (Storage & Desynchronization) -** This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecosystem or its buffering characteristics and provides social or economic value relative by protecting downstream lands from erosion and flooding.
- **Fish and Shellfish Habitat -** This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in providing fish and shellfish habitat.
- **Sediment/Toxicant/Pathogen Retention -** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands, or upstream erosive wetland areas.
- **Nutrient Removal/Retention/Transformation -** This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent the ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.
- **Production Export -** This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms.
- **Sediment/Shoreline Stabilization -** This function considers the effectiveness of the wetland in stabilizing stream banks and shorelines against erosion.
- **Wildlife Habitat -** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and wetland edge habitat. Both resident and migrating species are considered.
- **Recreation -** This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.
- **Educational/Scientific Value -** This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

- **Uniqueness/Heritage -** This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values, including archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, or its relative importance as a typical wetland class for the geographic location.
- **Visual Quality/Aesthetics -** This value considers the visual and aesthetic quality or usefulness of the wetland.
- **Endangered Species Habitat -** This value considers suitability of the wetland to support threatened or endangered species.

Findings

Wetland Overview

Overall wetlands proposed to be impacted by Project activity are small and isolated forested side seeps or depressions with evidence of disturbance from past timber harvest activities. The majority of these wetlands are not associated with other resources; however, four wetlands are associated with streams.

Wetland Vegetation, Hydrology, and Soils

Wetlands within the Survey Area are predominantly forested. These forested wetlands are generally comprised of mixed early successional growth forests intermixed with scrub shrubs species. Dominant tree species included balsam fir (*Abies balsamea*), gray birch *(Betula populifolia),* yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), red spruce *(Picea rubens),* and American beech *(Fagus grandifolia)*. Shrub wetland species include gray birch, red maple, striped maple *(Acer pensylvanicum),* yellow birch, and steeplebush *(Spiraea tomentosa).* Common herbaceous plants within wetlands include whorled nodding aster *(Oclemena acuminata),* flat-top goldentop *(Euthamia graminifolia),* wrinkle-leaf goldenrod *(Solidago rugosa),* cottongrass bulrush *(Scirpus cyperinus),* greater bladder sedge *(Carex intumescens),* pointed broom sedge *(Carex scoparia),* red-tinge bulrush *(Scirpus microcarpus),* melic manna grass *(Glyceria melicaria)*, nodding sedge *(Carex gynandra),* blue joint *(Calamagrostis canadensis),* cinnamon fern *(Osmundastrum cinnamomeum),* evergreen woodfern *(Dryopteris intermedia),* sensitive fern (*Onoclea sensibilis*), and bristly dewberry *(Rubus hispidus).*

Wetland hydrology includes surface water, high water table, saturation, water-stained leaves, drainage patterns, stunted or stressed plants, geomorphic position, shallow aquitard, and microtopographic relief.

Soils within wetlands are disturbed in areas of past timber harvest, but generally are not disturbed, largely deep organic or organic over depleted or redoximorphic sandy or silt loams. Many of these wetlands are perched on a shallow aquitard of ledge or bedrock.

Wetland Functions and Values

Overall functions and values served by these wetlands include groundwater recharge and discharge; flood flow alteration; sediment toxicant, and pathogen retention; nutrient removal, retention, and transformation; production export; wildlife habitat; recreation; uniqueness and heritage; and visual quality and aesthetics. The principal functions and values observed for these wetlands include flood flow, wildlife habitat, and uniqueness/heritage. Functions and values for wetlands proposed to be impacted by Project development are listed in Table 1.

Table 1. Wetland Summary with Functions and Values

Resource ID	*Dominant Cowardin Class*[1]	*Size (SF)*	*Wetland Functions and Values*	*Rationale (Reference #)*[2]	*Principal Function(s)/Value(s)*	*Associated Resources*	*Comments, Description, and Notes*	*Approximate Impact (SF)*
W-KMN-3	PFO1E	1,255	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19, 22; **L:** 5	**H.** Wildlife Habitat	None	Small isolated forested side slope seep crossing skid trail. Located in the dip between North and South Twin Mountain peaks.	1,153
W-KMN-4	PFO1E	1,098	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 4; **B:** 2, 3, 5, 9, 12; **D:** 6; **E**: 3, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5, 7	**H.** Wildlife Habitat	None	Small isolated forested wetland in naturalized woods road on side slope located below the peak of South Twin Mountain.	903
W-KMN-5	PFO1E	406	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6, 9; **E**: 3, 6, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5, 7	**H.** Wildlife Habitat	None	Small isolated forested groundwater seep on side slope located below the peak of South Twin Mountain.	406
W-KMN-7	PEM1E	666	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 9, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small isolated emergent wetland in skidder trail; site of previous timber harvest, located on the side and below the peak of South Twin Mountain.	666
W-KMN-37	PFO1E	309	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 4, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6, 9; **E**: 3, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small isolated forested groundwater seep located near the peak of South Twin Mountain.	118
W-KMN-38	PFO1E	10,730	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12, 18; **D:** 4, 5, 6, 9; **E**: 3, 10, 11; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8, 14, 15; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Predominantly forested wetland between rock outcrops located near the peak of South Twin Mountain.	914
W-KMN-40	PSS1E	1,321	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 4; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 9, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small scrub shrub wetland in regenerating skid road at base of slope below the peak of South Twin Mountain.	1,321
W-KMN-42	PSS1E	2,150	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 4; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 9, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small toe of slope forested wetland with evidence of forestry impacts and disturbed soils. Located near the peak of South Twin Mountain.	707
W-KMN-44	PFO1B	1,781	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6, 9; **E**: 3, 6, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small, forested seep between rock outcrops located below the peak of South Twin Mountain.	953
W-KMN-67	PFO1E	10,137	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **C. a)** Fish and Shellfish Habitat (Freshwater); **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; **K.** Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6, 7, **B:** 2, 3, 5, 9, 10, 12, 13; **C. a):** 1, 8, 16; **D:** 4, 5, 6, 10; **E**: 3, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 6, 7, 8; **I:** 3; **K:** 19, 24; **L:** 5	**B.** Floodflow Alteration; **H.** Wildlife Habitat; **K.** Uniqueness/Heritage	S-KMN-7	Forested groundwater seep adjacent to skid road and stream S-KMN-7. Stream known to contain northern spring salamander (*Gyrinophilus porphyriticus*).	1,114

Resource ID	*Dominant Cowardin Class*[1]	*Size (SF)*	*Wetland Functions and Values*	*Rationale (Reference #)*[2]	*Principal Function(s)/Value(s)*	*Associated Resources*	*Comments, Description, and Notes*	*Approximate Impact (SF)*
W-KMN-74	PEM1E	2,299	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **C. a)** Fish and Shellfish Habitat (Freshwater); **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; **K.** Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 4, 6, 7; **B:** 2, 3, 5, 9, 10, 12, 13; **C. a):** 1, 8, 14, 16; **D:** 4, 5, 6, 10; **E**: 3, 9, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 6, 7, 8; **I:** 3; **K:** 19; **L:** 5	**B.** Floodflow Alteration; **H.** Wildlife Habitat	S-KMN-39	Small emergent groundwater seep wetland in skidder trail with evidence of forestry impacts; drains into stream S-KMN-39. Located below Peak of North Twin Mountain.	1,644
W-KMN-77	PFO1E	346	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6, 9; **E**: 3, 6, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	None	Small isolated forested seep at base of rock outcrop on the northern side slope of North Twin Mountain.	281
W-KMN-80	PFO1E	10887	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 7; **B:** 2, 3, 5, 9, 10, 12, 13; **C. a):** 1, 8, 16; **D:** 4, 5, 6, 10; **E**: 3, 9, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 6, 7, 8; **I:** 3; **K:** 19; **L:** 5	**B.** Floodflow Alteration; **H.** Wildlife Habitat	S-KMN-42	Forested riparian wetland along S-KMN-42 with evidence of forestry impacts. Located north of the peak of North Twin Mountain.	1,529
W-KMN-81	PFO1E	813	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 7; **B:** 2, 3, 5, 9, 10, 12, 13; **C. a):** 1, 8, 16; **D:** 4, 5, 6, 10; **E**: 3, 9, 10; **F:** 1, 4, 12; **H:** 1, 3, 4, 5, 6, 7, 8; **I:** 3; **K:** 19; **L:** 5	**B.** Floodflow Alteration; **H.** Wildlife Habitat	S-KMN-44	Forested riparian wetland to stream S-KMN-44 with evidence of forestry impacts. Located north of the peak of North Twin Mountain.	336
W-KMN-83	PSS1E	781	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 9, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	none	Small, isolated scrub shrub wetland with evidence of forestry impacts. Located just north of the peak of South Twin Mountain.	781
W-KMN-84	PSS1E	515	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 9, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	none	Small, isolated scrub shrub wetland with evidence of forestry impacts. Located just north of the peak of South Twin Mountain.	515
W-RDK-32	PEM2E	1,492	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 9, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	none	Small emergent side slope seep with evidence of groundwater discharge. Continues out of Survey Area to the east. Located just northeast of the peak of South Twin Mountain.	309
W-RDK-33	PEM1E	3,610	**A.** Groundwater Recharge/ Discharge; **B.** Floodflow Alteration; **D.** Sediment/ Toxicant/ Pathogen Retention; **E.** Nutrient Removal/ Retention/ Transformation; **F.** Production Export; **H.** Wildlife Habitat; **I.** Recreation; K. Uniqueness/ Heritage; **L.** Visual Quality/ Aesthetics	**A:** 2, 6; **B:** 2, 3, 5, 9, 12; **D:** 4, 5, 6; **E**: 3, 6, 9, 10; **F:** 1, 4, 12; **H:** 3, 4, 5, 7, 8; **I:** 3; **K:** 19; **L:** 5	**H.** Wildlife Habitat	none	Small isolated emergent wetland adjacent to an old logging road. Located north of the peak of North Twin Mountain.	1,294

1. Wetland classifications per USFWS' Cowardin et al. 1979 (https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf)
2. Numbers correspond to the considerations/qualifiers for each function/value in the Highway Methodology 2015 Supplement included as **Appendix A.**

APPENDIX A

Highway Methodology Handbook: Wetland Evaluation Supporting Documentation

Appendix A

Wetland evaluation supporting documentation; Reproducible forms.

Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgment and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.

GROUNDWATER RECHARGE/DISCHARGE— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Piezometer data demonstrates discharge.
17. Other

FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

FISH AND SHELLFISH HABITAT (FRESHWATER) — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.

CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.

STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE

3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.
16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

Although the above example refers to freshwater wetlands, it can also be adapted for marine ecosystems. The following is an example provided by the National Marine Fisheries Service (NMFS) of an adaptation for the fish and shellfish function.

FISH AND SHELLFISH HABITAT (MARINE) — This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS

1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
2. Suitable spawning habitat is present at the site or in the area.
3. Commercially or recreationally important species are present or suitable habitat exists.
4. The wetland/waterway supports prey for higher trophic level marine organisms.
5. The waterway provides migratory habitat for anadromous fish.
6. Essential fish habitat, as defined by the 1996 amendments to the Magnuson-Stevens Fishery & Conservation Act, is present (consultation with NMFS may be necessary).
7. Other

SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other

NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

CONSIDERATIONS/QUALIFIERS

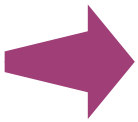
1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.

4. Potential sources of excess nutrients are present in the watershed above the wetland.
5. Wetland saturated for most of the season. Ponded water is present in the wetland.
6. Deep organic/sediment deposits are present.
7. Slowly drained fine grained mineral or organic soils are present.
8. Dense vegetation is present.
9. Emergent vegetation and/or dense woody stems are dominant.
10. Opportunity for nutrient attenuation exists.
11. Vegetation diversity/abundance sufficient to utilize nutrients.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

12. Waterflow through this wetland is diffuse.
13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
14. Water moves slowly through this wetland.
15. Other

PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms.



CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic vegetative diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants that are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring, however, no visible signs of export (assumes export is attenuated).
15. Other

SEDIMENT/SHORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.

CONSIDERATIONS/QUALIFIERS

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10') borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other

WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.[1]

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)
16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc.).
24. Other

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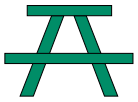
[1]In March 1995, a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team with funding and oversight provided by the New England Transportation Consortium. The method is called WEThings (wetland habitat indicators for non-game species). It produces a list of potential wetland-dependent mammal, reptile, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.

RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

CONSIDERATIONS/QUALIFIERS

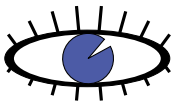
1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site is within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site is available.
12. Direct access to pond or lake at potential educational site is available.
13. No known safety hazards exist within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other

UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland is primarily urban.
2. Upland surrounding wetland is developing rapidly.
3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands.
4. Three or more wetland classes are present.
5. Deep and/or shallow marsh or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occur in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake exists at potential educational site.
12. Two or more wetland classes are visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) are visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings are found within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland is within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland.
24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes are visible from primary viewing locations.
2. Emergent marsh and/or open water are visible from primary viewing locations.
3. A diversity of vegetative species is visible from primary viewing locations.
4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species.

ES

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.

Alternatives Analysis

As the region moves to decarbonize, including electrifying heat and transportation, it will need to rely on new sources of clean electricity generation. Currently, ISO-NE is forecasting that it will need nearly 200% more electricity generation to meet anticipated load growth by 2050. To illustrate this growth, the record all-time peak load in New England was 28 GW in the summer of 2006, but the expected peak load in 2050 is 57 GW and in winter.[1] This shift from summer to winter peaking aligns well with New England wind energy as it's a winter peaking asset. The purpose of this Project is to help Maine increase its generation of clean energy and ultimately achieve its, and the region's, decarbonization goals.

In the early stages of developing a project, the Applicant reviews the following criteria for each potential site prior to selecting it for permitting a wind energy project:

- Wind Resource
  The first step in selecting a location for a viable wind project is to review the publicly available wind resource maps in the area. That initial information is used to assess potential economic viability. In Western Maine, the best wind resource is typically found along mountain ridges. Lower and flatter locations do not have sufficient wind to support a project.

  The Project team used both the publicly available wind data and their prior knowledge of wind resource along the ridges in Oxford County to select this location. In addition, the Project team installed a met tower on site to confirm that the wind resource is suitable for development. The met tower has confirmed that the wind resource on site will support the Project's economics.

- Ability to Interconnect
  Adding new generation to the existing transmission and distribution system is a complicated, and sometimes expensive, process and requires both informal study and formal study and design. The Project team's familiarity with the Roxbury Substation allowed the Applicant to propose an interconnection design that would be economical for the Project to build. This was confirmed through a feasibility study performed by ISO-NE in March 2022.

- Underlying and Surrounding Landowners
  When reviewing potential project locations, the team reviews the size of each underlying parcel, contiguous land owned by the same landowner, and abutters to the proposed project. The Twin wind turbines are proposed on a 639.5-acre parcel owned

[1] ISO New England Inc. Transmission Planning. DRAFT 2050 Transmission Study. November 1, 2023.

by a single landowner. That landowner also owns many more parcels that the Applicant reviewed for potential development prior to selecting the proposed location.

In addition to the underlying landowner, the Project requires easements from other landowners for site access and to inject the electricity into the transmission and distribution system. The Project has secured easements from the wind turbine locations to the point of interconnection. The Project team has also received easements from the closest residences to the Project.

- Environmental Due Diligence

  Designing, permitting and constructing a large project requires significant environmental review. This process started with a desktop analysis to review publicly available data and eliminate sites that may have critical habitat. After performing the desktop review, the Applicant contracted with Flycatcher LLC to perform environmental studies typically required of wind energy projects and to consult with environmental review agencies to design survey efforts, as appropriate.

  Over the course of multiple years, the Applicant has surveyed and reviewed the property. Through that on-site due diligence, the Applicant designed the Project to avoid impacts to wetlands and watercourses to the extent commercially feasible. In particular, 41 watercourses and 140 non-contiguous wetlands were delineated during the Wetland and Watercourse Survey (Exhibit 7-13 of Applicant's Site Location of Development Act Application, "SLODA Application"). This survey was critical in informing the Project design. As a result of this survey, the Project eliminated its original approach of accessing the site from Mexico along Yonder Way, as that path would impact significant environmental resources.

  Instead, the Project changed its approach to access the site from the Roxbury side. The Applicant negotiated with the adjacent landowner and RoxWind project to utilize the existing road on North Twin (See Section 1: Title, Right and Interest). As that road is already designed for wind project component delivery, it minimizes the amount of new road necessary to support the Project. The new road that will connect North Twin to South Twin is designed along existing grade, as feasible, to decrease the overall impact both from a resource and visual perspective.

  In addition, the adjacent landowner has granted Applicant an easement to run its collector system adjacent to RoxWind's and CMP's utility infrastructure. This decreases the visual impact of the Project and, by clustering resources together, decreases overall habitat fragmentation.

  The proposed Project design impacts only 18 out of 140 wetlands. In the 4 places where stream crossings occur, the Applicant has consulted with MDIFW, ACOE, USFWS and

Flycatcher, LLC to minimize the impact or make improvements to these streams. For stream KMN-7, which has been partially disturbed by historic forestry activities unrelated to the project, the Applicant proposes a large open box culvert and restoration in the previously impacted area following guidance from MDIFW and Flycatcher, LLC. This design should improve habitat and will avoid opening the canopy of surrounding trees in areas that are not currently impacted. More details on the stream crossing design can be found in the Construction Drawings (Exhibit 4). Stream KMN-40 has also been impacted by historic forestry activity and its flow is currently diverted from the original streambed. MDIFW visited this site and helped devise a plan to re-align this flow to the presumed former drainage path. This design will also improve the existing stream conditions. There are two other stream crossings (Exhibit 7-10, SLODA Application) where the Applicant has consulted with MDIFW and MDIFW has reviewed and approved the stream crossings (S-KMN-41 and S-KMN-38). The remaining two stream crossings are designed to adhere to Stream Smart Crossing guidelines.

- Permitting Requirements
  Permitting any infrastructure project requires a thorough understanding of local, state, and federal requirements. This site is located in the "expedited permitting area" within the State of Maine and within the boundaries of two towns that permit wind energy projects in their respective zoning codes. The site location was selected as the permitting would be better defined than in other locations that might not have clearly defined zoning requirements.

- Potential Cost and Feasibility
  Building a wind project requires significant capital, and building on a mountain ridge requires specific expertise and added expense. Given the Project team's experience building wind energy projects on ridgelines and the cost savings of using an existing road, the site was selected as the construction costs paired with the wind resource would balance for an economical project.

- Community Support
  While there are many components to developing a wind energy project, having a supportive community contributes to a project's viability. The Town of Rumford and Roxbury have been great partners. As discussed in the permitting discussion above, each town has a permitting process for wind energy projects. Their support provides a path forward for the Project's development, permitting, and construction. In addition, Oxford County has other wind projects operating within its boundaries, allowing residents to be comfortable with the technology and potential benefits.

In addition to the site selection process described above, the Applicant also reviewed the following courses of action:

Action 1: No Action

Doing nothing is always an option. Under the "no action" scenario, the Project would not be proposed and built, additional clean energy would not be added to the grid, and conventional fossil fuel would remain the dominant electricity source for the region. The Applicant is in the business of generating clean electricity and contributing to transitioning the region from conventional fossil fuels to locally produced, clean electricity. Both the State of Maine and the New England region have established goals to lower the carbon intensity of the State and region. In addition, the State of Maine supports economic growth through jobs and increased tax base. The Project will contribute new jobs, increased tax revenue, and provide renewable energy for decades into the future. With all of the benefits the Project generates, the Applicant rejected the "no action" option.

Action 2: Different Project Design

When the Project team initially approached the landowner, the team focused on developing a solar energy facility on the property. After reviewing the lower elevation areas owned by the landowner and the utility constraints closer to that location, it was determined that a solar project would not be economically feasible on the property. In addition, the team reviewed building a large solar field on the lower elevation site and connecting to the Roxbury Substation (as is proposed for the Project). Due to the lower capacity factor for solar projects in Maine (when compared to wind energy), and the amount of clearing required to generate a similar amount of solar energy, it was determined that it was more feasible to utilize the strong wind resource along the ridgeline.

After the team selected the technology, the team reviewed various locations for access and turbine layouts. Overall, over 450 acres were surveyed for the Project. The proposed new impervious footprint for the Project is only 5.26 acres. Other areas surveyed were eliminated for specific reasons including environmental impacts, buildability, and setback. (See Exhibit A for the surveyed footprint.)

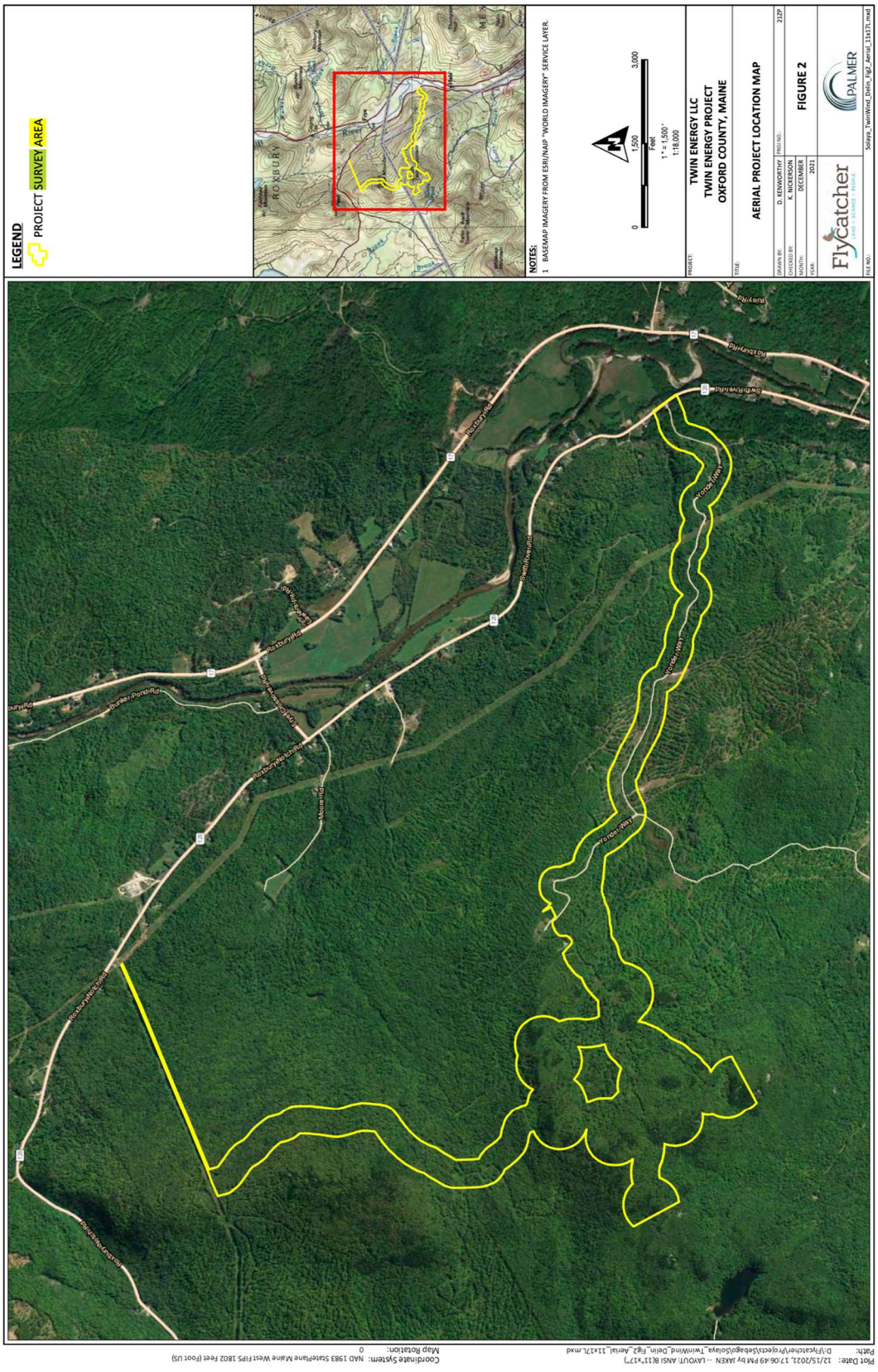
The proposed route from North Twin to South Twin follows an existing logging path, allowing the Project to stabilize and improve that access. The final design minimizes impacts while generating over 18 MW of clean, renewable energy.

Action 3: Proposed Project Design

The primary Project objective was to maximize wind energy generation while minimizing environmental impacts. As described above, the proposed Project achieves this objective by generating over 18 MW of clean energy in a manner that has minimal impacts to wetlands and no Essential Habitat within its footprint. To account for potential wetland impacts, the Applicant has consulted with MDIFW and ACOE to design thoughtful crossings and stabilization to minimize overall impacts. In terms of interconnection, the Project has an interconnection plan

that is both economical and compatible with the existing electrical infrastructure. The Applicant has prior experience connecting to the Roxbury Substation and was able to apply this knowledge to the Project design. Furthermore, the Project has support from both surrounding landowners and the community. The Applicant has devoted much time and effort into building relationships with the community during both the development of RoxWind and Twin Energy. In terms of visual impact, the Project was strategically designed to only impact 3 out of the 25 SRSNS, and 2 of these SRSNS have limited public access. Finally, having already developed in this area, the Applicant has both a thorough understanding of local and state permitting requirements and existing infrastructure that will decrease the development costs.

Exhibit A


LEGEND
PROJECT SURVEY AREA
NOTES:
1. BASEMAP IMAGERY FROM ESRI/NAIP "WORLD IMAGERY" SERVICE LAYER.
0
1,500
3,000
Feet
1" = 1,500'
1:18,000
PROJECT:
TWIN ENERGY LLC
TWIN ENERGY PROJECT
OXFORD COUNTY, MAINE
TITLE:
AERIAL PROJECT LOCATION MAP
DRAWN BY: D. KENWORTHY
CHECKED BY: K. NICKERSON
MONTH: DECEMBER
YEAR: 2021
PROJ NO: 2129
FIGURE 2
Flycatcher
PALMER
FILE NO: Solaya_TwinWind_Delin_Fig2_Aerial_11x17L.mxd
Plot Date: 12/15/2021, 12:06:49 PM by JAKEN -- LAYOUT: ANSI B(11"x17")
Path: D:\Flycatcher\Projects\Sebago\Solaya_TwinWind_Delin_Fig2_Aerial_11x17L.mxd
Coordinate System: NAD 1983 StatePlane Maine West FIPS 1802 Feet (Foot US)
Map Rotation: 0