34 SCHOOL STREET • LITTLETON, NH 03561 • PHONE 603-444-4111 • FAX 603-444-1343 • www.horizonsengineering.com

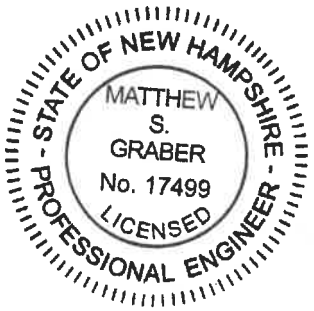
NHDES ALTERATION OF TERRAIN PERMIT APPLICATION

DIXVILLE CAPITAL, LLC.
THE BALSAMS GRAND RESORT
Dixville, New Hampshire

34 SCHOOL STREET • LITTLETON, NH 03561 • PHONE 603-444-4111 • FAX 603-444-1343 • www.horizonsengineering.com

APPLICATION FOR NHDES ALTERATION OF TERRAIN PERMIT FOR DIXVILLE CAPITAL, LLC THE BALSAMS – SKI LIFT AND TRAILS EXPANSION DIXVILLE, NH

FEBRUARY 2023



PROJECT NUMBER 220115

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- **4.2 Color Coded Hydrologic Soil Group Plans**
- **4.3 Pre and Post Development Drainage Area Plans**

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(UNBOUND)

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2.1 Copy of the Signed Application

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division/ Alteration of Terrain Bureau/ Land Resources Management
Check the Status of your Application: www.des.nh.gov/onestop

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number: Check No. Amount: Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)			
Applicant Name: Dixville Capital LLC	Contact Name: Ed Brisson		
Email: 1ed.brisson@gmail.com	Daytime Telephone: (207) 824-7402		
Mailing Address: 8 Airport Road, PO Box 547			
Town/City: Bethel	State: ME	Zip Code: 04217	
2. APPLICANT'S AGENT INFORMATION If none, check here: ☐			
Business Name:	Contact Name:		
Email:	Daytime Telephone:		
Address:			
Town/City:	State:	Zip Code:	
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)			
Applicant Name: Bayroot LLC	Contact Name: Daniel H. Hudnut		
Email:	Daytime Telephone:		
Mailing Address: 150 Orford Road, PO Box 160			
Town/City: Lyme	State: NH	Zip Code: 03768	
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☐			
Business Name:	Contact Name:		
Email:	Daytime Telephone:		
Address:			
Town/City:	State:	Zip Code:	
5. CONSULTANT INFORMATION If none, check here: ☐			
Engineering Firm: Horizons Engineering Inc.	Contact Name: Matt Graber		
Email: mgraber@horizonsengineering.com	Daytime Telephone: 603-444-4111		
Address: 34 School Street			
Town/City: Littleton	State: NH	Zip Code: 03561	

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Email:	Daytime Telephone:		
Address:			
Town/City:		State:	Zip Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)			
Applicant Name: Balsams View, LLC	Contact Name: Les Otten		
Email:	Daytime Telephone:		
Mailing Address: 8 Airport Road, PO Box 547			
Town/City: Bethel		State: ME	Zip Code: 04217
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☐			
Business Name:	Contact Name:		
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Town/City:		State:	Zip Code:
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Town/City: Bethel	State: ME	Zip Code: 04217	
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Business Name:	Contact Name:		
Email:	Daytime Telephone:		
Address:			
Town/City:	State:	Zip Code:	
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)			
Applicant Name: Balsams Resort Amenities, LLC	Contact Name: Les Otten		
Email:	Daytime Telephone:		
Mailing Address: 8 Airport Road, PO Box 547			
Town/City: Bethel	State: ME	Zip Code: 04217	
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☐			
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Town/City: Littleton	State: NH	Zip Code: 03561	

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Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)		
Applicant Name: Dixville Woodlands, LLC	Contact Name: Les Otten	
Email:	Daytime Telephone:	
Mailing Address: 8 Airport Road, PO Box 547		
Town/City: Bethel	State: ME	Zip Code: 04217
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☐		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
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Email: mgraber@horizonsengineering.com	Daytime Telephone: 603-444-4111	
Address: 34 School Street		
Town/City: Littleton	State: NH	Zip Code: 03561

6. PROJECT TYPE

☐ Excavation Only ☐ Residential ☐ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☒ Other: Env-Wq 1503.11b

7. PROJECT LOCATION INFORMATION

Project Name: The Balsams - Ski Lift and Trails Expansion

Street/Road Address: 1000 Cold Spring Road

Town/City: Dixville		County: Coos	
Tax Map: 1626	Block:	Lot Number: 1,3,3.3,3.4	Unit:
Location Coordinates: 44.86137, -71.32416	☒ Latitude/Longitude	☐ UTM	☐ State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A Class A surface water or Outstanding Resource Water? ☐ No ☒ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A lake or pond not covered previously? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond**

Is the project a High Load area? ☐ Yes ☒ No
If yes, specify the type of high load land use or activity: _____

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ☒ No
Is the project within a Groundwater Protection Area (GPA)? ☐ Yes ☒ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☒ Yes ☐ No

Note: Guidance document titled "*Using NHDES's OneStop WebGIS to Locate Protection Areas*" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☐ Yes ☒ No
If yes: Cut volume: _____ cubic feet within the 100-year floodplain
Fill volume: _____ cubic feet within the 100-year floodplain

☐ Project **IS** within **¼ mile of a designated river** Name of River:
☒ Project is **NOT** within ¼ mile of a designated river

☐ Project **IS** within **a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable**
☒ Project is **NOT** within a Coastal/Great Bay Region community

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

The Client is applying for an AoT permit per Env-Wq 1503.11(b) and 1504.03 for the clearing, grubbing, stumping and grading for 21 proposed ski trails, 3 trail access roads and 6 proposed ski lift lines. This submission will not include any new impervious area within the project disturbance area. Future projects with impervious improvements will be submitted as new projects per Env-Wq 1503.11 (d)

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: 02/13/2023.
(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: / / .
(Attach proof of delivery)

C. Type of plan required: ☐ Land Conversion ☐ Detailed Development ☒ Excavation, Grading & Reclamation ☐ Steep Slope

D. Additional plans required: ☒ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance: 9,991,513 square feet

F. Additional impervious cover as a result of the project: 0 square feet (use the "-" symbol to indicate a net reduction in impervious coverage).
Total final impervious cover: 0
square feet

G. Total undisturbed cover: 182,388,724 square feet

H. Number of lots proposed: 0

I. Total length of roadway: 0 linear feet

J. Name(s) of receiving water(s): Mohawk River, Clear Stream, Cascade Brook, Flume Brook, Unnamed Tributaries

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	☐ Yes ☒ No ☐ N/A	☐	Permit number:
2. Wetlands Permit	☒ Yes ☐ No ☐ N/A	☒	Permit number:
3. Shoreland Permit	☐ Yes ☒ No ☐ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☒ No ☐ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☒ No ☐ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☒ No ☐ N/A	☐	Permit number:
7. Other:	☐ Yes ☒ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: Report attached

M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A." Aluminum - Clear Stream; Flume Brook; Unnamed Brook; Cascade Brook

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☒ No
If yes, name of staff member:

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock: _____ cubic yards
If yes, standard blasting BMP notes must be placed on the plans, available at:
http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)

LOOSE:

- ☒ Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)
- ☒ Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm
- ☒ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BIND IN A REPORT IN THE FOLLOWING ORDER:

- ☒ Copy of the signed application form & application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)
- ☒ Copy of the check
- ☒ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- ☒ Web GIS printout with the "Surface Water Impairments" layer turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ Web GIS printouts with the AOT screening layers turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ NHB letter using DataCheck Tool – www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
- ☒ The Web Soil Survey Map with project's watershed outlined – websoilsurvey.nrcs.usda.gov
- ☒ Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- ☒ Photographs representative of the site
- ☐ Groundwater Recharge Volume calculations (one worksheet for each permit application): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☐ BMP worksheets (one worksheet for each treatment system): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- ☐ Riprap apron or other energy dissipation or stability calculations
- ☐ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3.*
- ☒ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- ☐ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): (http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- ☒ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- ☐ Source control plan

PLANS:

- ☒ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- ☒ Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- ☒ Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Checklist for Details

☐ **REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

____ By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☒ **APPLICANT** ☐ **APPLICANT'S AGENT:**

Signature: [signature] Date: 2/15/2023

Name (print or type): LESLIE B. OTTEN Title: AS MANAGER

☒ **PROPERTY OWNER** ☐ **PROPERTY OWNER'S AGENT:**

Signature: [signature] Date: 2/15/2023

Name (print or type): LESLIE B. OTTEN Title: AS MANAGER

Notes:
1- Authorization for Applicant to sign on behalf of landowner Bayroot LLC is attached.
2- Balsams View, LLC recently acquired Parcel Map 1626 Lot 3.1 from Tillotson Corporation. A copy of the warranty deed is attached. The parcel is identified as Parcel 1 in Exhibit A of the deed.

2.2 Copy of the Application Fee (check)

CASH ONLY IF ALL CheckLock™ SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

BALSAMS RESORT HOLDINGS LLC
PO BOX 547
BETHEL ME 04217

Northeast Bank
52-7455/2112

3464

2/15/2023

PAY TO THE ORDER OF Treasurer, State of New Hampshire $ **117,000.00

One Hundred Seventeen Thousand and 00/100********** DOLLARS

Treasurer, State of New Hampshire

MEMO Ski area AoT permit fee

Michele Tanner Cole MP

[redacted]

BALSAMS RESORT HOLDINGS LLC 3464

Treasurer, State of New Hampshire

2/15/2023

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
2/15/2023	Bill	Ski Area AoT	117,000.00	117,000.00		117,000.00
					Check Amount	117,000.00

Checking Account 117,000.00

BALSAMS RESORT HOLDINGS LLC 3464

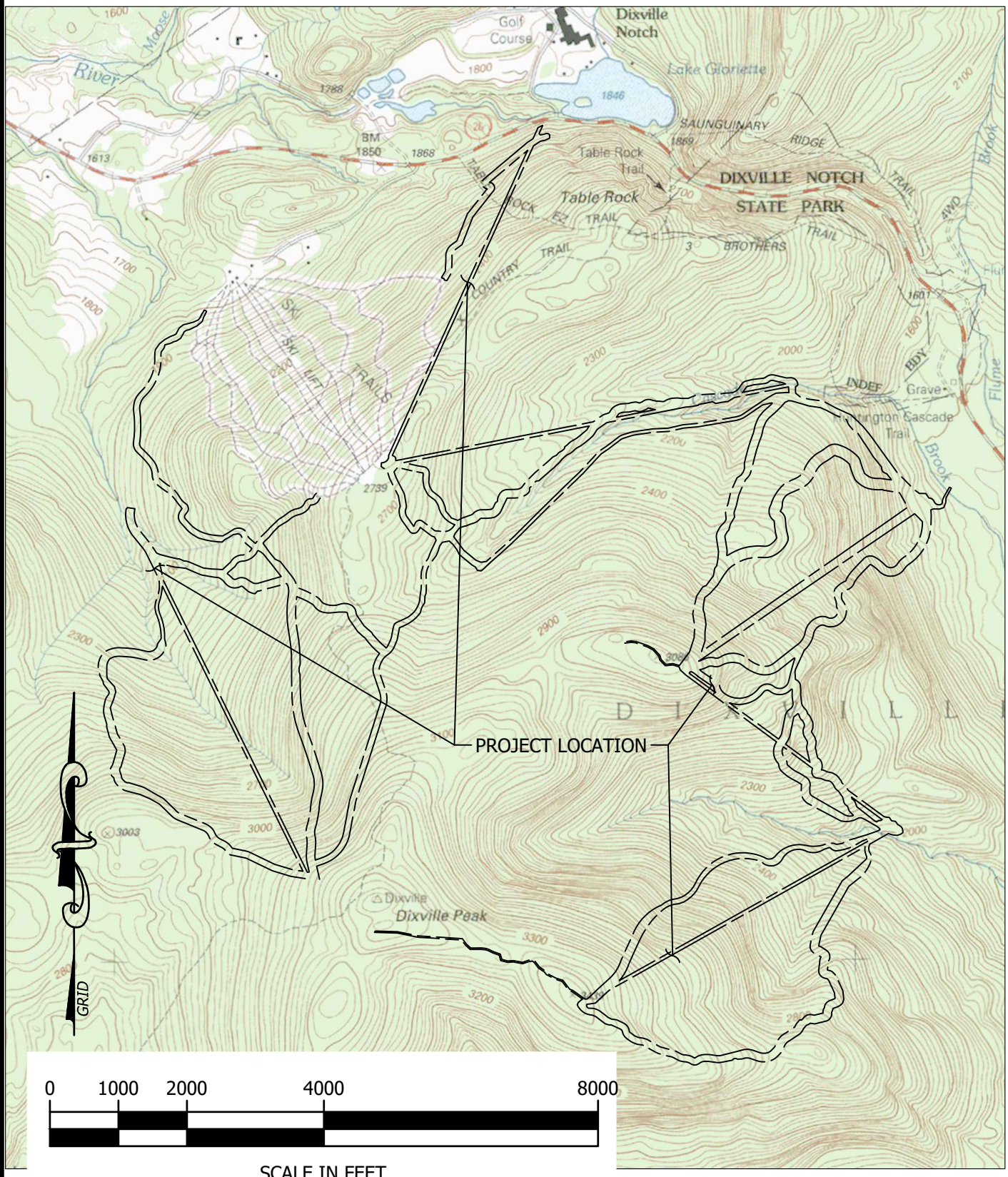
Treasurer, State of New Hampshire

2/15/2023

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
2/15/2023	Bill	Ski Area AoT	117,000.00	117,000.00		117,000.00
					Check Amount	117,000.00

Checking Account 117,000.00

2.3 USGS Location Map



horizons Engineering

Civil and Structural Engineering
Land Surveying and Environmental Consulting

MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

DIXVILLE CAPITAL, LLC

THE BALSAMS

DIXVILLE, COOS COUNTY, NH

USGS LOCATION MAP

PROJECT #:	220115
ENGIN'D BY:	MSG
DRAWN BY:	MSG
DATE:	JAN 2023

2.4 Certified Mail Receipts

7020 0640 0000 7091 0280

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at *www.usps.com®*.

OFFICIAL USE

Certified Mail Fee
$ 4.15

Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $ ____
- ☐ Return Receipt (electronic) $ ____
- ☐ Certified Mail Restricted Delivery $ ____
- ☐ Adult Signature Required $ ____
- ☐ Adult Signature Restricted Delivery $ ____

Postage
$ 22.80

Total Postage and Fees
$ 26.95

LITTLETON, NH
Postmark Here
FEB 10 2023
USPS 03561

Sent To
Unincorporated Places Coos County

Street and Apt. No., or PO Box No.
PO Box 310

City, State, ZIP+4®
West Stewartstown NH 03597

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

2.5 Application Check List

ATTACHMENT A:
ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

DESIGN PLANS

☒ Plans printed on 34 - 36" by 22 - 24" white paper

☒ PE stamp

☒ Wetland delineation

☒ Temporary erosion control measures

☒ Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.

☐ Pre-existing 2-foot contours

☐ Proposed 2-foot contours

☐ Drainage easements protecting the drainage/treatment structures

☒ Compliance with the Wetlands Bureau, RSA 482- A http://des.nh.gov/organization/divisions/water/wetlands/index.htm. Note that artificial detention in wetlands is not allowed.

☒ Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. http://des.nh.gov/organization/divisions/water/wetlands/cspa

☒ Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.

☒ Check to see if any proposed ponds need state Dam permits.
http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf

DETAILS

☐ Typical roadway x-section

☐ Detention basin with inverts noted on the outlet structure

☒ Stone berm level spreader

☐ Outlet protection – riprap aprons

☒ A general installation detail for an erosion control blanket

☒ Silt fences or mulch berm

☐ Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.

☒ Hay bale barriers

☒ Stone check dams

☒ Gravel construction exit

☒ Temporary sediment trap

☒ The treatment BMP's proposed

☒ Any innovative BMP's proposed

CONSTRUCTION SEQUENCE/EROSION CONTROL

☒ Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species.

☒ Note that perimeter controls shall be installed prior to earth moving operations.

☒ Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.

☒ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

☒ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

☒ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

☒ Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade

☒ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

☒ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

☒ Note the definition of the word "stable"

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

☒ Note the limit of time an area may be exposed
Example note: All areas shall be stabilized within 45 days of initial disturbance.

☒ Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

☒ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

☒ Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

DRAINAGE ANALYSES

Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

☒ PE stamp

☒ Rainfall amount obtained from the Northeast Regional Climate Center- http://precip.eas.cornell.edu/. Include extreme precipitation table as obtained from the above referenced website.

☒ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☒ Review the Area Listing and Soil Listing reports

- Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

☐ Check the storage input used to model the ponds.

☐ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☐ Check the outlet structure proposed and make sure it matches that modeled.

☒ Check to see if the total areas in the pre and post analyses are same.

☒ Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS

☒ Plans printed on 34 - 36" by 22 - 24" on white paper.

☒ Submit these plans separate from the soil plans.

☒ A north arrow.

☒ A scale.

☒ Labeled subcatchments, reaches and ponds.

☒ Tc lines.

☒ A clear delineation of the subcatchment boundaries.

☐ Roadway station numbers.

☐ Culverts and other conveyance structures.

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

☒ 11" × 17"sheets suitable, as long as it is readable.

☒ Submit these plans separate from the drainage area plans.

☒ A north arrow.

☒ A scale.

☐ Name of the soil scientist who performed the survey and date the soil survey took place.

☐ 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.

☒ Delineation of the soil boundaries and wetland boundaries.

☒ Delineation of the subcatchment boundaries.

☒ Soil series symbols (e.g., 26).

☒ A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).

☒ The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:

☐ Drainage report is not needed if site does not have off-site flow.

☒ 5 foot contours allowed rather than 2 foot.

☐ No PE stamp needed on the plans.

☐ Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.

☐ Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: http://des.nh.gov/organization/divisions/water/aot/categories/publications.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

☐ If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☒ If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☐ If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.

☐ If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(l) if applicable.

2.6 Project Narrative

2.6.1 Project Summary

Dixville Capital, LLC, is applying for an Alteration of Terrain (AoT) permit from the New Hampshire Department of Environmental Services (NHDES) for the clearing, grubbing, stump removal and grading for twenty-one (21) proposed ski trails, three (3) maintenance access trails and six (6) proposed ski lift lines located in Dixville, NH under Env-Wq 1503.11b requirements. The work will occur on several contiguous properties owned by Dixville Woodlands, LLC, Bayroot LLC, and Balsams Resort Amenities, LLC. The parcels are identified as lot 1.0, 3.0, 3.1, 3.3 and 3.4 on the Coos County Tax Map 1626. The total watershed area affected by the disturbance is 229 acres spanning across 4,416 acres on lots 1.0, 3.0, 3.1, 3.2, 3.3 and 3.4. Please note that no proposed work will occur within Lot 3.2, but due to its location it has been included in the Drainage Analysis for the total watershed. The total area of disturbance is 9,991,513 square feet (229.37 ac). The increase in impervious surface area, within the project watershed area, will be zero (0) square feet (0.00 ac).

As previously stated, this AoT is being submitted under Env-Wq 1503.11b and will not include any new impervious areas within the project disturbance area for the clearing, grubbing, stump removal and grading for the proposed improvement. Any new project within the proposed development area that requires the addition of impervious improvements, such as gravel roadways, ski lift roofs and canopies, etc. will be submitted as a new permit under Env-Wq 1503.11d as specified in Env-Wq 1504.05.

The current drainage design for this project will meet the NHDES Alteration of Terrain rules adopted in 2009. The stormwater design concept will consist of providing treatment of disturbed runoff areas thru treatment practices set on the project site, such as Water Bars and Grass Lined Swales as necessary.

This AoT submittal for the clearing, grubbing, stump removal and grading of the proposed ski trails, lift lines and maintenance access trails will allow for the progress of the Balsams Ski Area Expansion project which also coincides with the Balsams projects involving the Hotel and Village area expansion and the future snow-making water line extension project along Route 26. The AoT permit approval along with coinciding wetland permits will be critical to the overall Balsams projects moving forward. The ability to clear and grade these areas will allow for future detailed design of lift lines and other developments to take place. As previously stated, any new project within the proposed development area that requires the addition of impervious improvements will be submitted under a new permit.

The following table shows the 2, 10 and 50 year peak flow rate comparison at the discharge points.

Table 2.0 – 2, 10 and 50 Year Comparison

2-Year Runoff Peak Flow Rate Comparison			
Analysis Point	**Flow(Q) 2 year Pre-development**	**Flow(Q) 2 year Post-development**	**Difference**
AP1	161.93 cfs	161.93 cfs	0.0 cfs
AP2	55.08 cfs	55.08 cfs	0.0 cfs
AP3	22.73 cfs	22.73 cfs	0.0 cfs
AP4	578.62 cfs	578.62 cfs	0.0 cfs
Analysis Point	**Volume (acre/feet) 2 year Pre-development**	**Volume (acre/feet) 2 year Post-development**	**Difference**
AP1	37.815 af	37.815 af	0.0 af
AP2	6.027 af	6.027 af	0.0 af
AP3	2.228 af	2.228 af	0.0 af
AP4	115.590 af	115.590 af	0.0 af
		Net Change in Vol	0.0 af
10-Year Runoff Peak Flow Rate Comparison			
Analysis Point	**Pre-development Flow Rate (cfs)**	**Post-development Flow Rate (cfs)**	**Difference (cfs)**
AP1	566.23 cfs	566.23 cfs	0.0 cfs
AP2	127.67 cfs	127.67 cfs	0.0 cfs
AP3	44.91 cfs	44.91 cfs	0.0 cfs
AP4	1,421.21 cfs	1,421.21 cfs	0.0 cfs
50-Year Runoff Peak Flow Rate Comparison			
Analysis Point	**Pre-development Flow Rate (cfs)**	**Post-development Flow Rate (cfs)**	**Difference (cfs)**
AP1	1,395.12 cfs	1,395.12 cfs	0.0 cfs
AP2	249.63 cfs	249.63 cfs	0.0 cfs
AP3	80.10 cfs	80.10 cfs	0.0 cfs
AP4	2,901.68 cfs	2,901.68 cfs	0.0 cfs

Impacts to watershed water quality from development within the watersheds are likely from uncontrolled discharge from site runoff during construction activities and stabilized developed surfaces. To minimize the impacts to the watersheds, stormwater treatment devices and erosion control methods have been sized in accordance with the Env-Wq 1500 and the *New Hampshire Stormwater Management Manual* (December, 2008).

2.6.2 Existing Site Conditions

The watershed area for this project is spread across 4,416 acres on Lots 1.0, 3.0, 3.1, 3.2, 3.3 and 3.4 of which is mostly wooded, has several gravel roads and very minimal impervious surfaces. These impervious areas are generally located along the existing Route 26, as well as miscellaneous access trails and parking/pull off areas. Lot 3 also contains the existing cleared ski trail areas for the Wilderness Ski Slopes. Also, located on Lot 1 are Cascade Brook, Flume Brook and Clear Stream, as well as their unnamed tributaries. Stormwater runoff travels in an easterly and southernly direction to these streams then continues to move south east along Clear Stream. Lots 3.0, 3.2 and 3.4 stormwater runoff drains to north along unnamed tributaries of the Mohawk River. As previously noted, no proposed work will be performed within Lot 3.2. These tributaries drain across Route 26 and eventually continue to drain to the Mohawk River. A portion of Lot 3.3 also flows to the north to an existing culvert under Route 26, and eventually drains to Lake Gloriette.

In order to model the existing named and unnamed tributaries within HydroCAD, data was utilized from streamstats.usgs.gov and the provided Bankfull Statistics were averaged and utilized to model the reaches within the Time of Concentration calculations. The Bankfull Statistics parameters that were utilized were the Appalachian Highlands D Bieger 2015, New England P Bieger 2015 and the USA Bieger 2015. The StreamStats reports ran on December 6, 2022 are located in **Section 2.14**.

The soils at the site are listed as Hydrologic Soils Group (HSG) A, B, C and D. A waiver requesting the use NRCS Web Soil Survey data in lieu of a Site Specific Soils analysis has been submitted. Wetlands Delineation was completed by Normandeau Associates in July through September 2022.

2.6.3 Proposed Site Conditions & Disturbances

Approximately 9,991,513 square feet of earth disturbance will be required to for the clearing, grubbing, stump removal and grading for twenty-one (21) proposed ski trails, three (3) maintenance access trails and six (6) proposed ski lift lines. This project will not have any new impervious improvements, but is anticipated to permanently disturb existing wetlands. A complete wetlands application package will be submitted by Normandeau Associates to detail the impacts. An area of disturbance breakdown is shown in **Table 2.1**. The EIC and the UDC will be calculated using all the area for Lot 1.0, 3.0, 3.1, 3.2, 3.3 and 3.4 consisting of a total of 4,416 acres (192,380,237 square feet). The areas within the impacted watershed are shown in **Table 2.1.**

Table 2.1 – Existing/Proposed Disturbance Area Breakdown

Construction/Disturbance Activity	Area (square feet)	% EIC*	% UDC*
Total new impervious area within the project water shed area	0.00		
Total existing impervious area, roads, roofs, and parking all within the project water shed area to remain	2,623,881		
Total Site impervious within the watershed	2,623,881	1.36 %	

Total Proposed Site Disturbance	9,991,513		
Total Undisturbed Area (within water shed)	182,388,724		94.8 %
Total Area (within water shed)	192,380,237		

** EIC = Effective Impervious Cover*
** UDC = Undisturbed Cover*

The impacts to water quality during the clearing, grubbing, stump removal and grading for the proposed ski trails, ski lift lines and maintenance access trails will be minimized using temporary treatment devices and erosion control measures. Frequent site inspections during construction are required during or directly following rainfall events to ensure erosion control devices are working properly.

Any new projects or associated phases in the future that will include impervious improvements within the project disturbance area will be submitted as new projects per Env-Wq 1503.11 (d) and include any water quality treatment BMP's and design information as required.

2.6.4 Rainfall Data

Using SCS TR-20, run under HydroCAD Version 10.10-7a with Type II-24 hour rainfall events, pre-and post-development cover types and drainage paths were modeled to generate peak discharge rates. Rainfall events have specific intensities, or depths, depending on geographic location and are summarized in the following table:

Table 2.2 – Type III, 24 Hour Rainfall Depths for Project Site (44.853°N, 71.316°W)

Rainfall Event	Depth*
2-Year	2.28”
10-Year	3.19”
25-Year	3.87”
50-Year	4.48”

** Rainfall depths from Appendix the Northeast Regional Climate Center Extreme Precipitation Tables, http://precip.eas.cornell.edu, accessed 6 December 2022*

2.6.5 Peak Runoff Control Requirement

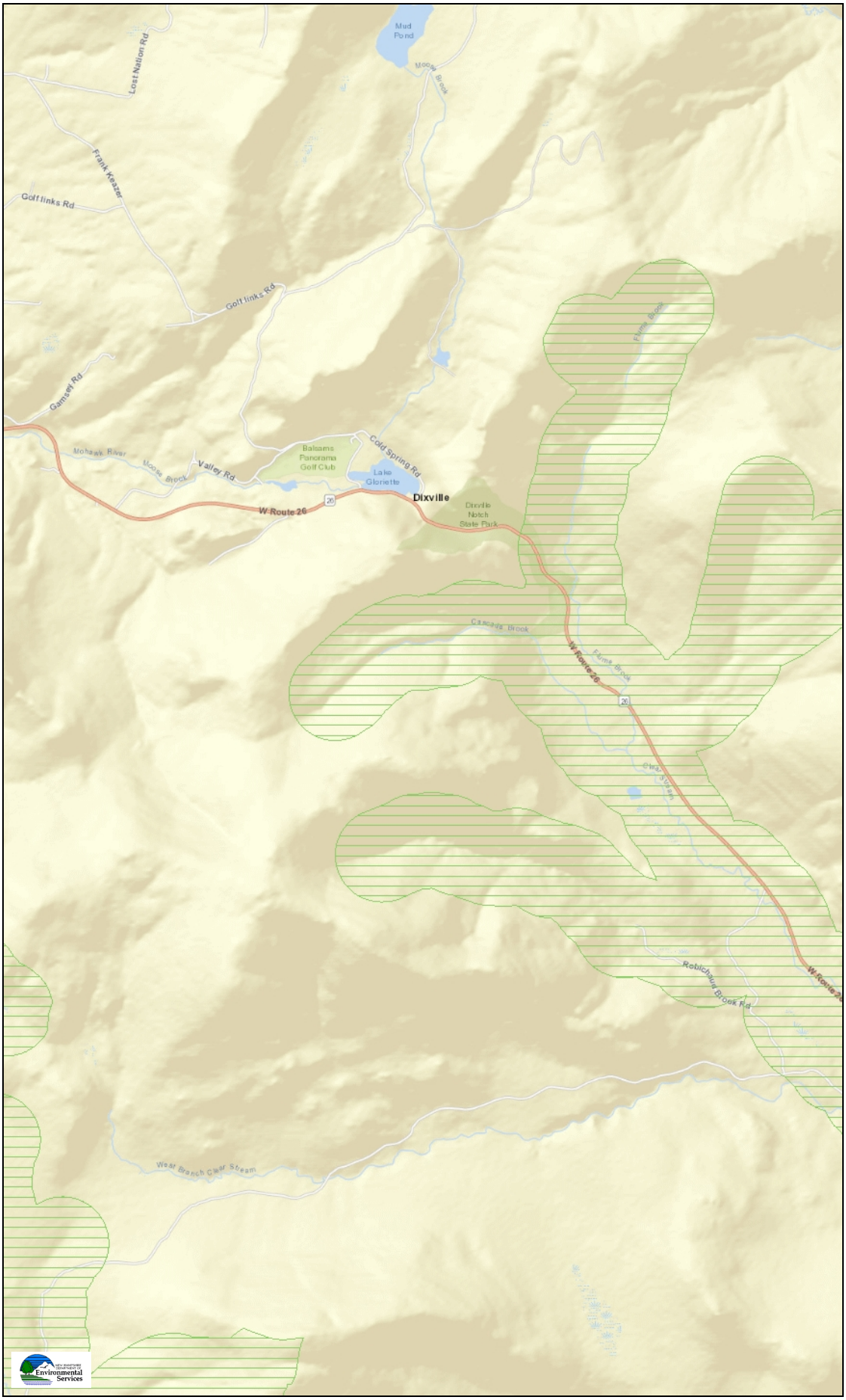
The proposed stormwater treatment devices are designed to attenuate the larger, less frequent rainfall events as required by Env-Wq 1507.06. **Table 2.0** previously summarized the stormwater runoff peak flows from the development for the 10 and 50 year peak flow rates. Note the results of the analysis show no increase in flow rate for the 2, 10 and 50 year events.

2.6.6 Channel Protection Requirement

NHDES requires that the receiving waters and downstream wetland channels be protected from erosion and sedimentation resulting from development. In order to show no impact, the offsite flows must meet one of the conditions in Env-Wq1507.05. **Table 2.0** previously indicated that no increase in 2-year 24 hour flow rates or volumes from the pre-development analysis to the post-development analysis are present.

2.7 Surface Water Impairments

Map By Horizons Engineering



Legend

- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Wellhead Protection Areas
- Water Supply Intake Protect Areas

Map Scale

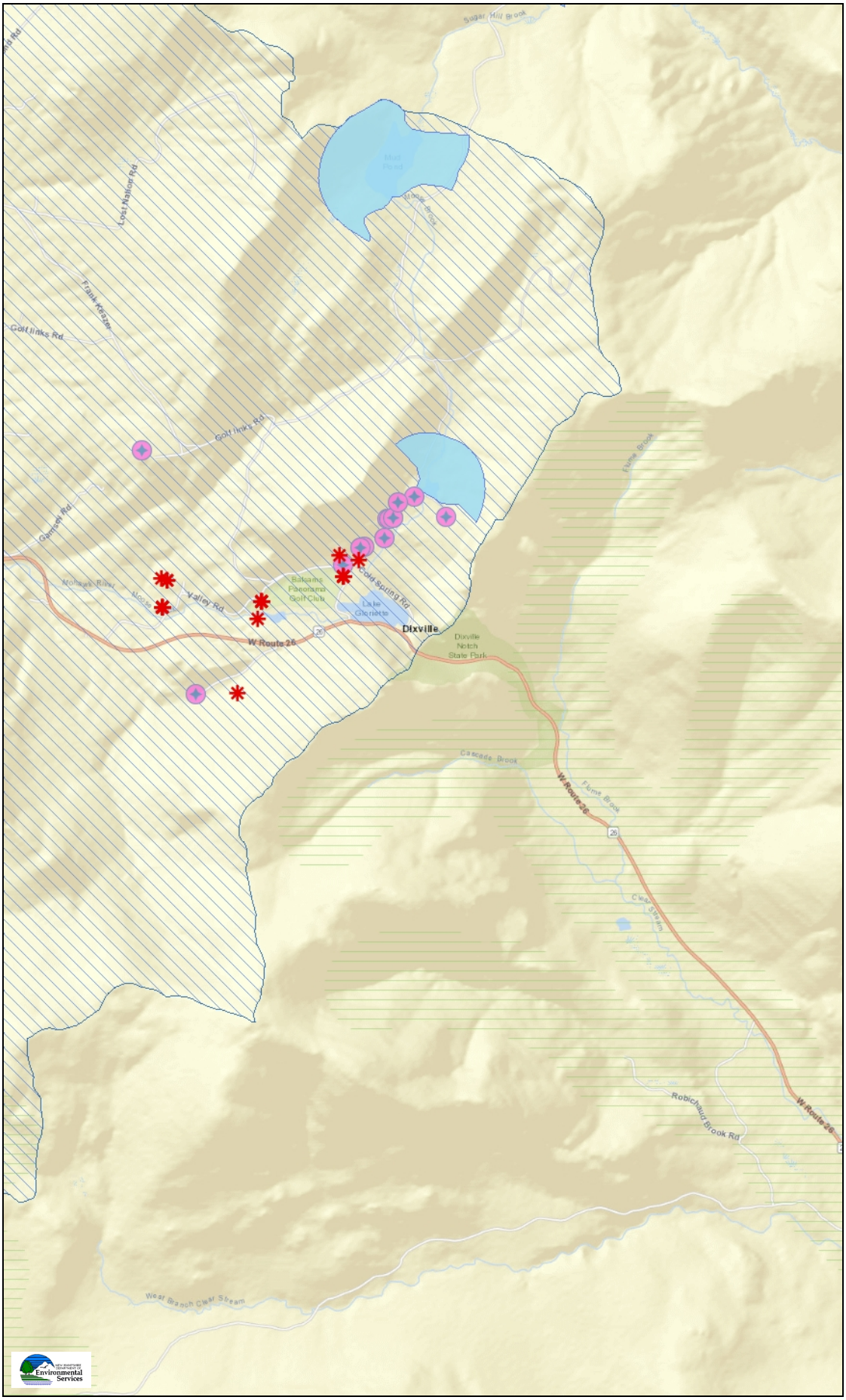
1: 50,000

Map Generated: 11/28/2022

Notes

2.8 AOT Screening Layers

Map By Horizons Engineering



Legend

- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Remediation Sites
- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification GA1
- Groundwater Classification GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarte Buffer
- Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Watersheds with Chloride Impairments 2016

Map Scale

1: 50,000

Map Generated: 11/28/2022

Notes

2.9 NHB Letter/Response

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: William McCloy, Normandeau Associates
P.O. Box 205
Rutland, VT 05701

From: NHB Review, NH Natural Heritage Bureau
Date: 6/14/2022 (valid until 06/14/2023)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit

NHB ID: **NHB22-1961** Town: Dixville Location: Route 26, Dixville, NH 03576
Description: The Balsams Resort redevelopment project is a master planned project that will involve renovation and reconstruction of the existing historic hotel and the addition of new and expanded resort amenities. This will involve improvement to and expansion of the existing ski area. This portion of the project will include clearing of trees for new ski trails and ski lift corridors, addition of snowmaking pipelines, construction of lodges and other ski area support facilities and associated access roads and other utilities.
cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: Please contact NHB regarding plant surveys for the species indicated on the Datacheck Letter.**
F&G: Please continue coordination with NHFG. Refer to NHFG consultation requirements below.

Plant species	**State[1]**	**Federal**	**Notes**
diapensia (*Diapensia lapponica ssp. lapponica*)	T	--	
mountain firmoss (*Huperzia appressa*)	E	--	The largest threat to this species is trampling by hikers.

Vertebrate species	**State[1]**	**Federal**	**Notes**
American Marten (*Martes americana*)	SC	--	Contact the NH Fish & Game Dept (see below).
Cliff Swallow (*Petrochelidon pyrrhonota*)	T	--	Contact the NH Fish & Game Dept (see below).
Common Loon (*Gavia immer*)	T	--	Contact the NH Fish & Game Dept (see below).

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Peregrine Falcon (*Falco peregrinus anatum*)	T	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://wildlife.state.nh.us/wildlife/environmental-review.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule)*, coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle *kim.tuttle@wildlife.nh.gov* with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and "review request" in the email subject line.

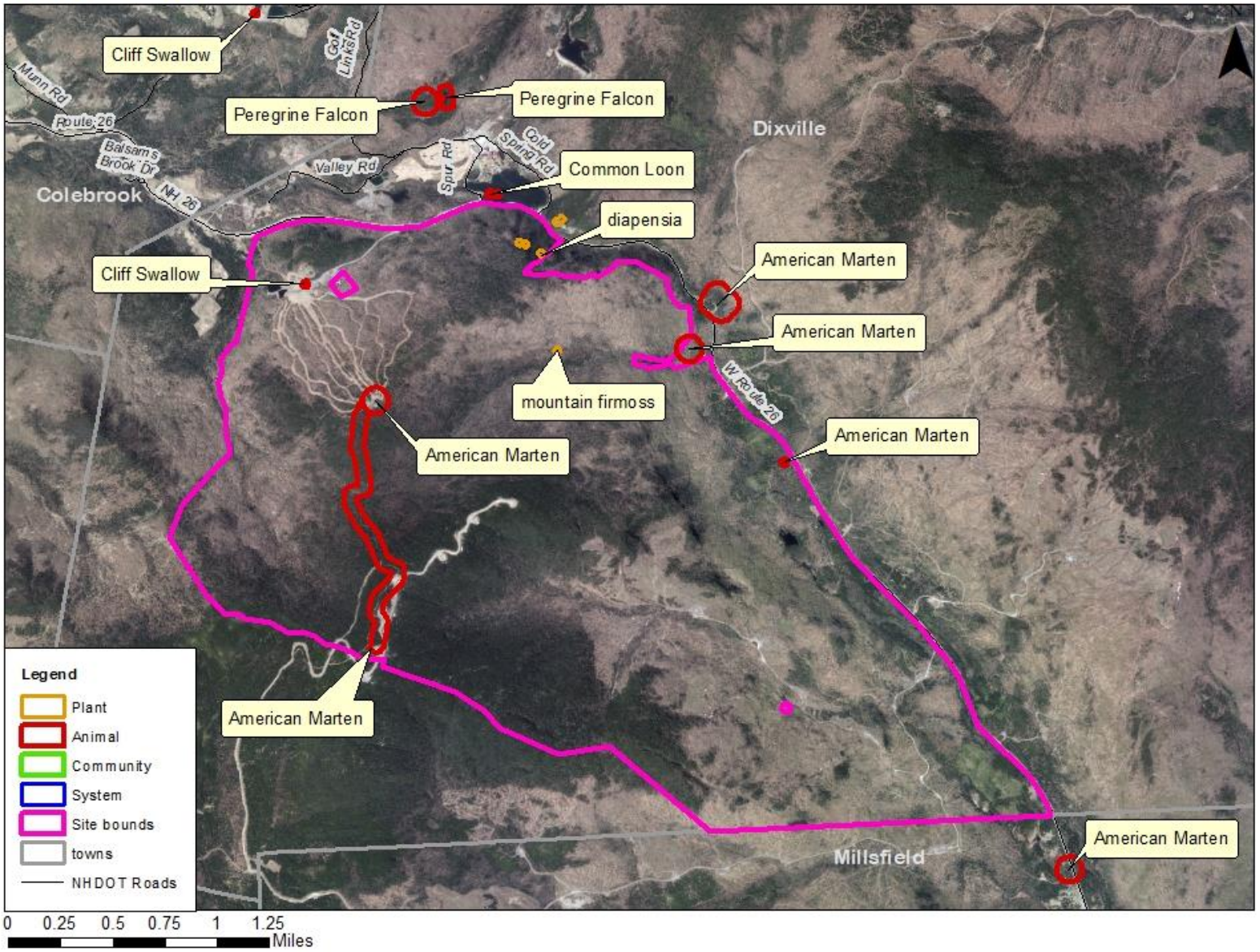
Contact NH Fish & Game at (603) 271-0467 with questions.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB22-1961



New Hampshire Natural Heritage Bureau - Plant Record

diapensia (*Diapensia lapponica ssp. lapponica*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank:	2006: This EO has persisted for nearly a century and is still locally abundant, as described by Pease upon its first observation in 1921. No threats are apparent, but potential stresses are rock climbing and climate change.
Detailed Description:	2016: Area 2: At least three clumps visible when looking over edge from above. 2006: Total estimate is 350 or more plants. Area 1: Estimated 300 or more plants. Area 2: Eight or more plants were observed from the summit of Table Rock proper by sticking head out over the edge of cliff, and a few more were observed from the base of the Table Rock cliffs where they meet the talus slope in a gully. Undoubtedly many more plants could be counted here by rappeling or by procuring a better vantage point. Area 3: Plants observed (no count). 1954: Specimen collected. 1921: Specimen collected.
General Area:	2016: Area 2: Cliff face below Table Rock in highly exposed environment.á Associated cliff plants include scrub balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), black spruce (*Picea mariana*), heart-leaved paper birch (*Betula cordifolia*), plus highland rush (*Juncus trifidus*), mountain cranberry (*Vaccinium vitis-idaea* ssp. *minus*), and haircap moss and lichens. 2006: Narrow ledges and cracks on northwest-facing cliffs on the south side of the notch, in the vicinity of Table Rock. These include the northwest faces of Table Rock proper (Area 2), its subsidiary arΩte (rock-spine) just to the west (Area 3), and the large cliff just to the east of Table Rock (Area 1). Associated species on the cliffs and promontory of Table Rock include *Ledum groenlandicum* (Labrador tea), *Picea rubens* (red spruce), *Vaccinium vitis-idaea* ssp. *minus* (mountain cranberry), *Juncus trifidus* (highland rush), *Abies balsamea* (balsam fir), *Cetraria islandica* (lichen), and *Betula cordifolia* (heartleaf birch). 1954: Cliffs. 1921: No details.
General Comments:	2006: The domes of *Diapensia* at this time of year are a distinctive dark maroon color, and start to appear just above the crown height of the trees at the base of the cliff (always out in the open). This is a very low elevation for this species (probably the lowest in New England), and its occurrence on northwest facing aspects is probably not random. The aspect and the exposure to prevailing west and northwest winds that funnel up the mountain and through the notch create a severe micro-climate that presumably gives *Diapensia* a competitive advantage over other plants.
Management Comments:	--

Location

Survey Site Name: Dixville Notch
Managed By:

County: Coos
Town(s): Dixville
Size: 1.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2006: From Colebrook, take Rte. 26 to Dixville Notch. Park at parking area below top of notch just past entrance to The Balsams resort. Hike up trail to Table Rock. Area 1: The large 5+ acre northwest-facing cliff just east of Table Rock; steep trail between this cliff and Table Rock is best access and one closer viewpoint than Table Rock viewpoint (trial unmarked from the top of the

trail). Area 2: Table Rock, northwest facing ledge. Area 3: ArΩte (rock-spine) immediately west of Table Rock, northwest facing ledge. 1921: Cliffs of Mt. Gloriette.

Dates documented

First reported:	1921	Last reported:	2016-07-19

New Hampshire Natural Heritage Bureau - Plant Record

mountain firmoss (*Huperzia appressa*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Endangered	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2016: Area A: 6 plants in a 1 x 6 m² area. Area B: 6 plants in a 2 x 3 m² area. Area C: 39 plants in a 10 x 30 m² area. Most plants had gemmae.
General Area:	2016: Plants occur on Sanguinary Ridge opposite Table Rock below and along the Sanguinary Ridge Trail across three micro-ledges and cliff faces. Associated plants include stunted balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), American mountain-ash (*Sorbus americana*), and heart-leaved paper birch (*Betula cordifolia*), as well as Labrador-tea (*Rhododendron groenlandicum*), mountain cranberry (*Vaccinium vitis-idaea* ssp. *minus*), and highland rush (*Juncus trifidus*), along with mosses and lichens.
General Comments:	--
Management Comments:	--

Location

Survey Site Name: Dixville Notch
Managed By:

County: Coos
Town(s): Dixville
Size: 1.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2016: From the Balsams Resort, take Route 26 east to the height of land in Dixville Notch. Park on right, cross highway to north, and ascend open ledges and cliffs to uppermost northwest exposures. Three sub-populations in this area. The Sanguinary Ridge Trail also ascends this ridge and offers a top-down approach to the lower sub-populations and traverses the uppermost sub-population, which lies below the trail on the cliff face to the northwest.

Dates documented

First reported: 2016-07-19 Last reported: 2016-07-19

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Special Concern	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2009: Male trapped.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Clear Stream
Managed By:

County: Coos
Town(s): Millsfield
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2009: Rt 26 by Log Haven (?).

Dates documented

First reported: 2009-12-02 Last reported: 2009-12-02

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2008: Male trapped.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Cascade Brook
Managed By:

County: Coos
Town(s): Dixville
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Near state shed in Dixville Notch State Park.

Dates documented

First reported: 2008-12-05 Last reported: 2008-12-05

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2014: Area 14278: Track census of mammals between Dixville Peak and Dixville Notch; 2 meanders, 2 straightline transects. Tracks believed to have been created by 5 to 15 animals. 2008: direct observation.
General Area: 2014: Area 14278: Montane Spruce-fir Forest and Northern Hardwoods-Spruce-Fir Forest
General Comments: --
Management Comments: --

Location

Survey Site Name: The Balsams - Wilderness Ski Resort
Managed By:

County: Coos
Town(s): Dixville
Size: 62.1 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2014: Area 14278: Ridgeline between Dixville Peak and Dixville Notch. 2008: Wilderness Ski Resort Patrol shack.

Dates documented

First reported: 2008-03-17 Last reported: 2014-12-17

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2003: Area 7014: 1 reported by trapper, L. Stanton. 2001: Area 6992: 1 observed by trapper, M. Arseneau. Area 6993: 1 observed by trapper, M. Arseneau. Area 6994: 1 observed by trapper, M. Arseneau. Area 7021: 1 observed by trapper, M. Arseneau.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Flume Brook
Managed By:

County: Coos
Town(s): Dixville
Size: 16.3 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: --

Dates documented

First reported: 2001 Last reported: 2003

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2008: direct observation.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: The Balsams - Wilderness Ski Resort
Managed By:

County: Coos
Town(s): Dixville
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Wilderness Ski Resort Patrol shack.

Dates documented

First reported: 2008-03-17 Last reported: 2008-03-17

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Cliff Swallow (*Petrochelidon pyrrhonota*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Not ranked (need more information)

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2021: Balsams Golf Club: Colony active, but no data collected. 2020: Balsams Golf Club: 2 pairs observed. 172 Harvey Swell Road: 8 pairs observed. 2018: Balsams Golf Club: Nests observed, no count reported. 2017: Balsams Golf Club: Nests observed, no count reported. Harvey Swell Road: Nests observed, no count reported. 2016: Balsams Golf Club: Nests observed, no count reported. 2014: 11 Harvey Swell Road: 1 nest observed. Ski Lodge: 3 nests observed. 2013: Balsams Golf Club: 3 nests observed. Ski Lodge: 3 nests observed. 2011: Balsams Golf Club: Nests observed, no count reported. Ski Lodge: Nests observed, no count reported. 2010: Balsams Golf Club: 10 nests observed. Ski Lodge: 4 nests observed. 2004: Balsams Golf Club: 5 nests observed.
General Area:	2020: 172 Harvey Swell Road: Nests on barn on farm property. 2014: 11 Harvey Swell Road: Nests on barn on farm property. 2010: Ski Lodge: Nests on building at base of ski slopes. 2004: Balsams Golf Club: Nests on building at golf course.
General Comments:	--
Management Comments:	--

Location

Survey Site Name:	Mohawk River Valley		
Managed By:			
County:	Coos		
Town(s):	Colebrook		
Size:	1.9 acres	Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2020: 172 Harvey Swell Road: Barn at 173 Harvey Swell Road. 2014: 11 Harvey Swell Road: Barn at 11 Harvey Swell Road, near intersection with Bear Rock Road. 2010: Ski Lodge: Balsams Wilderness Ski Lodge at base of ski slopes. 2004: Balsams Golf Club: Clubhouse at Panorama Golf Course at Balsams Resort.

Dates documented

First reported:	2004	Last reported:	2021

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Common Loon (*Gavia immer*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Not ranked (need more information)

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2021: 1 pair, no nest. 2020: 1 pair, no nest. 2019: Nest 1: Nest and eggs present, no chicks hatched. 2018: 1 pair, no nest. 2017: 2 nesting attempts: Nest 1: Nest and eggs present, no chicks hatched. Nest 2: 1 chick hatched, 1 chick survived. 2016: Nest location unknown: 1 chick hatched, 1 chick survived. 2015: Nest 1: Nest and eggs present, no chicks hatched. 2014: Nest 1: Nest and eggs present, no chicks hatched.
General Area:	--
General Comments:	LPC Territory NHT0517
Management Comments:	--

Location

Survey Site Name:	Lake Gloriette		
Managed By:			
County:	Coos		
Town(s):	Dixville		
Size:	.9 acres	Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: --

Dates documented

First reported:	2014	Last reported:	2019

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Peregrine Falcon (*Falco peregrinus anatum*)

Legal Status	Conservation Status
Federal: Not listed	Global: Apparently secure but with cause for concern
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Poor quality, condition and/or landscape context ('D' on a scale of A-D).
Comments on Rank:	Only 1 extant nesting site within the EO. The other site (EO# = 26) within this sub-EO has not been used since 1997.
Detailed Description:	2018: Nest 5: 1 chick fledged. 2017: Nest 5: Nest active, no chicks fledged. 2016: Nest 5: 3 chicks fledged. 2014: Nest 4: 1 chick fledged. 2013: Nest 4: Nest failed, no chicks fledged. 2012: Nest 4: Nest failed, no chicks fledged. 2011: Nest 4: Nest failed, no chicks fledged. 2010: Nest 4: 3 chicks fledged. 2009: Nest 3: 2 chicks fledged. 2008: Nest 3: Fledged 1 banded chick, 2 unhatched eggs recovered. 2006: Nest 2: Fledged 1 banded chick, 1 egg unhatched. 2005: Nest 2: Fledged 2 chicks. 2004: Nest 1: Never confirmed more than 1 individual present, did not locate an active nest. 2003: Nest 1: Incubation confirmed but failed to hatch (Obs_id 673). 2002: Nest 1: 4 chicks fledged. 2001: Nest 1: 2 chicks fledged about 7/2 (Obs_id 674). 2000: Nest 1: 3 chicks fledged. 1989-2000: Nest 1: From 1 to 4 young fledged (24 total) in 9 of 12 years (2.0 fledged/year). 1988: Nest 1: Pair present, including sub-adult female. 1933: Nest 1: 1 adult seen in June. 1904: Nest 1: Hoffman breeds.
General Area:	2005: Used new nest ledge in 2005. unknown year: South-facing cliff face.
General Comments:	2006: Adult male(?) right leg, unbanded left leg. Sub-adult female unbanded both legs. 2005: Both adults unbanded. 2004: Ravens nested in cave traditionally used by falcons. 2003: Adult male unbanded (Obs_id 673). 2001: Banded 2 young and collected 1 egg for USFWS on 6/11/2001; adult female unbanded (Obs_id 674).
Management Comments:	2006: No temporary recreational closure implemented.

Location

Survey Site Name: Abeniki Mountain
Managed By:

County: Coos
Town(s): Dixville
Size: 11.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Area 1: Take dirt road to trail to summit of Abeniki Mountain and use climbing gear to descend cliff face to nesting site. Area 2: Approximately 150 m southwest of site 1.

Dates documented

First reported: 1904 Last reported: 2018

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

2.91 Wildlife Impact Assessment

NORMANDEAU ASSOCIATES
Environmental Consultants

The Balsams Ski Area
Wildlife Impact Assessment

Prepared For:
Dixville Capital, LLC
8 Airport Road
PO Box 547
Bethel, ME 04217

Submitted On:
February 10, 2023

Prepared By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

www.normandeau.com

Table of Contents

Page

Part 1: Summary and Findings

Jason D. Collins CWB®	NHB22-1961
Normandeau Associates Inc.	Dixville Capital, LLC
25 Nashua Rd., Bedford NH 03110	Route 26, Dixville, NH
jcollins@normandeua.com	The Balsams Ski Area Phase 1
603-714-3449	Dixville, NH Parcel 1626-0003.0, 1626-0003.1, 1626-0003.3, 1626-0003.4 & 1626-0001

Proposed Project

The proposed The Balsams Ski Area Project ("Project") in the township of Dixville, New Hampshire (NH) consists of the expansion of an existing ski area (Parcel 1626-0003.0, 1626-0003.1, 1626-0003.3, and 1626-0003.4) on 4,905 acres (Parcel 1626-0001).

PHASE I Threatened and Endangered Wildlife and Habitat Assessment Findings:

Check one

- ☐ No threatened and endangered wildlife and habitat present, no threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities.
- ☐ Threatened and endangered wildlife and habitat present; HOWEVER, NO threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities. No conservation measures are proposed.
- ☑ Threatened and endangered wildlife and habitat present or wildlife corridors present. Proposed actions have the potential for impacts. Conservation measures incorporated into the proposed project or project design.

Threatened and Endangered Wildlife Habitat

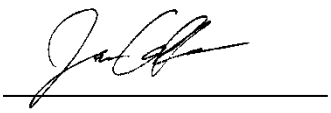
The Project is within the range of several threatened or endangered species according to the New Hampshire Heritage Bureau Data Check (Part 2; NHB Review). These include American marten (*Martes americana*), peregrine falcon (*Falco peregrinus*), cliff swallow (*Petrochelidon pyrrhonota*), common loon (*Gavia immer*) and several species of plants. The northern long-eared bat (*Myotis septentrionalis*) is potentially present and is listed by U.S. Fish and Wildlife Service (USFWS) as threatened (endangered as of March 31, 2023). No roosting or hibernacula locations were identified in the NHB Review. Canada lynx (*Lynx canadensis*) is present in the project vicinity and is listed by USFWS as threatened and as endangered in New Hampshire.

Proposed Conservation Measures

In order to minimize impacts to northern long-eared bat, and other species of bats, the project intends to remove trees outside of the active season (April 1 – October 31). Wetlands requiring clearing will be cut flush to the ground and the stumps left in place; no direct impacts to vernal pool depressions are anticipated at this time. Tree removal within 500 feet of a vernal pool will primarily occur when the ground is frozen, outside of the season when juveniles and adults are active on the forest floor (approximately, April 1 – December 31). In order to minimize impacts peregrine falcon and common loon, no blasting will occur in the project area during the nesting season (April 1 – August 15).

NHB22-1961
NHB Applicant: Dixville Capital, LLC
The Balsams Ski Area Phase 1
Route 26, Dixville, NH

I, Jason Collins, Certified Wildlife Biologist®, affirm to the accuracy of this wildlife assessment and the information contain herein, to the best of my knowledge, on December 9, 2022.



Part 2: NHB Datacheck Results, Figures, Site Photographs

New Hampshire Heritage Bureau Data Check

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: William McCloy, Normandeau Associates
P.O. Box 205
Rutland, VT 05701

From: NHB Review, NH Natural Heritage Bureau
Date: 6/14/2022 (valid until 06/14/2023)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Alteration of Terrain Permit, NHDES - Shoreland Standard Permit

NHB ID: **NHB22-1961** Town: Dixville Location: Route 26, Dixville, NH 03576
Description: The Balsams Resort redevelopment project is a master planned project that will involve renovation and reconstruction of the existing historic hotel and the addition of new and expanded resort amenities. This will involve improvement to and expansion of the existing ski area. This portion of the project will include clearing of trees for new ski trails and ski lift corridors, addition of snowmaking pipelines, construction of lodges and other ski area support facilities and associated access roads and other utilities.
cc: NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments **NHB: Please contact NHB regarding plant surveys for the species indicated on the Datacheck Letter.**
F&G: Please continue coordination with NHFG. Refer to NHFG consultation requirements below.

Plant species	**State[1]**	**Federal**	**Notes**
diapensia (*Diapensia lapponica ssp. lapponica*)	T	--	
mountain firmoss (*Huperzia appressa*)	E	--	The largest threat to this species is trampling by hikers.

Vertebrate species	**State[1]**	**Federal**	**Notes**
American Marten (*Martes americana*)	SC	--	Contact the NH Fish & Game Dept (see below).
Cliff Swallow (*Petrochelidon pyrrhonota*)	T	--	Contact the NH Fish & Game Dept (see below).
Common Loon (*Gavia immer*)	T	--	Contact the NH Fish & Game Dept (see below).

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

Peregrine Falcon (*Falco peregrinus anatum*)	T	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to https://wildlife.state.nh.us/wildlife/environmental-review.html. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule)*, coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle *kim.tuttle@wildlife.nh.gov* with a copy to NHFGreview@wildlife.nh.gov, and include the NHB Datacheck results letter number and "review request" in the email subject line.

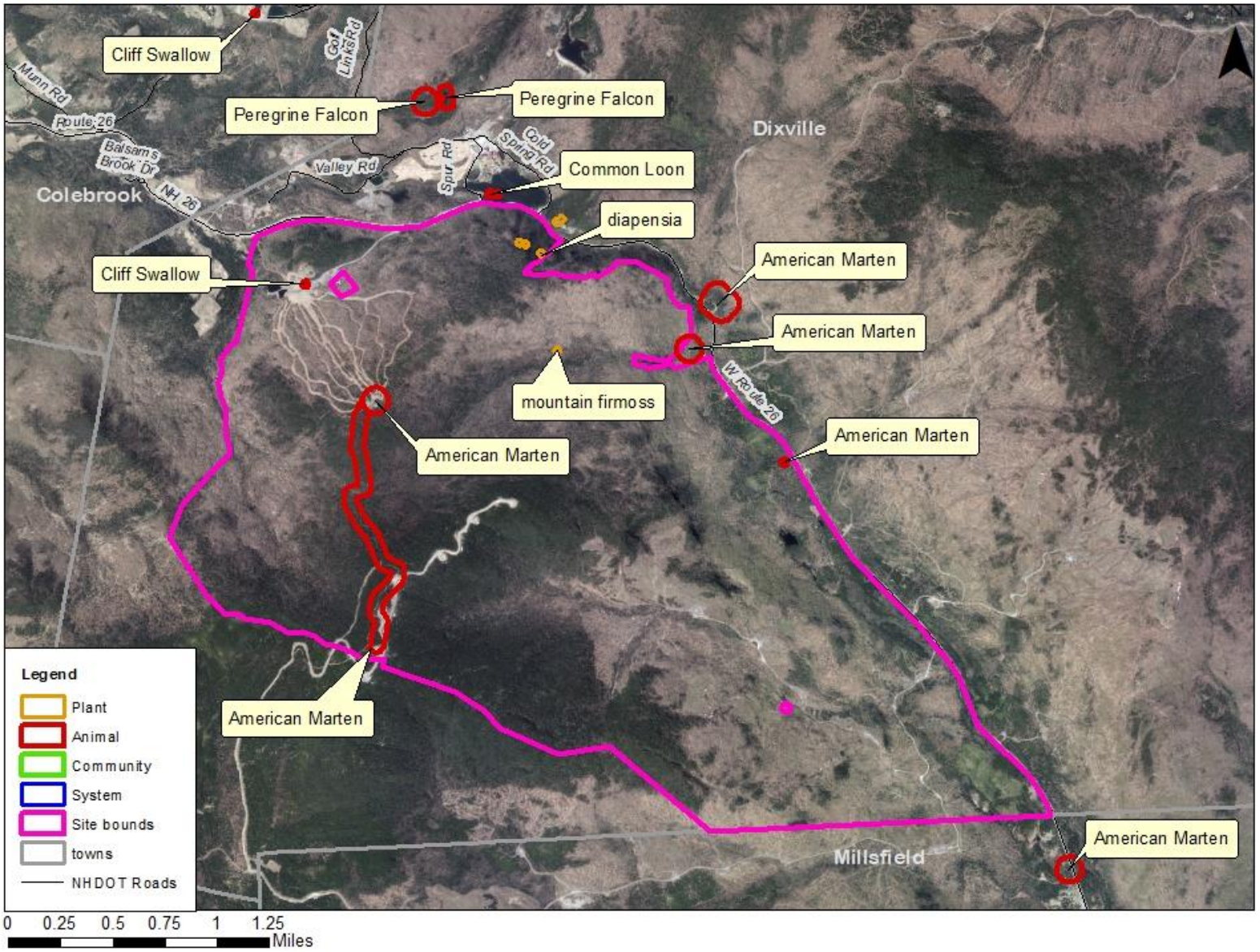
Contact NH Fish & Game at (603) 271-0467 with questions.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB22-1961



New Hampshire Natural Heritage Bureau - Plant Record

diapensia (*Diapensia lapponica ssp. lapponica*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank:	2006: This EO has persisted for nearly a century and is still locally abundant, as described by Pease upon its first observation in 1921. No threats are apparent, but potential stresses are rock climbing and climate change.
Detailed Description:	2016: Area 2: At least three clumps visible when looking over edge from above. 2006: Total estimate is 350 or more plants. Area 1: Estimated 300 or more plants. Area 2: Eight or more plants were observed from the summit of Table Rock proper by sticking head out over the edge of cliff, and a few more were observed from the base of the Table Rock cliffs where they meet the talus slope in a gully. Undoubtedly many more plants could be counted here by rappeling or by procuring a better vantage point. Area 3: Plants observed (no count). 1954: Specimen collected. 1921: Specimen collected.
General Area:	2016: Area 2: Cliff face below Table Rock in highly exposed environment.á Associated cliff plants include scrub balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), black spruce (*Picea mariana*), heart-leaved paper birch (*Betula cordifolia*), plus highland rush (*Juncus trifidus*), mountain cranberry (*Vaccinium vitis-idaea* ssp. *minus*), and haircap moss and lichens. 2006: Narrow ledges and cracks on northwest-facing cliffs on the south side of the notch, in the vicinity of Table Rock. These include the northwest faces of Table Rock proper (Area 2), its subsidiary arΩte (rock-spine) just to the west (Area 3), and the large cliff just to the east of Table Rock (Area 1). Associated species on the cliffs and promontory of Table Rock include *Ledum groenlandicum* (Labrador tea), *Picea rubens* (red spruce), *Vaccinium vitis-idaea* ssp. *minus* (mountain cranberry), *Juncus trifidus* (highland rush), *Abies balsamea* (balsam fir), *Cetraria islandica* (lichen), and *Betula cordifolia* (heartleaf birch). 1954: Cliffs. 1921: No details.
General Comments:	2006: The domes of *Diapensia* at this time of year are a distinctive dark maroon color, and start to appear just above the crown height of the trees at the base of the cliff (always out in the open). This is a very low elevation for this species (probably the lowest in New England), and its occurrence on northwest facing aspects is probably not random. The aspect and the exposure to prevailing west and northwest winds that funnel up the mountain and through the notch create a severe micro-climate that presumably gives *Diapensia* a competitive advantage over other plants.
Management Comments:	--

Location

Survey Site Name: Dixville Notch
Managed By:

County: Coos
Town(s): Dixville
Size: 1.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2006: From Colebrook, take Rte. 26 to Dixville Notch. Park at parking area below top of notch just past entrance to The Balsams resort. Hike up trail to Table Rock. Area 1: The large 5+ acre northwest-facing cliff just east of Table Rock; steep trail between this cliff and Table Rock is best access and one closer viewpoint than Table Rock viewpoint (trial unmarked from the top of the

trail). Area 2: Table Rock, northwest facing ledge. Area 3: ArΩte (rock-spine) immediately west of Table Rock, northwest facing ledge. 1921: Cliffs of Mt. Gloriette.

Dates documented

First reported:	1921	Last reported:	2016-07-19

New Hampshire Natural Heritage Bureau - Plant Record

mountain firmoss (*Huperzia appressa*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Endangered	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2016: Area A: 6 plants in a 1 x 6 m² area. Area B: 6 plants in a 2 x 3 m² area. Area C: 39 plants in a 10 x 30 m² area. Most plants had gemmae.
General Area:	2016: Plants occur on Sanguinary Ridge opposite Table Rock below and along the Sanguinary Ridge Trail across three micro-ledges and cliff faces. Associated plants include stunted balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), American mountain-ash (*Sorbus americana*), and heart-leaved paper birch (*Betula cordifolia*), as well as Labrador-tea (*Rhododendron groenlandicum*), mountain cranberry (*Vaccinium vitis-idaea* ssp. *minus*), and highland rush (*Juncus trifidus*), along with mosses and lichens.
General Comments:	--
Management Comments:	--

Location

Survey Site Name: Dixville Notch
Managed By:

County: Coos
Town(s): Dixville
Size: 1.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2016: From the Balsams Resort, take Route 26 east to the height of land in Dixville Notch. Park on right, cross highway to north, and ascend open ledges and cliffs to uppermost northwest exposures. Three sub-populations in this area. The Sanguinary Ridge Trail also ascends this ridge and offers a top-down approach to the lower sub-populations and traverses the uppermost sub-population, which lies below the trail on the cliff face to the northwest.

Dates documented

First reported: 2016-07-19 Last reported: 2016-07-19

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status		Conservation Status	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Special Concern	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2009: Male trapped.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Clear Stream
Managed By:

County: Coos
Town(s): Millsfield
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2009: Rt 26 by Log Haven (?).

Dates documented

First reported: 2009-12-02 Last reported: 2009-12-02

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2008: Male trapped.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Cascade Brook
Managed By:

County: Coos
Town(s): Dixville
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Near state shed in Dixville Notch State Park.

Dates documented

First reported: 2008-12-05 Last reported: 2008-12-05

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2014: Area 14278: Track census of mammals between Dixville Peak and Dixville Notch; 2 meanders, 2 straightline transects. Tracks believed to have been created by 5 to 15 animals. 2008: direct observation.
General Area: 2014: Area 14278: Montane Spruce-fir Forest and Northern Hardwoods-Spruce-Fir Forest
General Comments: --
Management Comments: --

Location

Survey Site Name: The Balsams - Wilderness Ski Resort
Managed By:

County: Coos
Town(s): Dixville
Size: 62.1 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2014: Area 14278: Ridgeline between Dixville Peak and Dixville Notch. 2008: Wilderness Ski Resort Patrol shack.

Dates documented

First reported: 2008-03-17 Last reported: 2014-12-17

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2003: Area 7014: 1 reported by trapper, L. Stanton. 2001: Area 6992: 1 observed by trapper, M. Arseneau. Area 6993: 1 observed by trapper, M. Arseneau. Area 6994: 1 observed by trapper, M. Arseneau. Area 7021: 1 observed by trapper, M. Arseneau.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: Flume Brook
Managed By:

County: Coos
Town(s): Dixville
Size: 16.3 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: --

Dates documented

First reported: 2001 Last reported: 2003

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

American Marten (*Martes americana*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Special Concern	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2008: direct observation.
General Area: --
General Comments: --
Management Comments: --

Location

Survey Site Name: The Balsams - Wilderness Ski Resort
Managed By:

County: Coos
Town(s): Dixville
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Wilderness Ski Resort Patrol shack.

Dates documented

First reported: 2008-03-17 Last reported: 2008-03-17

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Cliff Swallow (*Petrochelidon pyrrhonota*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Not ranked (need more information)

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2021: Balsams Golf Club: Colony active, but no data collected. 2020: Balsams Golf Club: 2 pairs observed. 172 Harvey Swell Road: 8 pairs observed. 2018: Balsams Golf Club: Nests observed, no count reported. 2017: Balsams Golf Club: Nests observed, no count reported. Harvey Swell Road: Nests observed, no count reported. 2016: Balsams Golf Club: Nests observed, no count reported. 2014: 11 Harvey Swell Road: 1 nest observed. Ski Lodge: 3 nests observed. 2013: Balsams Golf Club: 3 nests observed. Ski Lodge: 3 nests observed. 2011: Balsams Golf Club: Nests observed, no count reported. Ski Lodge: Nests observed, no count reported. 2010: Balsams Golf Club: 10 nests observed. Ski Lodge: 4 nests observed. 2004: Balsams Golf Club: 5 nests observed.
General Area:	2020: 172 Harvey Swell Road: Nests on barn on farm property. 2014: 11 Harvey Swell Road: Nests on barn on farm property. 2010: Ski Lodge: Nests on building at base of ski slopes. 2004: Balsams Golf Club: Nests on building at golf course.
General Comments:	--
Management Comments:	--

Location

Survey Site Name:	Mohawk River Valley		
Managed By:			
County:	Coos		
Town(s):	Colebrook		
Size:	1.9 acres	Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2020: 172 Harvey Swell Road: Barn at 173 Harvey Swell Road. 2014: 11 Harvey Swell Road: Barn at 11 Harvey Swell Road, near intersection with Bear Rock Road. 2010: Ski Lodge: Balsams Wilderness Ski Lodge at base of ski slopes. 2004: Balsams Golf Club: Clubhouse at Panorama Golf Course at Balsams Resort.

Dates documented

First reported:	2004	Last reported:	2021

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Common Loon (*Gavia immer*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Not ranked (need more information)

Description at this Location

Conservation Rank:	Not ranked
Comments on Rank:	--
Detailed Description:	2021: 1 pair, no nest. 2020: 1 pair, no nest. 2019: Nest 1: Nest and eggs present, no chicks hatched. 2018: 1 pair, no nest. 2017: 2 nesting attempts: Nest 1: Nest and eggs present, no chicks hatched. Nest 2: 1 chick hatched, 1 chick survived. 2016: Nest location unknown: 1 chick hatched, 1 chick survived. 2015: Nest 1: Nest and eggs present, no chicks hatched. 2014: Nest 1: Nest and eggs present, no chicks hatched.
General Area:	--
General Comments:	LPC Territory NHT0517
Management Comments:	--

Location

Survey Site Name:	Lake Gloriette		
Managed By:			
County:	Coos		
Town(s):	Dixville		
Size:	.9 acres	Elevation:	

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: --

Dates documented

First reported:	2014	Last reported:	2019

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Peregrine Falcon (*Falco peregrinus anatum*)

Legal Status	Conservation Status
Federal: Not listed	Global: Apparently secure but with cause for concern
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Poor quality, condition and/or landscape context ('D' on a scale of A-D).
Comments on Rank:	Only 1 extant nesting site within the EO. The other site (EO# = 26) within this sub-EO has not been used since 1997.
Detailed Description:	2018: Nest 5: 1 chick fledged. 2017: Nest 5: Nest active, no chicks fledged. 2016: Nest 5: 3 chicks fledged. 2014: Nest 4: 1 chick fledged. 2013: Nest 4: Nest failed, no chicks fledged. 2012: Nest 4: Nest failed, no chicks fledged. 2011: Nest 4: Nest failed, no chicks fledged. 2010: Nest 4: 3 chicks fledged. 2009: Nest 3: 2 chicks fledged. 2008: Nest 3: Fledged 1 banded chick, 2 unhatched eggs recovered. 2006: Nest 2: Fledged 1 banded chick, 1 egg unhatched. 2005: Nest 2: Fledged 2 chicks. 2004: Nest 1: Never confirmed more than 1 individual present, did not locate an active nest. 2003: Nest 1: Incubation confirmed but failed to hatch (Obs_id 673). 2002: Nest 1: 4 chicks fledged. 2001: Nest 1: 2 chicks fledged about 7/2 (Obs_id 674). 2000: Nest 1: 3 chicks fledged. 1989-2000: Nest 1: From 1 to 4 young fledged (24 total) in 9 of 12 years (2.0 fledged/year). 1988: Nest 1: Pair present, including sub-adult female. 1933: Nest 1: 1 adult seen in June. 1904: Nest 1: Hoffman breeds.
General Area:	2005: Used new nest ledge in 2005. unknown year: South-facing cliff face.
General Comments:	2006: Adult male(?) right leg, unbanded left leg. Sub-adult female unbanded both legs. 2005: Both adults unbanded. 2004: Ravens nested in cave traditionally used by falcons. 2003: Adult male unbanded (Obs_id 673). 2001: Banded 2 young and collected 1 egg for USFWS on 6/11/2001; adult female unbanded (Obs_id 674).
Management Comments:	2006: No temporary recreational closure implemented.

Location

Survey Site Name: Abeniki Mountain
Managed By:

County: Coos
Town(s): Dixville
Size: 11.4 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

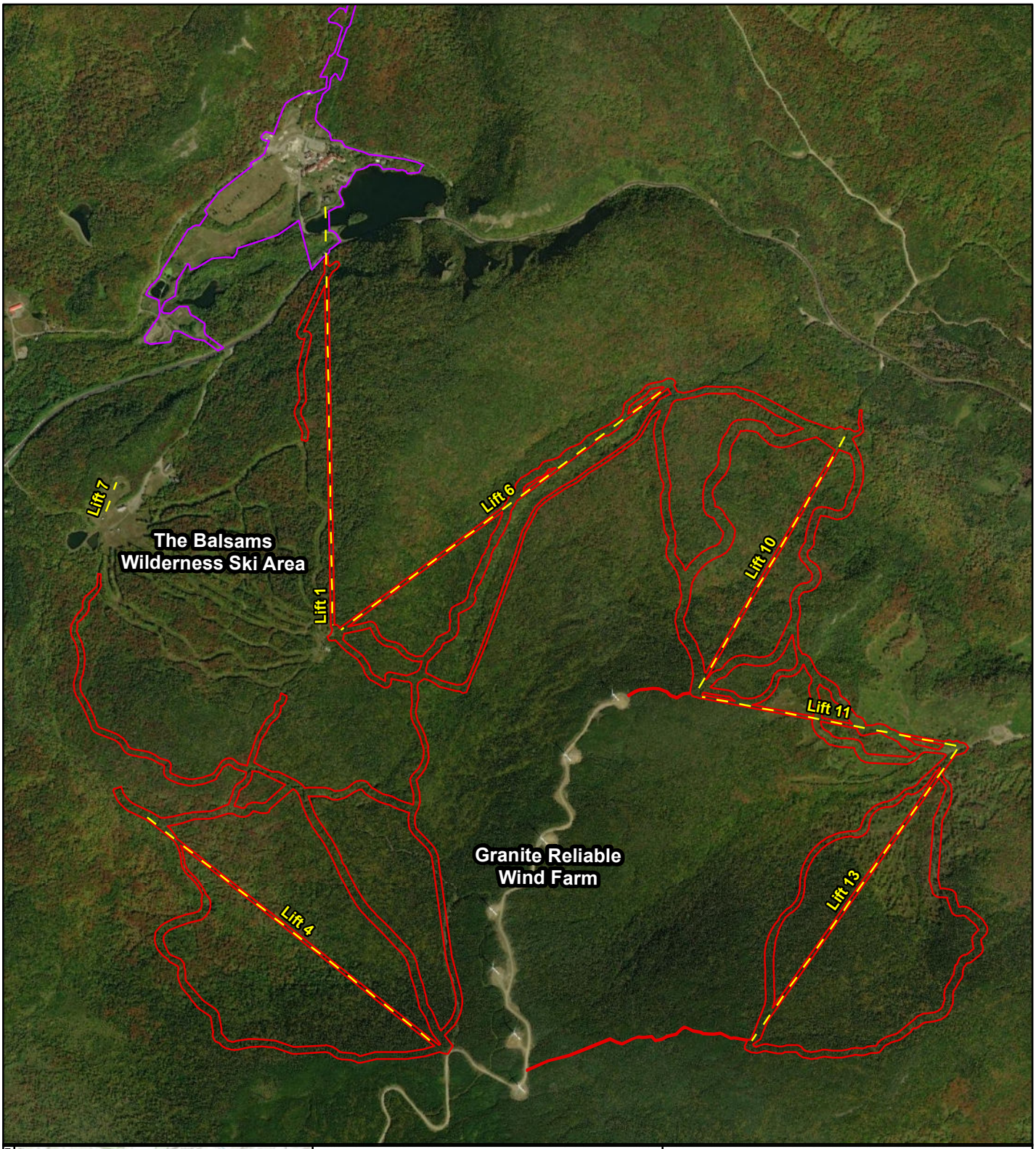
Directions: Area 1: Take dirt road to trail to summit of Abeniki Mountain and use climbing gear to descend cliff face to nesting site. Area 2: Approximately 150 m southwest of site 1.

Dates documented

First reported: 1904 Last reported: 2018

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

Habitat Features Maps



Index Map

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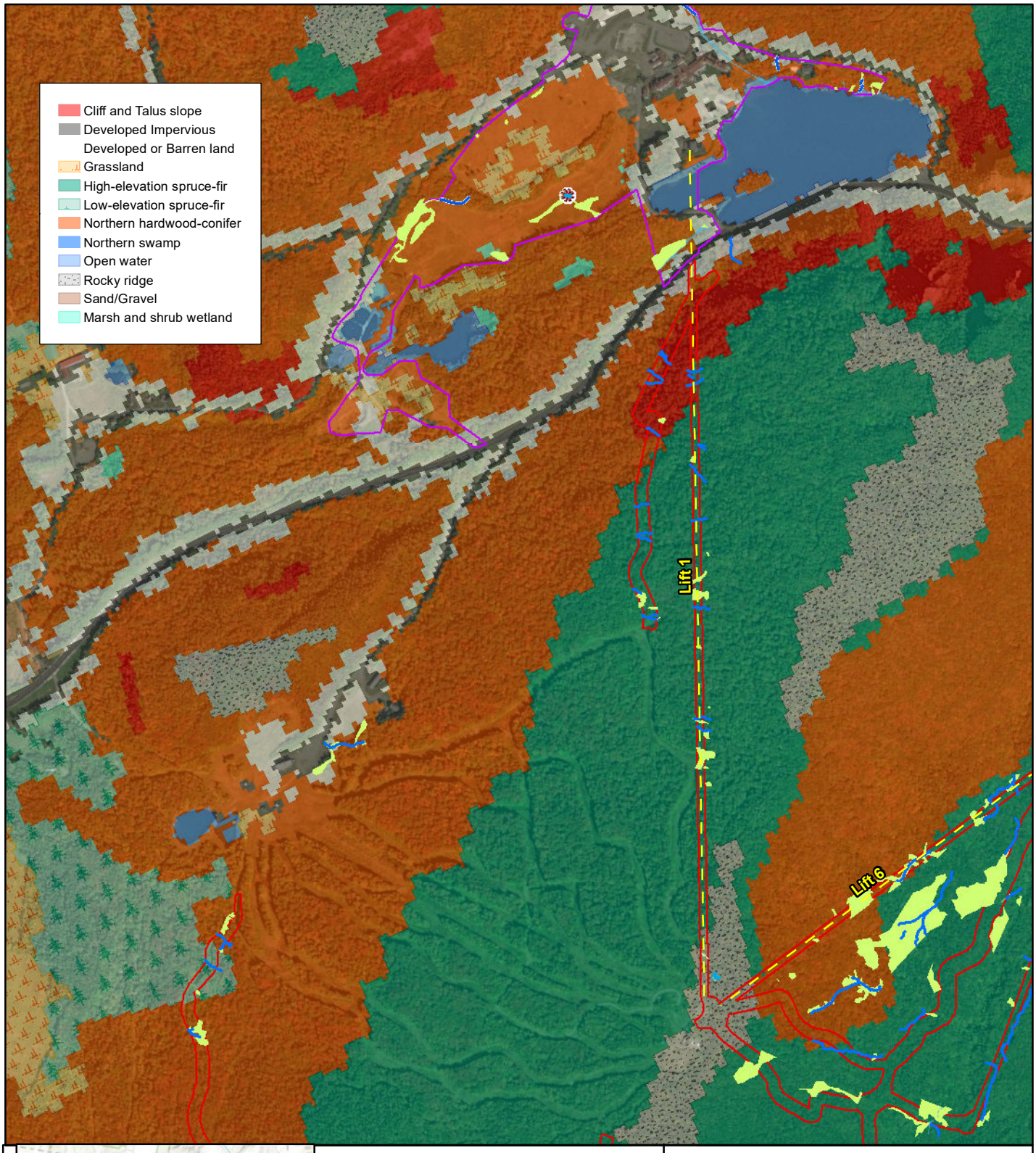
Proposed Skil Lift
Lake Gloriette House Project Area
Proposed Trails/Lifts

Project Location Map
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



Index Map

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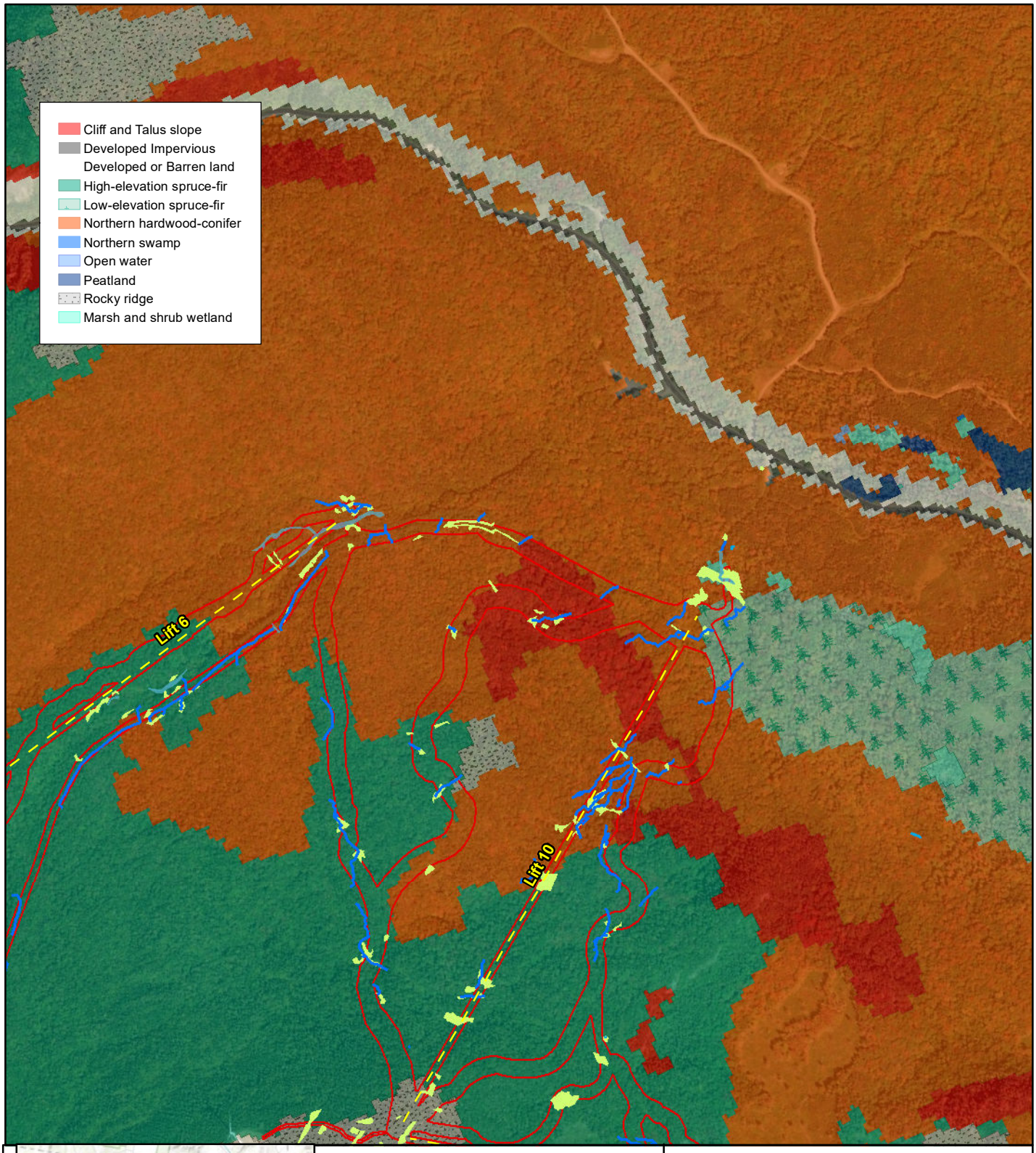
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

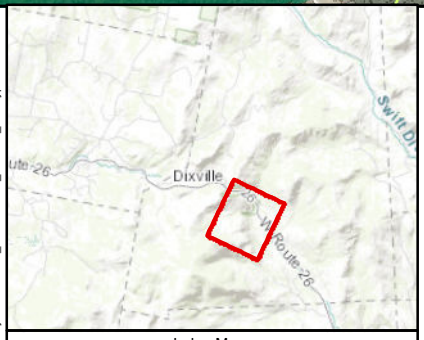
Wildlife Action Plan Habitat Type
Map 1 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet





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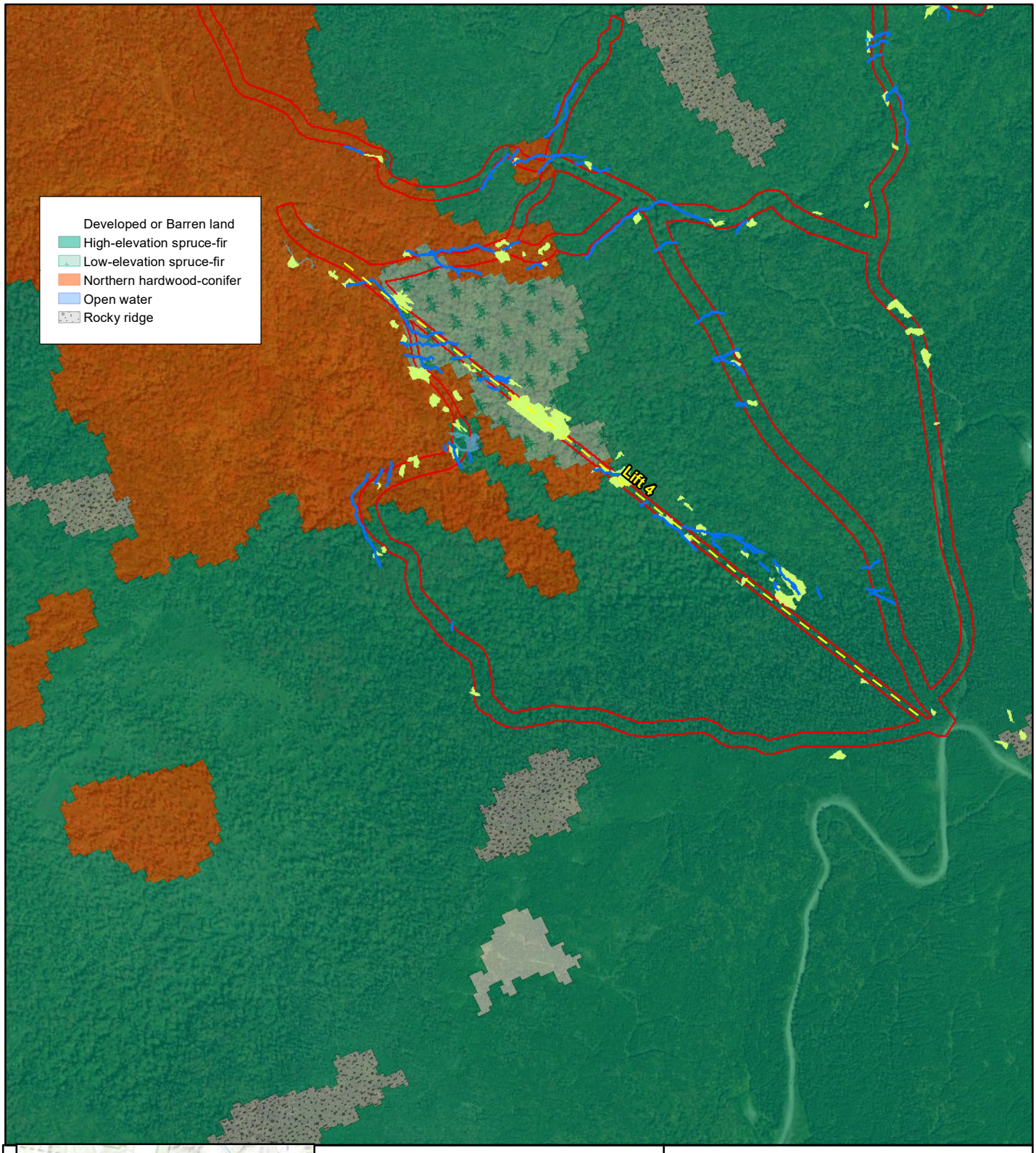
Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Proposed Trails/Lifts

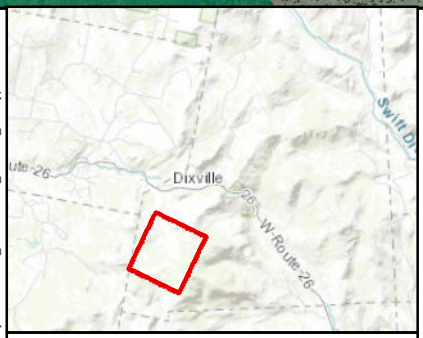
Wildlife Action Plan Habitat Type Map 2 - Balsams Ski Area Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet





Index Map

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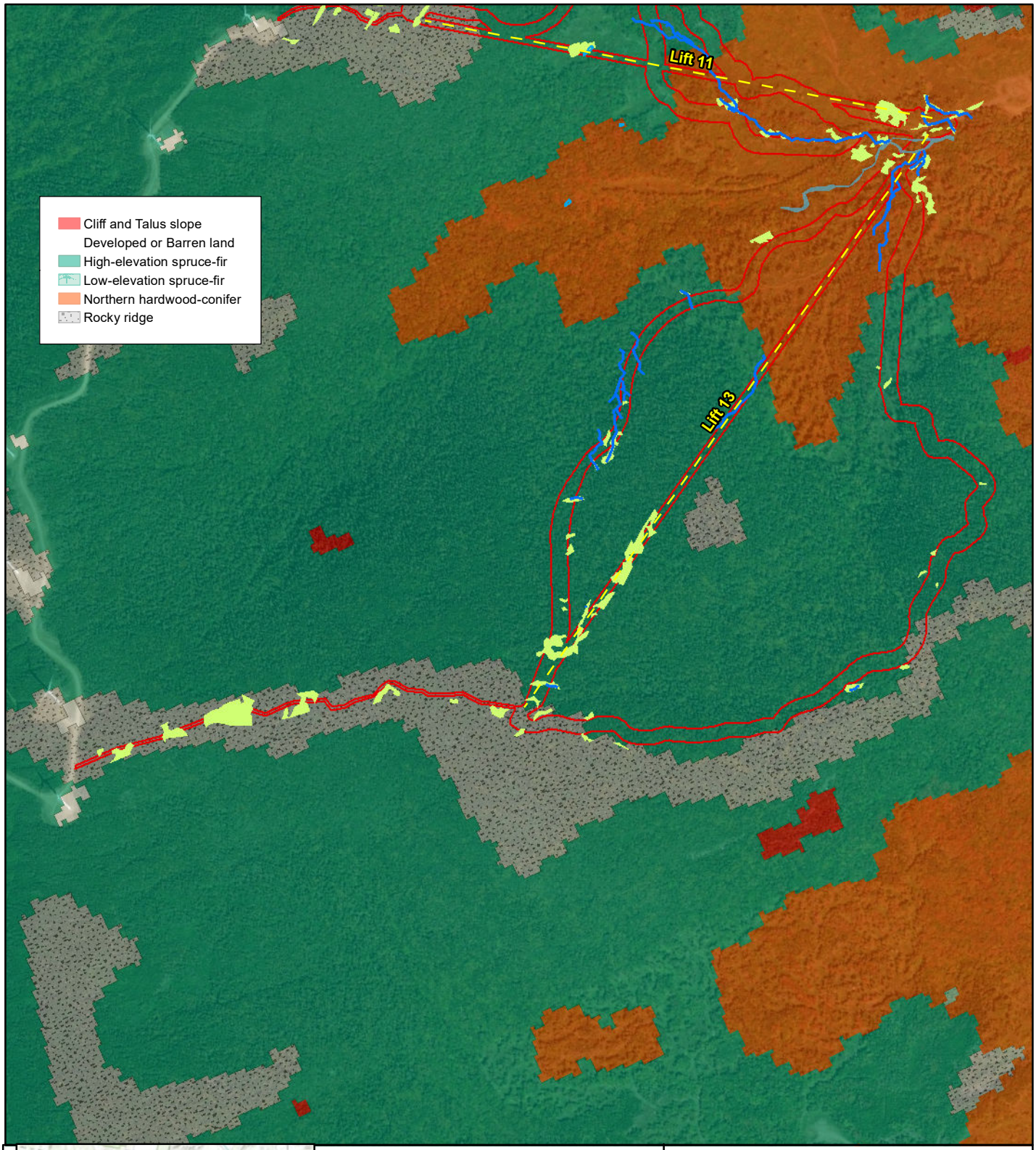
Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Proposed Trails/Lifts

Wildlife Action Plan Habitat Type
Map 3 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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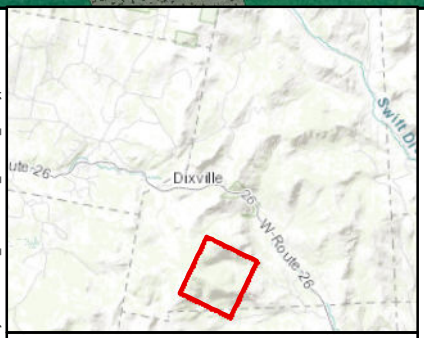


Index Map

Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Proposed Trails/Lifts

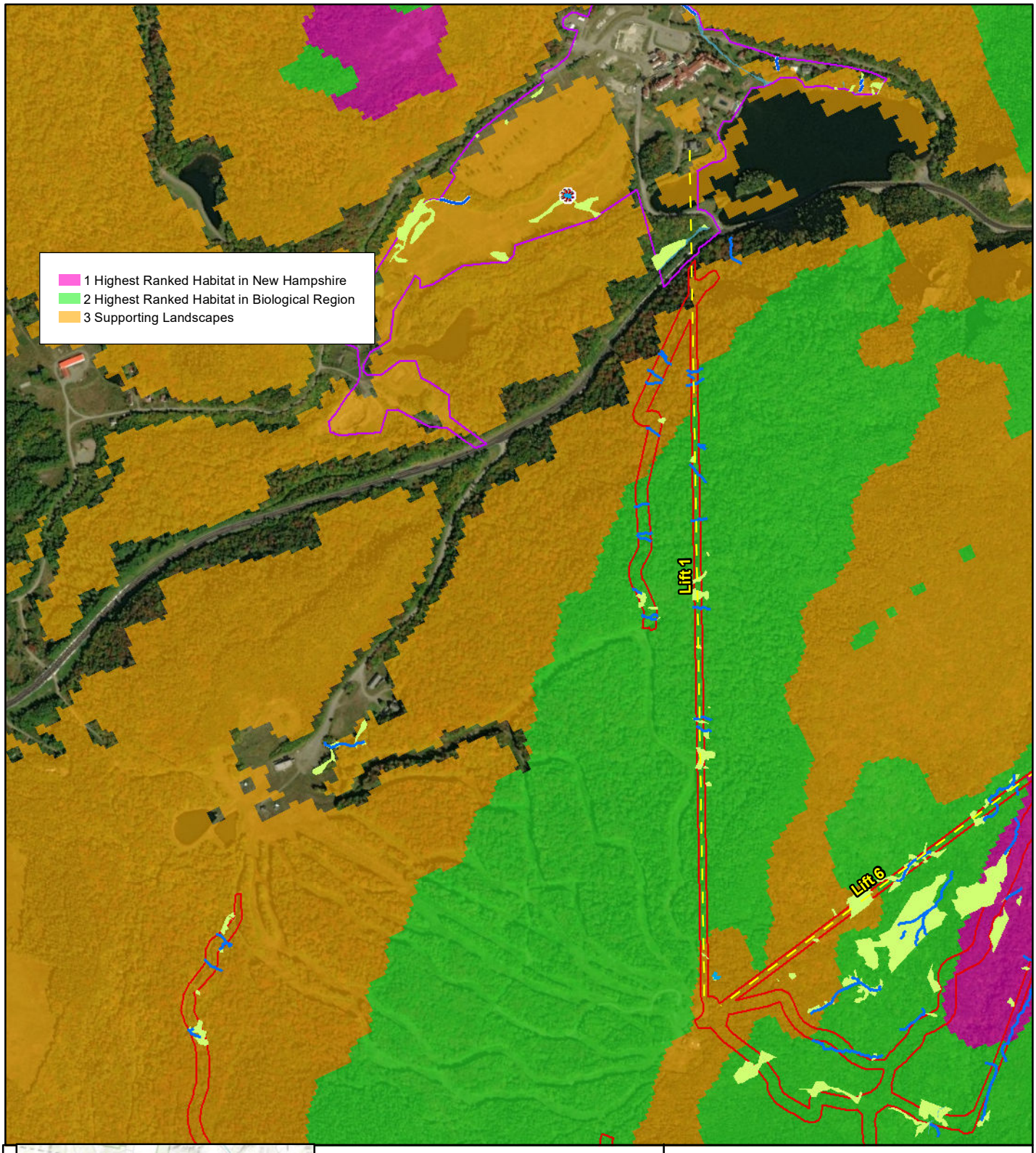
N
E
S
W

Wildlife Action Plan Habitat Type Map 4 - Balsams Ski Area Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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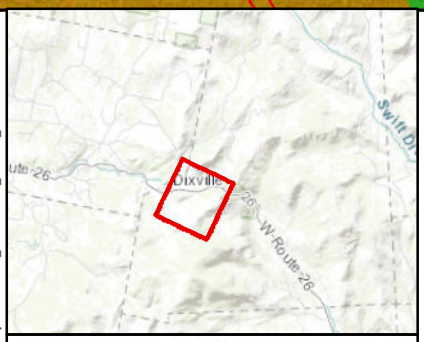


Index Map

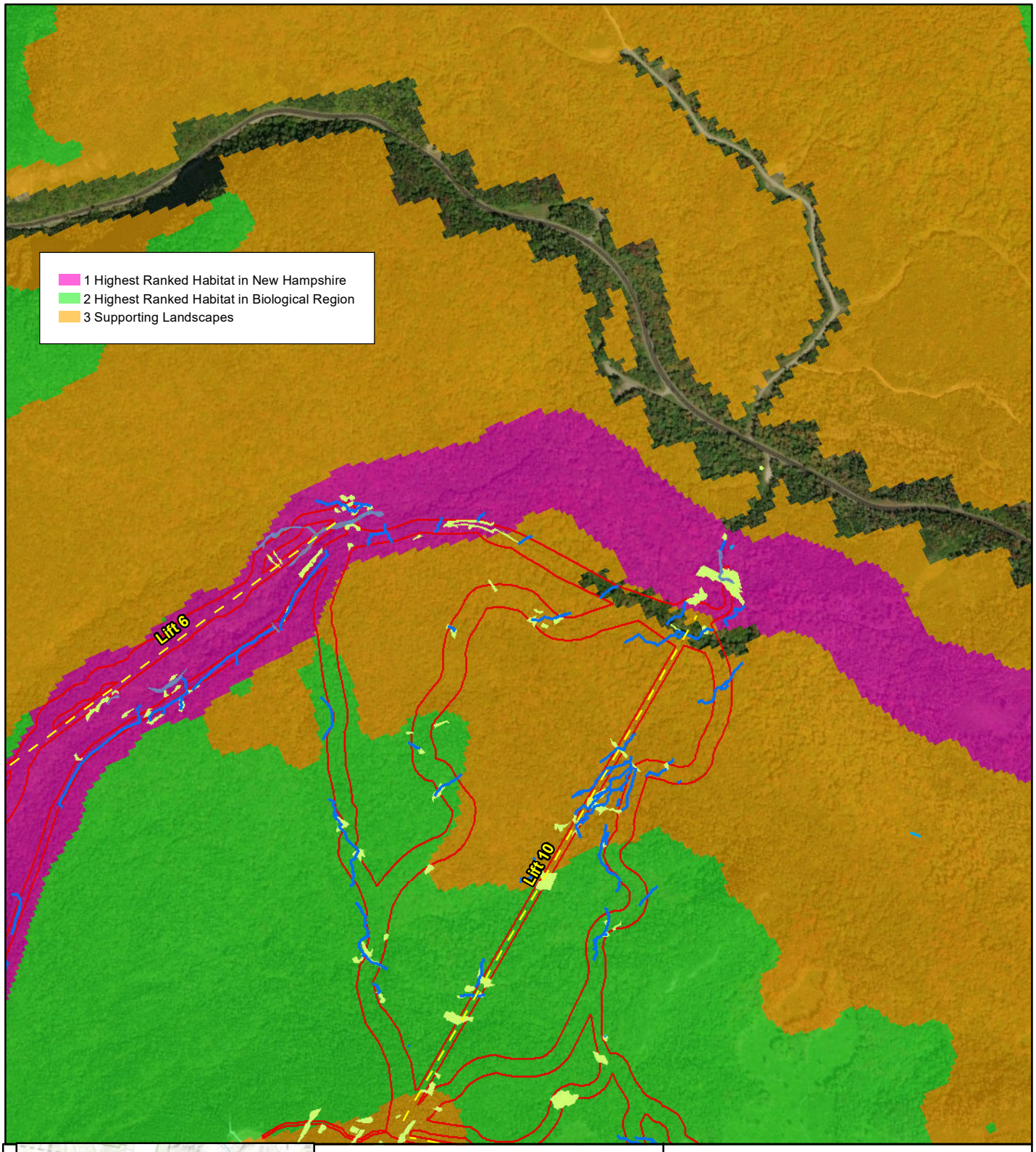
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

Wildlife Action Plan Habitat Tiers
Map 1 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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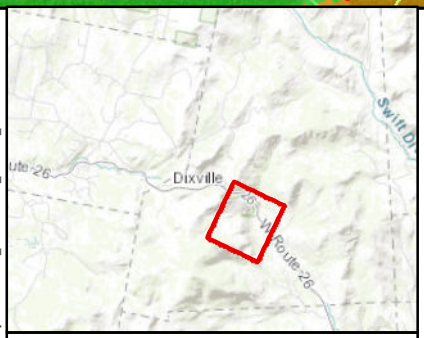


Index Map

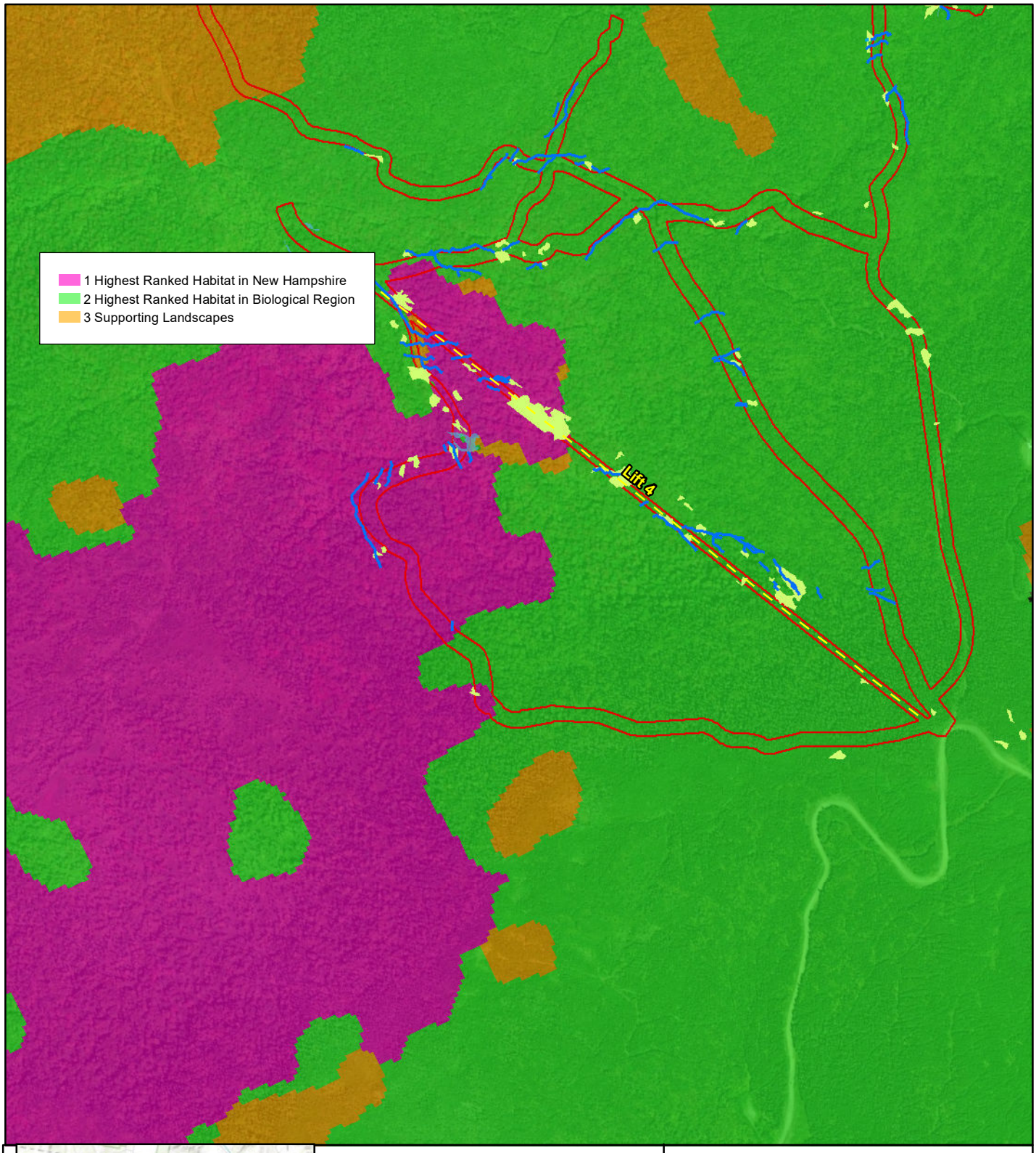
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Proposed Trails/Lifts

Wildlife Action Plan Habitat Tiers
Map 2 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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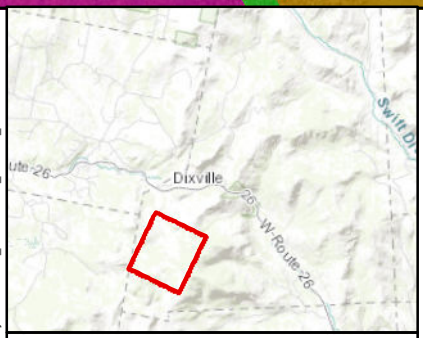


Index Map

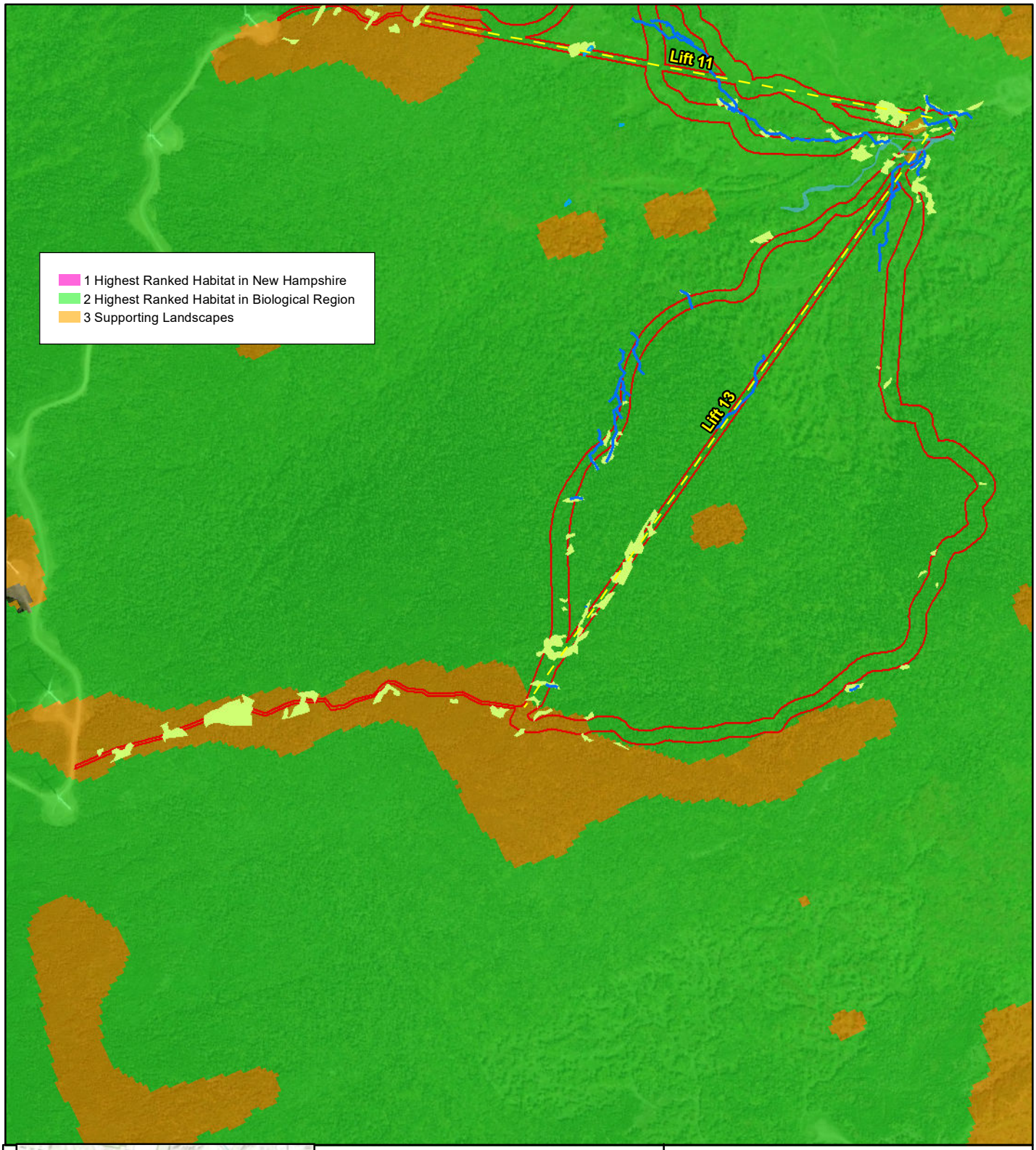
Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Proposed Trails/Lifts

Wildlife Action Plan Habitat Tiers
Map 3 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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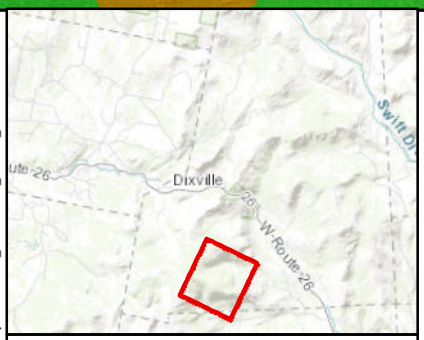


Index Map

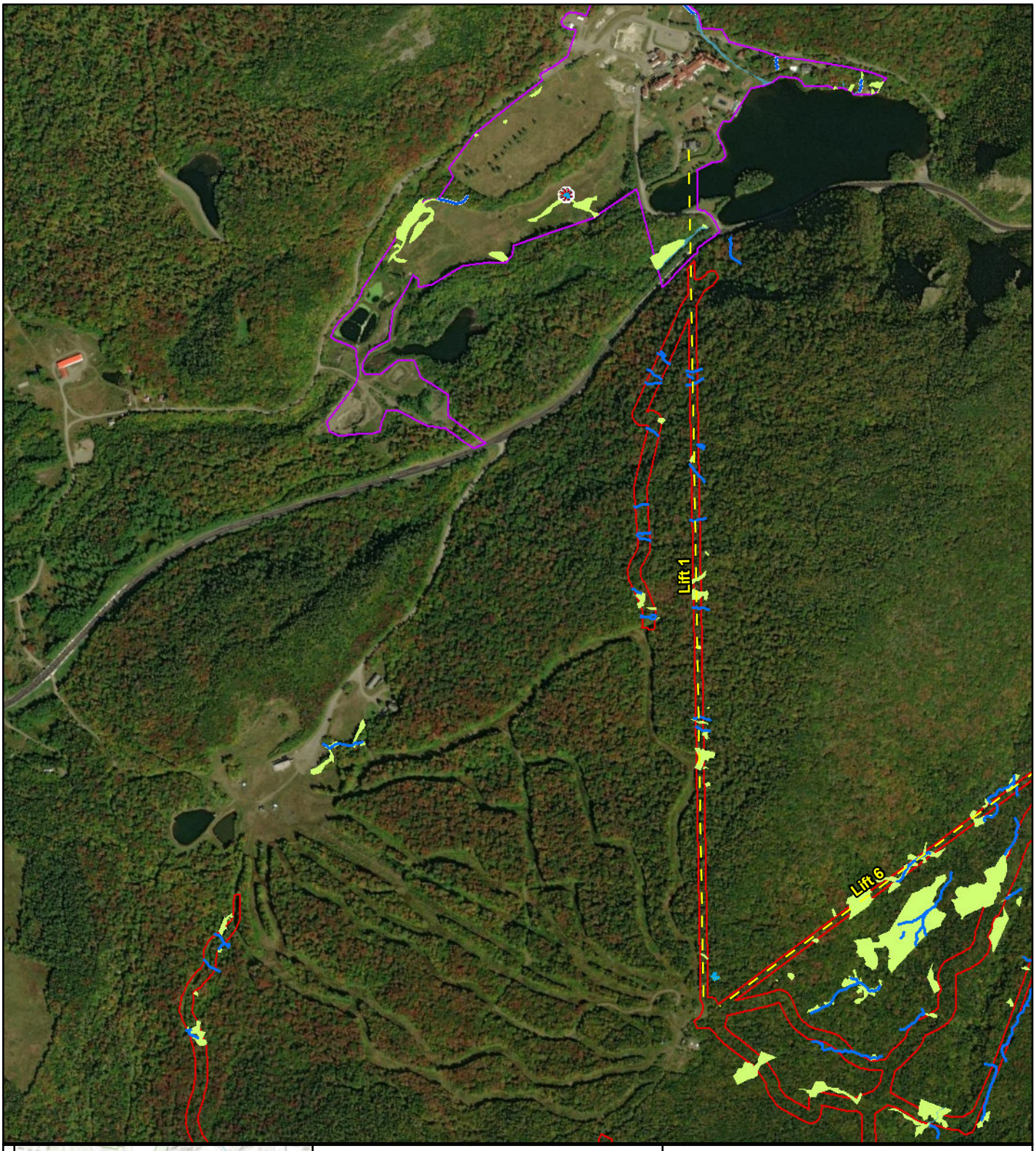
Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Proposed Trails/Lifts

Wildlife Action Plan Habitat Tiers
Map 4 - Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



Index Map

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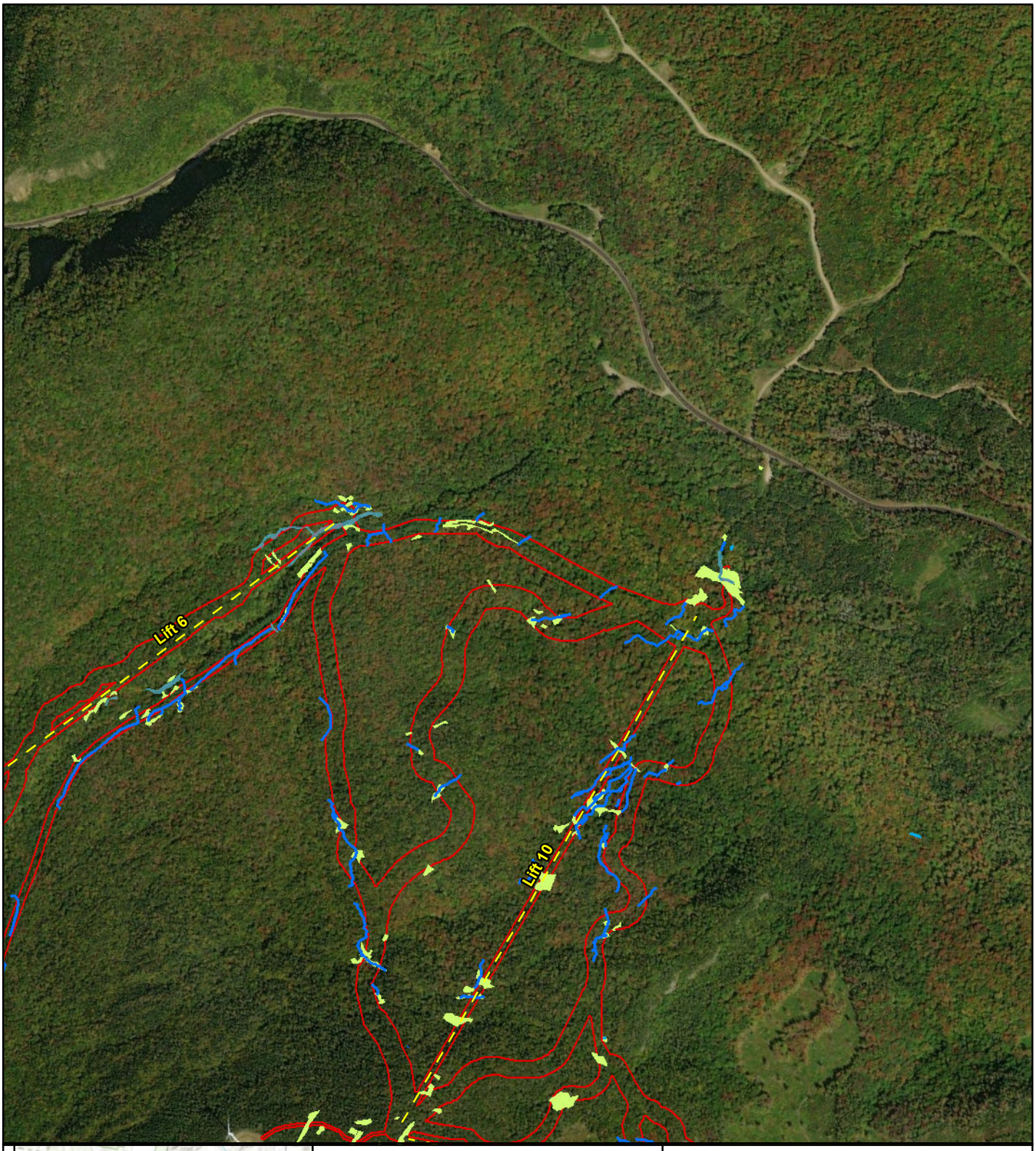
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

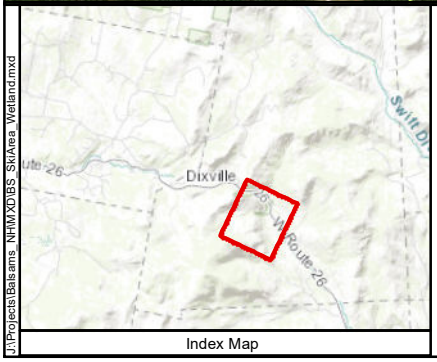
Wetland Map 1
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet





Index Map

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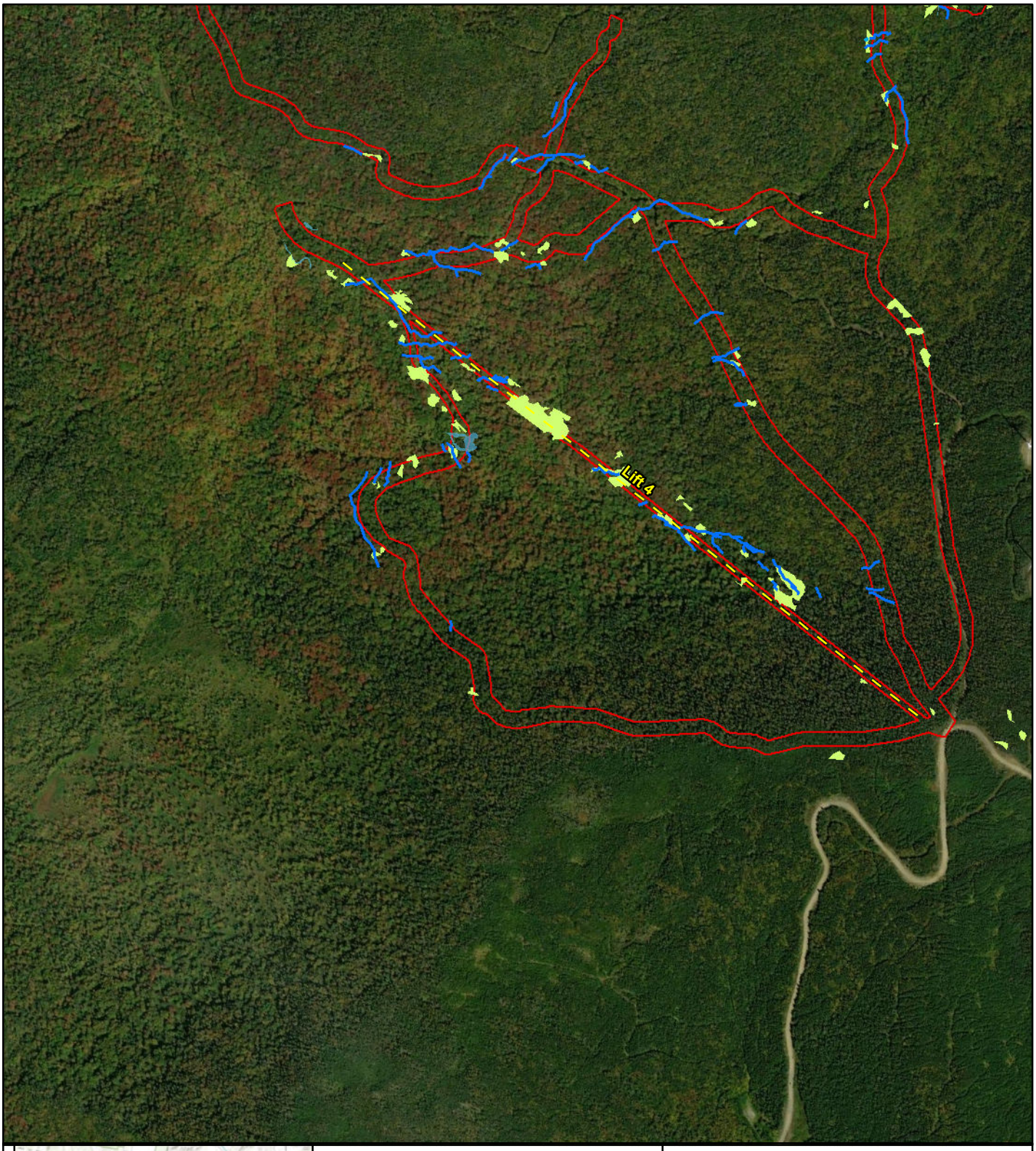
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

Wetland Map 2
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet



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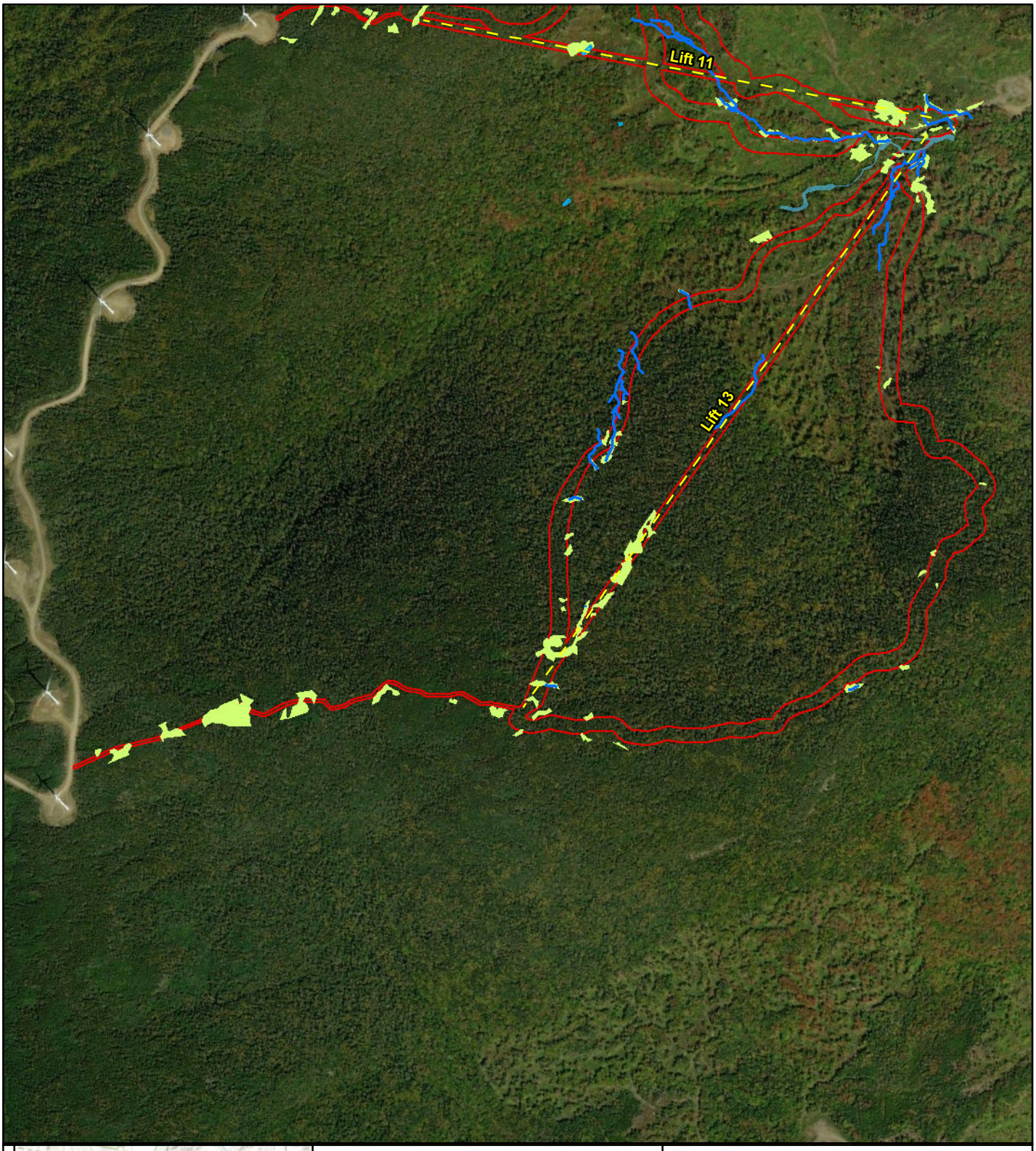
- Proposed Skil Lift
- Stream Centerline
- Stream Polygon
- Vernal Pool Polygon
- Wetland
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

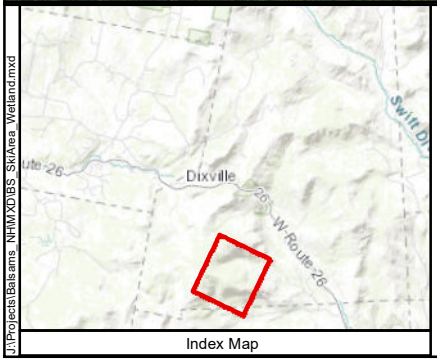
Wetland Map 3
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet





Index Map

Proposed Skil Lift
Stream Centerline
Stream Polygon
Vernal Pool Polygon
Wetland
Lake Gloriette House Project Area
Proposed Trails/Lifts

Wetland Map 4
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 500 1,000 2,000 Feet

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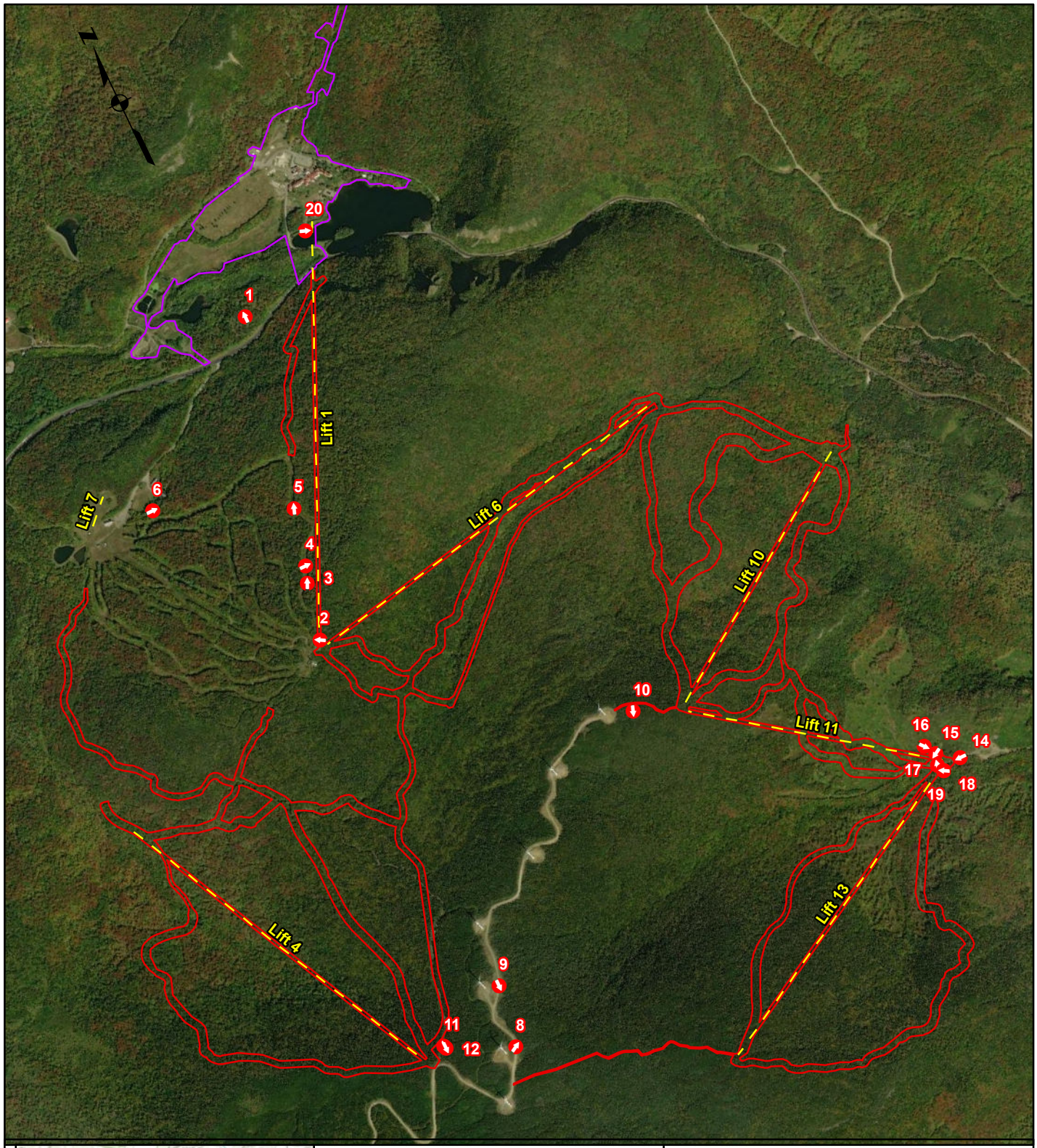

- Ski Area Photo Locations and Direction
- Proposed Skil Lift
- Lake Gloriette House Project Area
- Proposed Trails/Lifts

Ski Trail Photo Map
Balsams Ski Area
Dixville, NH

NORMANDEAU ASSOCIATES
Environmental Consultants

Source: ESRI

0 1,000 2,000 4,000 Feet

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Site Photographs

Photo 1. Facing northwest from the top of the existing ski area

Photo 2. Facing west from the top of the existing ski slope

Photo 3. Facing east down an existing ski trail

Photo 4. Evidence of moose in the project area

Photo 5. Facing north down an existing ski slope

Photo 6. Representative habitat

Photo 7. Facing northwest towards the project area (mountains in background)

Photo 8. Facing east from Dixville Peak

Photo 9. Facing south from Dixville Peak

Photo 10. Representative habitat

Photo 11. Facing east down snowmobile trail

Photo 12. Representative Habitat

Photo 13. Facing towards the project area (mountains in background)

Photo 14. Evidence of moose browse

Photo 15. Representative habitat

Photo 16. Evidence of moose

Photo 17. Representative habitat – Recently logged

Photo 18. Representative Habitat

Photo 19. Representative Habitat

Photo 20. Lake Gloriette towards Abenaki Mountain

Part 3: Detailed Evaluation

Proposed Project

Normandeau Associates Inc. (Normandeau) was contracted by Dixville Capital, LLC to conduct a review of the potential impact to wildlife from The Balsams Ski Area Expansion Project ("Project"; Attachment 1), located at approximately 100 Wilderness Rd., Colebrook (Dixville Township), New Hampshire. The Project is located on a 4,905-acre parcel (Parcel 1626-0001) and a 530-acre parcel that includes the existing ski trails (Parcel 1626-0003, 1626-0003.1, 1626-0003.3, and 1626.0003.4). In order to determine the impacts of the Project on wildlife, two site visits were conducted. On February 28-March 2 2022, Jason Collins a Certified Wildlife Biologist®, and Benjamin Griffith a NH Certified Wetlands Scientist and Track and Sign expert (Level 1, CyberTracker North America) reviewed high-elevation habitat, as defined as areas above 2,700 feet in elevation, within The Balsams Ski Expansion Area. On September 15-16, 2022, Jason Collins conducted a second site visit in order to assess the project area when it was free of snow cover. These observations in combination with review of project documents allowed Normandeau to assess potential wildlife impacts, and make recommendations for best management practices.

Project Site and Surrounding Land Use

The Project lies on the south side Route 26 in Dixville Township, NH. The Township of Dixville is heavily forested with northern hardwood-conifer forest (51%) and high-elevation spruce-fir forest (38%). The town lies in the Upper Montane/Alpine Zone and Quebec/New England Boundary Mountains in the Northeastern Highlands ecoregion (Olson et al., 2001).

Threatened and Endangered Species and Wildlife Habitat Evaluation

Two species listed under the U.S. Endangered Species Act of 1973 are known or potentially present in Dixville, northern long-eared bat (*Myotis septentrionalis*) and Canada lynx (*Lynx Canadensis*). The Monarch butterfly (*Danaus plexippus*) is a candidate species and is also potentially present. Under the New Hampshire Endangered Species Conservation Act, three endangered species and three threatened species are included in the 65 total species that have special status as species of special concern or species of greatest conservation (SGCN) need are potentially present in Dixville. The NHB Data check review indicated American marten (*Martes americana*), cliff swallow (*Petrochelidon pyrrhonota*), peregrine falcon (*Falco peregrinus anatum*) and common loon (*Gavia immer*) have historical records in the vicinity of the project area.

Previous studies indicate that approximately 60% of the project area is potentially suitable for northern long-eared bat (Normandeau, 2015a). Acoustic surveys did not identify any northern long-eared bat within the project area, however this survey did not meet the 2022 minimum level of effort to determine presence/probable absence of the species (Normandeau, 2015b). Little brown bat (*Myotis lucifugus*), a state listed endangered species, was detected in the project area in 2015. Five vernal pools were located inside of the project area during a 2015 survey, two near the

top of the existing ski area and three clustered near the center of the project area (Normandeau, 2015c). Wetland resources were delineated within 50 feet of the centerline of proposed ski lifts 1, 4, 6, and 10 in 2021 (Normandeau, 2022). Wetland and streams were delineated across all of the proposed ski trails and lift corridors in 2022.

The proposed Project consists of the expansion of a ski area with approximately 237.9 acres of forest clearing required to build new ski trails, lift lines, and access roads. The northern portion of the project area is a former ski resort with maintained ski trails and the proposed expansion connects to this existing facility. Forested community types identified within the study area included high-elevation balsam fir, high-elevation spruce-fir, northern hardwood -spruce fir, and sugar maple-beech-yellow birch; with those communities generally occurring in descending elevation. A section of the southeastern portion of the project area has been recently logged. Along the northern edge of the project there are cliff and talus slopes as well as to the east. Other notable site features include the existing, non-operational Wilderness Ski Area along the northern project boundary, and a portion of the Granite Reliable Wind Farm that exists within the boundary of the project area (seven turbines and the associated access road on Dixville Peak).
The State Wildlife Action Plan (NHFG, 2015) lists approximately half of the proposed development area as the "highest ranked habitat in biological region" with some areas being "highest ranked habitat in New Hampshire" and most of the rest being "supporting landscapes". The following communities are present in the project area:

High Elevation Balsam-Fir Forest

Although this community is more typical of areas above 4,000 feet, several parts of the Study Area were consistent with this natural community. These areas are characterized by dominant balsam fir (*Abies balsamea*) and a lack of intermixed red spruce (*Picea rubens*) and heartleaf birch (*Betula cordifolia*). These communities also generally contain much higher maximum tree density and are most suitable for nesting Bicknell's thrush (*Catharus bicknelli*), Species of Special Concern in NH). Typically, this community has low ground cover and shrub cover is restricted to canopy species. These areas likely provide suitable conditions for snowshoe hare and provide connectivity between more suitable areas. This habitat type may also be utilized by American marten and Canada lynx.

High Elevation Spruce-Fir Forest

This community differs from the above community due to the presence of more red spruce and heartleaf birch. This community is typically found between 2,500 and 4,000 feet and may occur higher or lower depending on the degree of protection or exposure. The coniferous species are generally more dominant, and during the growing season it is expected that this community would have more ground cover and may have some intermixed hobblebush (*Viburnum lantinoides*), mountain ash (*Sorbus* spp.), and mountain maple (*Acer spicatum*). This community is less likely to contain Bicknell's Thrush than the previously described community, although this community provides habitat connectivity between patches of high elevation balsam fir forest. Canada lynx are also associated with

this habitat type, in the presence of snowshoe hare, their primary prey particularly in the winter. American marten are also likely to use this habitat.

Northern Hardwood-Spruce-Fir Forest

This community differs from the above communities in that it is characterized as a mixed forest rather than a conifer forest. At this elevation (this community is typically found at elevations greater than 2,500 feet), the increased broadleaf cover consists of heartleaf, paper (*Betula papyrifera*), and yellow (*Betula allegheniensis*) birches. This community has a much more robust shrub layer, and hobblebush is frequently dominant. This community is not suitable for Bicknell's thrush or other coniferous obligate species. American marten likely occurs within this community, at least occasionally, as it is less tied to coniferous forest than Canada lynx or Bicknell's thrush.

Sugar Maple – Beech – Yellow Birch Community

This community is located near or below 2,700 feet of elevation where the natural communities become hardwood-dominated. Examples of this community within the Study Area occurred lower elevations and were dominated primarily by yellow birch, with lower densities of sugar maple. American beech was a minor component of these communities. As expected, these communities were more prominent on the south-facing slopes on Sanguinary Ridge. This community is unlikely to provide important habitat for any of the listed species identified, although snowshoe Hare may still be common and American marten occasionally use this community.

Table 1. Impacted area by cover types in the Ski Area Expansion Project area

Habitat Type	Impacted Area (Acres)
High Elevation Balsam-Fir Forest	1.0
High Elevation Spruce-Fir Forest	55.8
Mid-Elevation N. Hardwood-Spruce-Fir	148.9
Northern Hardwood-Spruce-Fir Forest	6.7
Logged/Regenerating	23.6
Developed/Open	1.9
Total:	***237.9 (212.4 Forested)***

Site Visit

On February 28-March 2 2022, two wildlife biologists from Normandeau reviewed the high-elevation habitat, as defined as areas above 2,700 feet in elevation, within the project area as well

as an adjacent parcel, known as Sanguinary Ridge. Review was focused on overall habitat types, as well as the presence or potential presence of listed wildlife.

Two species of state or federally listed mammal were identified as potentially occurring in the project area and were the focus of the winter survey: American marten and Canada lynx. Both species are predatory and typically occur at low densities and presence of prey items, particularly snowshoe hare (*Lepus americanus*), may be used to identify areas of suitable prey. Tracks from recent snow conditions were used to identify areas used by wildlife, especially snowshoe hare, American marten, and Canada lynx. Approximately 6 inches of freshly fallen snow was present at high elevations on February 28. An additional 2 inches of snow fell on the evening of March 2. As a result, fresh tracks were readily identified. Sign from a total of eleven species of mammal were observed during the survey. The most widespread species observed at high elevations was snowshoe hare, which was observed throughout the survey area. Both American Marten and Canada Lynx sign were observed during surveys. Other species detected during the survey were long-tailed/short-tailed weasel (*Neogale frenata/Mustela richardsonii)* , moose (*Alces alces*), northern flying squirrel (*Glaucomys sabrinus*), red squirrel (*Tamiasciurus hudsonicus*), deer/white-footed mouse (*Peromyscus maniculatus/leucopus*), southern red-backed vole (*Myodes gapperi*), and porcupine (*Erethizon dorsatum*).

On September 15-16, 2022 Jason Collins, Certified Wildlife Biologist® returned to observed the site when the ground was free of snow. The days were partly cloudy with some wind and the temperature was in the mid-50s. Mr. Collins spent approximately twelve hours walking and driving the Project site and surrounding area over the two days. The surrounding area was visited as allowed by public access. Primary attention was paid to habitat features and wildlife sign. A New Hampshire threatened species, peregrine falcon (*Falco peregrinus*) and a species of greatest conservation need, ruffed grouse (*Bonsai unbrellas*) were observed during this survey. Staff at the Balsams indicated that a common loon had been present on the lake the past summer with a fledgling, but was not observed during the site visit. No other threatened or endangered species were encountered during this visit, however this survey does not constitute presence/probably absence level of survey effort.

Species of interest are discussed below:

Snowshoe Hare

Densities of snowshoe hare varied between areas, with hare sign most common along Sanguinary Ridge southwest of the peak of Sanguinary Mountain between approximately 2,800 and 3,100 feet of elevation and throughout the Hodge's Valley area (area associated with Lift 4) of the Phase 1 Ski Expansion Area. The densest hare tracks were associated with high-elevation spruce-fir forests in these locations. Hare sign was particularly sparse in the vicinity of the area associated with Lifts 10 and 11. Hare sign was present in intermediate densities in the northern part of the Sanguinary Ridge as well as the vicinity

of and access corridor to the high-elevation trails associated with Lift 13. Photos documenting these observations can be found in the attached photo log.

Canada Lynx

A single Canada lynx was tracked for approximately 1,000 feet along the Cohos trail, passing through the Sanguinary Ridge. The area in which the tracks were found contained the highest density of snowshoe hare tracks. This individual was initially identified by a combination of its walking gait and t-shaped impressions in the snow. Eventually, tracks were discovered that showed a clear cat pad pattern. Average track width was approximately 3 inches. The track size and shape as well as the shape of the impressions in the snow are diagnostic for Canada lynx and eliminates the possibility of bobcat or a canine. Photos documenting this observation can be found in the attached photolog.

American Marten

Single observations of American marten were located along Sanguinary Ridge and along the Cohos trail in the vicinity of the existing ski area. American marten are typically associated with coarse woody debris in coniferous forests. New Hampshire Natural Heritage Bureau (NHNHB) records indicate that American marten regularly use the Dixville Notch area and presence of the species was to be expected. Although marten had not previously been documented at Sanguinary Ridge, the presence of the species there is expected. Photos documenting these observations can be found in the photo log.

Peregrine Falcon

A single peregrine falcon was observed bathing in Lake Gloriette during the September site visit. The bird was overserved for a few minutes before it took off and began swooping over route 26 by Tabletop Rock, before disappearing over the trees. According to the NHB report, a nesting site has been historical used on Abenaki Mountain, approximately one mile north of the project area, with observations as recently as 2018 when one chick was fledged.

The U. S. Fish and Wildlife Information for Planning and Consultation (IPaC) tool indicated that the project is within the range of the northern long-eared bat (threatened), Canada lynx (threatened) and monarch butterfly (*Danaus plexippus*) (candidate species). However, USFWS is currently updating the status of the northern long-eared bat to endangered, which is anticipated to go into effect on March 31, 2023. The New Hampshire Natural Heritage Bureau Review, indicated historical records of cliff swallow near the existing ski area, American marten in and around the project area, common loon at Lake Gloriette, and Peregrine Falcon to the North of The Balsams resort.

Potential Impacts and Proposed Conservation Measures

As with all development of natural lands, some impacts to wildlife are unavoidable, however the use of best management practices aid in avoiding and minimizing these impacts and mitigation

measures may offset many, thereby reducing the overall impacts to wildlife. Development is known to have direct impacts to wildlife habitat through the removal of native vegetation and fragmentation, which can have nontrivial consequences to wildlife (e.g. Theobald et al., 1997; Fischer and Lindenmayer, 2007). Indirect impacts to wildlife can be caused by seemingly benign activities such as installation of fencing that can restrict movement, landscaping with non-native vegetation that can decrease food availability, and human activities that can induce avoidance behaviors (Gabrielson and Smith, 1995; Whitcomb et al., 1981). The full impact of development on wildlife is poorly understood and it is difficult to determine the cumulative impacts of development to wildlife communities as the individual species response is so variable (Theobald et al., 1997). Two components of development that are critical to understanding the impact of development on wildlife are the density and pattern of the site design (Theobald et al., 1997). The interaction between these two elements can have a major impact on the zones of wildlife disturbance and the degree of habitat fragmentation (Theobald et al., 1997). The type of habitat being developed is also an important consideration. According to the New Hampshire Department of Environmental Service (NHDES), important habitats for wildlife include lands inhabited by threatened or endangered species, un-fragmented lands, riparian areas, priority wetlands, open lands, connecting lands, and unique or critical habitat (NHDES, 2004a).

Approximately 237.9 acres will be developed in total, and given the nature of the current habitat, the project has potential to impact wildlife, in particular those associated with high-elevation habitat such as Canada lynx, American marten, and Bicknell's Thrush. Other species could be impacted through tree removal include northern long-eared bats, tri-colored bat (*Perimyotis subflavus;* state endangered), and little brown bat (*Myotis lucifugus*), if it is present. The cliff and talus slopes offer important habitats for peregrine falcons, cliff swallows, eastern small-footed bat (*Myotis leibii*), and rare plants, however these areas will be avoided. Wetlands and vernal pools were avoided to the extent possible. Tree removal (no stumping) will be necessary in some wetland areas in addition to temporary impacts associated with access through these areas if required. No direct impacts to vernal pool depressions are anticipated at this time; clearing within 500 feet of vernal pools has been minimized where possible. These wetlands and vernal pools provide potential habitat for many species including species of greatest conservation need such as wood turtle (*Glyptemys insculpta*).

The removal of trees, which may be utilized by the federally endangered northern long-eared bat (NLEB) and other species of bat, likely presents the greatest direct threat to wildlife from the project.

Best Management Practices

In order to avoid impacts to wildlife, the Project's trail design team has coordinated closely with Normandeau's wetland scientist to limit the impacts to high-elevation forest, wetlands and vernal pools.

Efforts to avoid and minimize high-elevation impacts include:

- Existing high-elevation roads/trails/wind farm areas were utilized as much as possible to limit high-elevation clearing and impacts and fragmentation,
- Ski trail and lift corridor width was constricted in high-elevation areas (trails and lift corridors range from approx. 50-feet wide up to 125-feet wide, with most trails between 85 and 95-feet wide) and grading was limited to areas where needed to allow for safe ski terrain,
- Access trails were constricted as much as possible for accessing tops of Lifts 10, 11 and 13 with permanent impacts to wetlands limited as much as possible,
- Two conceptual trails that start in high-elevation areas and which would have been trails that traverse steeper slopes resulting in more high-elevation clearing and grading were eliminated during our trail field screening effort to limit impacts to high-elevation habitat and water resources (this reduced high-elevation clearing by approximately 11.8 acres >2700 Feet), and
- Lift 4 was shortened (by about 500 linear feet) and shifted downslope resulting in 2.5 acres less of high-elevation habitat clearing and substantially less grading due to gentler slopes.

The project is also avoiding open cliff and talus slopes, which potentially support a number of sensitive species. Water quality will be protected by following established best management practices (BMPs) for erosion and sediment control. In addition, work will be conducted in a manner required to protect headwater streams, wetlands, and other habitat consistent with provisions developed in *Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire (Second Edition)*. The NHDES Permit Conditions include other requirements to protect natural resources, water quality and wildlife habitats.

In order to minimize impacts to northern long-eared bat and other species of bats, the project intends to limit tree removal to outside of the active season (April 1 – October 31). Glade areas will be cut by hand in swath of 100-200 feet in width, where understory trees less than 3" DBH and shrubs will be cut. Woody material will be left in place and low and dangerous limbs may be removed as needed. Trees will remain and glade "trails" will be spaced at least 200 feet apart, creating a diversity of over story and understory edge structure. Wetlands and vernal pools requiring clearing will be cut flush to the ground and the stumps left in place; direct impacts to wetlands, streams and vernal pools will be avoided or limited by restricting or minimizing grading/fill and by bridging streams. Tree removal within 500 feet of a vernal pool will occur primarily when the ground is frozen, outside of the season when juveniles and adults are active on the forest floor (approximately, April 1 – December 31 although variable based on elevation). In order to minimize impacts peregrine falcon and common loon, no blasting will occur in the project area during the nesting season (April 1 – August 15).

In order to mitigate for unavoidable impacts, particularly to those species reliant on high-elevation habitat, the project's mitigation plan will place comparable high-elevation habitat at Sanguinary Ridge into a conservation easement along with over 300 acres of high quality wildlife habitat located in the proposed State Park and Clear Stream mitigation parcels. Additionally, the Project as agreed to place 158 acres above 2,000 feet in elevation, within the Society for the Protection of New Hampshire Forest (SPNHF) easement area as a "Natural Area". No ski trails will be placed within this area and additional restrictions will be imposed to protect old growth and late succession forest as well as high elevation habitats.

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Attachment 1: The Balsams Ski Area Plan

Attachment 2: Biologist Qualifications

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

JASON D. COLLINS, CWB®

Senior Wildlife Biologist

Mr. Collins has over twelve years of professional experienced as a biological consultant and is a Certified Wildlife Biologist® through The Wildlife Society. His technical expertise includes chiropteran biology and GIS based habitat modeling. He has in-depth knowledge of wildlife of the Eastern United States including threatened and endangered species.

His project experience includes mid-stream transmission pipelines, military installations, and wind farms, where he has conducted wildlife impact assessments, compensatory mitigation planning and monitoring, wildlife habitat surveys, small-mammal trapping, fish surveys, and amphibian survey.

Mr. Collins has co-authored Bird and Bat Conservation Strategies, Biological Assessments, and Construction and Operation Plans for various projects. He completed his Master's thesis investigating the distributions and habitat associations of bats in West Virginia under leading bat expert Dr. Allen Kurta as well as a Master's of Business Administration from Southern New Hampshire University.

EDUCATION

2022 M.B.A., Southern New Hampshire University

2016 M.S., General Biology, Eastern Michigan University

2010 B.S., Wildlife and Fisheries Science, Delaware State University

PROFESSIONAL EXPERIENCE

2015-Present Normandeau Associates
2008-2015 Sanders Environmental Inc.

PROFESSIONAL CERTIFICATIONS

- Certified Wildlife Biologist®

PROFESSIONAL AFFILIATIONS

- The Wildlife Society
- North American Society for Bat Research
- North Eastern Bat Working Group

REPRESENTATIVE PROJECT EXPERIENCE

Massachusetts Department of Transportation (State Wide) (2016-Present). An environmental open-end contract for biological surveys including northern long-eared bat acoustics surveys, mussel surveys, wetlands, and other environmental related tasks for the construction and rehabilitation of roadways and bridges in the state of Massachusetts. Mr. Collins is the acting Project Manager for this contract.

Community Solar Development, New England Solar Garden (State Wide, NH) (2020-2022). In coordination with the New England Solar Garden team, Mr. Collins conducted wildlife habitat assessments to assist with environmental permitting, for multiple community-scale solar development projects in New Hampshire.

PPL Sugar Notch Re-power Project, Woodland Design (Luzerne Co., PA) (2016-2021). A Phase 1 habitat assessment was conducted for eastern small-footed bats for a proposal re-power of 18 miles of powerline right of way. The site was located in close proximity to known eastern small-footed habitat and Mr. Collins developed the study protocol, installed exclusion devices, oversaw construction of artificial habitat structures for mitigation, and conducted follow up emergence surveys of the structures for three years. Project Manager, Qualified Bat Surveyor.

Fort Pickett Bat Surveys, EEE Consulting Inc. (Nottoway Co., VA) (2019) A general bat survey was requested to assist with natural resources planning for the Virginia Department of Military at Fort Pickett Maneuver Training Center. Mr. Collins developed the study plan and oversaw mist-netting, radio-telemetry, emergence surveys, and reporting.

PennDOT Oley Interchange, H&K Engineering (Berks Co., PA) (2019) Mr. Collins assisted with an emergence survey that was necessary to facilitate the construction of a roundabout for the Pennsylvania Department of Transportation. Six trees were visually overserved for bats allowing for the continuation of project construction.

Camp Pendleton Small Mammal Surveys, EEE Consulting Inc. (Virginia Beach, VA) (2018) A small mammal trapping survey was conducted in order to assist with natural resources planning for the Virginia Department of Military at Camp Pendleton State Military Reservation. Mr. Collins oversaw survey design, placement of traps, and reporting.

Bat Surveys at Three Air National Guard Bases, WA, NH, WV, Ledios (2017-2018). Mr. Collins is the lead researcher and qualified bat survey to ascertain bat resources at three large ANG bases. Both Spring and Summer surveys were performed at each base using a combination of mist netting and acoustics. Mr. Collins wrote Study Plans for approval by the USFWS and State Endangered Species Biologists. Wildlife Biologist/Qualified Bat Surveyor.

Hazleton Materials Quarry Expansion, H&K Engineering (Luzerne Co. PA) (2016). A Phase 1 habitat assessment was conducted for eastern small-footed bats for a proposed 80 acre quarry expansion project. Mr. Collins developed the proposal, conducted the survey, and reported his findings. Project Manager, Qualified Bat Surveyor.

Atlantic Sunrise Project, Williams (Pennsylvania), (2015). Williams is proposing the construction and operation of the Atlantic Sunrise Project. The pipeline is approximately 180 miles of greenfield pipeline, two pipeline loops, and two new compressor facilities that will connect producing regions in northeastern PA to markets in the Mid-Atlantic. Mr. Collins was a Qualified Indiana Bat Surveyor conducting mist-netting and radio telemetry surveys. Bat Identifier and Team Leader.

Ringer Hill Wind Farm, OwnEnergy (Somerset Co. PA), (2010-2014). A 40 megawatt wind farm set to begin production in 2017. Mr. Collins assisted in Indiana bat presence/absence surveys and agency coordination. Lead author of a Bird and Bat Conservation Strategy resulting in agency concurrence. Team Leader, Lead Author.

Potomac-Appalachian Transmission Highline (PATH), (West Virginia and Maryland), (2010). A proposed 290 mile 765kv powerline, running through 13 counties in West Virginia and three in Maryland. Mr. Collins was a Team leader and Bat Identifier conducting mist-netting presence-absence surveys of Indiana bats.

REPRESENTATIVE PUBLICATIONS

Kurta, A.,…, J. D. Collins, et al. (2020). Exceptional longevity in little brown bats still occurs, despite presence of white-nose syndrome. Journal of Fish and Wildlife Management.

Hayes, M. A.,…, J. D. Collins, et al. (2019). A smart curtailment approach for reducing bat fatalities and curtailment time at wind energy facilities. Ecological Applications.

Collins, J. D., C. S. Sanders. (2016). A Summary of Bat-friendly Gates and Applications in Pennsylvania, in Conservation and Ecology of Pennsylvania's Bats.

Collins, J. D. (2016). Bats of the Monongahela National Forest (Master's Thesis). Eastern Michigan University.

2.10 NRCS Soil Information (Web Soil Survey Map)

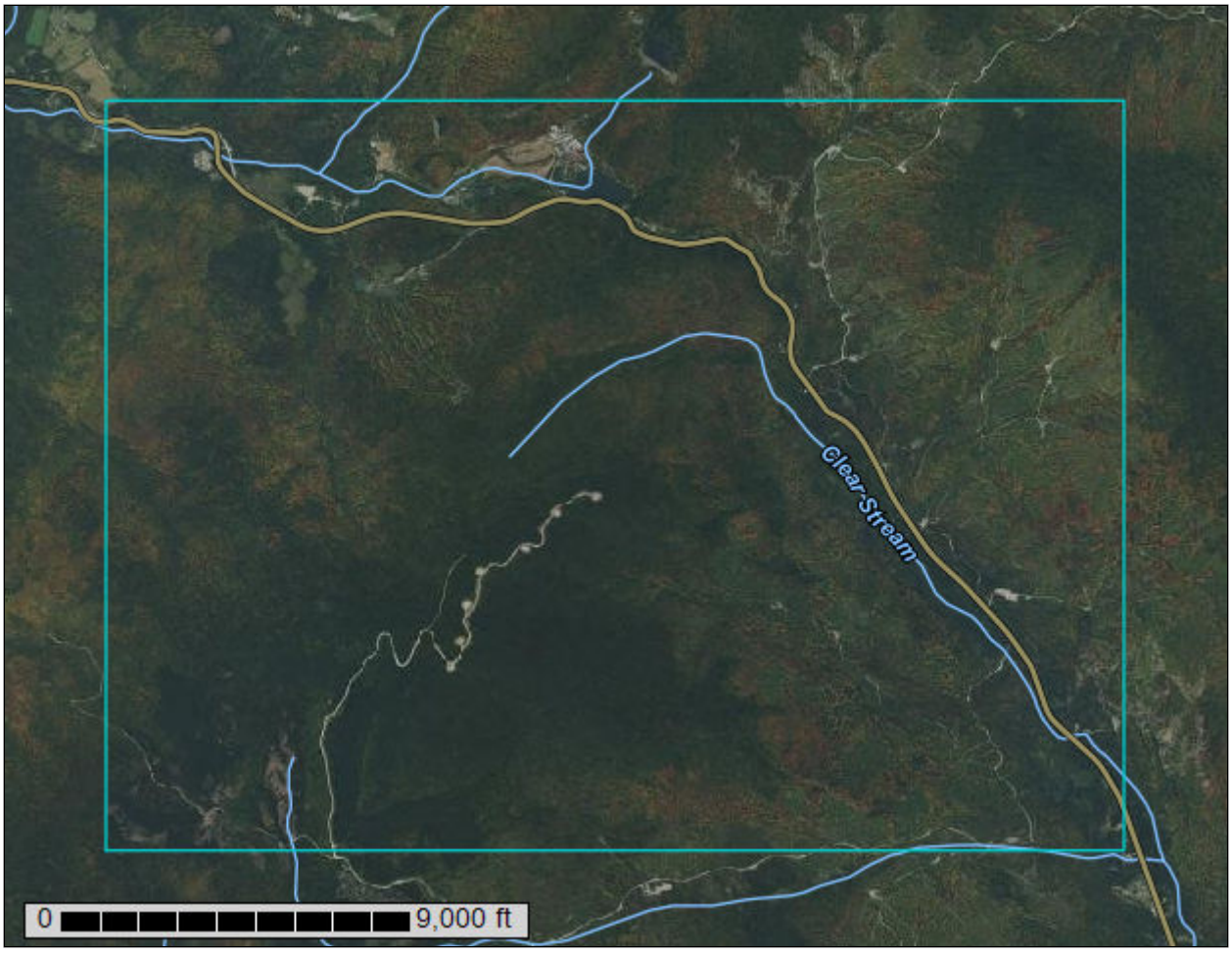
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Coos County Area, New Hampshire



December 1, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

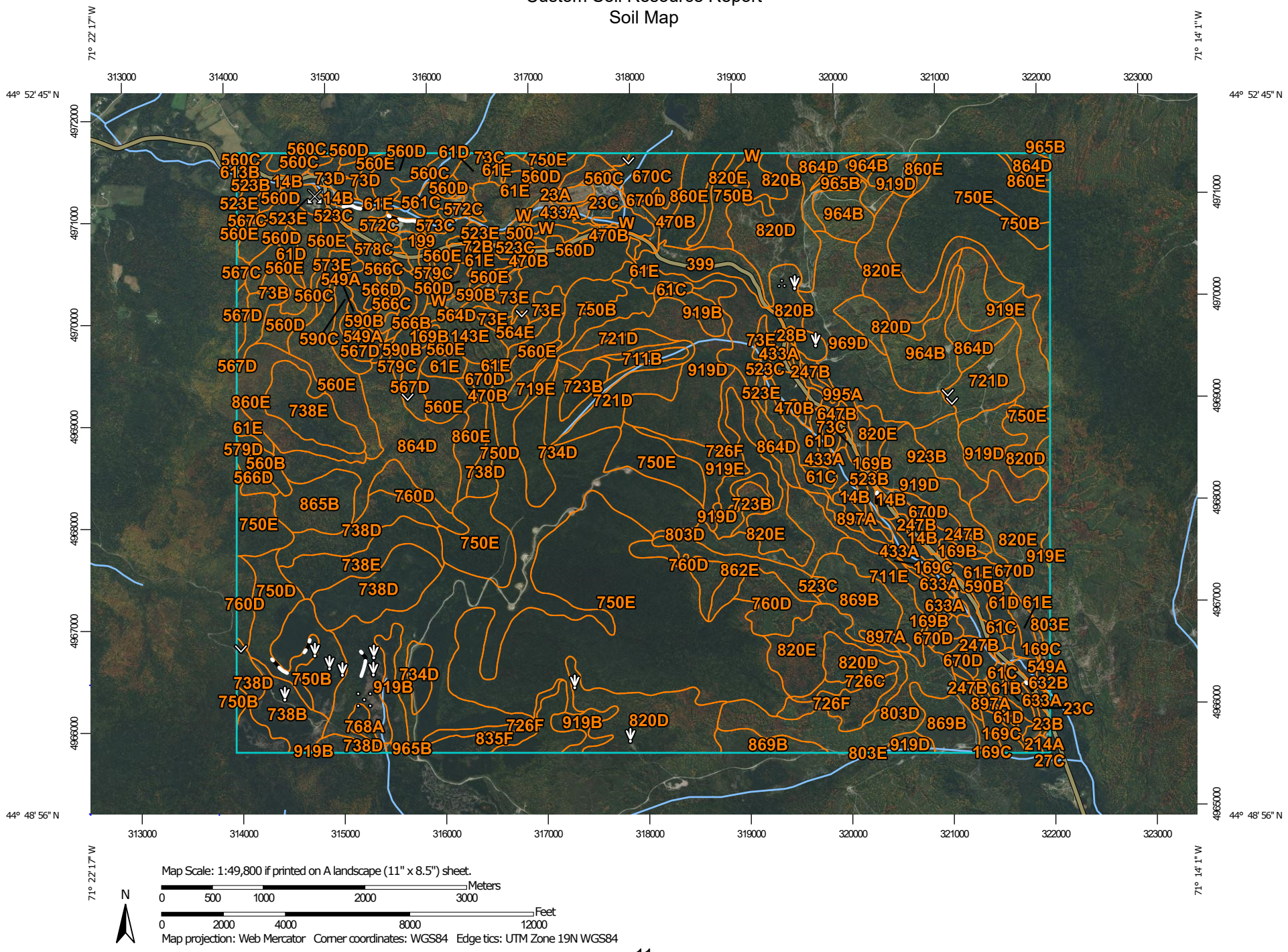
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


71° 22' 17" W
71° 14' 1" W
44° 52' 45" N
44° 48' 56" N
313000
314000
315000
316000
317000
318000
319000
320000
321000
322000
323000
4972000
4971000
4970000
4969000
4968000
4967000
4966000
4965000
Map Scale: 1:49,800 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 500 1000 2000 3000
Feet
0 2000 4000 8000 12000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Coos County Area, New Hampshire
Survey Area Data: Version 28, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 21, 2020—Nov 10, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
14B	Sheepscot cobbly very fine sandy loam, 1 to 8 percent slopes	100.4	0.9%
15A	Searsport mucky peat, 0 to 3 percent slopes	22.5	0.2%
23A	Masardis gravelly fine sandy loam, 0 to 3 percent slopes	14.0	0.1%
23B	Masardis gravelly fine sandy loam, 3 to 8 percent slopes	7.9	0.1%
23C	Masardis gravelly fine sandy loam, 8 to 15 percent slopes	34.2	0.3%
27C	Groveton fine sandy loam, 8 to 15 percent slopes	0.0	0.0%
28B	Madawaska very fine sandy loam, 3 to 8 percent slopes	2.9	0.0%
61B	Tunbridge-Lyman-Rock outcrop complex, 0 to 8 percent slopes	12.7	0.1%
61C	Tunbridge-Lyman-Rock outcrop complex, 8 to 15 percent slopes	65.1	0.6%
61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	92.9	0.8%
61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	508.5	4.4%
72B	Berkshire fine sandy loam, 3 to 8 percent slopes	3.6	0.0%
72C	Berkshire fine sandy loam, 8 to 15 percent slopes	9.4	0.1%
73B	Berkshire fine sandy loam, 0 to 8 percent slopes, very stony	10.2	0.1%
73C	Berkshire fine sandy loam, 8 to 15 percent slopes, very stony	18.9	0.2%
73D	Berkshire fine sandy loam, 15 to 25 percent slopes, very stony	56.7	0.5%
73E	Berkshire fine sandy loam, 25 to 50 percent slopes, very stony	50.7	0.4%
143E	Monadnock fine sandy loam, 25 to 50 percent slopes, very stony	65.2	0.6%
169B	Sunapee fine sandy loam, 0 to 8 percent slopes, very stony	75.8	0.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
169C	Sunapee fine sandy loam, 8 to 15 percent slopes, very stony	91.6	0.8%
169D	Sunapee fine sandy loam, 15 to 35 percent slopes, very stony	26.3	0.2%
199	Dumps—bark, chips and organic material	3.2	0.0%
214A	Naumburg fine sandy loam, 0 to 3 percent slopes	3.9	0.0%
247B	Lyme fine sandy loam, 0 to 8 percent slopes, very stony	54.5	0.5%
399	Rock outcrop	82.4	0.7%
406A	Medomak mucky silt loam, 0 to 2 percent slopes, frequently flooded	38.8	0.3%
433A	Grange silt loam, 0 to 5 percent slopes	135.5	1.2%
470B	Tunbridge-Peru complex, 3 to 8 percent slopes, rocky	29.6	0.3%
500	Udorthents, loamy	4.7	0.0%
505A	Cohas loam, 0 to 2 percent slopes, occasionally flooded	10.7	0.1%
523B	Stetson fine sandy loam, 3 to 8 percent slopes	16.9	0.1%
523C	Stetson fine sandy loam, 8 to 15 percent slopes	89.3	0.8%
523E	Stetson fine sandy loam, 15 to 60 percent slopes	65.5	0.6%
549A	Peacham mucky peat, 0 to 8 percent slopes, very stony	33.9	0.3%
560B	Tunbridge-Plaisted-Lyman complex, 3 to 8 percent slopes	35.0	0.3%
560C	Tunbridge-Plaisted-Lyman complex, 8 to 15 percent slopes	84.4	0.7%
560D	Tunbridge-Plaisted-Lyman complex, 15 to 25 percent slopes	212.6	1.8%
560E	Tunbridge-Plaisted-Lyman complex, 25 to 35 percent slopes	272.2	2.3%
561C	Tunbridge-Plaisted-Lyman complex, 8 to 15 percent slopes, very stony	36.6	0.3%
564D	Plaisted loam, 15 to 30 percent slopes, very stony	13.6	0.1%
564E	Plaisted loam, 30 to 60 percent slopes, very stony	15.1	0.1%
566B	Howland gravelly loam, 3 to 8 percent slopes	5.4	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
566C	Howland gravelly loam, 8 to 15 percent slopes	14.2	0.1%
566D	Howland silt loam, 15 to 25 percent slopes	28.4	0.2%
567C	Howland silt loam, 8 to 15 percent slopes, very stony	59.4	0.5%
567D	Howland silt loam, 15 to 30 percent slopes, very stony	81.1	0.7%
572C	Bangor silt loam, 8 to 15 percent slopes	32.9	0.3%
573C	Bangor silt loam, 8 to 15 percent slopes, very stony	10.7	0.1%
573E	Bangor silt loam, 25 to 35 percent slopes, very stony	58.8	0.5%
578C	Dixmont very fine sandy loam, 8 to 15 percent slopes	28.9	0.2%
579B	Dixmont very fine sandy loam, 3 to 8 percent slopes, very stony	4.5	0.0%
579C	Dixmont very fine sandy loam, 8 to 15 percent slopes, very stony	25.3	0.2%
579D	Dixmont very fine sandy loam, 15 to 25 percent slopes, very stony	8.3	0.1%
589B	Cabot silt loam, 3 to 8 percent slopes	5.7	0.0%
589C	Cabot silt loam, 8 to 15 percent slopes	7.6	0.1%
590B	Cabot silt loam, 0 to 8 percent slopes, very stony	59.6	0.5%
590C	Cabot silt loam, 8 to 15 percent slopes, very stony	35.3	0.3%
613B	Croghan loamy fine sand, 0 to 8 percent slopes	4.1	0.0%
632A	Nicholville very fine sandy loam, 0 to 3 percent slopes	31.7	0.3%
632B	Nicholville very fine sandy loam, 3 to 8 percent slopes	0.5	0.0%
633A	Pemi silt loam, 0 to 5 percent slopes	12.6	0.1%
647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	9.2	0.1%
670C	Tunbridge-Berkshire-Lyman complex, 8 to 15 percent slopes	66.8	0.6%
670D	Tunbridge-Berkshire-Lyman complex, 15 to 25 percent slopes	96.1	0.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
711B	Monadnock-Hermon association, 0 to 8 percent slopes, very stony	24.1	0.2%
711E	Monadnock-Hermon association, 15 to 60 percent slopes, very stony	74.4	0.6%
719E	Marlow-Tunbridge association, steep, very stony	71.6	0.6%
721D	Peru-Marlow association, 15 to 35 percent slopes, very stony	213.0	1.8%
723B	Peru-Pillsbury association, 0 to 8 percent slopes, very stony	57.0	0.5%
726C	Rock outcrop-Lyman complex, strongly sloping	30.0	0.3%
726F	Rock outcrop-Lyman complex, very steep	170.4	1.5%
734D	Surplus-Sisk association, moderately steep, very stony	105.0	0.9%
738B	Glebe-Saddleback-Sisk association, gently sloping, very stony	85.9	0.7%
738D	Glebe-Saddleback-Sisk association, moderately steep, very stony	347.8	3.0%
738E	Glebe-Saddleback-Sisk association, steep, very stony	225.8	1.9%
750B	Saddleback-Glebe-Ricker association, gently sloping, very stony	223.6	1.9%
750D	Saddleback-Glebe-Ricker association, moderately steep, very stony	1,015.2	8.7%
750E	Saddleback-Glebe-Ricker association, steep, very stony	1,560.0	13.3%
760D	Tunbridge-Plaisted association, moderately steep, very stony	207.0	1.8%
768A	Peacham-Wonsqueak-Cabot association, nearly level, extremely stony	17.0	0.1%
803D	Monadnock-Berkshire complex, 15 to 35 percent slopes, very stony	293.1	2.5%
803E	Monadnock-Berkshire complex, 35 to 60 percent slopes, very stony	0.2	0.0%
820B	Lyman-Tunbridge-Rock outcrop complex, gently sloping	93.4	0.8%
820D	Lyman-Tunbridge-Rock outcrop complex, moderately steep	515.9	4.4%
820E	Lyman-Tunbridge-Rock outcrop complex, steep	626.1	5.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
835F	Ricker-Rock outcrop complex, very steep	25.6	0.2%
860E	Tunbridge-Lyman-Rock outcrop complex, steep	244.8	2.1%
862E	Plaisted-Tunbridge association, 35 to 45 percent slopes, very stony	77.8	0.7%
864D	Howland-Plaisted association, 15 to 35 percent slopes, very stony	392.4	3.4%
865B	Bemis-Surplus association, gently sloping, very stony	96.2	0.8%
869B	Sunapee-Moosilauke-Monadnock association, gently sloping, very stony	218.7	1.9%
897A	Peacham, Bucksport, and Rumney soils, 0 to 2 percent slopes, ponded	58.2	0.5%
919B	Tunbridge-Lyman-Marlow association, 0 to 15 percent slopes, very stony	107.6	0.9%
919D	Tunbridge-Lyman-Marlow association, 15 to 35 percent slopes, very stony	542.4	4.6%
919E	Tunbridge-Lyman-Marlow association, 35 to 60 percent slopes, very stony	195.7	1.7%
923B	Marlow-Peru association, 0 to 8 percent slopes, extremely bouldery	68.4	0.6%
964B	Howland-Cabot association, gently sloping, very stony	178.4	1.5%
965B	Cabot-Howland association, gently sloping, very stony	32.3	0.3%
969D	Sunapee-Monadnock association, moderately steep, very stony	244.0	2.1%
995A	Wonsqueak muck, 0 to 2 percent slopes	19.3	0.2%
W	Water	34.0	0.3%
Totals for Area of Interest		**11,689.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps.

The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

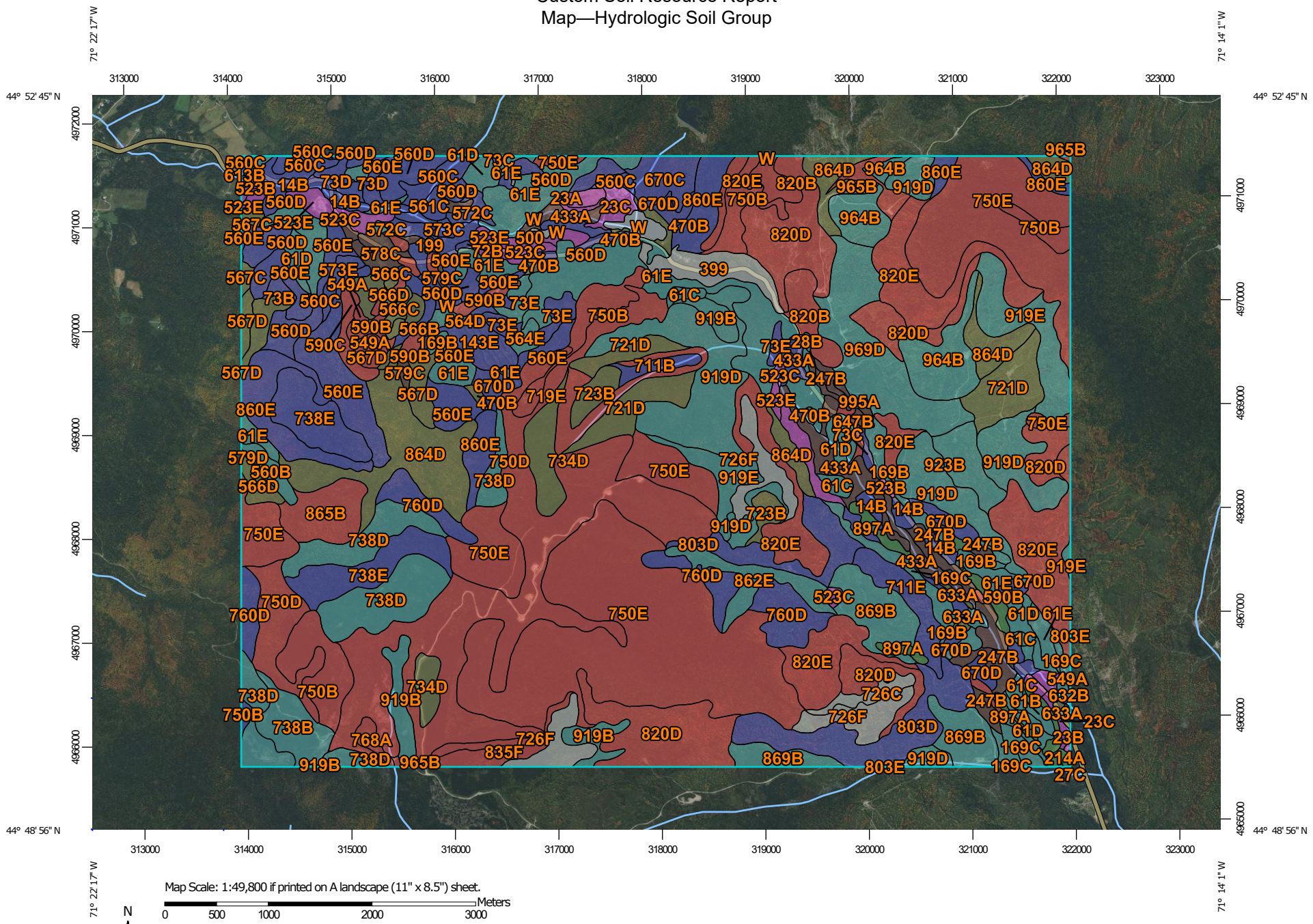
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Coos County Area, New Hampshire
Survey Area Data: Version 28, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 21, 2020—Nov 10, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
14B	Sheepscot cobbly very fine sandy loam, 1 to 8 percent slopes	B	100.4	0.9%
15A	Searsport mucky peat, 0 to 3 percent slopes	A/D	22.5	0.2%
23A	Masardis gravelly fine sandy loam, 0 to 3 percent slopes	A	14.0	0.1%
23B	Masardis gravelly fine sandy loam, 3 to 8 percent slopes	A	7.9	0.1%
23C	Masardis gravelly fine sandy loam, 8 to 15 percent slopes	A	34.2	0.3%
27C	Groveton fine sandy loam, 8 to 15 percent slopes	B	0.0	0.0%
28B	Madawaska very fine sandy loam, 3 to 8 percent slopes	C	2.9	0.0%
61B	Tunbridge-Lyman-Rock outcrop complex, 0 to 8 percent slopes	C	12.7	0.1%
61C	Tunbridge-Lyman-Rock outcrop complex, 8 to 15 percent slopes	C	65.1	0.6%
61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	C	92.9	0.8%
61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	C	508.5	4.4%
72B	Berkshire fine sandy loam, 3 to 8 percent slopes	B	3.6	0.0%
72C	Berkshire fine sandy loam, 8 to 15 percent slopes	B	9.4	0.1%
73B	Berkshire fine sandy loam, 0 to 8 percent slopes, very stony	B	10.2	0.1%
73C	Berkshire fine sandy loam, 8 to 15 percent slopes, very stony	B	18.9	0.2%
73D	Berkshire fine sandy loam, 15 to 25 percent slopes, very stony	B	56.7	0.5%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
73E	Berkshire fine sandy loam, 25 to 50 percent slopes, very stony	B	50.7	0.4%
143E	Monadnock fine sandy loam, 25 to 50 percent slopes, very stony	B	65.2	0.6%
169B	Sunapee fine sandy loam, 0 to 8 percent slopes, very stony	C	75.8	0.6%
169C	Sunapee fine sandy loam, 8 to 15 percent slopes, very stony	C	91.6	0.8%
169D	Sunapee fine sandy loam, 15 to 35 percent slopes, very stony	C	26.3	0.2%
199	Dumps—bark, chips and organic material		3.2	0.0%
214A	Naumburg fine sandy loam, 0 to 3 percent slopes	A/D	3.9	0.0%
247B	Lyme fine sandy loam, 0 to 8 percent slopes, very stony	B/D	54.5	0.5%
399	Rock outcrop		82.4	0.7%
406A	Medomak mucky silt loam, 0 to 2 percent slopes, frequently flooded	B/D	38.8	0.3%
433A	Grange silt loam, 0 to 5 percent slopes	B/D	135.5	1.2%
470B	Tunbridge-Peru complex, 3 to 8 percent slopes, rocky	C/D	29.6	0.3%
500	Udorthents, loamy	B	4.7	0.0%
505A	Cohas loam, 0 to 2 percent slopes, occasionally flooded	B/D	10.7	0.1%
523B	Stetson fine sandy loam, 3 to 8 percent slopes	A	16.9	0.1%
523C	Stetson fine sandy loam, 8 to 15 percent slopes	A	89.3	0.8%
523E	Stetson fine sandy loam, 15 to 60 percent slopes	A	65.5	0.6%
549A	Peacham mucky peat, 0 to 8 percent slopes, very stony	D	33.9	0.3%
560B	Tunbridge-Plaisted-Lyman complex, 3 to 8 percent slopes	C	35.0	0.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
560C	Tunbridge-Plaisted-Lyman complex, 8 to 15 percent slopes	B	84.4	0.7%
560D	Tunbridge-Plaisted-Lyman complex, 15 to 25 percent slopes	B	212.6	1.8%
560E	Tunbridge-Plaisted-Lyman complex, 25 to 35 percent slopes	B	272.2	2.3%
561C	Tunbridge-Plaisted-Lyman complex, 8 to 15 percent slopes, very stony	B	36.6	0.3%
564D	Plaisted loam, 15 to 30 percent slopes, very stony	C	13.6	0.1%
564E	Plaisted loam, 30 to 60 percent slopes, very stony	C	15.1	0.1%
566B	Howland gravelly loam, 3 to 8 percent slopes	C/D	5.4	0.0%
566C	Howland gravelly loam, 8 to 15 percent slopes	C/D	14.2	0.1%
566D	Howland silt loam, 15 to 25 percent slopes	C/D	28.4	0.2%
567C	Howland silt loam, 8 to 15 percent slopes, very stony	C/D	59.4	0.5%
567D	Howland silt loam, 15 to 30 percent slopes, very stony	C/D	81.1	0.7%
572C	Bangor silt loam, 8 to 15 percent slopes	B	32.9	0.3%
573C	Bangor silt loam, 8 to 15 percent slopes, very stony	B	10.7	0.1%
573E	Bangor silt loam, 25 to 35 percent slopes, very stony	B	58.8	0.5%
578C	Dixmont very fine sandy loam, 8 to 15 percent slopes	B/D	28.9	0.2%
579B	Dixmont very fine sandy loam, 3 to 8 percent slopes, very stony	B/D	4.5	0.0%
579C	Dixmont very fine sandy loam, 8 to 15 percent slopes, very stony	B/D	25.3	0.2%
579D	Dixmont very fine sandy loam, 15 to 25 percent slopes, very stony	B/D	8.3	0.1%
589B	Cabot silt loam, 3 to 8 percent slopes	D	5.7	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
589C	Cabot silt loam, 8 to 15 percent slopes	D	7.6	0.1%
590B	Cabot silt loam, 0 to 8 percent slopes, very stony	D	59.6	0.5%
590C	Cabot silt loam, 8 to 15 percent slopes, very stony	D	35.3	0.3%
613B	Croghan loamy fine sand, 0 to 8 percent slopes	A	4.1	0.0%
632A	Nicholville very fine sandy loam, 0 to 3 percent slopes	C	31.7	0.3%
632B	Nicholville very fine sandy loam, 3 to 8 percent slopes	C	0.5	0.0%
633A	Pemi silt loam, 0 to 5 percent slopes	C/D	12.6	0.1%
647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	D	9.2	0.1%
670C	Tunbridge-Berkshire-Lyman complex, 8 to 15 percent slopes	B	66.8	0.6%
670D	Tunbridge-Berkshire-Lyman complex, 15 to 25 percent slopes	B	96.1	0.8%
711B	Monadnock-Hermon association, 0 to 8 percent slopes, very stony	B	24.1	0.2%
711E	Monadnock-Hermon association, 15 to 60 percent slopes, very stony	B	74.4	0.6%
719E	Marlow-Tunbridge association, steep, very stony	D	71.6	0.6%
721D	Peru-Marlow association, 15 to 35 percent slopes, very stony	C/D	213.0	1.8%
723B	Peru-Pillsbury association, 0 to 8 percent slopes, very stony	C/D	57.0	0.5%
726C	Rock outcrop-Lyman complex, strongly sloping		30.0	0.3%
726F	Rock outcrop-Lyman complex, very steep		170.4	1.5%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
734D	Surplus-Sisk association, moderately steep, very stony	C/D	105.0	0.9%
738B	Glebe-Saddleback-Sisk association, gently sloping, very stony	C	85.9	0.7%
738D	Glebe-Saddleback-Sisk association, moderately steep, very stony	C	347.8	3.0%
738E	Glebe-Saddleback-Sisk association, steep, very stony	B	225.8	1.9%
750B	Saddleback-Glebe-Ricker association, gently sloping, very stony	D	223.6	1.9%
750D	Saddleback-Glebe-Ricker association, moderately steep, very stony	D	1,015.2	8.7%
750E	Saddleback-Glebe-Ricker association, steep, very stony	D	1,560.0	13.3%
760D	Tunbridge-Plaisted association, moderately steep, very stony	B	207.0	1.8%
768A	Peacham-Wonsqueak-Cabot association, nearly level, extremely stony	D	17.0	0.1%
803D	Monadnock-Berkshire complex, 15 to 35 percent slopes, very stony	B	293.1	2.5%
803E	Monadnock-Berkshire complex, 35 to 60 percent slopes, very stony	B	0.2	0.0%
820B	Lyman-Tunbridge-Rock outcrop complex, gently sloping	D	93.4	0.8%
820D	Lyman-Tunbridge-Rock outcrop complex, moderately steep	D	515.9	4.4%
820E	Lyman-Tunbridge-Rock outcrop complex, steep	D	626.1	5.4%
835F	Ricker-Rock outcrop complex, very steep	D	25.6	0.2%
860E	Tunbridge-Lyman-Rock outcrop complex, steep	B	244.8	2.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
862E	Plaisted-Tunbridge association, 35 to 45 percent slopes, very stony	C	77.8	0.7%
864D	Howland-Plaisted association, 15 to 35 percent slopes, very stony	C/D	392.4	3.4%
865B	Bemis-Surplus association, gently sloping, very stony	D	96.2	0.8%
869B	Sunapee-Moosilauke-Monadnock association, gently sloping, very stony	C	218.7	1.9%
897A	Peacham, Bucksport, and Rumney soils, 0 to 2 percent slopes, ponded	A/D	58.2	0.5%
919B	Tunbridge-Lyman-Marlow association, 0 to 15 percent slopes, very stony	C	107.6	0.9%
919D	Tunbridge-Lyman-Marlow association, 15 to 35 percent slopes, very stony	C	542.4	4.6%
919E	Tunbridge-Lyman-Marlow association, 35 to 60 percent slopes, very stony	C	195.7	1.7%
923B	Marlow-Peru association, 0 to 8 percent slopes, extremely bouldery	C	68.4	0.6%
964B	Howland-Cabot association, gently sloping, very stony	C	178.4	1.5%
965B	Cabot-Howland association, gently sloping, very stony	D	32.3	0.3%
969D	Sunapee-Monadnock association, moderately steep, very stony	C	244.0	2.1%
995A	Wonsqueak muck, 0 to 2 percent slopes	B/D	19.3	0.2%
W	Water		34.0	0.3%
Totals for Area of Interest			**11,689.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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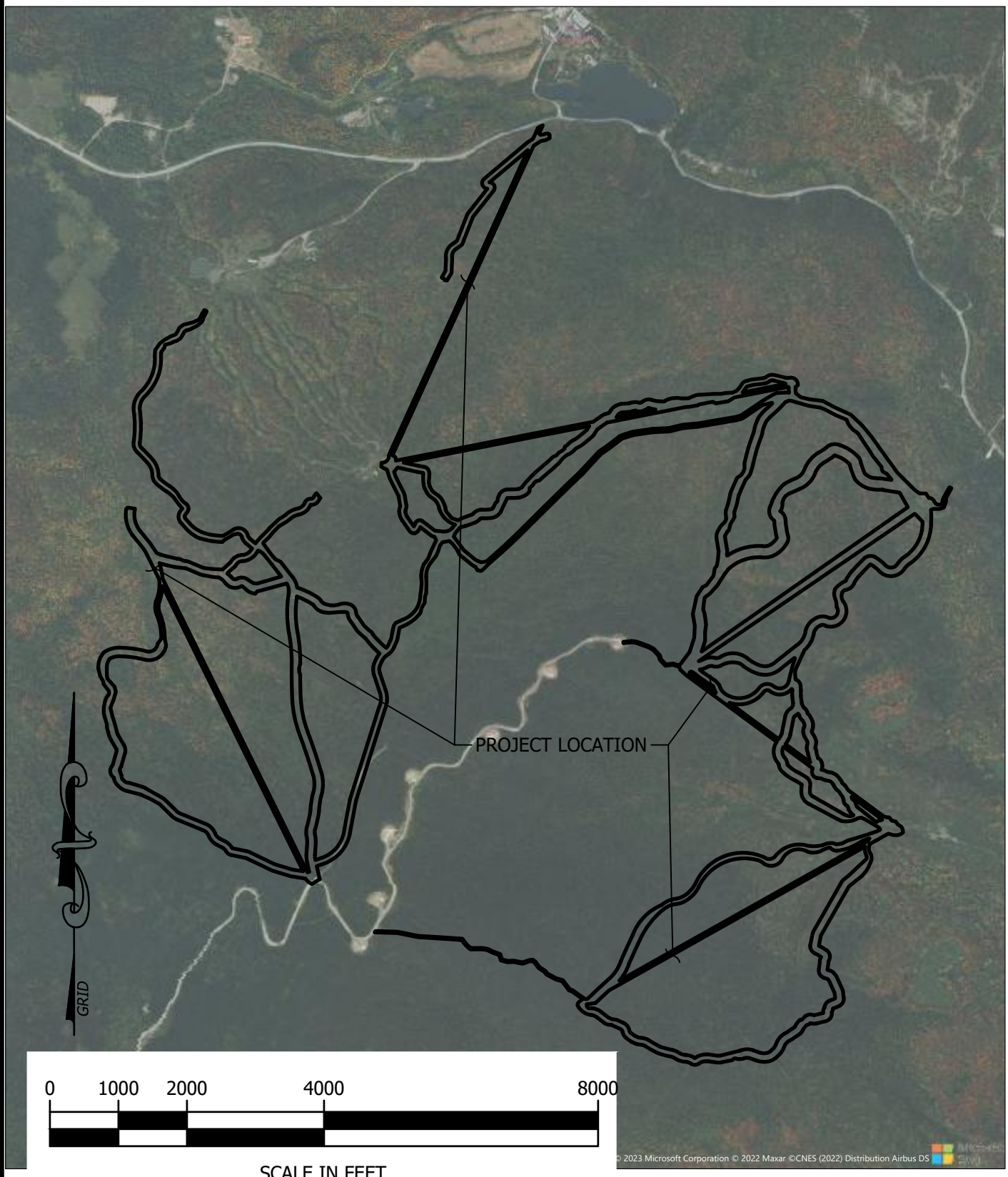
2.11 Aerial Photograph



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THE BALSAMS

DIXVILLE, COOS COUNTY, NH

AERIAL MAP

PROJECT #:	220115
ENGIN'D BY:	MSG
DRAWN BY:	MSG
DATE:	JAN 2023

2.12 Site Photographs

Photo # 1 – Existing Wind Facility

horizons Engineering

34 School Street
Littleton, NH 03561
(603) 444-4111

Alteration of Terrain Permit Application
EXISTING SITE PHOTOS
DIXVILLE CAPITAL, LLC
NHDES AOT Permitting
Dixville, New Hampshire
Project No. 220115

Photo # 2 – Forest looking West near top of Lift 10 area

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EXISTING SITE PHOTOS
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Photo # 3 – Forest near top of Lift 6 near Existing Ski Resort facing South

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Alteration of Terrain Permit Application
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Project No. 220115

Photo # 4 – Lift 4 area higher elevation Wetland

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(603) 444-4111

Alteration of Terrain Permit Application
EXISTING SITE PHOTOS
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Dixville, New Hampshire
Project No. 220115

Photo # 5 – Lift 6 area upper slope, previously logged forest

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EXISTING SITE PHOTOS
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Photo # 6 – Lift 10 area higher elevation woods

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Alteration of Terrain Permit Application
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Project No. 220115

Photo # 7 – Lift 11 area typical previously logged area 1

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Photo # 8 – Lift 11 area typical previously logged area 2

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EXISTING SITE PHOTOS
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Dixville, New Hampshire
Project No. 220115

Photo # 9 – Lift 13 area access road high elevation

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(603) 444-4111

Alteration of Terrain Permit Application
EXISTING SITE PHOTOS
DIXVILLE CAPITAL, LLC
NHDES AOT Permitting
Dixville, New Hampshire
Project No. 220115

2.13 Extreme Precipitation Tables
(Northeast Regional Climate Center)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.316 degrees West
Latitude	44.853 degrees North
Elevation	0 feet
Date/Time	Tue, 06 Dec 2022 13:33:21 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.41	0.51	0.66	0.83	1.02	**1yr**	0.71	0.95	1.15	1.39	1.65	1.95	2.26	**1yr**	1.73	2.18	2.62	3.24	3.82	**1yr**
2yr	0.29	0.44	0.55	0.73	0.92	1.14	**2yr**	0.79	1.04	1.30	1.58	1.90	2.28	2.63	**2yr**	2.02	2.53	3.04	3.73	4.33	**2yr**
5yr	0.34	0.52	0.65	0.88	1.12	1.40	**5yr**	0.97	1.25	1.60	1.94	2.32	2.76	3.21	**5yr**	2.44	3.09	3.65	4.41	5.08	**5yr**
10yr	0.37	0.58	0.74	1.01	1.31	1.65	**10yr**	1.13	1.45	1.89	2.28	2.71	3.19	3.74	**10yr**	2.82	3.59	4.20	5.02	5.74	**10yr**
25yr	0.43	0.69	0.88	1.21	1.61	2.04	**25yr**	1.39	1.76	2.34	2.81	3.32	3.87	4.56	**25yr**	3.42	4.39	5.06	5.95	6.74	**25yr**
50yr	0.49	0.78	1.00	1.40	1.89	2.40	**50yr**	1.63	2.04	2.75	3.30	3.88	4.48	5.31	**50yr**	3.96	5.11	5.83	6.77	7.63	**50yr**
100yr	0.55	0.89	1.15	1.63	2.22	2.83	**100yr**	1.92	2.36	3.24	3.87	4.52	5.19	6.19	**100yr**	4.59	5.95	6.71	7.72	8.63	**100yr**
200yr	0.63	1.02	1.32	1.89	2.61	3.33	**200yr**	2.25	2.74	3.81	4.54	5.27	6.01	7.22	**200yr**	5.32	6.94	7.74	8.80	9.77	**200yr**
500yr	0.74	1.22	1.59	2.31	3.23	4.14	**500yr**	2.79	3.35	4.74	5.62	6.47	7.31	8.84	**500yr**	6.47	8.50	9.36	10.47	11.52	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.39	0.53	0.65	0.86	**1yr**	0.56	0.84	0.90	1.12	1.50	1.69	2.12	**1yr**	1.50	2.04	2.31	2.98	3.24	**1yr**
2yr	0.28	0.43	0.52	0.71	0.87	1.03	**2yr**	0.75	1.00	1.15	1.41	1.75	2.23	2.58	**2yr**	1.98	2.48	2.98	3.66	4.27	**2yr**
5yr	0.31	0.47	0.58	0.80	1.02	1.18	**5yr**	0.88	1.15	1.31	1.65	2.07	2.62	3.04	**5yr**	2.32	2.93	3.48	4.21	4.87	**5yr**
10yr	0.33	0.51	0.64	0.89	1.15	1.31	**10yr**	0.99	1.28	1.45	1.85	2.23	2.95	3.44	**10yr**	2.61	3.31	3.91	4.66	5.38	**10yr**
25yr	0.37	0.57	0.71	1.01	1.33	1.52	**25yr**	1.14	1.48	1.68	2.11	2.55	3.47	4.03	**25yr**	3.07	3.88	4.57	5.37	6.12	**25yr**
50yr	0.40	0.61	0.76	1.09	1.46	1.69	**50yr**	1.26	1.66	1.87	2.30	2.80	3.93	4.56	**50yr**	3.48	4.39	5.13	5.98	6.74	**50yr**
100yr	0.43	0.65	0.82	1.18	1.62	1.94	**100yr**	1.40	1.90	2.18	2.50	3.09	4.46	5.15	**100yr**	3.95	4.96	5.79	6.66	7.44	**100yr**
200yr	0.47	0.70	0.89	1.29	1.80	2.19	**200yr**	1.56	2.14	2.45	2.71	3.37	5.06	5.84	**200yr**	4.48	5.61	6.54	7.43	8.24	**200yr**
500yr	0.52	0.78	1.00	1.45	2.07	2.58	**500yr**	1.78	2.52	2.87	3.01	3.77	6.01	6.88	**500yr**	5.32	6.62	7.70	8.60	9.37	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.73	0.90	1.05	**1yr**	0.78	1.03	1.19	1.49	1.79	2.07	2.48	**1yr**	1.83	2.38	2.82	3.43	4.01	**1yr**
2yr	0.30	0.46	0.57	0.77	0.95	1.11	**2yr**	0.82	1.08	1.24	1.57	1.87	2.34	2.72	**2yr**	2.07	2.62	3.12	3.80	4.46	**2yr**
5yr	0.36	0.55	0.68	0.93	1.19	1.35	**5yr**	1.02	1.32	1.52	1.90	2.34	2.91	3.38	**5yr**	2.58	3.25	3.84	4.61	5.27	**5yr**
10yr	0.42	0.64	0.79	1.11	1.43	1.62	**10yr**	1.24	1.58	1.83	2.28	2.78	3.44	4.02	**10yr**	3.04	3.87	4.50	5.33	6.06	**10yr**
25yr	0.52	0.79	0.98	1.40	1.84	2.06	**25yr**	1.59	2.01	2.34	2.94	3.52	4.29	5.05	**25yr**	3.79	4.86	5.58	6.47	7.27	**25yr**
50yr	0.61	0.92	1.15	1.65	2.22	2.46	**50yr**	1.92	2.40	2.83	3.58	4.22	5.05	6.01	**50yr**	4.47	5.78	6.56	7.51	8.35	**50yr**
100yr	0.72	1.09	1.36	1.97	2.70	2.88	**100yr**	2.33	2.81	3.32	4.36	5.08	5.98	7.15	**100yr**	5.29	6.87	7.73	8.71	9.59	**100yr**
200yr	0.86	1.29	1.63	2.36	3.29	3.43	**200yr**	2.84	3.35	3.98	5.30	6.10	7.05	8.51	**200yr**	6.24	8.18	9.09	10.10	11.01	**200yr**
500yr	1.08	1.61	2.07	3.01	4.28	4.33	**500yr**	3.69	4.24	5.07	6.88	7.83	8.78	10.71	**500yr**	7.77	10.29	11.26	12.30	13.22	**500yr**

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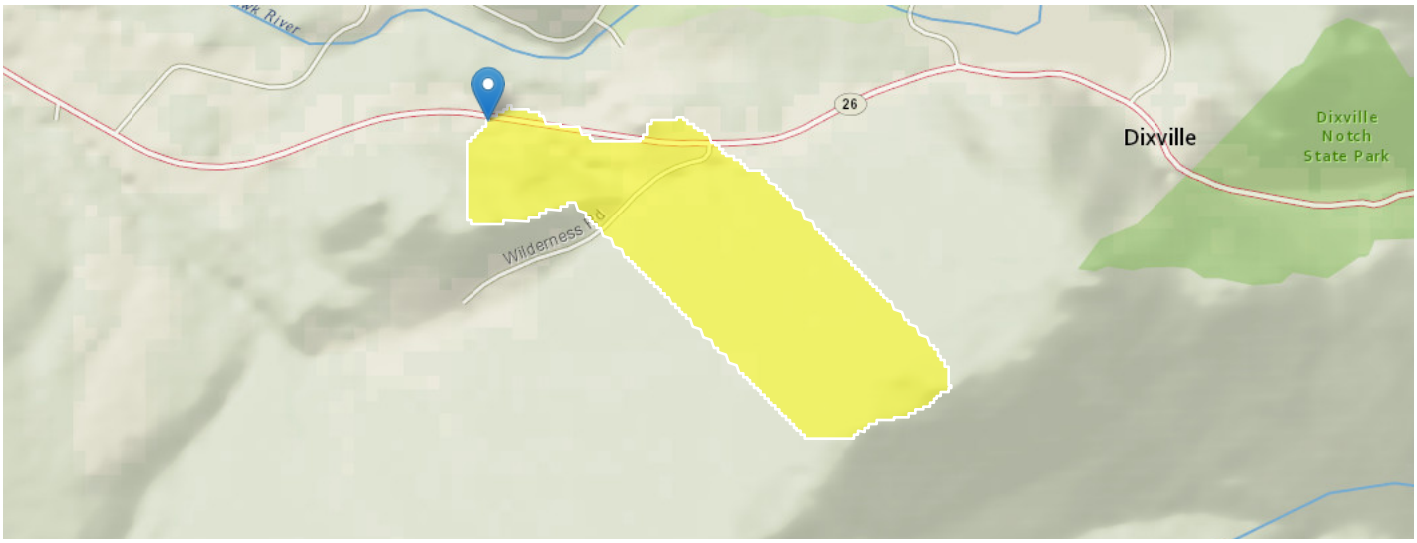
2.14 USGS StreamStats Reports

StreamStats Report Unnamed to SR 26 to Mohawk River 1

Region ID: NH
Workspace ID: NH20221206141750590000
Clicked Point (Latitude, Longitude): 44.86583, -71.32283
Time: 2022-12-06 09:18:17 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	3.176	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	27.218	percent
CONIF	Percentaqe of land surface covered by coniferous forest	12.0638	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	1060	feet per mi
DRNAREA	Area that drains to a point on a stream	0.17	square miles
ELEVMAX	Maximum basin elevation	2618.144	feet
MINTEMP_W	Mean winter minimum air temperature over basin surface area	4.462	degrees F
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	58.9306	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	7.87	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	8.9	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	50.4	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	48.7	inches
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.2	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	23.2	inches
SNOFALL	Mean Annual Snowfall	116.296	inches
TEMP	Mean Annual Temperature	37.58	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	54.498	degrees F
WETLAND	Percentage of Wetlands	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.176	inches	2.79	6.23
WETLAND	Percent Wetlands	0	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	1060	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
50-percent AEP flood	11.2	ft^3/s
20-percent AEP flood	20	ft^3/s
10-percent AEP flood	27.8	ft^3/s
4-percent AEP flood	39	ft^3/s
2-percent AEP flood	48.6	ft^3/s
1-percent AEP flood	60.1	ft^3/s
0.2-percent AEP flood	89.2	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	3.26	689
TEMP	Mean Annual Temperature	37.58	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0262	ft^3/s
7 Day 10 Year Low Flow	0.00939	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1
TEMP	Mean Annual Temperature	37.58	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.129	ft^3/s
70 Percent Duration	0.103	ft^3/s
80 Percent Duration	0.0682	ft^3/s
90 Percent Duration	0.0404	ft^3/s
95 Percent Duration	0.027	ft^3/s
98 Percent Duration	0.0179	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	3.26	689
CONIF	Percent Coniferous Forest	12.0638	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	7.87	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	27.218	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	58.9306	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.5
TEMP	Mean Annual Temperature	37.58	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	54.498	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	2618.144	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.111	ft^3/s

Statistic	Value	Unit
Jan to Mar15 70 Percent Flow	0.0914	ft^3/s
Jan to Mar15 80 Percent Flow	0.0793	ft^3/s
Jan to Mar15 90 Percent Flow	0.056	ft^3/s
Jan to Mar15 95 Percent Flow	0.0436	ft^3/s
Jan to Mar15 98 Percent Flow	0.0357	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	0.0759	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	0.0379	ft^3/s
Mar16 to May 60 Percent Flow	0.468	ft^3/s
Mar16 to May 70 Percent Flow	0.355	ft^3/s
Mar16 to May 80 Percent Flow	0.241	ft^3/s
Mar16 to May 90 Percent Flow	0.156	ft^3/s
Mar16 to May 95 Percent Flow	0.107	ft^3/s
Mar16 to May 98 Percent Flow	0.0714	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	0.107	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	0.0555	ft^3/s
Jun to Oct 60 Percent Flow	0.0819	ft^3/s
Jun to Oct 70 Percent Flow	0.0631	ft^3/s
Jun to Oct 80 Percent Flow	0.0419	ft^3/s
Jun to Oct 90 Percent Flow	0.0284	ft^3/s
Jun to Oct 95 Percent Flow	0.02	ft^3/s
Jun to Oct 98 Percent Flow	0.0177	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	0.0296	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	0.0111	ft^3/s
Nov to Dec 60 Percent Flow	0.221	ft^3/s
Nov to Dec 70 Percent Flow	0.178	ft^3/s
Nov to Dec 80 Percent Flow	0.148	ft^3/s
Nov to Dec 90 Percent Flow	0.102	ft^3/s
Nov to Dec 95 Percent Flow	0.0658	ft^3/s
Nov to Dec 98 Percent Flow	0.0402	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	0.132	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	0.0643	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	7.28	ft
Bieger_D_channel_depth	0.674	ft
Bieger_D_channel_cross_sectional_area	4.95	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	15.4	ft
Bieger_P_channel_depth	0.931	ft
Bieger_P_channel_cross_sectional_area	14	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	6.64	ft
Bieger_USA_channel_depth	0.827	ft
Bieger_USA_channel_cross_sectional_area	6.56	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	7.28	ft
Bieger_D_channel_depth	0.674	ft
Bieger_D_channel_cross_sectional_area	4.95	ft^2
Bieger_P_channel_width	15.4	ft
Bieger_P_channel_depth	0.931	ft
Bieger_P_channel_cross_sectional_area	14	ft^2
Bieger_USA_channel_width	6.64	ft
Bieger_USA_channel_depth	0.827	ft
Bieger_USA_channel_cross_sectional_area	6.56	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Recharge Statistics

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	48.7	inches	35.83	53.11
TEMP	Mean Annual Temperature	37.58	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	4.462	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	12.0638	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	116.296	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	58.9306	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	8.9	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	50.4	inches	37.44	75.91

Recharge Statistics Disclaimers [Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	4.56	in
GW_Recharge_Mar16_to_May	9.94	in
GW_Recharge_Jun_to_Oct	6.34	in
GW_Recharge_Nov_to_Dec	4.24	in
GW_Recharge_Ann	25.6	in

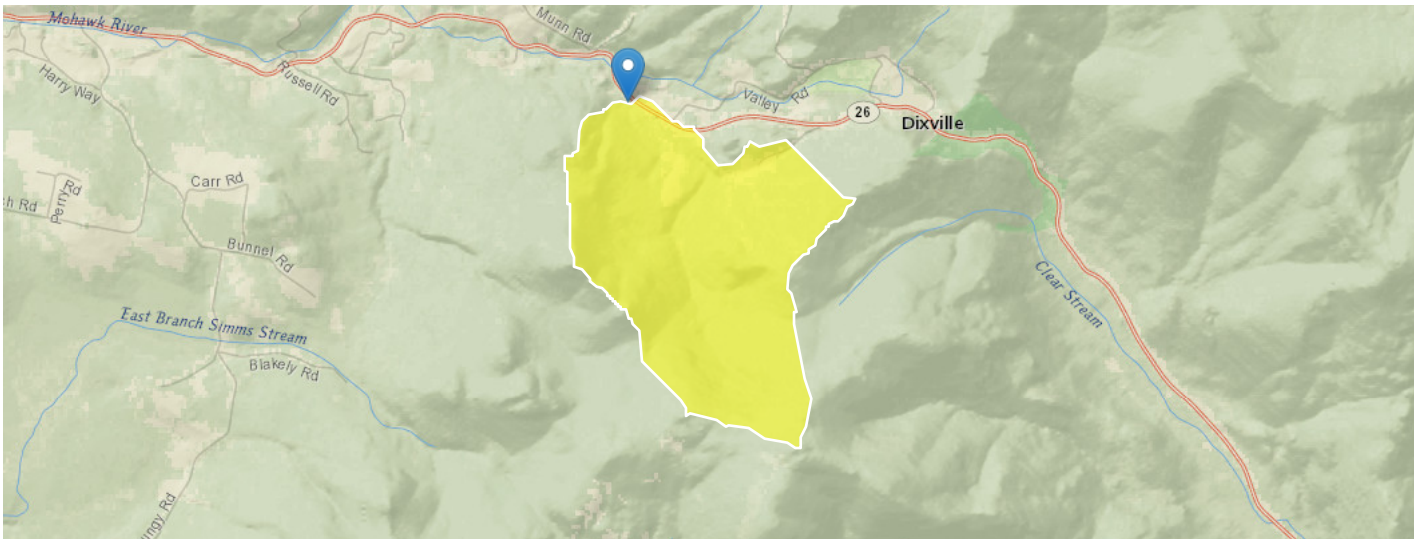
Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report Unnamed to SR 26 to Mohawk River 2

Region ID: NH
Workspace ID: NH20221206142315285000
Clicked Point (Latitude, Longitude): 44.86729, -71.34047
Time: 2022-12-06 09:23:34 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	3.22	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	25.628	percent
CONIF	Percentaqe of land surface covered by coniferous forest	22.2311	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	493	feet per mi
DRNAREA	Area that drains to a point on a stream	2.39	square miles
ELEVMAX	Maximum basin elevation	3474.313	feet
MINTEMP_W	Mean winter minimum air temperature over basin surface area	4.72	degrees F
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	33.2689	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.39	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	9.49	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	53.1	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	46.7	inches
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	8.9	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	22.5	inches
SNOFALL	Mean Annual Snowfall	122.82	inches
TEMP	Mean Annual Temperature	37.641	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	54.53	degrees F
WETLAND	Percentage of Wetlands	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.22	inches	2.79	6.23
WETLAND	Percent Wetlands	0	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	493	feet per mi	5.43	543

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp	Equiv. Yrs.
50-percent AEP flood	123	ft^3/s	74.8	202	30.1	3.2
20-percent AEP flood	203	ft^3/s	121	339	31.1	4.7
10-percent AEP flood	270	ft^3/s	158	461	32.3	6.2
4-percent AEP flood	361	ft^3/s	204	639	34.3	8
2-percent AEP flood	436	ft^3/s	239	797	36.4	9
1-percent AEP flood	525	ft^3/s	278	993	38.6	9.8
0.2-percent AEP flood	737	ft^3/s	357	1520	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	3.26	689
TEMP	Mean Annual Temperature	37.641	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	22.5	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.631	ft^3/s
7 Day 10 Year Low Flow	0.326	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	22.5	inches	16.5	23.1
TEMP	Mean Annual Temperature	37.641	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	2.11	ft^3/s
70 Percent Duration	1.72	ft^3/s
80 Percent Duration	1.28	ft^3/s
90 Percent Duration	0.862	ft^3/s
95 Percent Duration	0.635	ft^3/s
98 Percent Duration	0.474	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	3.26	689
CONIF	Percent Coniferous Forest	22.2311	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.39	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	25.628	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	33.2689	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	8.9	inches	6.83	11.5
TEMP	Mean Annual Temperature	37.641	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	54.53	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	22.5	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	3474.313	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	1.59	ft^3/s

Statistic	Value	Unit
Jan to Mar15 70 Percent Flow	1.34	ft^3/s
Jan to Mar15 80 Percent Flow	1.15	ft^3/s
Jan to Mar15 90 Percent Flow	0.861	ft^3/s
Jan to Mar15 95 Percent Flow	0.683	ft^3/s
Jan to Mar15 98 Percent Flow	0.558	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	1.14	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	0.625	ft^3/s
Mar16 to May 60 Percent Flow	6.68	ft^3/s
Mar16 to May 70 Percent Flow	5.12	ft^3/s
Mar16 to May 80 Percent Flow	3.68	ft^3/s
Mar16 to May 90 Percent Flow	2.42	ft^3/s
Mar16 to May 95 Percent Flow	1.7	ft^3/s
Mar16 to May 98 Percent Flow	1.21	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	1.52	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	0.82	ft^3/s
Jun to Oct 60 Percent Flow	1.51	ft^3/s
Jun to Oct 70 Percent Flow	1.21	ft^3/s
Jun to Oct 80 Percent Flow	0.944	ft^3/s
Jun to Oct 90 Percent Flow	0.691	ft^3/s
Jun to Oct 95 Percent Flow	0.54	ft^3/s
Jun to Oct 98 Percent Flow	0.458	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	0.689	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	0.368	ft^3/s
Nov to Dec 60 Percent Flow	2.76	ft^3/s
Nov to Dec 70 Percent Flow	2.24	ft^3/s
Nov to Dec 80 Percent Flow	1.84	ft^3/s
Nov to Dec 90 Percent Flow	1.29	ft^3/s
Nov to Dec 95 Percent Flow	0.905	ft^3/s
Nov to Dec 98 Percent Flow	0.616	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	1.74	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	0.893	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.39	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	21.8	ft
Bieger_D_channel_depth	1.44	ft
Bieger_D_channel_cross_sectional_area	31.8	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	32.3	ft
Bieger_P_channel_depth	1.67	ft
Bieger_P_channel_cross_sectional_area	54	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	16.8	ft
Bieger_USA_channel_depth	1.45	ft
Bieger_USA_channel_cross_sectional_area	27.4	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	21.8	ft
Bieger_D_channel_depth	1.44	ft
Bieger_D_channel_cross_sectional_area	31.8	ft^2
Bieger_P_channel_width	32.3	ft
Bieger_P_channel_depth	1.67	ft
Bieger_P_channel_cross_sectional_area	54	ft^2
Bieger_USA_channel_width	16.8	ft
Bieger_USA_channel_depth	1.45	ft
Bieger_USA_channel_cross_sectional_area	27.4	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Recharge Statistics

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	46.7	inches	35.83	53.11
TEMP	Mean Annual Temperature	37.641	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	4.72	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	22.2311	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	8.9	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	122.82	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	22.5	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	33.2689	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	9.49	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	53.1	inches	37.44	75.91

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp
GW_Recharge_Jan_to_Mar15	3.87	in	15.5
GW_Recharge_Mar16_to_May	9.69	in	12.4
GW_Recharge_Jun_to_Oct	6.93	in	26.5
GW_Recharge_Nov_to_Dec	4.04	in	15.8
GW_Recharge_Ann	25.4	in	12.4

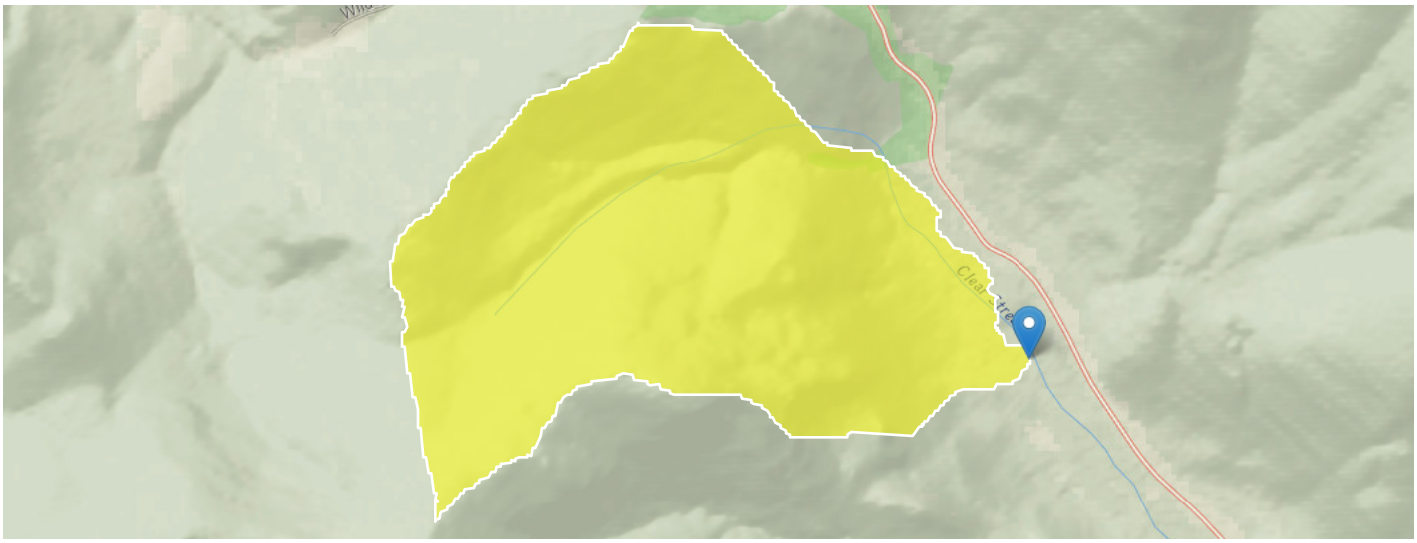
Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report - Cascade Brook to Clear Stream

Region ID: NH
Workspace ID: NH20221206135830843000
Clicked Point (Latitude, Longitude): 44.84686, -71.27870
Time: 2022-12-06 08:58:57 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	3.3	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	27.238	percent
CONIF	Percentaqe of land surface covered by coniferous forest	39.3318	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	563	feet per mi
DRNAREA	Area that drains to a point on a stream	1.77	square miles
ELEVMAX	Maximum basin elevation	3292.728	feet
MINTEMP_W	Mean winter minimum air temperature over basin surface area	5.154	degrees F
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	23.2408	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.31	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	9.49	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	54	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	51.3	inches
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.6	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	25	inches
SNOFALL	Mean Annual Snowfall	130.979	inches
TEMP	Mean Annual Temperature	37.693	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	54.446	degrees F
WETLAND	Percentage of Wetlands	0.2885	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.3	inches	2.79	6.23
WETLAND	Percent Wetlands	0.2885	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	563	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
50-percent AEP flood	97.1	ft^3/s
20-percent AEP flood	162	ft^3/s
10-percent AEP flood	217	ft^3/s
4-percent AEP flood	293	ft^3/s
2-percent AEP flood	355	ft^3/s
1-percent AEP flood	429	ft^3/s
0.2-percent AEP flood	606	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	3.26	689
TEMP	Mean Annual Temperature	37.693	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	25	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.615	ft^3/s
7 Day 10 Year Low Flow	0.329	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	25	inches	16.5	23.1
TEMP	Mean Annual Temperature	37.693	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	1.99	ft^3/s
70 Percent Duration	1.63	ft^3/s
80 Percent Duration	1.22	ft^3/s
90 Percent Duration	0.814	ft^3/s
95 Percent Duration	0.589	ft^3/s
98 Percent Duration	0.444	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	3.26	689
CONIF	Percent Coniferous Forest	39.3318	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.31	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	27.238	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	23.2408	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.6	inches	6.83	11.5
TEMP	Mean Annual Temperature	37.693	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	54.446	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	25	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	3292.728	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.957	ft^3/s

Statistic	Value	Unit
Jan to Mar15 70 Percent Flow	0.8	ft^3/s
Jan to Mar15 80 Percent Flow	0.702	ft^3/s
Jan to Mar15 90 Percent Flow	0.54	ft^3/s
Jan to Mar15 95 Percent Flow	0.434	ft^3/s
Jan to Mar15 98 Percent Flow	0.368	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	0.724	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	0.397	ft^3/s
Mar16 to May 60 Percent Flow	5.03	ft^3/s
Mar16 to May 70 Percent Flow	3.84	ft^3/s
Mar16 to May 80 Percent Flow	2.83	ft^3/s
Mar16 to May 90 Percent Flow	1.88	ft^3/s
Mar16 to May 95 Percent Flow	1.33	ft^3/s
Mar16 to May 98 Percent Flow	0.974	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	1.11	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	0.603	ft^3/s
Jun to Oct 60 Percent Flow	1.3	ft^3/s
Jun to Oct 70 Percent Flow	1.02	ft^3/s
Jun to Oct 80 Percent Flow	0.892	ft^3/s
Jun to Oct 90 Percent Flow	0.637	ft^3/s
Jun to Oct 95 Percent Flow	0.502	ft^3/s
Jun to Oct 98 Percent Flow	0.389	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	0.657	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	0.362	ft^3/s
Nov to Dec 60 Percent Flow	1.96	ft^3/s
Nov to Dec 70 Percent Flow	1.54	ft^3/s
Nov to Dec 80 Percent Flow	1.23	ft^3/s
Nov to Dec 90 Percent Flow	0.833	ft^3/s
Nov to Dec 95 Percent Flow	0.559	ft^3/s
Nov to Dec 98 Percent Flow	0.367	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	1.19	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	0.567	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.77	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	19.3	ft
Bieger_D_channel_depth	1.32	ft
Bieger_D_channel_cross_sectional_area	25.8	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	29.6	ft
Bieger_P_channel_depth	1.56	ft
Bieger_P_channel_cross_sectional_area	46.3	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	15.1	ft
Bieger_USA_channel_depth	1.36	ft
Bieger_USA_channel_cross_sectional_area	23.3	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	19.3	ft
Bieger_D_channel_depth	1.32	ft
Bieger_D_channel_cross_sectional_area	25.8	ft^2
Bieger_P_channel_width	29.6	ft
Bieger_P_channel_depth	1.56	ft
Bieger_P_channel_cross_sectional_area	46.3	ft^2
Bieger_USA_channel_width	15.1	ft
Bieger_USA_channel_depth	1.36	ft
Bieger_USA_channel_cross_sectional_area	23.3	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Recharge Statistics

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	51.3	inches	35.83	53.11
TEMP	Mean Annual Temperature	37.693	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	5.154	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	39.3318	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	9.6	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	130.979	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	25	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	23.2408	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	9.49	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	54	inches	37.44	75.91

Recharge Statistics Disclaimers [Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	3.98	in
GW_Recharge_Mar16_to_May	10	in
GW_Recharge_Jun_to_Oct	8.74	in
GW_Recharge_Nov_to_Dec	3.2	in
GW_Recharge_Ann	23	in

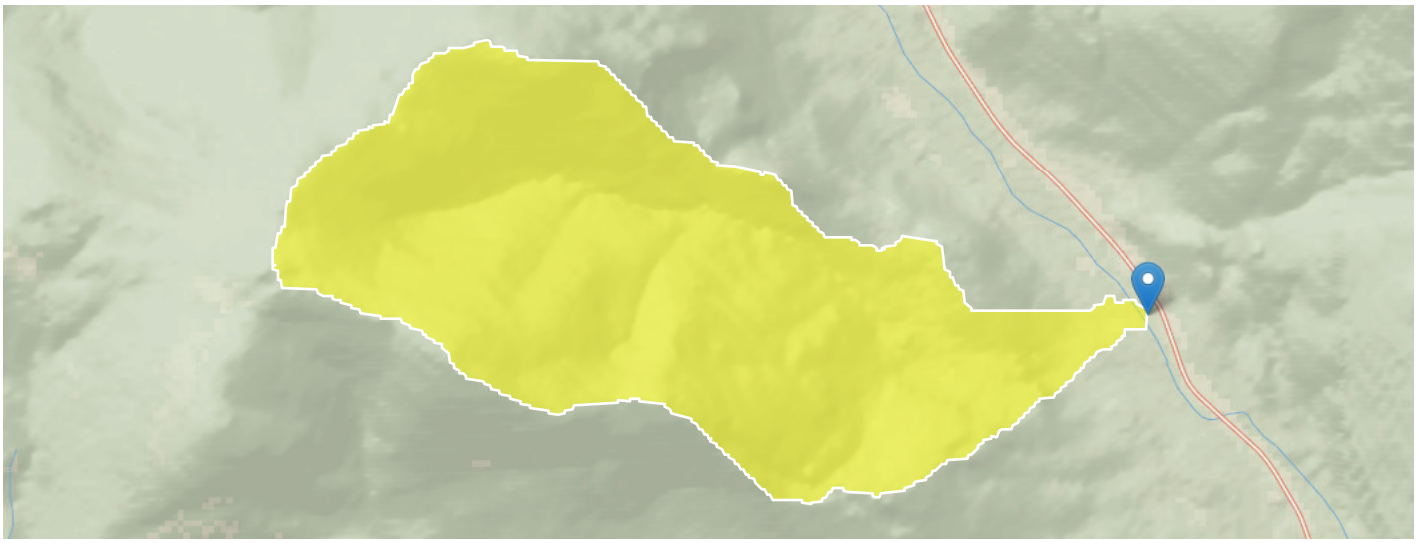
Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report - Unnamed to Clear Stream

Region ID: NH
Workspace ID: NH20221206141159053000
Clicked Point (Latitude, Longitude): 44.83360, -71.26191
Time: 2022-12-06 09:12:19 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	3.419	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	28.96	percent
CONIF	Percentaqe of land surface covered by coniferous forest	45.2223	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	477	feet per mi
DRNAREA	Area that drains to a point on a stream	1.97	square miles
ELEVMAX	Maximum basin elevation	3474.5	feet
MINTEMP_W	Mean winter minimum air temperature over basin surface area	5.607	degrees F
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	17.6392	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	8.11	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	9.37	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	54.2	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	48.3	inches
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.1	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	23.3	inches
SNOFALL	Mean Annual Snowfall	134.362	inches
TEMP	Mean Annual Temperature	37.837	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	54.596	degrees F
WETLAND	Percentage of Wetlands	0.082	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.419	inches	2.79	6.23
WETLAND	Percent Wetlands	0.082	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	477	feet per mi	5.43	543

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp	Equiv. Yrs.
50-percent AEP flood	111	ft^3/s	67.7	182	30.1	3.2
20-percent AEP flood	186	ft^3/s	112	310	31.1	4.7
10-percent AEP flood	250	ft^3/s	147	425	32.3	6.2
4-percent AEP flood	337	ft^3/s	191	594	34.3	8
2-percent AEP flood	409	ft^3/s	225	743	36.4	9
1-percent AEP flood	494	ft^3/s	263	929	38.6	9.8
0.2-percent AEP flood	700	ft^3/s	342	1430	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	3.26	689
TEMP	Mean Annual Temperature	37.837	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	23.3	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.542	ft^3/s
7 Day 10 Year Low Flow	0.277	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	23.3	inches	16.5	23.1
TEMP	Mean Annual Temperature	37.837	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	1.87	ft^3/s
70 Percent Duration	1.52	ft^3/s
80 Percent Duration	1.11	ft^3/s
90 Percent Duration	0.74	ft^3/s
95 Percent Duration	0.536	ft^3/s
98 Percent Duration	0.398	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	3.26	689
CONIF	Percent Coniferous Forest	45.2223	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	8.11	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	28.96	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	17.6392	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.1	inches	6.83	11.5
TEMP	Mean Annual Temperature	37.837	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	54.596	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	23.3	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	3474.5	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.999	ft^3/s

Statistic	Value	Unit
Jan to Mar15 70 Percent Flow	0.835	ft^3/s
Jan to Mar15 80 Percent Flow	0.737	ft^3/s
Jan to Mar15 90 Percent Flow	0.572	ft^3/s
Jan to Mar15 95 Percent Flow	0.462	ft^3/s
Jan to Mar15 98 Percent Flow	0.395	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	0.769	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	0.423	ft^3/s
Mar16 to May 60 Percent Flow	5.71	ft^3/s
Mar16 to May 70 Percent Flow	4.36	ft^3/s
Mar16 to May 80 Percent Flow	3.28	ft^3/s
Mar16 to May 90 Percent Flow	2.18	ft^3/s
Mar16 to May 95 Percent Flow	1.56	ft^3/s
Mar16 to May 98 Percent Flow	1.17	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	1.16	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	0.627	ft^3/s
Jun to Oct 60 Percent Flow	1.15	ft^3/s
Jun to Oct 70 Percent Flow	0.904	ft^3/s
Jun to Oct 80 Percent Flow	0.812	ft^3/s
Jun to Oct 90 Percent Flow	0.586	ft^3/s
Jun to Oct 95 Percent Flow	0.456	ft^3/s
Jun to Oct 98 Percent Flow	0.375	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	0.593	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	0.314	ft^3/s
Nov to Dec 60 Percent Flow	2.17	ft^3/s
Nov to Dec 70 Percent Flow	1.71	ft^3/s
Nov to Dec 80 Percent Flow	1.36	ft^3/s
Nov to Dec 90 Percent Flow	0.921	ft^3/s
Nov to Dec 95 Percent Flow	0.619	ft^3/s
Nov to Dec 98 Percent Flow	0.409	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	1.33	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	0.632	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.97	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	20.1	ft
Bieger_D_channel_depth	1.36	ft
Bieger_D_channel_cross_sectional_area	27.8	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	30.6	ft
Bieger_P_channel_depth	1.6	ft
Bieger_P_channel_cross_sectional_area	48.9	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	15.7	ft
Bieger_USA_channel_depth	1.39	ft
Bieger_USA_channel_cross_sectional_area	24.6	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	20.1	ft
Bieger_D_channel_depth	1.36	ft
Bieger_D_channel_cross_sectional_area	27.8	ft^2
Bieger_P_channel_width	30.6	ft
Bieger_P_channel_depth	1.6	ft
Bieger_P_channel_cross_sectional_area	48.9	ft^2
Bieger_USA_channel_width	15.7	ft
Bieger_USA_channel_depth	1.39	ft
Bieger_USA_channel_cross_sectional_area	24.6	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Recharge Statistics

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	48.3	inches	35.83	53.11
TEMP	Mean Annual Temperature	37.837	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	5.607	degrees F	0.8	19.88
CONIF	Percent Coniferous Forest	45.2223	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	9.1	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	134.362	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	23.3	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	17.6392	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	9.37	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	54.2	inches	37.44	75.91

Recharge Statistics Disclaimers [Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	3.33	in
GW_Recharge_Mar16_to_May	9.62	in
GW_Recharge_Jun_to_Oct	7.95	in
GW_Recharge_Nov_to_Dec	2.85	in
GW_Recharge_Ann	22	in

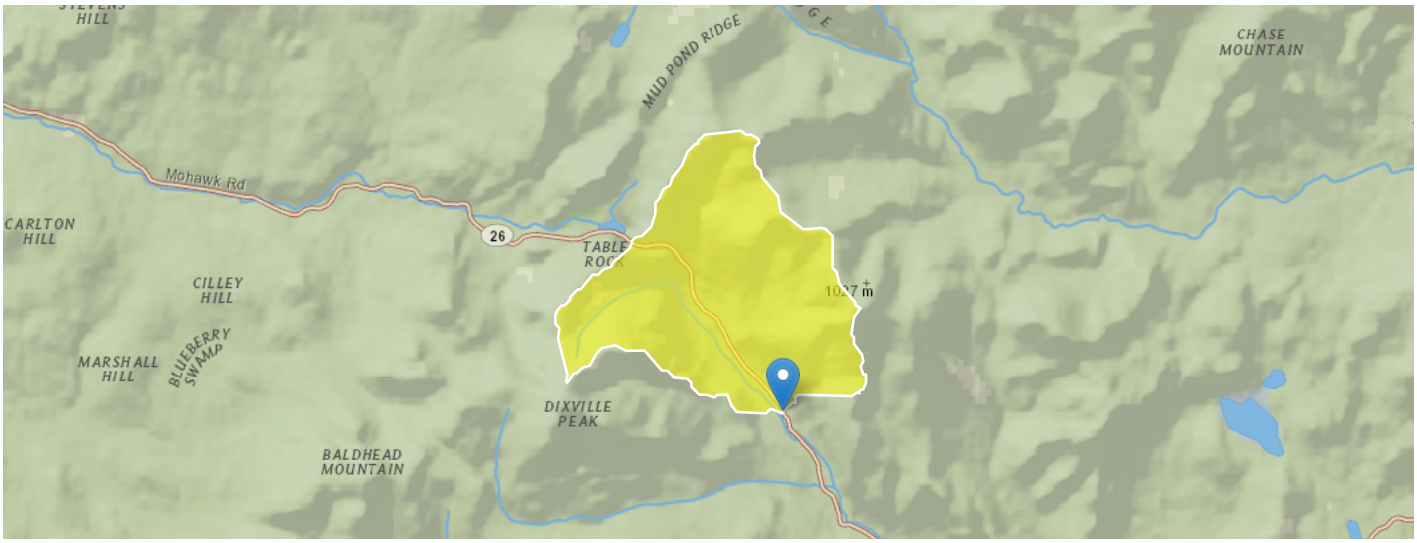
Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report - Clear Stream SR 26

Region ID: NH
Workspace ID: NH20221206140725142000
Clicked Point (Latitude, Longitude): 44.83385, -71.26154
Time: 2022-12-06 09:07:45 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	3.41	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	24.16	percent
CONIF	Percentaqe of land surface covered by coniferous forest	22.0825	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	258	feet per mi
DRNAREA	Area that drains to a point on a stream	8.06	square miles
ELEVMAX	Maximum basin elevation	3361.18	feet
MINTEMP_W	Mean winter minimum air temperature over basin surface area	4.985	degrees F
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	22.6379	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	7.8	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	8.9	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	51.3	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	48.2	inches
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.1	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	23.2	inches
SNOFALL	Mean Annual Snowfall	131.225	inches
TEMP	Mean Annual Temperature	37.673	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	54.502	degrees F
WETLAND	Percentage of Wetlands	1.1463	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.41	inches	2.79	6.23
WETLAND	Percent Wetlands	1.1463	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	258	feet per mi	5.43	543

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp	Equiv. Yrs.
50-percent AEP flood	354	ft^3/s	217	577	30.1	3.2
20-percent AEP flood	567	ft^3/s	343	937	31.1	4.7
10-percent AEP flood	743	ft^3/s	441	1250	32.3	6.2
4-percent AEP flood	976	ft^3/s	560	1700	34.3	8
2-percent AEP flood	1160	ft^3/s	645	2080	36.4	9
1-percent AEP flood	1390	ft^3/s	748	2580	38.6	9.8
0.2-percent AEP flood	1910	ft^3/s	946	3860	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	3.26	689
TEMP	Mean Annual Temperature	37.673	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	3.17	ft^3/s
7 Day 10 Year Low Flow	2	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1
TEMP	Mean Annual Temperature	37.673	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	8.53	ft^3/s
70 Percent Duration	7.09	ft^3/s
80 Percent Duration	5.57	ft^3/s
90 Percent Duration	4.01	ft^3/s
95 Percent Duration	3.08	ft^3/s
98 Percent Duration	2.46	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Seasonal Flow Statistics

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	3.26	689
CONIF	Percent Coniferous Forest	22.0825	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	7.8	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	24.16	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	22.6379	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.1	inches	6.83	11.5
TEMP	Mean Annual Temperature	37.673	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	54.502	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	3361.18	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	5.32	ft^3/s

Statistic	Value	Unit
Jan to Mar15 70 Percent Flow	4.5	ft^3/s
Jan to Mar15 80 Percent Flow	3.84	ft^3/s
Jan to Mar15 90 Percent Flow	2.93	ft^3/s
Jan to Mar15 95 Percent Flow	2.33	ft^3/s
Jan to Mar15 98 Percent Flow	1.9	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	3.86	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	2.18	ft^3/s
Mar16 to May 60 Percent Flow	22.5	ft^3/s
Mar16 to May 70 Percent Flow	17.3	ft^3/s
Mar16 to May 80 Percent Flow	12.9	ft^3/s
Mar16 to May 90 Percent Flow	8.62	ft^3/s
Mar16 to May 95 Percent Flow	6.16	ft^3/s
Mar16 to May 98 Percent Flow	4.54	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	5.51	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	3.05	ft^3/s
Jun to Oct 60 Percent Flow	7	ft^3/s
Jun to Oct 70 Percent Flow	5.7	ft^3/s
Jun to Oct 80 Percent Flow	4.51	ft^3/s
Jun to Oct 90 Percent Flow	3.4	ft^3/s
Jun to Oct 95 Percent Flow	2.82	ft^3/s
Jun to Oct 98 Percent Flow	2.24	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	3.36	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	2.18	ft^3/s
Nov to Dec 60 Percent Flow	8.69	ft^3/s
Nov to Dec 70 Percent Flow	7.05	ft^3/s
Nov to Dec 80 Percent Flow	5.74	ft^3/s
Nov to Dec 90 Percent Flow	4.06	ft^3/s
Nov to Dec 95 Percent Flow	2.94	ft^3/s
Nov to Dec 98 Percent Flow	2.08	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	5.53	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	2.86	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Bankfull Statistics

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	8.06	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	36.1	ft
Bieger_D_channel_depth	2.04	ft
Bieger_D_channel_cross_sectional_area	74.9	ft^2

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	45.3	ft
Bieger_P_channel_depth	2.18	ft
Bieger_P_channel_cross_sectional_area	100	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	25.8	ft
Bieger_USA_channel_depth	1.88	ft
Bieger_USA_channel_cross_sectional_area	52.7	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	36.1	ft
Bieger_D_channel_depth	2.04	ft
Bieger_D_channel_cross_sectional_area	74.9	ft^2
Bieger_P_channel_width	45.3	ft
Bieger_P_channel_depth	2.18	ft
Bieger_P_channel_cross_sectional_area	100	ft^2
Bieger_USA_channel_width	25.8	ft
Bieger_USA_channel_depth	1.88	ft
Bieger_USA_channel_cross_sectional_area	52.7	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Recharge Statistics

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIPOUT	Mean Annual Precip at Gage	48.2	inches	35.83	53.11
TEMP	Mean Annual Temperature	37.673	degrees F	36.05	48.69
MINTEMP_W	Mean Winter Min Temperature	4.985	degrees F	0.8	19.88

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONIF	Percent Coniferous Forest	22.0825	percent	3.07	56.18
PREG_03_05	Mar to May Gage Precipitation	9.1	inches	6.83	11.54
SNOFALL	Mean Annual Snowfall	131.225	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	23.2	inches	16.46	23.11
MIXFOR	Percent Mixed Forest	22.6379	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	8.9	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	51.3	inches	37.44	75.91

Recharge Statistics Disclaimers [Groundwater Recharge Statewide 2004 5019]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

Statistic	Value	Unit
GW_Recharge_Jan_to_Mar15	4.16	in
GW_Recharge_Mar16_to_May	10.2	in
GW_Recharge_Jun_to_Oct	7.73	in
GW_Recharge_Nov_to_Dec	3.75	in
GW_Recharge_Ann	24.4	in

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019, 67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

2.15 Waiver Requests

Dixville Capital LLC - The Balsams Ski Lift and Trails Expansion

February 13th, 2023

Waiver requests

Prepared by:

Horizons Engineering, Inc.
Don Bouchard – Project Contact
34 School Street Littleton, NH 03561
Dbouchard@horizonsengineering.com
(603) 444-4111

Property Owner(s):

Parcel: Dixville Map 1626/Lot 1
Daniel H. Hudnut
Bayroot, LLC
150 Orford Road, PO Box 160
Lyme, NH 03768

Parcel: Dixville Map 1626/Lot 3
Les Otten
Balsams Resort Amenities, LLC
8 Airport Road, PO Box 547
Bethel, ME 04217
(207) 824-7402
1ed.brisson@gmail.com

Parcel: Dixville Map 1626/Lot 3.1
Les Otten
Balsams View, LLC
8 Airport Road, PO Box 547
Bethel, ME 04217
(207) 824-7402

Parcel: Dixville Map 1626/Lot 3.2
Thomas & Deborah Tillotson

Parcel: Dixville Map 1626/Lot 3.3 & 3.4
Les Otten
Dixville Woodlands, LLC
8 Airport Road, PO Box 547
Bethel, ME 04217
(207) 824-7402
1ed.brisson@gmail.com

Applicant:

Ed Brisson
Dixville Capital, LLC
8 Airport Road, PO Box 547
Bethel, ME 04217
(207) 824-7402
1ed.brisson@gmail.com

We have prepared the following waiver requests for the Balsams Ski Lift and Trails Expansion AoT permit consistent with Env-Wq 1509. Waivers are requested for all properties listed of the above parcels upon which the project will take place, and are waivers related to supplying data in the AoT application that in the case of this project are not necessary to demonstrate compliance with AoT rules.

Waiver from Env-Wq 1504.09(b)(3)b)

We are requesting a partial waiver to determine the soil type on all parcels for the AoT permit submission for the Balsams Ski Lift and Trails Expansion per Env-Wq 1503.11b. The proposed work under this AoT permit will only include the clearing, grubbing, stumping and grading for the proposed ski trails, lift lines and maintenance trails over an area surpassing 229 acres with no additions to the existing site's impervious area. Utilizing NRCS Web Soil Survey data for these activities over this large of an area is adequate and practical for this AoT's drainage analysis. Granting the waiver will be protective of the environment and not be contrary to the intent of this portion of the Rules. Any further development for new ski lift terminals, towers, access roads or other building development will be included in future AoT applications.

Waiver from Env-Wq 1504.13

The pre- vs post-drainage analysis showed no increase in flow for the 2-10-, and 50-year storm events, and no increase in volume in the 2-year storm event. Our model does not propose any BMP to achieve this. There are no impervious improvements proposed in this AoT permit consistent with Env-WQ 1503.11b. Water bars, silt fence, stone check dams and other best management practices will be utilized during construction to ensure control of stormwater runoff. Additionally, with no impervious surfaces proposed, pollutants are anticipated to be minimal (atmospheric deposition of pollen and nitrogen with very minor amounts of P and N respectively). For these potential pollutants, the soil profile will remove (through particulate filtering and adsorption of soluble phase for) P and N which is best removed by nitrification and denitrification as stormwater moves through an unsaturated and saturated zone expected to be present at some depth in the soil profile. Any further development for new ski lift terminals, towers, access roads or other building development will be included in future AoT applications, and shall include treatment and pre-treatment of all new impervious surfaces - Granting the waiver will be protective of the environment and not be contrary to the intent of this portion of the Rules.

This Waivers Request is supported by the following signatories:

The Requestor: _____ Date: 2/15/2023

The Applicant: _____ Date: 2/15/2023

The Landowner: _____ Date: 2/15/2023

END

SECTION 3.0 - DRAINAGE CALCULATIONS, ANALYSIS & DESIGN

3.1 Groundwater Recharge Volume (GRV) Calculations (NOT INCLUDED, NO INCREASE IN PRE/POST FLOWS OR VOLUMES)

3.2 BMP Worksheets for all Treatment Systems (NOT INCLUDED, NO INCREASE IN PRE/POST FLOWS OR VOLUMES)

3.21 Pollutant Model
(NOT INCLUDED, NO NEW IMPERVIOUS AREAS PLANNED FOR THIS PHASE. NOT REQUIRED PER Env Wq 1503.11b)

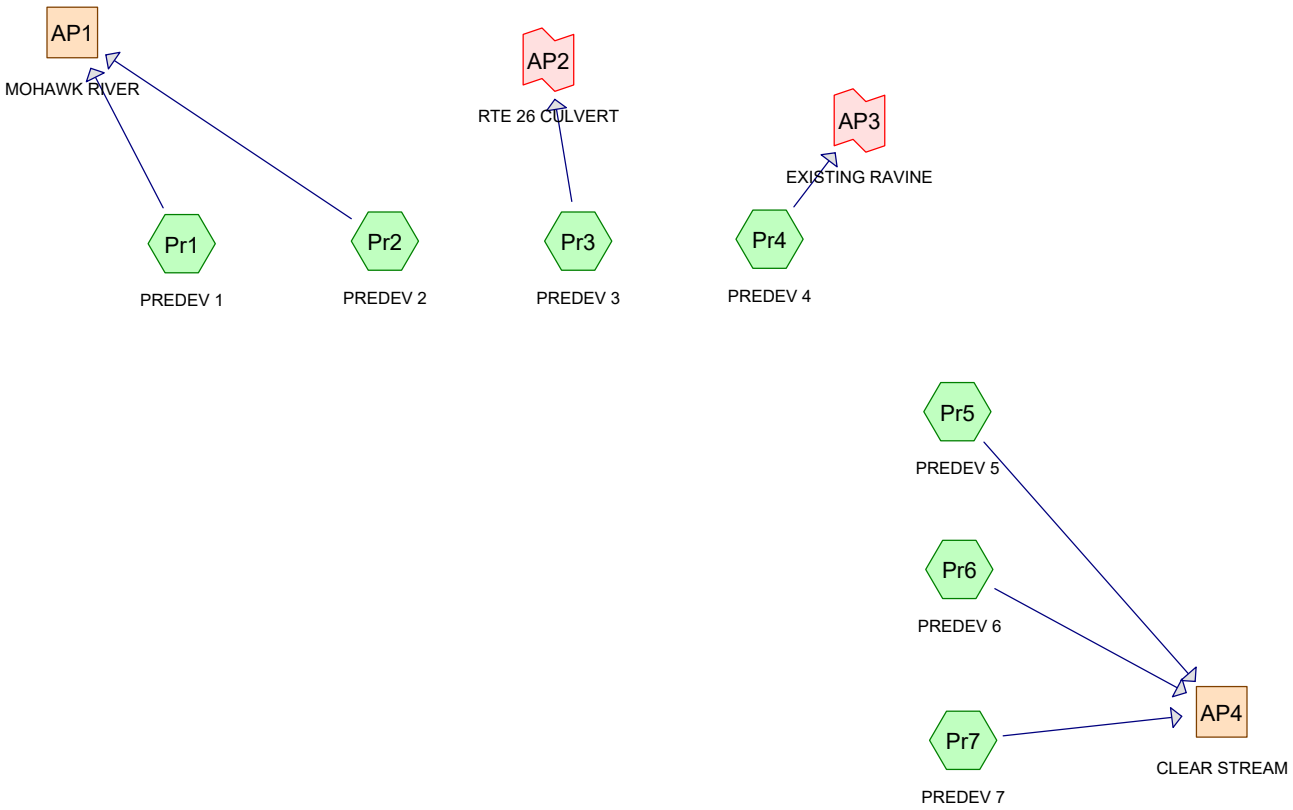
3.3 Pre-Development Analysis

3.3 Pre-Development Analysis

Based on an aerial survey of the property and USGS maps, four analysis points have been established. These points are identified on the drainage plans as AP1, AP2, AP3 and AP4. All analysis points are located down gradient of the proposed work. On Lot 1.0, stormwater runoff travels in an easterly and southernly direction to Cascade Brook and Clear Stream, as well as their unnamed tributaries, and ultimately continues to flow south east in Clear Stream along Route 26. Lots 3.0, 3.2 and 3.4 the stormwater runoff drains to the north along unnamed tributaries of the Mohawk River. These tributaries drain across Route 26 and eventually continue to drain to the Mohawk River. A portion of Lot 3.3 also flows to the north to an existing culvert under SR 26, and eventually drains to Lake Gloriette. Ultimately water from Lake Gloriette also discharges to the Mohawk River. The proposed work will occur over a 4,852-acre water shed, which has been broken down into 7 pre-development sub catchments based on the locations of existing ridge lines, roadway culverts and intermittent and perennial streams. These sub catchments identified on the pre-development plans as areas Pr1 thru Pr7. It should be noted, that Pr4 and Po4 are located on Lot 2, which did not include any proposed development. This drainage area flows to analysis point AP3, which appears to be a large ravine near SR 26. Also, drainage areas Pr6 and Po6 are located within a portion of Lot 1.0 that did not include any proposed development. Thus, the total watershed for the project occurs over a 4,416-acre watershed as previously stated with these areas removed.

Stormwater from Pr1 and Pr2 will flow thru the site in a northerly direction to analysis point AP1, into the Mohawk River through separate unnamed tributaries. Pre-development area Pr3 also flows to the north to an existing culvert under Route 26, and eventually drains to Lake Gloriette. Pr5, Pr6 and Pr7 travel in an easterly and southernly direction to Cascade Brook, Flume Brook, Clear Stream and their unnamed tributaries, then continues to move south east along Clear Stream to analysis point AP 4. Pre-Development drainage plans with the sub catchment areas, soils and drainage paths can be found in **Section 4** of this report. In summary, the existing site is mostly wooded, with soils which are listed as being Hydrological Soil Group (HGS) A, B, C and D. All seven sub catchment areas include existing paved or gravel surfaces which are generally located along the existing Route 26, as well as miscellaneous access trails and parking/pull off areas. The resulting weighted curve number (CN) for each watershed and the time of concentration (Tc) can be found in **Section 3.3.1** and **3.3.2**.

3.3.1 Pre-Development Node Listing 2, 10 and 50 - Year Storm



Subcat Reach Pond Link

Routing Diagram for 220115 HydroCAD Pre-Dev
Prepared by Horizons Engineering, Printed 2/3/2023

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2YR-24HR	Type II 24-hr		Default	24.00	1	2.28	2
2	10YR-24HR	Type II 24-hr		Default	24.00	1	3.19	2
3	50YR-24HR	Type II 24-hr		Default	24.00	1	4.48	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.999	30	Meadow, non-grazed, HSG A (Pr2, Pr7)
94.397	58	Meadow, non-grazed, HSG B (Pr1, Pr6, Pr7)
90.168	71	Meadow, non-grazed, HSG C (Pr1, Pr5, Pr6, Pr7)
166.352	78	Meadow, non-grazed, HSG D (Pr1, Pr5, Pr6, Pr7)
67.369	98	Paved parking, HSG D (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
33.464	88	ROCK OUTCROP 50% - HSG D (Pr7)
5.172	92	ROCK OUTCROP 70% - HSG D (Pr6)
63.830	93	ROCK OUTCROP 70-85% - HSG D (Pr5)
13.162	95	ROCK OUTCROP 85% - HSG D (Pr3)
11.768	95	ROCK OUTCROP 85% - HSG D (Pr4)
4.871	98	Water Surface, HSG D (Pr1, Pr6)
60.301	30	Woods, Good, HSG A (Pr2, Pr5, Pr6, Pr7)
849.940	55	Woods, Good, HSG B (Pr1, Pr2, Pr3, Pr5, Pr6, Pr7)
1,011.303	70	Woods, Good, HSG C (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
2,377.143	77	Woods, Good, HSG D (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
4,852.239	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
63.300	HSG A	Pr2, Pr5, Pr6, Pr7
944.337	HSG B	Pr1, Pr2, Pr3, Pr5, Pr6, Pr7
1,101.471	HSG C	Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7
2,743.131	HSG D	Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7
0.000	Other	
4,852.239		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPr1: PREDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.27"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=154.54 cfs 35.672 af

SubcatchmentPr2: PREDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.27"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=8.04 cfs 2.143 af

SubcatchmentPr3: PREDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=0.53"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=55.08 cfs 6.027 af

SubcatchmentPr4: PREDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=0.74"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=22.73 cfs 2.228 af

SubcatchmentPr5: PREDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.45"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=268.84 cfs 50.045 af

SubcatchmentPr6: PREDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.30"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=30.27 cfs 9.877 af

SubcatchmentPr7: PREDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=0.53"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=294.77 cfs 55.668 af

Reach AP1: MOHAWK RIVER Inflow=161.93 cfs 37.815 af
Outflow=161.93 cfs 37.815 af

Reach AP4: CLEAR STREAM Inflow=578.62 cfs 115.590 af
Outflow=578.62 cfs 115.590 af

Link AP2: RTE 26 CULVERT Inflow=55.08 cfs 6.027 af
Primary=55.08 cfs 6.027 af

Link AP3: EXISTING RAVINE Inflow=22.73 cfs 2.228 af
Primary=22.73 cfs 2.228 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 161.659 af Average Runoff Depth = 0.40"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPr1: PREDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.68"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=541.36 cfs 90.226 af

SubcatchmentPr2: PREDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.68"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=27.71 cfs 5.420 af

SubcatchmentPr3: PREDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=1.09"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=127.67 cfs 12.453 af

SubcatchmentPr4: PREDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=1.39"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=44.91 cfs 4.195 af

SubcatchmentPr5: PREDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.98"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=684.41 cfs 107.904 af

SubcatchmentPr6: PREDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.73"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=94.32 cfs 24.220 af

SubcatchmentPr7: PREDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=1.09"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=688.07 cfs 115.019 af

Reach AP1: MOHAWK RIVER Inflow=566.23 cfs 95.645 af
Outflow=566.23 cfs 95.645 af

Reach AP4: CLEAR STREAM Inflow=1,421.21 cfs 247.142 af
Outflow=1,421.21 cfs 247.142 af

Link AP2: RTE 26 CULVERT Inflow=127.67 cfs 12.453 af
Primary=127.67 cfs 12.453 af

Link AP3: EXISTING RAVINE Inflow=44.91 cfs 4.195 af
Primary=44.91 cfs 4.195 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 359.435 af Average Runoff Depth = 0.89"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPr1: PREDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=1.45"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=1,335.60 cfs 191.954 af

SubcatchmentPr2: PREDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=1.45"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=67.66 cfs 11.530 af

SubcatchmentPr3: PREDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=2.03"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=249.63 cfs 23.306 af

SubcatchmentPr4: PREDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=2.44"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=80.10 cfs 7.356 af

SubcatchmentPr5: PREDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=1.88"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=1,412.58 cfs 207.827 af

SubcatchmentPr6: PREDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=1.52"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=221.80 cfs 50.592 af

SubcatchmentPr7: PREDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=2.03"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=1,362.00 cfs 215.266 af

Reach AP1: MOHAWK RIVER Inflow=1,395.12 cfs 203.484 af
Outflow=1,395.12 cfs 203.484 af

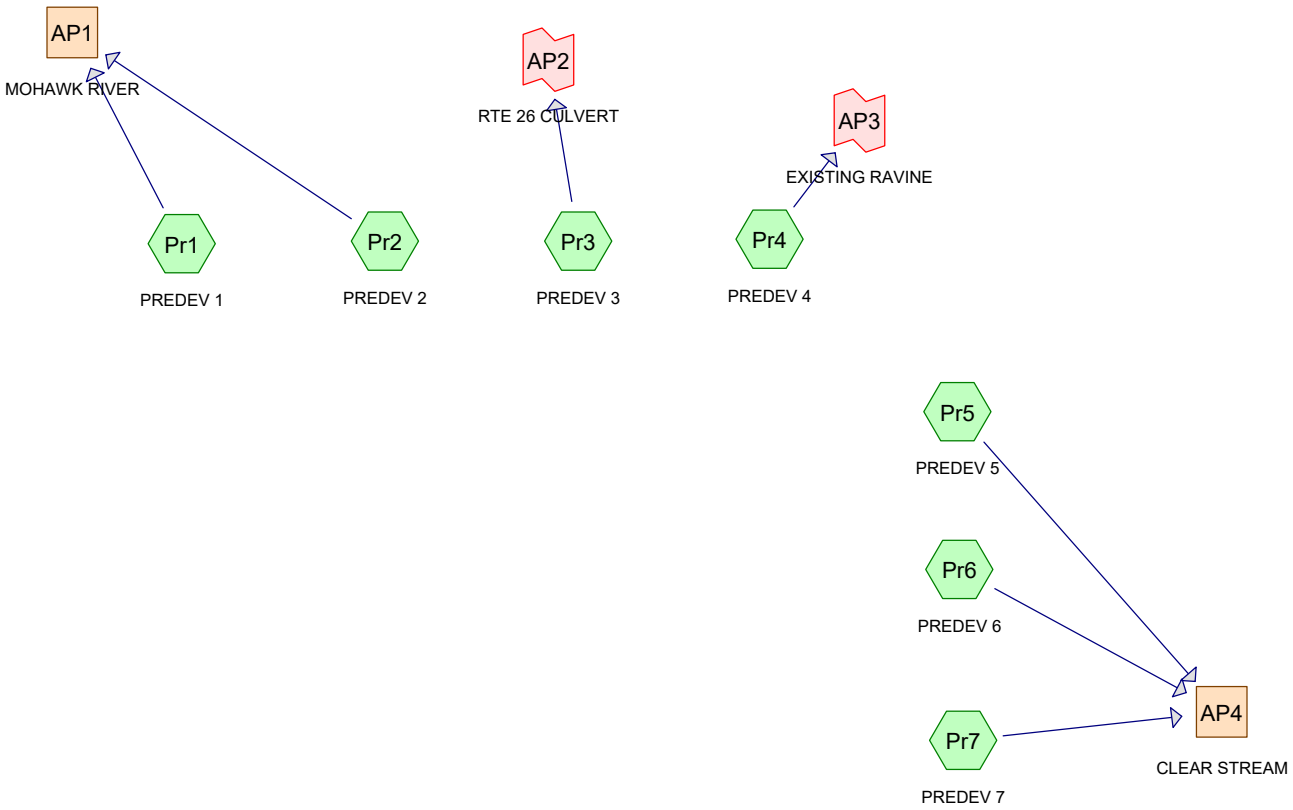
Reach AP4: CLEAR STREAM Inflow=2,901.68 cfs 473.685 af
Outflow=2,901.68 cfs 473.685 af

Link AP2: RTE 26 CULVERT Inflow=249.63 cfs 23.306 af
Primary=249.63 cfs 23.306 af

Link AP3: EXISTING RAVINE Inflow=80.10 cfs 7.356 af
Primary=80.10 cfs 7.356 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 707.832 af Average Runoff Depth = 1.75"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

3.3.2 Pre-Development Full Summary and Diagram 10 - Year Storm



Subcat Reach Pond Link

Routing Diagram for 220115 HydroCAD Pre-Dev
Prepared by Horizons Engineering, Printed 2/3/2023

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10YR-24HR	Type II 24-hr		Default	24.00	1	3.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.999	30	Meadow, non-grazed, HSG A (Pr2, Pr7)
94.397	58	Meadow, non-grazed, HSG B (Pr1, Pr6, Pr7)
90.168	71	Meadow, non-grazed, HSG C (Pr1, Pr5, Pr6, Pr7)
166.352	78	Meadow, non-grazed, HSG D (Pr1, Pr5, Pr6, Pr7)
67.369	98	Paved parking, HSG D (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
33.464	88	ROCK OUTCROP 50% - HSG D (Pr7)
5.172	92	ROCK OUTCROP 70% - HSG D (Pr6)
63.830	93	ROCK OUTCROP 70-85% - HSG D (Pr5)
13.162	95	ROCK OUTCROP 85% - HSG D (Pr3)
11.768	95	ROCK OUTCROP 85% - HSG D (Pr4)
4.871	98	Water Surface, HSG D (Pr1, Pr6)
60.301	30	Woods, Good, HSG A (Pr2, Pr5, Pr6, Pr7)
849.940	55	Woods, Good, HSG B (Pr1, Pr2, Pr3, Pr5, Pr6, Pr7)
1,011.303	70	Woods, Good, HSG C (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
2,377.143	77	Woods, Good, HSG D (Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7)
4,852.239	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
63.300	HSG A	Pr2, Pr5, Pr6, Pr7
944.337	HSG B	Pr1, Pr2, Pr3, Pr5, Pr6, Pr7
1,101.471	HSG C	Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7
2,743.131	HSG D	Pr1, Pr2, Pr3, Pr4, Pr5, Pr6, Pr7
0.000	Other	
4,852.239		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPr1: PREDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.68"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=541.36 cfs 90.226 af

SubcatchmentPr2: PREDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.68"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=27.71 cfs 5.420 af

SubcatchmentPr3: PREDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=1.09"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=127.67 cfs 12.453 af

SubcatchmentPr4: PREDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=1.39"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=44.91 cfs 4.195 af

SubcatchmentPr5: PREDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.98"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=684.41 cfs 107.904 af

SubcatchmentPr6: PREDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.73"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=94.32 cfs 24.220 af

SubcatchmentPr7: PREDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=1.09"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=688.07 cfs 115.019 af

Reach AP1: MOHAWK RIVER Inflow=566.23 cfs 95.645 af
Outflow=566.23 cfs 95.645 af

Reach AP4: CLEAR STREAM Inflow=1,421.21 cfs 247.142 af
Outflow=1,421.21 cfs 247.142 af

Link AP2: RTE 26 CULVERT Inflow=127.67 cfs 12.453 af
Primary=127.67 cfs 12.453 af

Link AP3: EXISTING RAVINE Inflow=44.91 cfs 4.195 af
Primary=44.91 cfs 4.195 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 359.435 af Average Runoff Depth = 0.89"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Summary for Subcatchment Pr1: PREDEV 1

[47] Hint: Peak is 108% of capacity of segment #4
[47] Hint: Peak is 151% of capacity of segment #5

Runoff = 541.36 cfs @ 12.54 hrs, Volume= 90.226 af, Depth= 0.68"
Routed to Reach AP1 : MOHAWK RIVER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

Area (ac)	CN	Description
15.395	98	Paved parking, HSG D
2.507	98	Water Surface, HSG D
632.411	77	Woods, Good, HSG D
61.404	78	Meadow, non-grazed, HSG D
203.642	70	Woods, Good, HSG C
12.267	71	Meadow, non-grazed, HSG C
604.655	55	Woods, Good, HSG B
55.646	58	Meadow, non-grazed, HSG B
1,587.927	67	Weighted Average
1,570.025		98.87% Pervious Area
17.902		1.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	100	0.0500	0.09		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
12.3	2,180	0.3463	2.94		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
2.2	2,654	0.1922	20.55	774.73	**Channel Flow, REACH 1** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
7.7	6,145	0.0806	13.31	501.70	**Channel Flow, REACH 2** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
8.0	4,584	0.0414	9.54	359.56	**Channel Flow, REACH 3** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
47.8	15,663	Total			

Summary for Subcatchment Pr2: PREDEV 2

Runoff = 27.71 cfs @ 12.73 hrs, Volume= 5.420 af, Depth= 0.68"
Routed to Reach AP1 : MOHAWK RIVER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

Area (ac)	CN	Description
4.506	98	Paved parking, HSG D
21.536	77	Woods, Good, HSG D
49.583	70	Woods, Good, HSG C
10.152	55	Woods, Good, HSG B
8.958	30	Woods, Good, HSG A
0.647	30	Meadow, non-grazed, HSG A
95.382	67	Weighted Average
90.876		95.28% Pervious Area
4.506		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0140	0.06		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.4	2,348	0.2939	2.71		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
13.1	1,271	0.1039	1.61		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
3.2	1,343	0.0515	6.93	58.92	**Channel Flow, REACH 1** Area= 8.5 sf Perim= 11.4' r= 0.75' n= 0.040 Mountain streams
60.0	5,062	Total			

Summary for Subcatchment Pr3: PREDEV 3

Runoff = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af, Depth= 1.09"
Routed to Link AP2 : RTE 26 CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	4.910	98	Paved parking, HSG D
*	13.162	95	ROCK OUTCROP 85% - HSG D
	42.873	77	Woods, Good, HSG D
	71.135	70	Woods, Good, HSG C
	5.371	55	Woods, Good, HSG B
	137.451	75	Weighted Average
	132.541		96.43% Pervious Area
	4.910		3.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1940	0.16		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
7.9	845	0.1266	1.78		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.9	1,771	0.3586	2.99		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
28.1	2,716	Total			

Summary for Subcatchment Pr4: PREDEV 4

Runoff = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af, Depth= 1.39"
Routed to Link AP3 : EXISTING RAVINE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	2.093	98	Paved parking, HSG D
*	11.768	95	ROCK OUTCROP 85% - HSG D
	0.443	77	Woods, Good, HSG D
	21.804	70	Woods, Good, HSG C
	36.108	80	Weighted Average
	34.015		94.20% Pervious Area
	2.093		5.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.1520	0.15		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
5.9	918	0.2658	2.58		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
2.0	540	0.8148	4.51		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
8.7	864	0.1100	1.66		**Shallow Concentrated Flow, SCF 3** Woodland Kv= 5.0 fps
27.9	2,422	Total			

Summary for Subcatchment Pr5: PREDEV 5

[47] Hint: Peak is 154% of capacity of segment #3
[47] Hint: Peak is 267% of capacity of segment #5
[47] Hint: Peak is 360% of capacity of segment #6

Runoff = 684.41 cfs @ 12.57 hrs, Volume= 107.904 af, Depth= 0.98"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	14.370	98	Paved parking, HSG D
*	63.830	93	ROCK OUTCROP 70-85% - HSG D
	686.436	77	Woods, Good, HSG D
	5.114	78	Meadow, non-grazed, HSG D
	461.163	70	Woods, Good, HSG C
	9.675	71	Meadow, non-grazed, HSG C
	46.392	55	Woods, Good, HSG B
	39.149	30	Woods, Good, HSG A
	1,326.129	73	Weighted Average
	1,311.759		98.92% Pervious Area
	14.370		1.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4	100	0.0520	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.3	2,138	0.2470	2.48		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.4	7,876	0.0987	14.00	445.27	**Channel Flow, REACH 1** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
0.7	1,018	0.2829	23.71	753.84	**Channel Flow, REACH 2** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
5.7	2,751	0.0327	8.06	256.29	**Channel Flow, REACH 3** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
5.6	1,995	0.0180	5.98	190.15	**Channel Flow, REACH 4** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
53.1	15,878	Total			

Summary for Subcatchment Pr6: PREDEV 6

Runoff = 94.32 cfs @ 13.18 hrs, Volume= 24.220 af, Depth= 0.73"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	7.548	98	Paved parking, HSG D
	2.364	98	Water Surface, HSG D
*	5.172	92	ROCK OUTCROP 70% - HSG D
	143.573	77	Woods, Good, HSG D
	12.693	78	Meadow, non-grazed, HSG D
	60.186	70	Woods, Good, HSG C
	19.270	71	Meadow, non-grazed, HSG C
	131.280	55	Woods, Good, HSG B
	8.665	58	Meadow, non-grazed, HSG B
	8.939	30	Woods, Good, HSG A
	399.690	68	Weighted Average
	389.778		97.52% Pervious Area
	9.912		2.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	100	0.0820	0.12		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
7.1	818	0.1455	1.91		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
7.4	1,430	0.4126	3.21		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
25.1	1,470	0.0381	0.98		**Shallow Concentrated Flow, SCF 3** Woodland Kv= 5.0 fps
35.1	7,980	0.0044	3.79	287.63	**Channel Flow, REACH 1** Area= 75.9 sf Perim= 39.8' r= 1.91' n= 0.040 Winding stream, pools & shoals
89.2	11,798	Total			

Summary for Subcatchment Pr7: PREDEV 7

[47] Hint: Peak is 136% of capacity of segment #3
[47] Hint: Peak is 231% of capacity of segment #4
[47] Hint: Peak is 120% of capacity of segment #5
[47] Hint: Peak is 292% of capacity of segment #6

Runoff = 688.07 cfs @ 12.67 hrs, Volume= 115.019 af, Depth= 1.09"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	18.547	98	Paved parking, HSG D
*	33.464	88	ROCK OUTCROP 50% - HSG D
	849.871	77	Woods, Good, HSG D
	87.141	78	Meadow, non-grazed, HSG D
	143.790	70	Woods, Good, HSG C
	48.956	71	Meadow, non-grazed, HSG C
	52.090	55	Woods, Good, HSG B
	30.086	58	Meadow, non-grazed, HSG B
	3.255	30	Woods, Good, HSG A
	2.352	30	Meadow, non-grazed, HSG A
	1,269.552	75	Weighted Average
	1,251.005		98.54% Pervious Area
	18.547		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0300	0.08		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.7	2,454	0.3093	2.78		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.3	8,357	0.1087	14.98	506.18	**Channel Flow, REACH 1** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
8.3	4,396	0.0375	8.80	297.31	**Channel Flow, REACH 2** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
1.3	1,330	0.1391	16.94	572.61	**Channel Flow, REACH 3** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
4.2	1,740	0.0236	6.98	235.86	**Channel Flow, REACH 4** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
59.4	18,377	Total			

Summary for Reach AP1: MOHAWK RIVER

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,683.309 ac, 1.33% Impervious, Inflow Depth = 0.68" for 10YR-24HR event
Inflow = 566.23 cfs @ 12.54 hrs, Volume= 95.645 af
Outflow = 566.23 cfs @ 12.54 hrs, Volume= 95.645 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach AP4: CLEAR STREAM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2,995.371 ac, 1.43% Impervious, Inflow Depth = 0.99" for 10YR-24HR event
Inflow = 1,421.21 cfs @ 12.62 hrs, Volume= 247.142 af
Outflow = 1,421.21 cfs @ 12.62 hrs, Volume= 247.142 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: RTE 26 CULVERT

Inflow Area = 137.451 ac, 3.57% Impervious, Inflow Depth = 1.09" for 10YR-24HR event
Inflow = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af
Primary = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP3: EXISTING RAVINE

Inflow Area = 36.108 ac, 5.80% Impervious, Inflow Depth = 1.39" for 10YR-24HR event
Inflow = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af
Primary = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

3.4 Post-Development Analysis

3.4 Post-Development Analysis

In general, pre-development areas have been modified in the post development analysis by renaming the water shed area from a Pr prefix to a Po prefix, and encompass the same pre-development drainage area. The post development analysis includes the areas for the clearing, grubbing, stump removal and grading for the proposed ski trails, ski lift lines and maintenance access trails. This project will not have an increase in impervious area. The impacts to water quality during the clearing, grubbing, stump removal and grading for the proposed ski trails, ski lift lines and maintenance access trails will be minimized using temporary treatment devices and erosion control measures. Frequent site inspections during construction are required during or directly following rainfall events to ensure erosion control devices are working properly.

Pre-development area Pr1 will contain the same area found in Po1. The clearing and grading of the various trails located within Pr1 and Po1 have increased the area of meadow and reduced the area of woods, however the CN and Time of Concentration remain unchanged by these developments. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. As mentioned previously, Lot 3.2 within this drainage area will not have any proposed development. Stormwater runoff will ultimately continue to run to the existing unnamed tributaries of the Mohawk River that it previously ran to, and will flow to analysis point AP1 in the same volume and rate and previously determined.

Pre-development area Pr2 will contain the same area found in Po2. The clearing and grading of the various trails located within Pr2 and Po2 have increased the area of meadow and reduced the area of woods, however the CN and Time of Concentration remain unchanged by these developments. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. Stormwater runoff will ultimately continue to run to the existing unnamed tributaries of the Mohawk River that it previously ran to, and will flow to analysis point AP1 in the same volume and rate and previously determined.

Pre-development area Pr3 will contain the same area found in Po3. The clearing and grading of the various trails located within Pr3 and Po3 have increased the area of meadow and reduced the area of woods, however the CN and Time of Concentration remain unchanged by these developments. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. Stormwater runoff will ultimately continue to run to the existing culvert under Route 26 that it previously ran to, and will flow to analysis point AP2 in the same volume and rate and previously determined.

As mentioned in **Section 3.3**, It should be noted, that Pr4 and Po4 are located on Lot 2, which did not include any proposed development. This drainage area flows to analysis point AP3, which appears to be a large ravine near Route 26. Pre-development area Pr4 will contain the same area found in Po4 and the land use type will remain the same as it won't be disturbed. The CN and Time of Concentration remain unchanged. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of

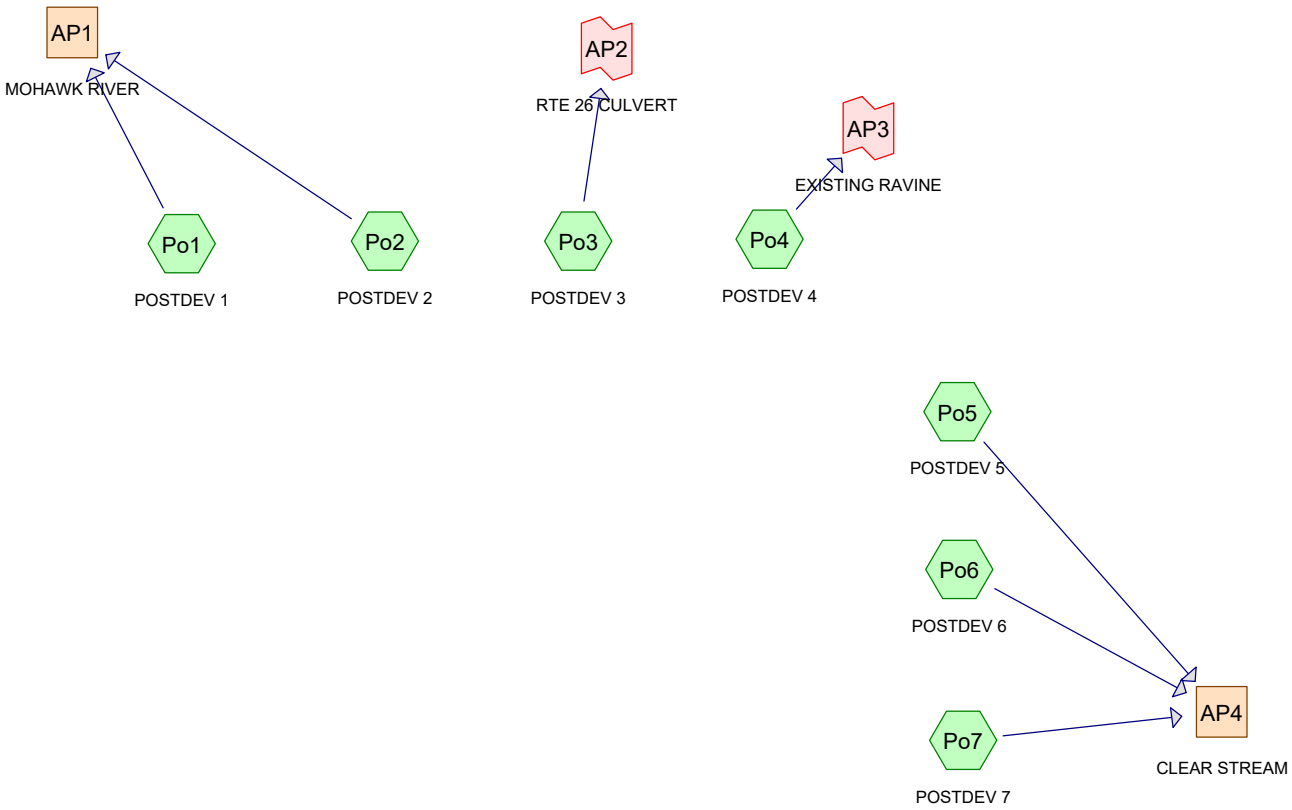
Concentration remains the same. Stormwater runoff will ultimately continue to run to an existing ravine near Route 26 that has been identified as analysis point AP3.

Pre-development area Pr5 will contain the same area found in Po5. The clearing and grading of the various trails located within Pr5 and Po5 have increased the area of meadow and reduced the area of woods, however the CN and Time of Concentration remain unchanged by these developments. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. As previously noted, a portion of Lot 2 is included in this drainage area, and will have any proposed development. Stormwater runoff will ultimately continue to Cascade Brook, Flume Brook and their unnamed tributaries that it previously ran to, and will flow to analysis point AP4 in the same volume and rate and previously determined.

Pre-development area Pr6 will contain the same area found in Po6, as this drainage area did not include any proposed development and the land use type will remain the same. The CN and Time of Concentration remain unchanged. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. Stormwater runoff will ultimately continue to Clear Stream and its unnamed tributaries that it previously ran to, and will flow to analysis point AP4 in the same volume and rate and previously determined.

Pre-development area Pr7 will contain the same area found in Po7. The clearing and grading of the various trails located within Pr7 and Po7 have increased the area of meadow and reduced the area of woods, however the CN and Time of Concentration remain unchanged by these developments. No additional flows from other development areas have been directed to or from the drainage area, and the flow path for the Time of Concentration remains the same. Stormwater runoff will ultimately continue to Clear Stream and its unnamed tributaries that it previously ran to, and will flow to analysis point AP4 in the same volume and rate and previously determined.

3.4.1 Post-Development 2, 10, and 50 - Year Storm



Subcat Reach Pond Link

Routing Diagram for 220115 HydroCAD Post-Dev
Prepared by Horizons Engineering, Printed 2/3/2023

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2YR-24HR	Type II 24-hr		Default	24.00	1	2.28	2
2	10YR-24HR	Type II 24-hr		Default	24.00	1	3.19	2
3	50YR-24HR	Type II 24-hr		Default	24.00	1	4.48	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.822	30	Meadow, non-grazed, HSG A (Po2, Po5, Po7)
125.972	58	Meadow, non-grazed, HSG B (Po1, Po2, Po3, Po5, Po6, Po7)
147.729	71	Meadow, non-grazed, HSG C (Po1, Po2, Po3, Po5, Po6, Po7)
298.983	78	Meadow, non-grazed, HSG D (Po1, Po2, Po5, Po6, Po7)
67.369	98	Paved parking, HSG D (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
33.464	88	ROCK OUTCROP 50% - HSG D (Po7)
5.172	92	ROCK OUTCROP 70% - HSG D (Po6)
61.119	93	ROCK OUTCROP 70-85% - HSG D (Po5)
13.162	95	ROCK OUTCROP 85% - HSG D (Po3)
11.768	95	ROCK OUTCROP 85% - HSG D (Po4)
4.871	98	Water Surface, HSG D (Po1, Po6)
56.477	30	Woods, Good, HSG A (Po2, Po5, Po6, Po7)
818.366	55	Woods, Good, HSG B (Po1, Po2, Po3, Po5, Po6, Po7)
953.742	70	Woods, Good, HSG C (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
2,247.223	77	Woods, Good, HSG D (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
4,852.239	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
63.299	HSG A	Po2, Po5, Po6, Po7
944.338	HSG B	Po1, Po2, Po3, Po5, Po6, Po7
1,101.471	HSG C	Po1, Po2, Po3, Po4, Po5, Po6, Po7
2,743.131	HSG D	Po1, Po2, Po3, Po4, Po5, Po6, Po7
0.000	Other	
4,852.239		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPo1: POSTDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.27"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=154.54 cfs 35.672 af

SubcatchmentPo2: POSTDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.27"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=8.04 cfs 2.143 af

SubcatchmentPo3: POSTDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=0.53"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=55.08 cfs 6.027 af

SubcatchmentPo4: POSTDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=0.74"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=22.73 cfs 2.228 af

SubcatchmentPo5: POSTDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.45"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=268.84 cfs 50.045 af

SubcatchmentPo6: POSTDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.30"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=30.27 cfs 9.877 af

SubcatchmentPo7: POSTDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=0.53"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=294.77 cfs 55.668 af

Reach AP1: MOHAWK RIVER Inflow=161.93 cfs 37.815 af
Outflow=161.93 cfs 37.815 af

Reach AP4: CLEAR STREAM Inflow=578.62 cfs 115.590 af
Outflow=578.62 cfs 115.590 af

Link AP2: RTE 26 CULVERT Inflow=55.08 cfs 6.027 af
Primary=55.08 cfs 6.027 af

Link AP3: EXISTING RAVINE Inflow=22.73 cfs 2.228 af
Primary=22.73 cfs 2.228 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 161.659 af Average Runoff Depth = 0.40"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPo1: POSTDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.68"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=541.36 cfs 90.226 af

SubcatchmentPo2: POSTDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.68"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=27.71 cfs 5.420 af

SubcatchmentPo3: POSTDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=1.09"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=127.67 cfs 12.453 af

SubcatchmentPo4: POSTDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=1.39"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=44.91 cfs 4.195 af

SubcatchmentPo5: POSTDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.98"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=684.41 cfs 107.904 af

SubcatchmentPo6: POSTDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.73"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=94.32 cfs 24.220 af

SubcatchmentPo7: POSTDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=1.09"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=688.07 cfs 115.019 af

Reach AP1: MOHAWK RIVER Inflow=566.23 cfs 95.645 af
Outflow=566.23 cfs 95.645 af

Reach AP4: CLEAR STREAM Inflow=1,421.21 cfs 247.142 af
Outflow=1,421.21 cfs 247.142 af

Link AP2: RTE 26 CULVERT Inflow=127.67 cfs 12.453 af
Primary=127.67 cfs 12.453 af

Link AP3: EXISTING RAVINE Inflow=44.91 cfs 4.195 af
Primary=44.91 cfs 4.195 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 359.435 af Average Runoff Depth = 0.89"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPo1: POSTDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=1.45"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=1,335.60 cfs 191.954 af

SubcatchmentPo2: POSTDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=1.45"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=67.66 cfs 11.530 af

SubcatchmentPo3: POSTDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=2.03"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=249.63 cfs 23.306 af

SubcatchmentPo4: POSTDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=2.44"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=80.10 cfs 7.356 af

SubcatchmentPo5: POSTDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=1.88"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=1,412.58 cfs 207.827 af

SubcatchmentPo6: POSTDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=1.52"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=221.80 cfs 50.592 af

SubcatchmentPo7: POSTDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=2.03"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=1,362.00 cfs 215.266 af

Reach AP1: MOHAWK RIVER Inflow=1,395.12 cfs 203.484 af
Outflow=1,395.12 cfs 203.484 af

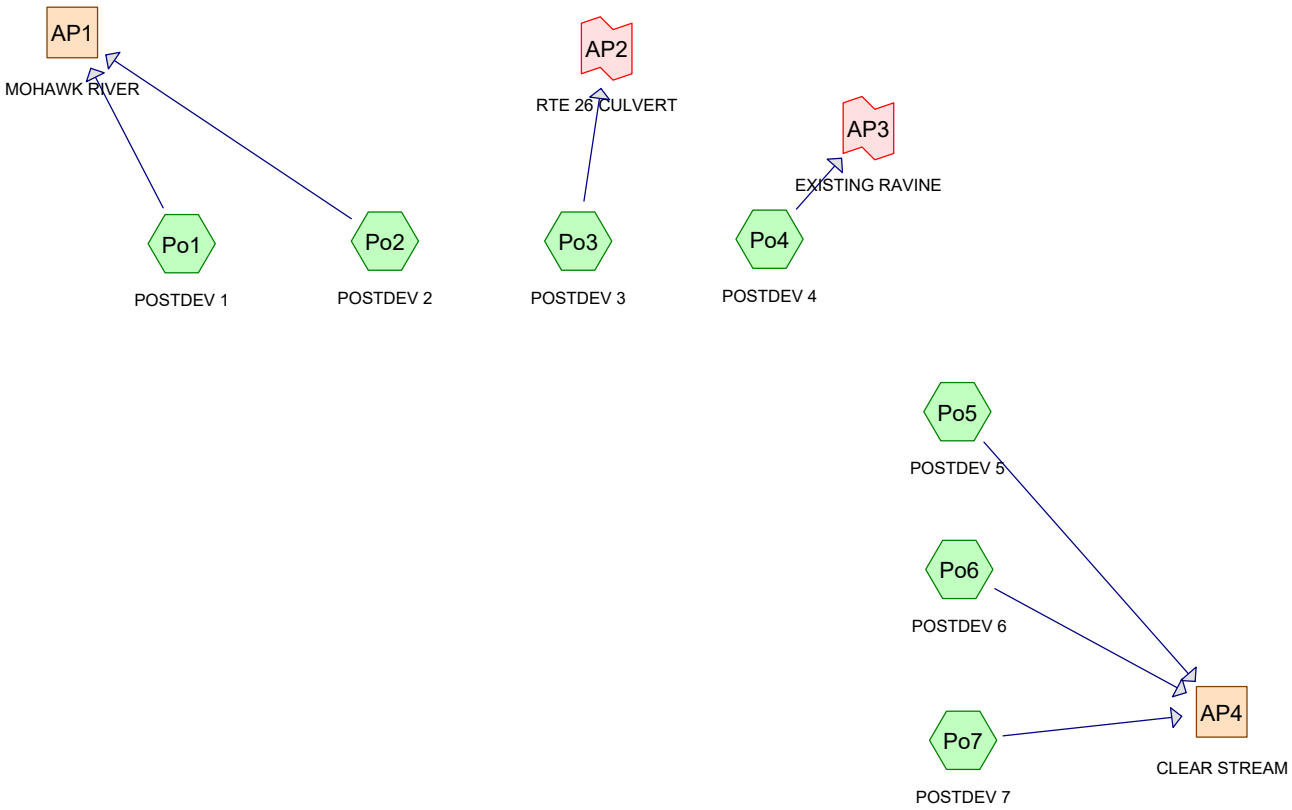
Reach AP4: CLEAR STREAM Inflow=2,901.68 cfs 473.685 af
Outflow=2,901.68 cfs 473.685 af

Link AP2: RTE 26 CULVERT Inflow=249.63 cfs 23.306 af
Primary=249.63 cfs 23.306 af

Link AP3: EXISTING RAVINE Inflow=80.10 cfs 7.356 af
Primary=80.10 cfs 7.356 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 707.832 af Average Runoff Depth = 1.75"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

3.4.2 Post-Development Full Summary and Diagram 10 - Year Storm



Subcat Reach Pond Link

Routing Diagram for 220115 HydroCAD Post-Dev
Prepared by Horizons Engineering, Printed 2/3/2023

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10YR-24HR	Type II 24-hr		Default	24.00	1	3.19	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.822	30	Meadow, non-grazed, HSG A (Po2, Po5, Po7)
125.972	58	Meadow, non-grazed, HSG B (Po1, Po2, Po3, Po5, Po6, Po7)
147.729	71	Meadow, non-grazed, HSG C (Po1, Po2, Po3, Po5, Po6, Po7)
298.983	78	Meadow, non-grazed, HSG D (Po1, Po2, Po5, Po6, Po7)
67.369	98	Paved parking, HSG D (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
33.464	88	ROCK OUTCROP 50% - HSG D (Po7)
5.172	92	ROCK OUTCROP 70% - HSG D (Po6)
61.119	93	ROCK OUTCROP 70-85% - HSG D (Po5)
13.162	95	ROCK OUTCROP 85% - HSG D (Po3)
11.768	95	ROCK OUTCROP 85% - HSG D (Po4)
4.871	98	Water Surface, HSG D (Po1, Po6)
56.477	30	Woods, Good, HSG A (Po2, Po5, Po6, Po7)
818.366	55	Woods, Good, HSG B (Po1, Po2, Po3, Po5, Po6, Po7)
953.742	70	Woods, Good, HSG C (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
2,247.223	77	Woods, Good, HSG D (Po1, Po2, Po3, Po4, Po5, Po6, Po7)
4,852.239	**71**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
63.299	HSG A	Po2, Po5, Po6, Po7
944.338	HSG B	Po1, Po2, Po3, Po5, Po6, Po7
1,101.471	HSG C	Po1, Po2, Po3, Po4, Po5, Po6, Po7
2,743.131	HSG D	Po1, Po2, Po3, Po4, Po5, Po6, Po7
0.000	Other	
4,852.239		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPo1: POSTDEV 1 Runoff Area=1,587.927 ac 1.13% Impervious Runoff Depth=0.68"
Flow Length=15,663' Tc=47.8 min CN=67 Runoff=541.36 cfs 90.226 af

SubcatchmentPo2: POSTDEV 2 Runoff Area=95.382 ac 4.72% Impervious Runoff Depth=0.68"
Flow Length=5,062' Tc=60.0 min CN=67 Runoff=27.71 cfs 5.420 af

SubcatchmentPo3: POSTDEV 3 Runoff Area=137.451 ac 3.57% Impervious Runoff Depth=1.09"
Flow Length=2,716' Tc=28.1 min CN=75 Runoff=127.67 cfs 12.453 af

SubcatchmentPo4: POSTDEV 4 Runoff Area=36.108 ac 5.80% Impervious Runoff Depth=1.39"
Flow Length=2,422' Tc=27.9 min CN=80 Runoff=44.91 cfs 4.195 af

SubcatchmentPo5: POSTDEV 5 Runoff Area=1,326.129 ac 1.08% Impervious Runoff Depth=0.98"
Flow Length=15,878' Tc=53.1 min CN=73 Runoff=684.41 cfs 107.904 af

SubcatchmentPo6: POSTDEV 6 Runoff Area=399.690 ac 2.48% Impervious Runoff Depth=0.73"
Flow Length=11,798' Tc=89.2 min CN=68 Runoff=94.32 cfs 24.220 af

SubcatchmentPo7: POSTDEV 7 Runoff Area=1,269.552 ac 1.46% Impervious Runoff Depth=1.09"
Flow Length=18,377' Tc=59.4 min CN=75 Runoff=688.07 cfs 115.019 af

Reach AP1: MOHAWK RIVER Inflow=566.23 cfs 95.645 af
Outflow=566.23 cfs 95.645 af

Reach AP4: CLEAR STREAM Inflow=1,421.21 cfs 247.142 af
Outflow=1,421.21 cfs 247.142 af

Link AP2: RTE 26 CULVERT Inflow=127.67 cfs 12.453 af
Primary=127.67 cfs 12.453 af

Link AP3: EXISTING RAVINE Inflow=44.91 cfs 4.195 af
Primary=44.91 cfs 4.195 af

Total Runoff Area = 4,852.239 ac Runoff Volume = 359.435 af Average Runoff Depth = 0.89"
98.51% Pervious = 4,779.999 ac 1.49% Impervious = 72.240 ac

Summary for Subcatchment Po1: POSTDEV 1

[47] Hint: Peak is 108% of capacity of segment #4
[47] Hint: Peak is 151% of capacity of segment #5

Runoff = 541.36 cfs @ 12.54 hrs, Volume= 90.226 af, Depth= 0.68"
Routed to Reach AP1 : MOHAWK RIVER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

Area (ac)	CN	Description
15.395	98	Paved parking, HSG D
2.507	98	Water Surface, HSG D
592.920	77	Woods, Good, HSG D
100.894	78	Meadow, non-grazed, HSG D
195.209	70	Woods, Good, HSG C
20.700	71	Meadow, non-grazed, HSG C
585.708	55	Woods, Good, HSG B
74.594	58	Meadow, non-grazed, HSG B
1,587.927	67	Weighted Average
1,570.025		98.87% Pervious Area
17.902		1.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	100	0.0500	0.09		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
12.3	2,180	0.3463	2.94		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
2.2	2,654	0.1922	20.55	774.73	**Channel Flow, REACH 1** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
7.7	6,145	0.0806	13.31	501.70	**Channel Flow, REACH 2** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
8.0	4,584	0.0414	9.54	359.56	**Channel Flow, REACH 3** Area= 37.7 sf Perim= 26.6' r= 1.42' n= 0.040 Mountain streams
47.8	15,663	Total			

Summary for Subcatchment Po2: POSTDEV 2

Runoff = 27.71 cfs @ 12.73 hrs, Volume= 5.420 af, Depth= 0.68"
Routed to Reach AP1 : MOHAWK RIVER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

Area (ac)	CN	Description
4.506	98	Paved parking, HSG D
21.350	77	Woods, Good, HSG D
48.340	70	Woods, Good, HSG C
8.388	55	Woods, Good, HSG B
8.958	30	Woods, Good, HSG A
0.647	30	Meadow, non-grazed, HSG A
0.186	78	Meadow, non-grazed, HSG D
1.243	71	Meadow, non-grazed, HSG C
1.764	58	Meadow, non-grazed, HSG B
95.382	67	Weighted Average
90.876		95.28% Pervious Area
4.506		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0140	0.06		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.4	2,348	0.2939	2.71		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
13.1	1,271	0.1039	1.61		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
3.2	1,343	0.0515	6.93	58.92	**Channel Flow, REACH 1** Area= 8.5 sf Perim= 11.4' r= 0.75' n= 0.040 Mountain streams
60.0	5,062	Total			

Summary for Subcatchment Po3: POSTDEV 3

Runoff = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af, Depth= 1.09"
Routed to Link AP2 : RTE 26 CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	4.910	98	Paved parking, HSG D
*	13.162	95	ROCK OUTCROP 85% - HSG D
	42.873	77	Woods, Good, HSG D
	65.868	70	Woods, Good, HSG C
	5.301	55	Woods, Good, HSG B
	5.267	71	Meadow, non-grazed, HSG C
	0.070	58	Meadow, non-grazed, HSG B
	137.451	75	Weighted Average
	132.541		96.43% Pervious Area
	4.910		3.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.1940	0.16		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
7.9	845	0.1266	1.78		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.9	1,771	0.3586	2.99		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
28.1	2,716	Total			

Summary for Subcatchment Po4: POSTDEV 4

Runoff = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af, Depth= 1.39"
Routed to Link AP3 : EXISTING RAVINE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	2.093	98	Paved parking, HSG D
*	11.768	95	ROCK OUTCROP 85% - HSG D
	0.443	77	Woods, Good, HSG D
	21.804	70	Woods, Good, HSG C
	36.108	80	Weighted Average
	34.015		94.20% Pervious Area
	2.093		5.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.1520	0.15		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
5.9	918	0.2658	2.58		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
2.0	540	0.8148	4.51		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
8.7	864	0.1100	1.66		**Shallow Concentrated Flow, SCF 3** Woodland Kv= 5.0 fps
27.9	2,422	Total			

Summary for Subcatchment Po5: POSTDEV 5

[47] Hint: Peak is 154% of capacity of segment #3
[47] Hint: Peak is 267% of capacity of segment #5
[47] Hint: Peak is 360% of capacity of segment #6

Runoff = 684.41 cfs @ 12.57 hrs, Volume= 107.904 af, Depth= 0.98"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	14.370	98	Paved parking, HSG D
*	61.119	93	ROCK OUTCROP 70-85% - HSG D
	627.034	77	Woods, Good, HSG D
	67.227	78	Meadow, non-grazed, HSG D
	425.936	70	Woods, Good, HSG C
	44.903	71	Meadow, non-grazed, HSG C
	38.975	55	Woods, Good, HSG B
	35.325	30	Woods, Good, HSG A
	7.417	58	Meadow, non-grazed, HSG B
	3.823	30	Meadow, non-grazed, HSG A
	1,326.129	73	Weighted Average
	1,311.759		98.92% Pervious Area
	14.370		1.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4	100	0.0520	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.3	2,138	0.2470	2.48		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.4	7,876	0.0987	14.00	445.27	**Channel Flow, REACH 1** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
0.7	1,018	0.2829	23.71	753.84	**Channel Flow, REACH 2** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
5.7	2,751	0.0327	8.06	256.29	**Channel Flow, REACH 3** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
5.6	1,995	0.0180	5.98	190.15	**Channel Flow, REACH 4** Area= 31.8 sf Perim= 24.2' r= 1.31' n= 0.040 Mountain streams
53.1	15,878	Total			

Summary for Subcatchment Po6: POSTDEV 6

Runoff = 94.32 cfs @ 13.18 hrs, Volume= 24.220 af, Depth= 0.73"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	7.548	98	Paved parking, HSG D
	2.364	98	Water Surface, HSG D
*	5.172	92	ROCK OUTCROP 70% - HSG D
	143.573	77	Woods, Good, HSG D
	12.693	78	Meadow, non-grazed, HSG D
	60.186	70	Woods, Good, HSG C
	19.270	71	Meadow, non-grazed, HSG C
	131.280	55	Woods, Good, HSG B
	8.665	58	Meadow, non-grazed, HSG B
	8.939	30	Woods, Good, HSG A
	399.690	68	Weighted Average
	389.778		97.52% Pervious Area
	9.912		2.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	100	0.0820	0.12		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
7.1	818	0.1455	1.91		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
7.4	1,430	0.4126	3.21		**Shallow Concentrated Flow, SCF 2** Woodland Kv= 5.0 fps
25.1	1,470	0.0381	0.98		**Shallow Concentrated Flow, SCF 3** Woodland Kv= 5.0 fps
35.1	7,980	0.0044	3.79	287.63	**Channel Flow, REACH 1** Area= 75.9 sf Perim= 39.8' r= 1.91' n= 0.040 Winding stream, pools & shoals
89.2	11,798	Total			

Summary for Subcatchment Po7: POSTDEV 7

[47] Hint: Peak is 136% of capacity of segment #3
[47] Hint: Peak is 231% of capacity of segment #4
[47] Hint: Peak is 120% of capacity of segment #5
[47] Hint: Peak is 292% of capacity of segment #6

Runoff = 688.07 cfs @ 12.67 hrs, Volume= 115.019 af, Depth= 1.09"
Routed to Reach AP4 : CLEAR STREAM

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10YR-24HR Rainfall=3.19"

	Area (ac)	CN	Description
	18.547	98	Paved parking, HSG D
*	33.464	88	ROCK OUTCROP 50% - HSG D
	819.030	77	Woods, Good, HSG D
	117.983	78	Meadow, non-grazed, HSG D
	136.399	70	Woods, Good, HSG C
	56.346	71	Meadow, non-grazed, HSG C
	48.714	55	Woods, Good, HSG B
	33.462	58	Meadow, non-grazed, HSG B
	3.255	30	Woods, Good, HSG A
	2.352	30	Meadow, non-grazed, HSG A
	1,269.552	75	Weighted Average
	1,251.005		98.54% Pervious Area
	18.547		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0300	0.08		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.28"
14.7	2,454	0.3093	2.78		**Shallow Concentrated Flow, SCF 1** Woodland Kv= 5.0 fps
9.3	8,357	0.1087	14.98	506.18	**Channel Flow, REACH 1** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
8.3	4,396	0.0375	8.80	297.31	**Channel Flow, REACH 2** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
1.3	1,330	0.1391	16.94	572.61	**Channel Flow, REACH 3** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
4.2	1,740	0.0236	6.98	235.86	**Channel Flow, REACH 4** Area= 33.8 sf Perim= 25.0' r= 1.35' n= 0.040 Mountain streams
59.4	18,377	Total			

Summary for Reach AP1: MOHAWK RIVER

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,683.309 ac, 1.33% Impervious, Inflow Depth = 0.68" for 10YR-24HR event
Inflow = 566.23 cfs @ 12.54 hrs, Volume= 95.645 af
Outflow = 566.23 cfs @ 12.54 hrs, Volume= 95.645 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Reach AP4: CLEAR STREAM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2,995.371 ac, 1.43% Impervious, Inflow Depth = 0.99" for 10YR-24HR event
Inflow = 1,421.21 cfs @ 12.62 hrs, Volume= 247.142 af
Outflow = 1,421.21 cfs @ 12.62 hrs, Volume= 247.142 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: RTE 26 CULVERT

Inflow Area = 137.451 ac, 3.57% Impervious, Inflow Depth = 1.09" for 10YR-24HR event
Inflow = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af
Primary = 127.67 cfs @ 12.24 hrs, Volume= 12.453 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP3: EXISTING RAVINE

Inflow Area = 36.108 ac, 5.80% Impervious, Inflow Depth = 1.39" for 10YR-24HR event
Inflow = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af
Primary = 44.91 cfs @ 12.24 hrs, Volume= 4.195 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

3.5 Stone Riprap Calculations
(NOT INCLUDED, NO PROPOSED STORM WATER CULVERTS)

3.6 Site Specific Soil Survey
(NOT APPLICABLE FOR PROJECTS UNDER Env-Wq 1503.11 (b), WAIVER REQUESTED)

3.7 Infiltration Feasibility Report
(NOT INCLUDED, WAIVER REQUESTED)

3.8 Inspection and Maintenance Manual

Inspection and Maintenance Plan

For
DIXVILLE CAPTIAL, LLC
The Balsams – Ski Trails and Lifts
Dixville, NH

Introduction

This document is intended to provide a unified procedure for the party(ies) responsible for inspecting and maintaining the stormwater management device(s) that are located within the site development (see Design Plan for the device locations).

Responsible Parties

The ultimate responsibility for complying with this plan rests with the owners of the Property.

Owner's Name: Dixville Capital, LLC

Parties assigned to complete inspection and maintenance tasks are presented in the following table:

DEVICE	TASK	PARTY RESPONSIBLE
Structural Stormwater Devices		
Ditches	Inspection	OWNER
	Maintenance	OWNER
	Reporting	OWNER
Water Bars	Inspection	OWNER
	Maintenance	OWNER
	Reporting	OWNER

Frequency of Activities

The best time to perform inspections is during the onset of rain. To the extent practicable, inspections should be timed to coincide with moderate storms that do not have the potential for severe (thunderstorms, etc) precipitation. The frequency of inspection and maintenance will vary by intensity of use; however, the following shall serve as the minimum inspection frequency:

- Pretreatment measures (Ditches and Water Bars) should be inspected and cleaned at least seasonally.

Maintenance frequencies will be determined based upon the results of the inspections and if specific maintenance thresholds are observed to have been crossed during inspections.

All inspection activities shall be recorded on the appropriate attached Inspection Form. One form shall be used for each stormwater device.

Records

A record of inspection and maintenance activities shall be recorded on the Inspection and Maintenance Log presented below. Records of Inspection Forms and Inspection and Maintenance Logs shall be made available upon request.

_____ BMP Name

Ditches and Water Bars

Inspection Form

The Balsams – Ski Trails and Lifts, Dixville, NH

Date of today's inspection__/__/__ Inspector Name_____
Date of last inspection (of this BMP) __/__/__

Recent Weather history

Storm date(s)	Storm duration	Rainfall amount	Did runoff occur?

Today's Weather_____

INSPECTION AREAS	LOOK FOR	CIRCLE ONE		IF YES
Ditches				
	Sediment or debris in Ditch? Erosion of bank or bottom?	Y	N	Remove sediment, leaves & debris as needed. Inspect ditch and clean if necessary. Ensure positive drainage is maintained.
Water bars				
	Sediment or debris at water bar inlet or outlets? Sediment traps greater than 50% full?	Y	N	Remove sediment, leaves and debris as needed from water bar and inlet/outlet sediment traps. Inspect water bar and clean stone or replace stone if necessary. Ensure positive drainage is maintained.

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

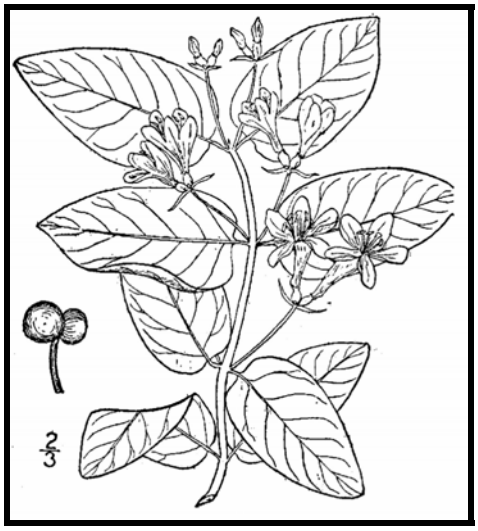
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

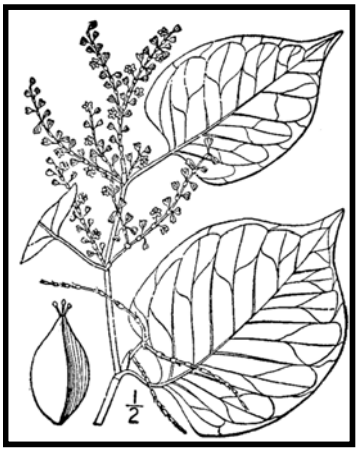
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

3.9 References

Preparer’s / Reviewer’s Certification

REFERENCES

Mays, Larry. *Stormwater Collection Systems Design Handbook*. McGraw-Hill. New York, NY. 2001

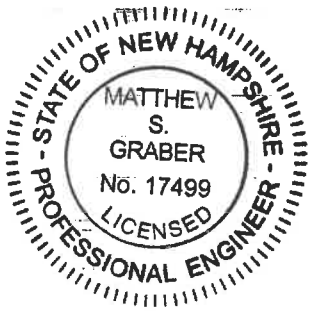
McCarthy, David. *Essentials of Soil Mechanics and Foundations: Sixth Edition*. Prentice Hall. Columbus, Ohio. 2002.

NHDES. *New Hampshire Stormwater Manual*. New Hampshire Department of Environmental Services. 2008.

The UNH Stormwater Center, *The LID Stormwater Management Systems Demonstrate LID Stormwater Management Systems Demonstrate Superior Cold Climate Performance than Superior Cold Climate Performance than Conventional Stormwater Management Systems.*
UNH Stormwater Center, NEIWPCC 2007 NPS Conference, Newport, RI, May 2007

PREPARER & REVIEWER'S CERTIFICATION

Prepared by Matthew Graber, P.E. No.17499



SECTION 4.0 – PLANS

4.1 Design Plans
(Unbound)

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(Plans Bound Separately)

4.2 Color Coded Hydrologic Soils Group Plans

4.3 Pre & Post Development Drainage Area Plans