MOYSE
ENVIRONMENTAL
SERVICES, INC.
Environmental and
Land Use Consulting

December 3, 2015

Chris and Joelle Rioux
14 Merritt Drive
Orono, Maine
04473

RE: Protected Resource ID and Preliminary Site Evaluation Report
Proposed Minor Subdivision Site – "Kittredge Knoll"
Formerly Part of Kelly Family Trust Land, Kittredge Road
Bangor, Maine

As requested, on October 14, 2015, we completed a protected resource identification (ID) and preliminary site evaluation of a portion of the former Kelly Family Trust land on outer Kittredge Road in Bangor (see Site Location Maps). We understand that you have purchased this 10± acre, mostly wooded parcel as a potential home site, along with two potential house lots that you may sell in the future (minor subdivision - "Kittredge Knoll"). The purpose of this evaluation was to assess the suitability of the soils on each of the proposed house lots for subsurface wastewater disposal (septic systems). We were also asked to identify and map any protected resources and describe any restrictions that they may pose for the project. This information will be used by Plisga & Day Land Surveyors of Bangor to help you properly plan, design and permit this minor subdivision. This information is typically required for both local/municipal approval and Maine Department of Environmental Protection (DEP) approval, if needed. Confirming that the soils are suitable for septic systems is also common "due diligence" at the early stages of planning either a home site or a possible subdivision development.

The DEP regulates development activity in proximity to protected resources pursuant to the Maine Natural Resources Protection Act (NRPA). The U.S. Army Corps of Engineers regulates activities within all waters of the United States, particularly freshwater wetlands pursuant to Section 404 of the Clean Water Act (1977). The local, state and federal environmental and development regulations outline what site investigations must be completed and what information must be submitted for their review and approval. The site characteristics that we evaluated included soils, streams or brooks, freshwater wetlands, vernal pools and significant wildlife habitat.

SITE INVESTIGATION

Moyse Environmental Services, Inc. completed an off-site review, including information on the Maine GIS (MEGIS) website, such as the National Wetland Inventory (NWI), the USDA Soil Conservation Service (now the NRCS) soil survey, Maine Inland Fisheries & Wildlife (IF&W) habitat mapping, etc. (see copies attached). We completed our on-site investigation on October 14th and 15th, 2015. We walked over the entire site, and documented our observations based on the following definitions and guidance:

Site Evaluation - The current Maine Subsurface Wastewater Disposal Rules, dated August 03, 2015, require that a minimum of 9 inches of free-draining soil be present for the standard installation of a subsurface wastewater disposal system outside of the shoreland zone. We understand that a dwelling on any of the proposed three lots will likely be either a three or four-bedroom, single-family home, with no additional wastewater generating structures. A home of this size theoretically generates between 270 and 360 gallons of wastewater per day (gpd). That is the design flow that we used for disposal field size estimations and on-site evaluation purposes. We examined the existing soil conditions, including color, texture, consistency, depth to mottling, depth to restrictive layers and related soil properties with a shovel and hand auger. Each test pit/auger boring was marked with labeled (HTB #), orange with black striped flagging. The flags were located using a mapping grade, Trimble Pro XH, Global Positioning System (GPS) unit. The GPS data is referenced to a coordinate system and known ground control points on the site, including survey pins. We processed the GPS data and using CAD we overlaid that data on to the base survey plan provided by Plisga & Day.

Vernal Pools - The MDEP defines a vernal pool pursuant to the Maine Natural Resources Protection Act (NRPA) as a *"Natural, temporary to semi-permanent body of water occurring in shallow depressions that typically fills in the spring or fall, and may dry in the summer. Vernal pools have no permanent inlet or outlet, and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs, spotted salamanders, blue-spotted salamanders, and fairy shrimp, as well as valuable habitat for other plants and wildlife, including several rare, threatened, and endangered species."*

The identification of vernal pools is based on the presence of specific amphibian "Indicator Species" during their breeding season, which is in the early spring. The optimal identification period for a given region in Maine varies according to geographic location and weather, but it is typically during the months of April and May in this region. Specifically, we evaluate each potential vernal pool (PVP) identified for the presence of egg masses deposited by each individual "Indicator Species". The presence of egg masses in a pool indicates amphibians are actively using the pool *environment for breeding purposes and the pool is identified as a "vernal pool"*. Our assessments are based on methods considered the current "standard of practice" by the Maine Association of Wetland Scientists (MAWS). The guidance of technical publications like Calhoun and Klemens (2002), Calhoun (2003) and Kenney and Burne (2000) were also referenced.

With all that said to provide a background on vernal pool assessments, this investigation was atypical as it was done outside of the recommended identification period (spring months). We could only look for potential vernal pools (PVPs) based on the physical evidence present. Some of the key identification criteria that we used include observations of isolated, concave-shaped depressions with bare soils, blackened soils or mucky surfaces due to seasonal ponding. Also, depressional wetlands dominated by emergent marsh, scrub shrub or forested vegetation that appear to be seasonally ponded or

inundated for a significant period during the wetter months. Some of this evidence can be easily overlooked during the drier months, so we investigate the area very carefully.

Wetlands - Our wetland determinations are based primarily on the procedures outlined in the 1987 Army Corps of Engineers Wetlands Delineation Manual and the identification criteria of the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region was also referred to later, but there are no differences in the approach for these wetlands. For an area to be a jurisdictional "wetland", it must possess three criteria:

1. *Predominance of hydrophytic vegetation*
2. *Predominance of hydric soils*
3. *Predominance of wetland hydrology*

A wetland delineation is an evaluation of an area to determine if that area is dominated (greater than 50 percent occurrence) by these three criteria. The National List of Plant Species That Occur in Wetlands: Maine was used to identify the indicator status of the hydrophytic vegetative species. Hydric soil determinations were based on the New England Interstate Water Pollution Control Commission's Manual: Field Indicators for Identifying Hydric Soils in New England. Soils information obtained from the USDA Soil Conservation Service (SCS) mapping was also used to supplement the findings of our wetland delineation fieldwork. Wetland hydrology is identified based on the presence of strong hydrology indicators as described in the above manuals.

Streams - Moyse Environmental Services also completed a stream determination for this site. Pursuant to the Maine NRPA, for a drainageway to be called a "stream", it must have a channel between defined banks. The channel must have been created by the action of surface water and has to possess 2 or more of the following characteristics:

- It is depicted as a solid or broken line on the most recent 7.5' USGS topographic map
- It contains or is known to contain flowing water continuously for at least 6 months of the year in most years
- The channel bed is composed primarily of mineral material such as sand and gravel, parent material or bedrock, that has been deposited or scoured
- The channel contains aquatic animals, such as fish, aquatic insects or mollusks in the water, or if no surface water is present, within the stream bed
- The channel contains aquatic vegetation and is essentially devoid of upland vegetation

SUMMARY OF FINDINGS

Please refer to the survey plan by Plisga & Day, dated December 01, 2015, for more detailed information while reviewing the following text. Our off-site review agreed with our actual on-site findings. The NWI mapping did not identify any wetlands on the site. The SCS soil survey did not identify any *hydric soils*. No potential vernal pools, wetlands, streams or brooks, significant wildlife habitats or other protected resources of concern were found by either our on-site investigation or off-site GIS mapping review.

Under provisions of the Rules, we found suitable soils for installing a wastewater disposal field on each of the three proposed house lots shown on the current plan. The approximate location of these suitable "spots" are depicted on the plan with the labeled symbol, "HTB101 to HTB 104". The soil profile conditions appear to be either 2AIII or 2AIII/C, with dominant soil textures of very stony fine sandy loams. No evidence of a seasonally high water table or restrictive layer was noted in any of the explorations, but the depth to the underlying bedrock ("ledge") appears to be shallow to moderately deep in HTB 101 to HTB 103. Apparent, fractured bedrock (maybe very rocky layer?) was observed in all three of these test pits/auger borings, ranging from about 17 to 20 inches in depth. A firm subsoil layer was observed in HTB 104 in the field at about 18 inches in depth and a very rocky layer at 22 inches, which again may be bedrock. The depth to bedrock and similar subsurface limitations can only be confirmed with backhoe-dug test pits. Areas of exposed bedrock, or very large boulders, were noted through the center of the wooded portion of the site, oriented northeast-southwest, particularly on the northerly part of proposed Lot 2 and proposed Lot 3. The contour mapping of the site clearly shows the small ridge of the bedrock-controlled topography, with steeper slopes off the easterly side. The SCS soils mapping agrees with our observations as they identified the soils as Thorndike very rocky silt loams (TkB and TkC), which are shallow to bedrock soils, less than 20 inches to ledge contact. In our opinion, the "best spots" for building a new home on Lots 2 and 3 are within 150 feet or so of the road. The northerly corner of the field on Lot 1 appears to provide a very nice location for a new home. However, a prospective buyer may view it otherwise, depending on their house plans.

Based on our observations, either a typical stone bed or chamber-type disposal field is feasible in our opinion given the large, available footprint of suitable soils and gently sloping soil surfaces. A plastic chamber type system would be a more favorable option on the stronger slopes. The final location and design of the septic system will depend on the final development plans. The proper installation of a septic system relative to a dwelling, wells (owner's and abutter's), the road right-of-way (R.O.W.), a driveway, any ditches, property lines and shallow-to-bedrock soils are some of the necessary considerations to comply with the Rules. We strongly recommend that backhoe-dug test pits be done on each lot prior to the establishment of any development plans to confirm the depth to bedrock. The earthwork required for the installation of a foundation, underground utilities or a septic system in shallow soils can be costly, so the subsurface conditions should be investigated and identified first to properly plan and design any home project on this site. "Best Management Practices for Construction" should be followed closely. Stabilization of

disturbed soils as soon as possible should be emphasized in any measures that will be implemented. The area of soil exposed at any one time should be minimized.

In summary, the soils on this site are suitable for subsurface wastewater disposal and typical residential development, with the proper planning, design and implementation of current construction practices. Please note that the City of Bangor has zoning ordinances and development regulations that apply to subdivisions, including specific setback and buffer requirements. We recommend that all pertinent resource protection and development regulations be reviewed thoroughly, and understood, to ensure that this subdivision will be in complete compliance.

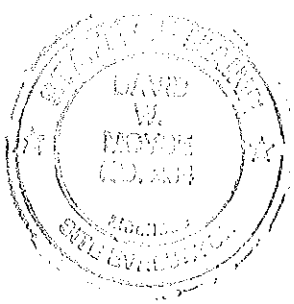
We will gladly design the septic systems for the proposed lots, upon request. It was a pleasure to assist you with this phase of your project. Please contact us if you have any questions.

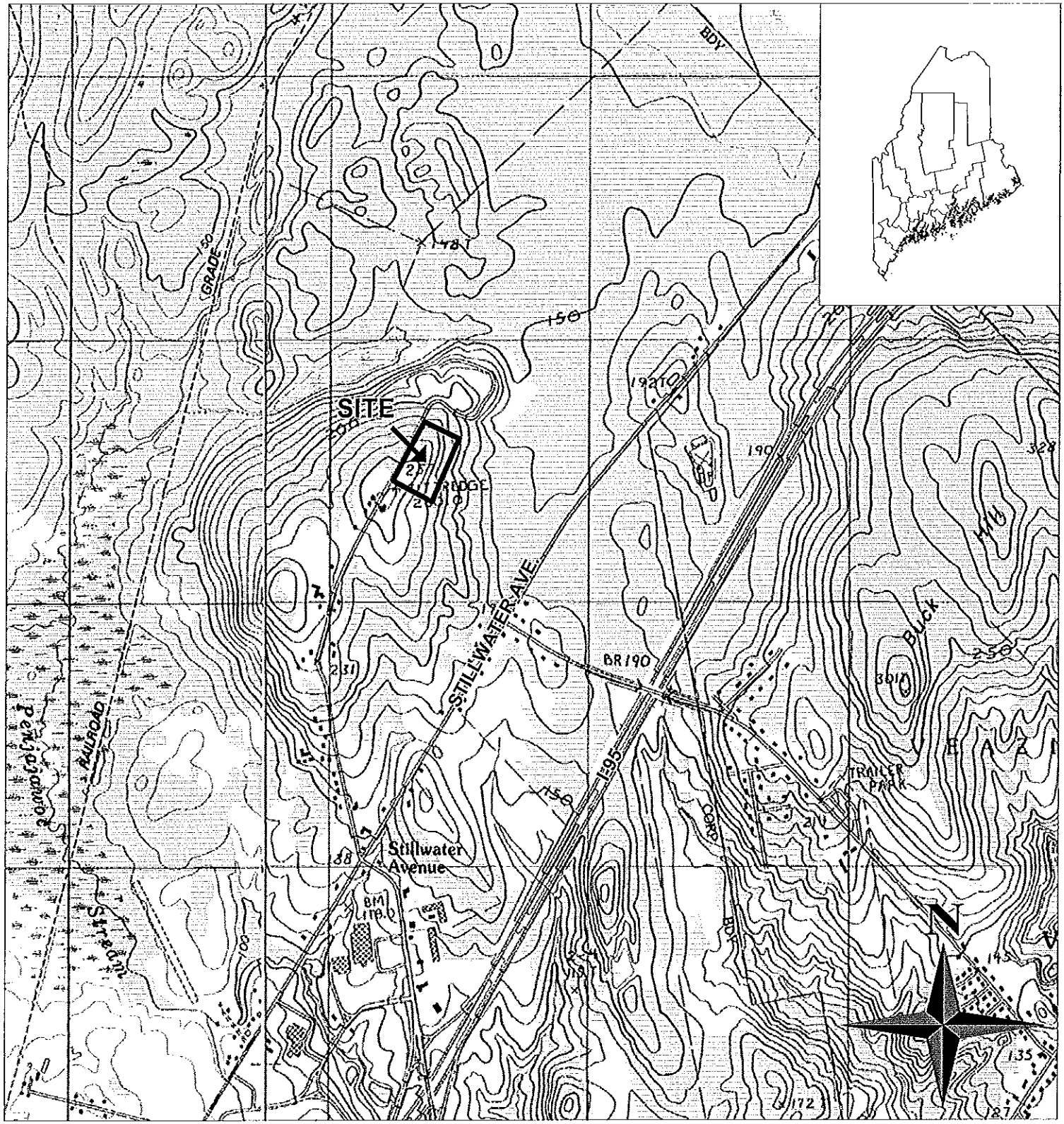
Sincerely,

MOYSE ENVIRONMENTAL SERVICES, INC.

David W. Moyse, LSE, CSS

cc: File





Sheet Tilte:

SITE LOCATION MAP - 7.5 USGS TOPO

Bangor, Maine

Project:

KITTREDGE KNOLL
RIOUX PROPERTY

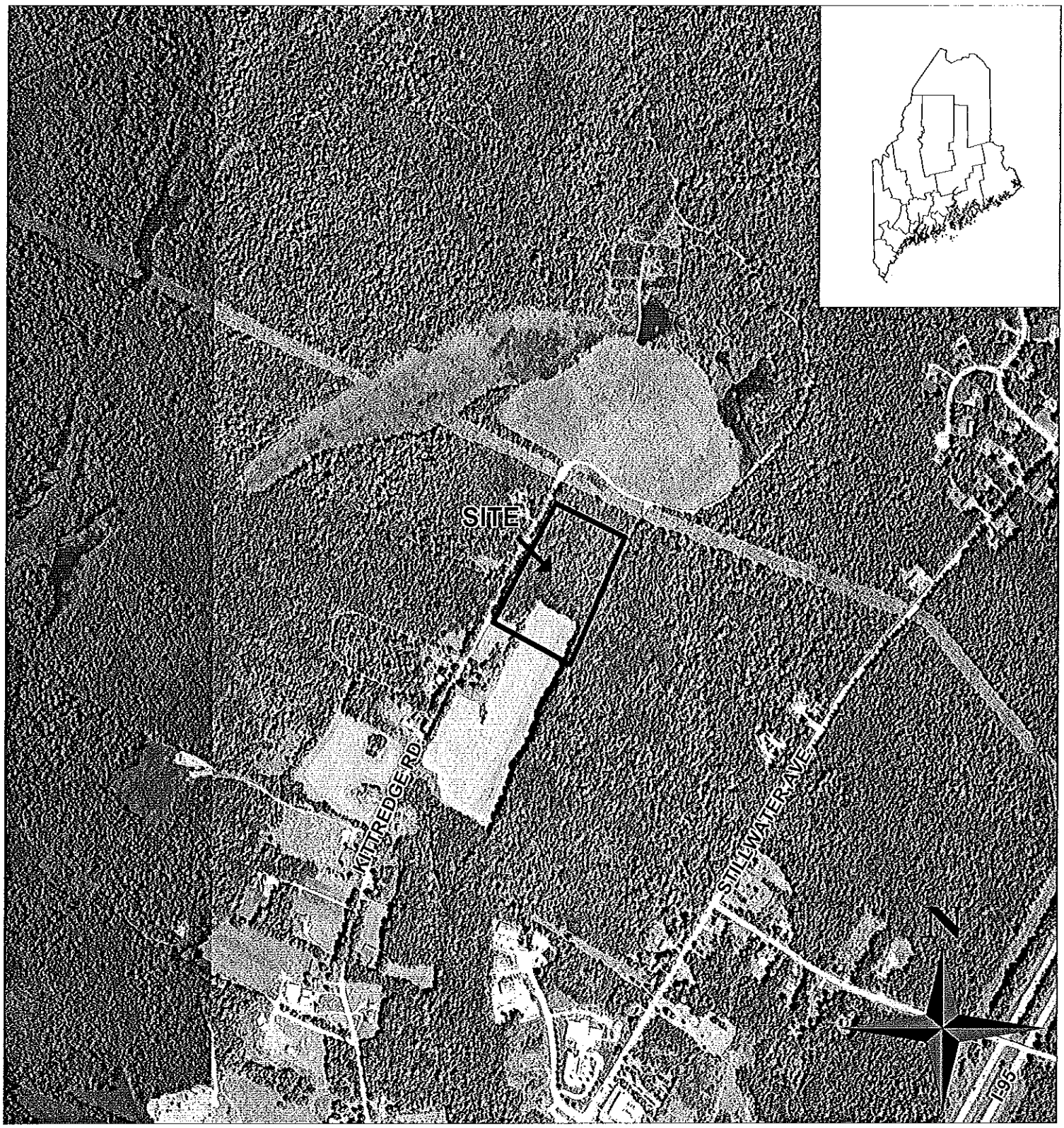
Moyse Environmental Services, Inc.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6179
Fax (207) 433-7225

0 2,000 4,000

1 in. = 2,000 ft.

Date: December 07, 2015

File No.: 015-044WSE_Rioux_Bangor



Sheet Title:

SITE LOCATION MAP - AERIAL PHOTO

Bangor, Maine

Project:

KITTREDGE KNOLL
RIOUX PROPERTY

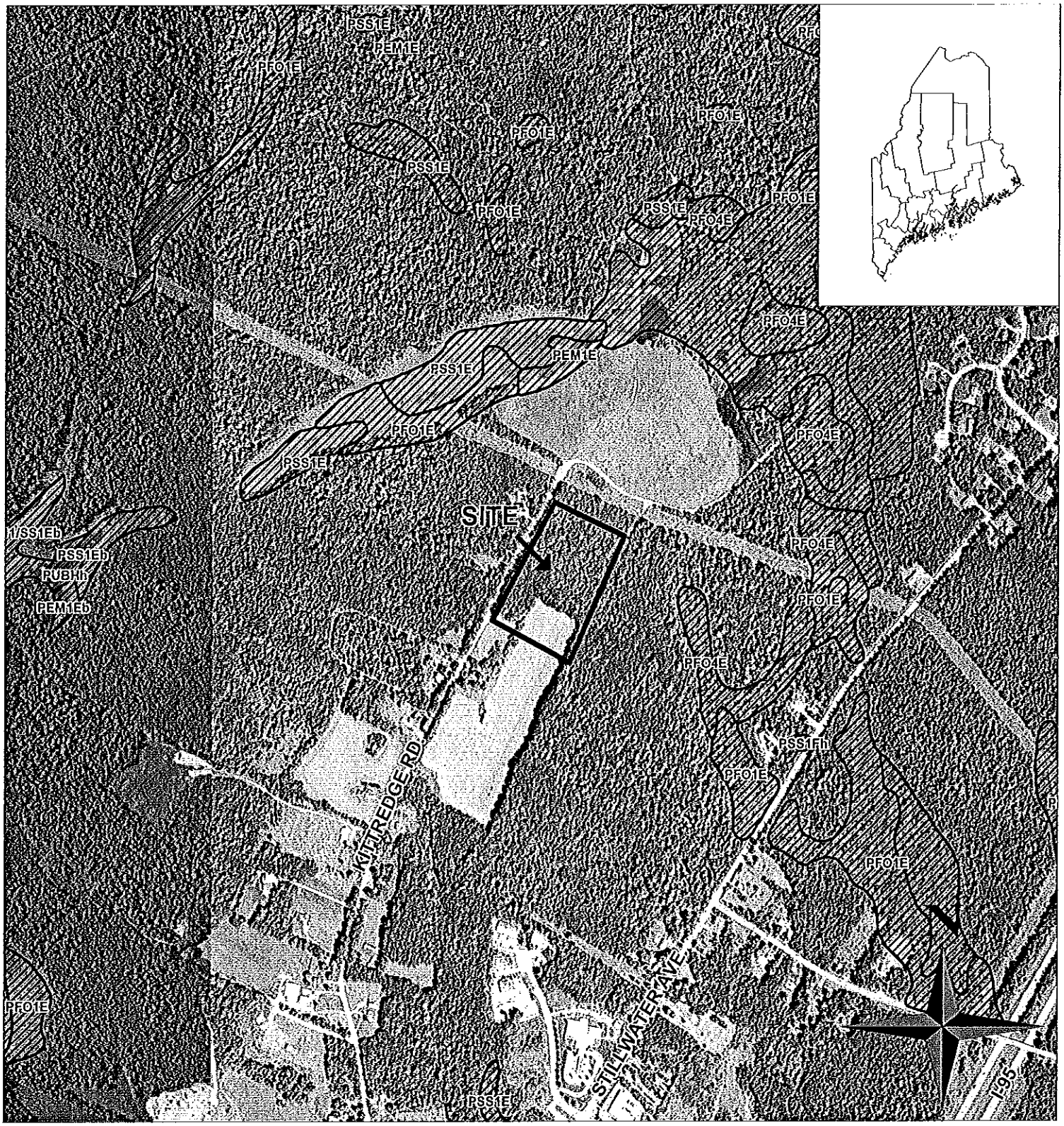
MOYSE
ENVIRONMENTAL
SERVICES, INC.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6178
Fax (207) 433-7225

0 1,000 2,000

1 in. = 1,000 ft.

Date: December 07, 2015

File No.: 015-044WSE_Rioux_Bangor



Sheet Tilte:

NATIONAL WETLAND INVENTORY MAP

Bangor, Maine

Project:

KITTREDGE KNOLL
RIOUX PROPERTY

MOYSE ENVIRONMENTAL SERVICES, INC.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6179
Fax (207) 433-7225

0 1,000 2,000

1 in. = 1,000 ft.

Date: December 07, 2015

File No.: 015-044WSE_Rioux_Bangor

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB — AQUATIC BED	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*
RF — REEF	1 Coral 3 Worm
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 — INTERTIDAL

CLASS	Subclass
AB — AQUATIC BED	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*
RF — REEF	1 Coral 3 Worm
RS — ROCKY SHORE	1 Bedrock 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM: R — RIVERINE

SUBSYSTEM: 1 — TIDAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
*SB — STREAMBED	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
AB — AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
RS — ROCKY SHORE	1 Bedrock 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
**EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 2 — LOWER PERENNIAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
*SB — STREAMBED	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
AB — AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
RS — ROCKY SHORE	1 Bedrock 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
**EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 3 — UPPER PERENNIAL

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
*SB — STREAMBED	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
AB — AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
RS — ROCKY SHORE	1 Bedrock 2 Rubble
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
**EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

SUBSYSTEM: 4 — INTERMITTENT

CLASS	Subclass
*SB — STREAMBED	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated

SUBSYSTEM: 5 — *UNKNOWN PERENNIAL*

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB — AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
**EM — EMERGENT	2 Nonpersistent
OW — *OPEN WATER/ Unknown Bottom*	

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

SYSTEM: P — PALUSTRINE

CLASS	Subclass
RB — ROCK BOTTOM	1 Bedrock 2 Rubble
UB — UNCONSOLIDATED BOTTOM	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB — AQUATIC BED	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*
US — UNCONSOLIDATED SHORE	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
ML — MOSS-LICHEN	1 Moss 2 Lichen
EM — EMERGENT	1 Persistent 2 Nonpersistent
SS — SCRUB-SHRUB	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*
FO — FORESTED	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*
OW — *OPEN WATER/ Unknown Bottom*	

E — ESTUARINE

1 — SUBTIDAL

RB — ROCK BOTTOM
1 Bedrock
2 Rubble

UB — UNCONSOLIDATED BOTTOM
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

AB — AQUATIC BED
1 Algal
3 Rooted Vascular
4 Floating Vascular
5 *Unknown Submergent*
6 *Unknown Surface*

RF — REEF
2 Mollusc
3 Worm

OW — *OPEN WATER/ Unknown Bottom*

2 — INTERTIDAL

AB — AQUATIC BED
1 Algal
3 Rooted Vascular
4 Floating Vascular
5 *Unknown Submergent*
6 *Unknown Surface*

RF — REEF
2 Mollusc
3 Worm

SB — STREAMBED
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

RS — ROCKY SHORE
1 Bedrock
2 Rubble

US — UNCONSOLIDATED SHORE
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

EM — EMERGENT
1 Persistent
2 Nonpersistent

SS — SCRUB-SHRUB
1 Broad-Leaved Deciduous
2 Needle-Leaved Deciduous
3 Broad-Leaved Evergreen
4 Needle-Leaved Evergreen
5 Dead
6 *Deciduous*
7 *Evergreen*

FO — FORESTED
1 Broad-Leaved Deciduous
2 Needle-Leaved Deciduous
3 Broad-Leaved Evergreen
4 Needle-Leaved Evergreen
5 Dead
6 *Deciduous*
7 *Evergreen*

L — LACUSTRINE

1 — LIMNETIC

RB — ROCK BOTTOM
1 Bedrock
2 Rubble

UB — UNCONSOLIDATED BOTTOM
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

AB — AQUATIC BED
1 Algal
2 Aquatic Moss
3 Rooted Vascular
4 Floating Vascular
5 *Unknown Submergent*
6 *Unknown Surface*

OW — *OPEN WATER/ Unknown Bottom*

2 — LITTORAL

RB — ROCK BOTTOM
1 Bedrock
2 Rubble

UB — UNCONSOLIDATED BOTTOM
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

AB — AQUATIC BED
1 Algal
2 Aquatic Moss
3 Rooted Vascular
4 Floating Vascular
5 *Unknown Submergent*
6 *Unknown Surface*

RS — ROCKY SHORE
1 Bedrock
2 Rubble

US — UNCONSOLIDATED SHORE
1 Cobble-Gravel
2 Sand
3 Mud
4 Organic
5 Vegetated

EM — EMERGENT
2 Nonpersistant

OW — *OPEN WATER/ Unknown Bottom*

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

A Temporarily Flooded
B Saturated
C Seasonally Flooded
D *Seasonally Flooded/ Well Drained*
E *Seasonally Flooded/ Saturated*
F Semipermanently Flooded
G Intermittently Exposed
H Permanently Flooded
J Intermittently Flooded
K Artificially Flooded
W Intermittently Flooded/Temporary
Y Saturated/Semipermanent/ Seasonal
Z Intermittently Exposed/Permanent
U *Unknown*

Tidal

K *Artificially Flooded*
L Subtidal
M Irregularly Exposed
N Regularly Flooded
P Irregularly Flooded
*S Temporary-Tidal
*R Seasonal-Tidal
*T Semipermanent-Tidal
*V Permanent-Tidal
U *Unknown*

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity

1 Hyperhaline
2 Euhaline
3 Mixohaline *(Brackish)*
4 Polyhaline
5 Mesohaline
6 Oligohaline
0 Fresh

Inland Salinity

7 Hypersaline
8 Eusaline
9 Mixosaline
0 Fresh

pH Modifiers for all Fresh Water

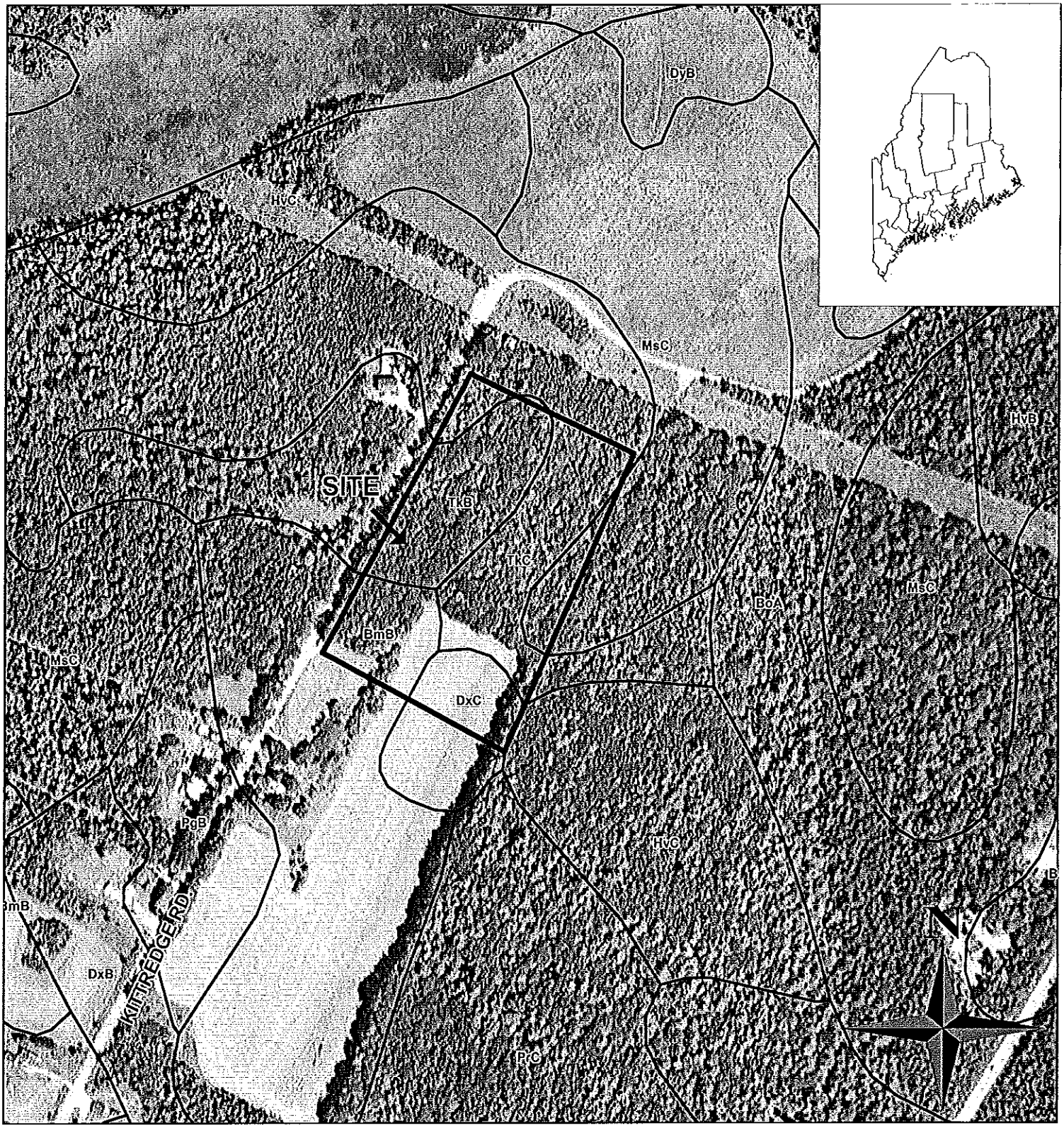
a Acid
t Circumneutral
i Alkaline

SOIL

g Organic
n Mineral

SPECIAL MODIFIERS

b *Beaver*
d *Partially Drained/Ditched*
f Farmed
h *Diked/Impounded*
r Artificial Substrate
s *Spoil*
x Excavated



Sheet Title:	Project:
SOIL CONSERVATION SERVICE SOIL SURVEY MAP	**KITTREDGE KNOLL RIOUX PROPERTY** Bangor, Maine

MOYSE ENVIRONMENTAL SERVICES, INC.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6178
Fax (207) 433-7225

0 1,000 2,000

1 in. = 1,000 ft.

Date: December 07, 2015

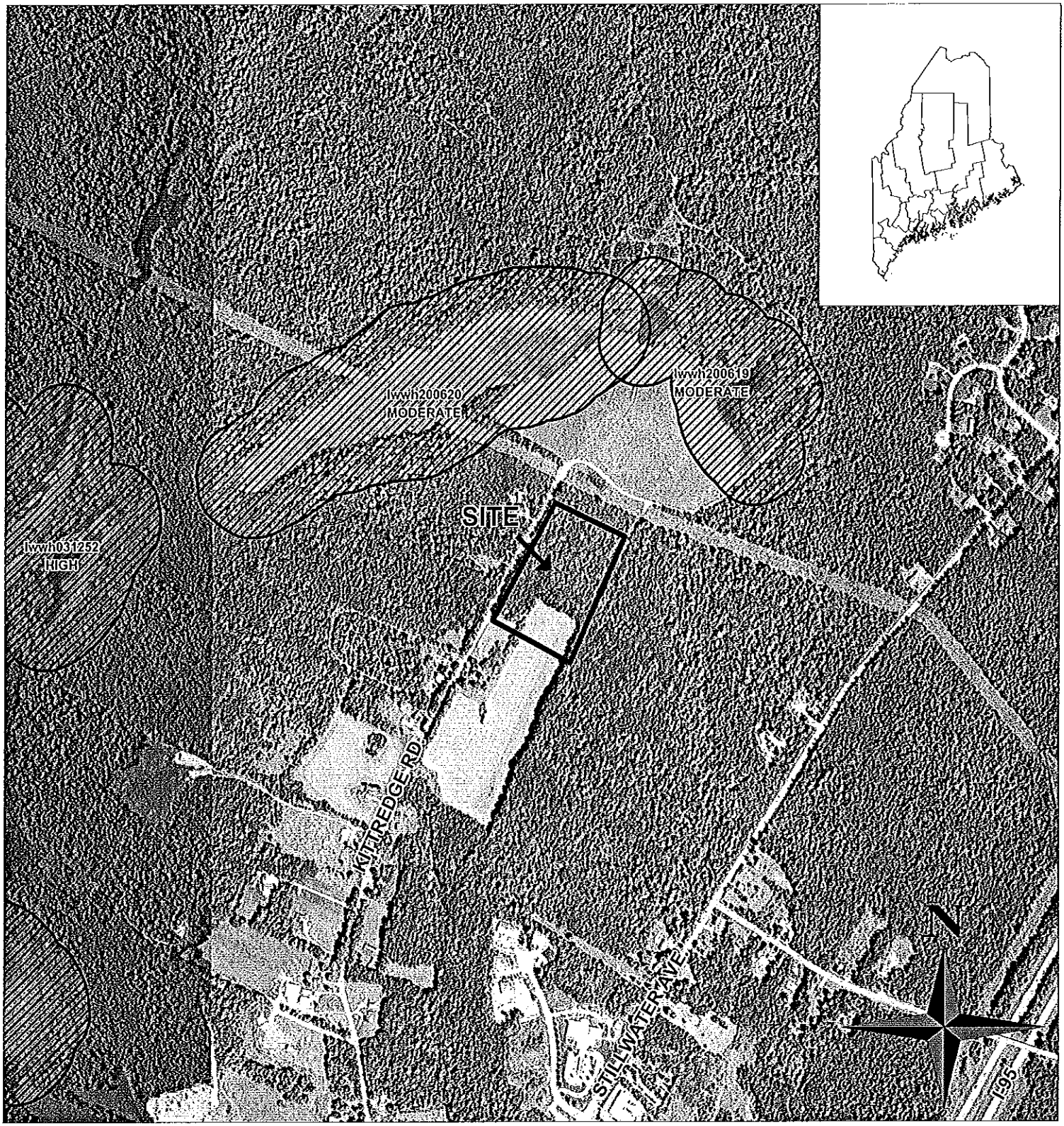
File No.: 015-044WSE_Rioux_Bangor

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, or E, shows the slope. Symbols without a slope letter are those of nearly level soils, such as Limerick silt loam, or of land types, such as Rock outcrop, which have a considerable range of slope. A final number 2, in the symbol, shows that the soil is eroded.

SYMBOL	NAME
AsB	Adams loamy sand, 0 to 8 percent slopes
AsC	Adams loamy sand, 8 to 15 percent slopes
AsE	Adams loamy sand, 15 to 45 percent slopes
AgA	Allagash fine sandy loam, 0 to 2 percent slopes
AgB	Allagash fine sandy loam, 2 to 8 percent slopes
AgC	Allagash fine sandy loam, 8 to 15 percent slopes
AgD	Allagash fine sandy loam, 15 to 25 percent slopes
BgA	Bangor silt loam, 0 to 2 percent slopes
BaB	Bangor silt loam, 2 to 8 percent slopes
BaC	Bangor silt loam, 8 to 15 percent slopes
BaD	Bangor silt loam, 15 to 25 percent slopes
BmB	Bangor silt loam, moderately deep, 2 to 8 percent slopes
BmC	Bangor silt loam, moderately deep, 8 to 15 percent slopes
BmD	Bangor silt loam, moderately deep, 15 to 35 percent slopes
BnB	Bangor very stony silt loam, 0 to 8 percent slopes
BnC	Bangor very stony silt loam, 8 to 15 percent slopes
BnD	Bangor very stony silt loam, 15 to 25 percent slopes
BoA	Biddeford silt loam, 0 to 3 percent slopes
BrA	Burnham silt loam, 0 to 3 percent slopes
BuA	Buxton silt loam, 0 to 2 percent slopes
BuB	Buxton silt loam, 2 to 8 percent slopes
BuC	Buxton silt loam, 8 to 15 percent slopes
BxB	Buxton, Scantic, and Biddeford stony silt loams, 0 to 8 percent slopes
CaC	Canaan extremely rocky sandy loam, 5 to 15 percent slopes
CaE	Canaan extremely rocky sandy loam, 15 to 45 percent slopes
CcH	Colton cobbly sandy loam, dark materials, 0 to 8 percent slopes
CcC	Colton cobbly sandy loam, dark materials, 8 to 15 percent slopes
CcD	Colton cobbly sandy loam, dark materials, 15 to 25 percent slopes
CcE	Colton cobbly sandy loam, dark materials, 25 to 45 percent slopes
CnA	Colton gravelly sandy loam, dark materials, 0 to 2 percent slopes
CnB	Colton gravelly sandy loam, dark materials, 2 to 8 percent slopes
CnC	Colton gravelly sandy loam, dark materials, 8 to 15 percent slopes
CnD	Colton gravelly sandy loam, dark materials, 15 to 25 percent slopes
CnE	Colton gravelly sandy loam, dark materials, 25 to 45 percent slopes
CsA	Colton loamy fine sand, dark materials, 0 to 2 percent slopes
CsB	Colton loamy fine sand, dark materials, 2 to 8 percent slopes
CsC	Colton loamy fine sand, dark materials, 8 to 15 percent slopes
CsD	Colton loamy fine sand, dark materials, 15 to 25 percent slopes
DaA	Daigle silt loam, 0 to 2 percent slopes
DaB	Daigle silt loam, 2 to 8 percent slopes
DaC	Daigle silt loam, 8 to 15 percent slopes
DgA	Daigle stony silt loam, 0 to 2 percent slopes
DgB	Daigle stony silt loam, 2 to 8 percent slopes
DgC	Daigle stony silt loam, 8 to 15 percent slopes
DxA	Dixmont silt loam, 0 to 2 percent slopes
DxB	Dixmont silt loam, 2 to 8 percent slopes
DxC	Dixmont silt loam, 8 to 15 percent slopes
DyA	Dixmont very stony silt loam, 0 to 2 percent slopes
DyB	Dixmont very stony silt loam, 2 to 8 percent slopes
DyC	Dixmont very stony silt loam, 8 to 15 percent slopes
EwB	Elmwood fine sandy loam, 0 to 8 percent slopes
Ha	Hadley silt loam
HbB	Hermon sandy loam, 2 to 8 percent slopes
HbC	Hermon sandy loam, 8 to 15 percent slopes
HdB	Hermon sandy loam, moderately deep, 2 to 8 percent slopes
HdC	Hermon sandy loam, moderately deep, 8 to 15 percent slopes
HsB	Hermon very stony sandy loam, 2 to 8 percent slopes
HsC	Hermon very stony sandy loam, 8 to 15 percent slopes
HsE	Hermon very stony sandy loam, 15 to 45 percent slopes
HhC	Hermon extremely stony sandy loam, 5 to 15 percent slopes
HoB	Howland gravelly loam, 0 to 8 percent slopes
HoC	Howland gravelly loam, 8 to 15 percent slopes
HvB	Howland very stony loam, 0 to 8 percent slopes
HvC	Howland very stony loam, 8 to 15 percent slopes
HvD	Howland very stony loam, 15 to 25 percent slopes
Lk	Limerick silt loam
MaB	Machias fine sandy loam, 0 to 8 percent slopes
MbB	Madawaska very fine sandy loam, 0 to 8 percent slopes
Md	Made land
MeA	Melrose fine sandy loam, 0 to 2 percent slopes
MeB	Melrose fine sandy loam, 2 to 8 percent slopes
MeC	Melrose fine sandy loam, 8 to 15 percent slopes
Mn	Mixed alluvial land
MoB	Monarda silt loam, 0 to 8 percent slopes
MrB	Monarda and Burnham very stony silt loams, 0 to 8 percent slopes
MsC	Monarda and Burnham extremely stony silt loams, 0 to 15 percent slopes
Mu	Muck
On	Ondawa fine sandy loam
Pa	Peat and muck
Pc	Peat, coarsely fibrous
Pf	Peat, moderately fibrous
PgB	Plaisted gravelly loam, 2 to 8 percent slopes
PgC	Plaisted gravelly loam, 8 to 15 percent slopes
PgD	Plaisted gravelly loam, 15 to 25 percent slopes
PgE	Plaisted gravelly loam, 25 to 45 percent slopes
PhB	Perham silt loam, 0 to 8 percent slopes
PhC	Perham silt loam, 8 to 15 percent slopes
PmB	Perham stony silt loam, 0 to 8 percent slopes
PmC	Perham stony silt loam, 8 to 15 percent slopes
PrC	Plaisted very stony loam, 5 to 15 percent slopes
PrE	Plaisted very stony loam, 15 to 45 percent slopes
Ps	Peat, sphagnum
PxC	Plaisted extremely stony loam, 5 to 15 percent slopes
Py	Podunk fine sandy loam
RaB	Red Hook and Atherton silt loams, 0 to 8 percent slopes
RdB	Red Hook and Atherton fine sandy loams, 0 to 8 percent slopes
Re	Riverwash
RkC	Rockland, Canaan material, sloping
RkD	Rockland, Canaan material, strongly sloping
RmC	Rockland, Thorndike material, sloping
RmD	Rockland, Thorndike material, strongly sloping
Ro	Rock outcrop
Sa	Saco silt loam
ScB	Scantic silt loam, 0 to 8 percent slopes
SeA	Stetson fine sandy loam, 0 to 2 percent slopes
SeB	Stetson fine sandy loam, 2 to 8 percent slopes
SeC	Stetson fine sandy loam, 8 to 15 percent slopes
SeD	Stetson fine sandy loam, 15 to 25 percent slopes
SfC	Stetson-Suffield complex, 0 to 15 percent slopes
SfE	Stetson-Suffield complex, 15 to 45 percent slopes
ShD	Stony land, Hermon material, strongly sloping
SpD	Stony land, Plaisted material, strongly sloping
SuA	Suffield silt loam, 0 to 2 percent slopes
SuB	Suffield silt loam, 2 to 8 percent slopes
SuC	Suffield silt loam, 8 to 15 percent slopes
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded
SuD	Suffield silt loam, 15 to 25 percent slopes
SuD2	Suffield silt loam, 15 to 25 percent slopes, eroded
SuE	Suffield silt loam, 25 to 45 percent slopes
SvA	Suffield very fine sandy loam, 0 to 2 percent slopes
SvB	Suffield very fine sandy loam, 2 to 8 percent slopes
SvC	Suffield very fine sandy loam, 8 to 15 percent slopes
SvD	Suffield very fine sandy loam, 15 to 25 percent slopes
ThB	Thorndike shaly silt loam, 2 to 8 percent slopes
ThC	Thorndike shaly silt loam, 8 to 15 percent slopes
ThD	Thorndike shaly silt loam, 15 to 25 percent slopes
ThE	Thorndike shaly silt loam, 25 to 45 percent slopes
TkB	Thorndike very rocky silt loam, 2 to 8 percent slopes
TkC	Thorndike very rocky silt loam, 8 to 15 percent slopes
TvB	Thorndike very stony silt loam, 2 to 8 percent slopes
TvC	Thorndike very stony silt loam, 8 to 15 percent slopes
TvD	Thorndike very stony silt loam, 15 to 35 percent slopes
Wn	Winooski silt loam

Soil map constructed 1962 by Cartographic Division, Soil Conservation Service, USDA, from 1942, 1947 and 1960 aerial photographs. Controlled mosaic based on Maine plane coordinate system, east zone, transverse Mercator projection, 1927 North American datum.



Sheet Title:

IF&W INLAND WADING BIRD & WATERFOWL HABITAT Bangor, Maine

Project:

KITTREDGE KNOLL RIOUX PROPERTY

Moyse Environmental Services, Inc.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6179
Fax (207) 433-7226

0 1,000 2,000

1 in. = 1,000 ft.

Date: December 07, 2015

File No.: 015-044WSE_Rioux_Bangor

Maine Department of Inland Fisheries and Wildlife

Purpose: To identify boundaries of Inland Waterfowl / Wading Bird Habitats (IWWHs) those qualify under Municipal Shoreland Zoning (MSZ). This layer is the official definition of IWWH under MSZ.

IWWH –

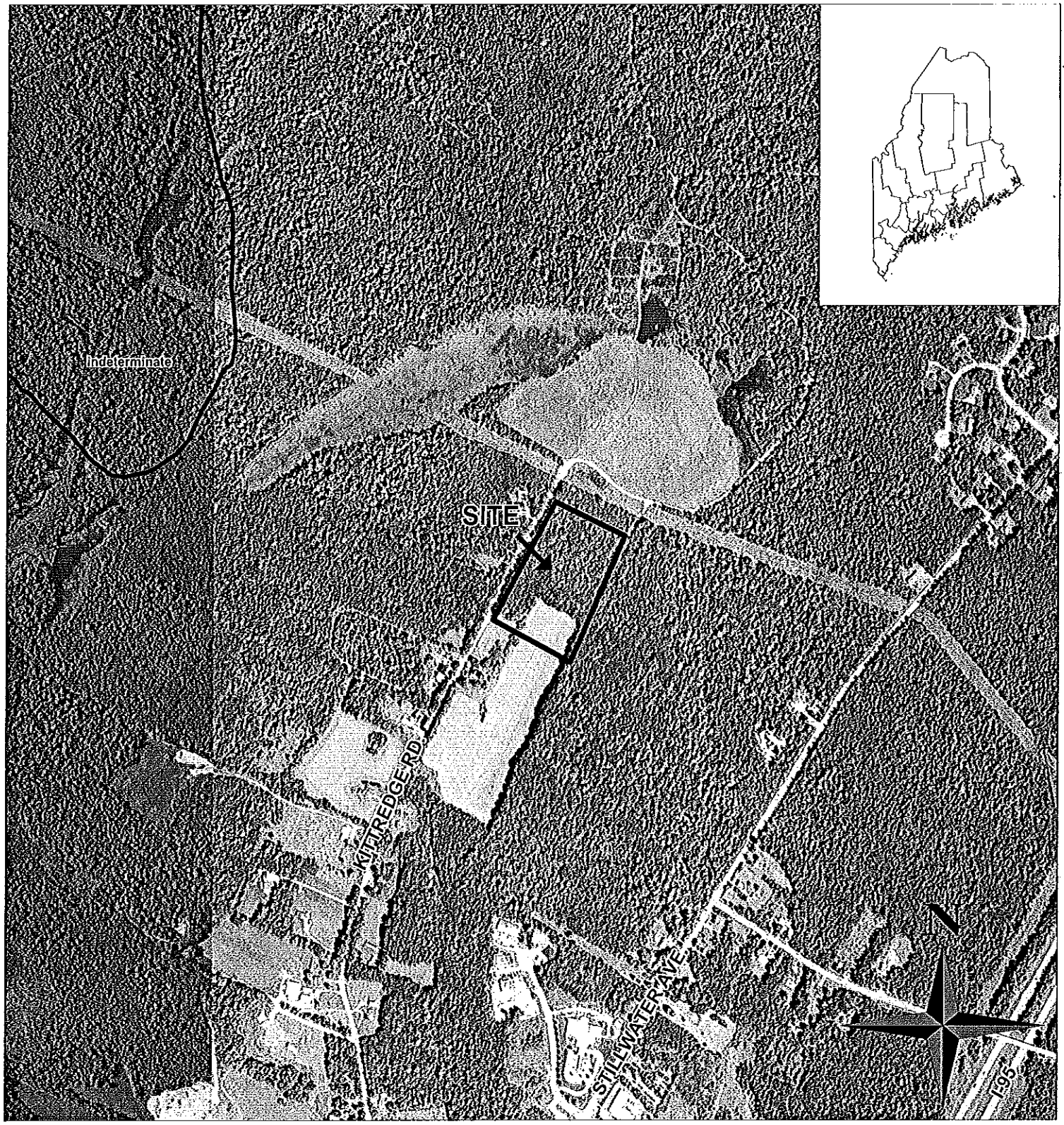
Wetland complex identification number, Feature ID for relating to MDIFW ACCESS database of Inland Waterfowl and Wading Bird Habitats, except those starting with "UMO" which indicates they were generated by Heather L. Rustigian and William B. Krohn, University of Maine, Maine Cooperative Fish and Wildlife Research Unit.

This layer represents Inland Waterfowl / Wading bird Habitat (**IWWH**) that qualify under Municipal Shoreland Zoning. To qualify, each IWWH must be a Significant Wildlife Habitat defined under Maine's Natural Resources Protection Act (NRPA; http://www.maine.gov/dep/blwq/docstand/nrpapage.htm). Polygons with a high or moderate rating meet the Significant Wildlife Habitat definition and are protected under NRPA; low-rated polygons do not meet the definition and are not protected under NRPA. NRPA Iwwhs with a wetland acreage (which does not include forested wetlands) of at least 10 acres qualify under Municipal Shoreland Zoning. Boundaries and attributes of polygons in organized townships were updated in 2008 by MDIFW staff using recent (2001-2007), high-resolution (<=1 m), color orthoimagery. For most polygons, multiple images from different years and seasons were used. Polygons in unorganized townships were mapped by MDIFW regional staff in the 1990s from lower-resolution orthoimagery, various wetland data sets, and field visits or via an automated process developed by Heather Rustigian and William Krohn (USGS Biological Resources Division) using statewide digital NWI (National Wetlands Inventory) data, aerial imagery, and hydrology data. Each IWWH boundary includes a 250-foot upland zone around the wetland perimeter. Upland zones were edited to exclude areas of intensive development, slivers crossing major roads into non-wetland habitat, and shorelines >250 ft from a vegetated, non-forested wetland on a Great Pond. This update was completed Sept. 2012.

RATING –

Rating of the IWWH (*moderate and high-value polygons are considered as candidate NRPA habitats*). See the *Supplemental Information* section of the layer description for rating criteria.

Supplemental Information: Five criteria are used to assess IWWHs: *Dominant wetland type, Diversity of wetland types, Size, Interspersion, and Amount of open water*. A **high** to **moderate** value inland habitat is an inland wetland complex including a 250 ft upland habitat zone that, through a combination of the five criteria listed above, meets MDIFW guidelines or is an inland wetland complex. For further information on this rating system please refer to the following document: "GIS-Based Evaluation of Waterfowl and Wading Bird Habitats in Maine" by Heather L. Rustigian and William B. Krohn, University of Maine, Orono, Final Contract Report to the Maine Dept. Inland Fisheries and Wildlife, Augusta, Maine, June 2002. Not all ratings have been field verified.



Sheet Title:

IF&W DEER WINTERING HABITAT

Bangor, Maine

Project:

KITTREDGE KNOLL
RIOUX PROPERTY

MOYSE ENVIRONMENTAL SERVICES, INC.
Soil and Land Use Consulting
42 Pleasant View Avenue, Bangor, ME 04401
Phone (207) 945-6178
Fax (207) 433-7225

0 1,000 2,000

1 in. = 1,000 ft.

Date: December 07, 2015

File No.: 015-044WSE_Rioux_Bangor

Maine Department of Inland Fisheries and Wildlife

Deer Wintering Areas

Mapped deer wintering areas (**DWAs**), **rated high, moderate or indeterminate**, in organized towns statewide (see Deer Wintering Area and Travel Corridor document, MDIFW, 12/22/99). DWAs were mapped by regional biologists and were then transferred to mylar 7.5 minute quads for digitizing. This data set was developed in accordance with Maine's Natural Resources Protection Act (NRPA). Under this act, the Maine Department of Inland Fisheries and Wildlife (MDIFW) are designated as the authority for determining significant wildlife habitats (SWHs). It is further specified that MDIFW must first map SWHs before they are offered for protection under the law except when they occur in another protected resource.

A deer wintering area is defined as a forested area used by deer when snow depth in the open/hardwoods exceeds 12 inches, deer sinking depth in the open/hardwoods exceeds 8 inches and mean daily temperatures are below 32 degrees Fahrenheit. Non-forested wetlands, non-stocked clear-cut's, hardwood types, and stands predominated by Eastern Larch are included within the DWA only if less than 10 acres in size. Agricultural and development areas within DWAs are excluded regardless of size. Evaluation (rating procedure): Deer wintering areas are evaluated based on three criteria: 1) quality of softwood shelter, 2) intensity of deer use, and 3) size. Information on the quality of softwood shelter and intensity of deer use are based on ground survey plots within the final boundary of the DWA being evaluated. The acreage of the DWA is determined after the final outline of the DWA has been drawn. The final rating of the DWA is determined by summing the scores for the three criteria and assigning a rating as follows: high (score of 10-12), moderate (score of 7-9.9) or low (score of 0-6.9). A regional biologist may recommend a rating change with justification and approval by the management section supervisor. No delisting criteria for regulated NRPA DWAs have been developed. **Currently all DWAs are rated as indeterminate.**