Presentation on High Elevation Developments, Forests, Stormwater, Wetlands, Wildlife

to House Natural Resources, Fish & Wildlife Committee

Feb. 14, 2019

Vermonters for a Clean Environment

Annette Smith
Executive Director
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Vermont Land Areas Above

2500 ft.

Green Mountain

National Forest

Outlined in Red

2000 ft.

1500 ft.

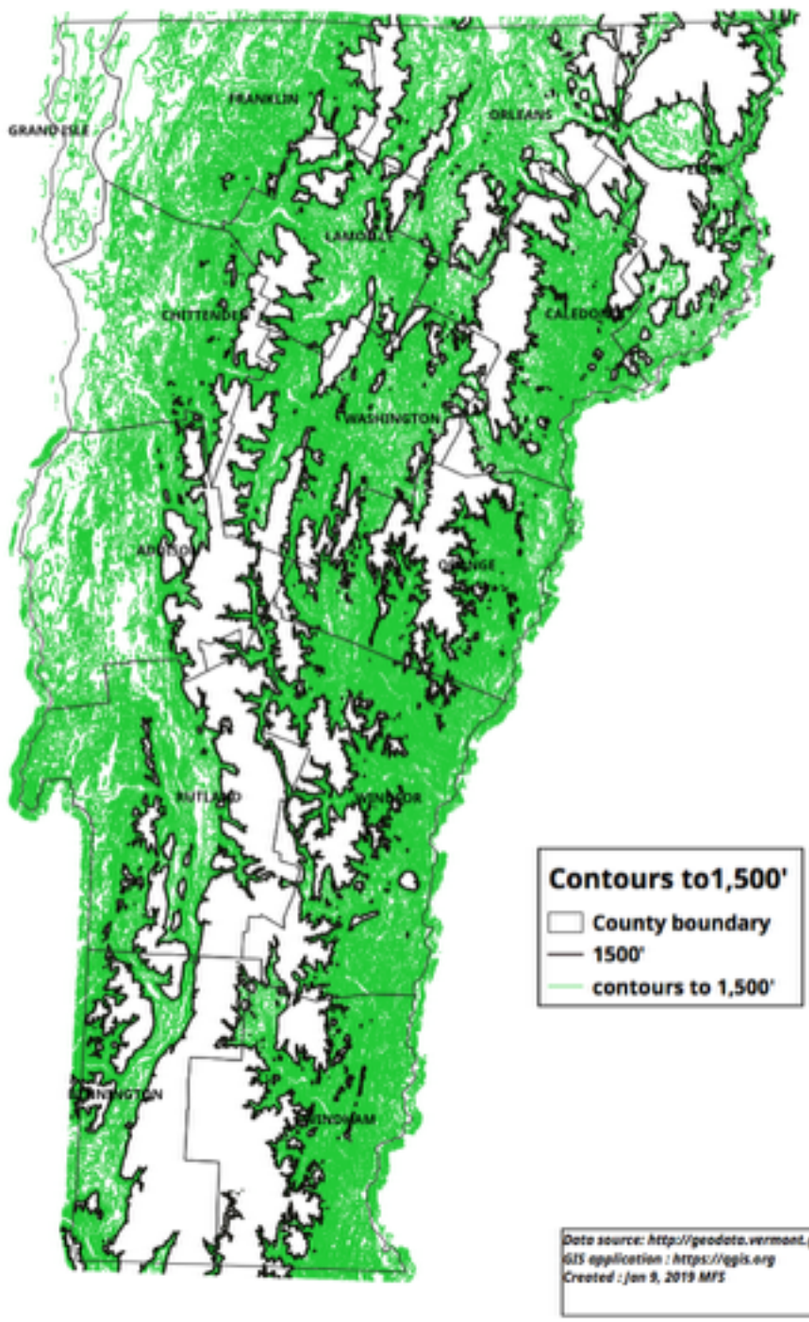
Vermont Land Areas

up to 1500 ft. — **green**

1500 to 2000 ft. — **yellow**

2000 to 2500 ft. — **purple**

1



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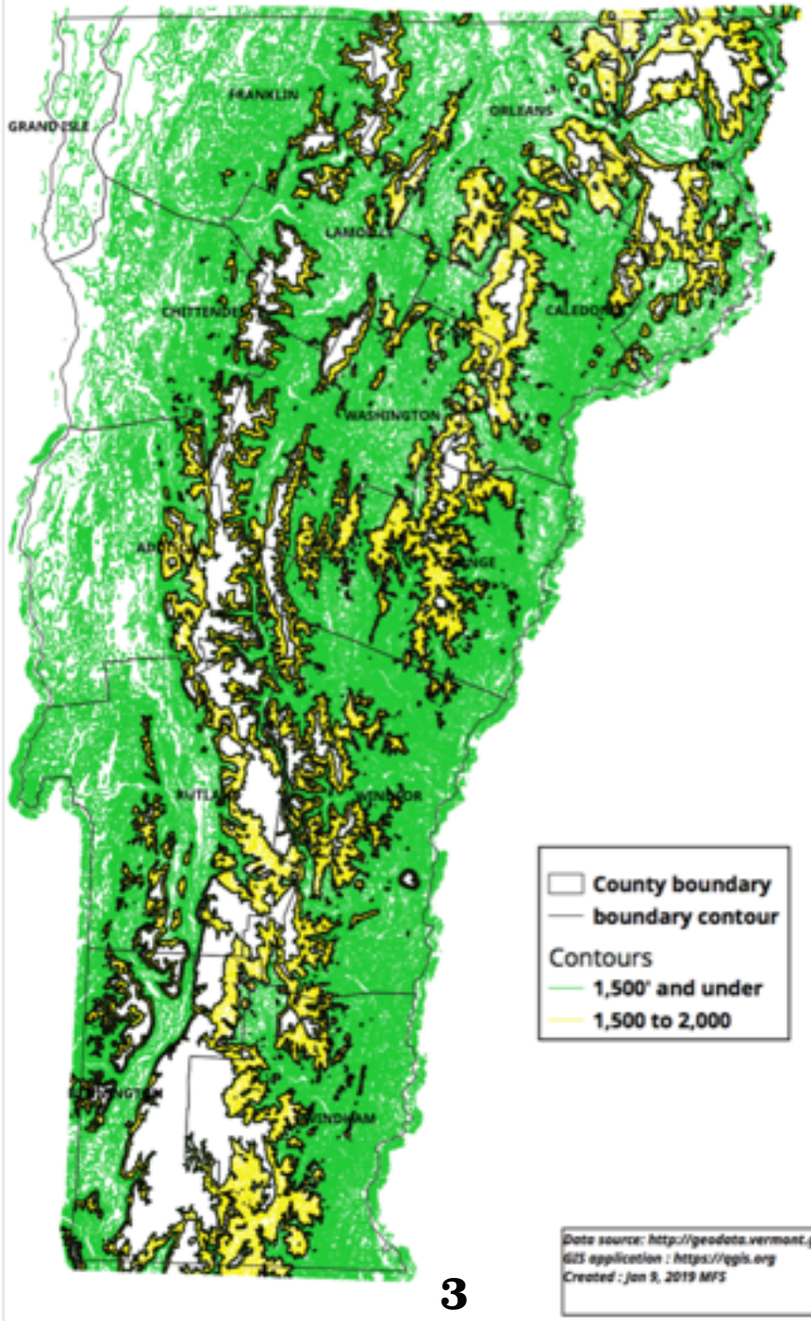

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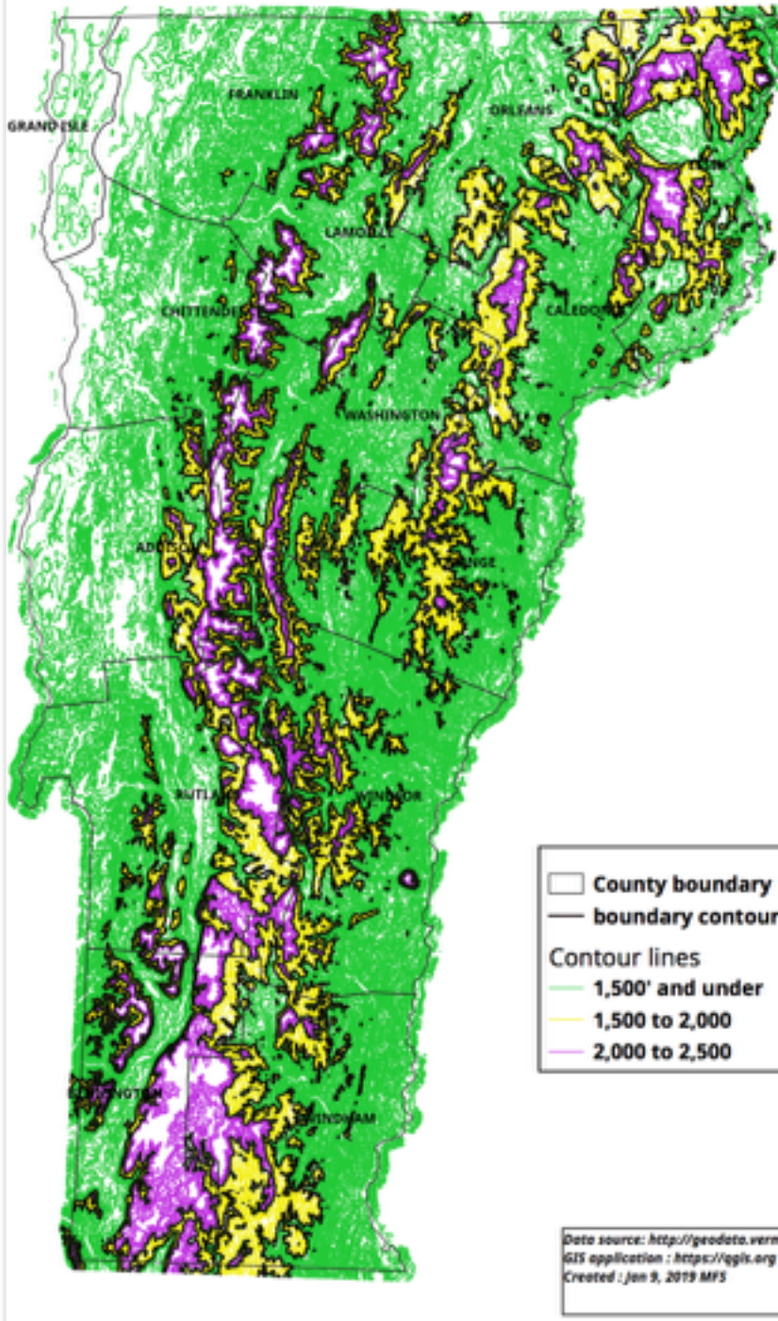
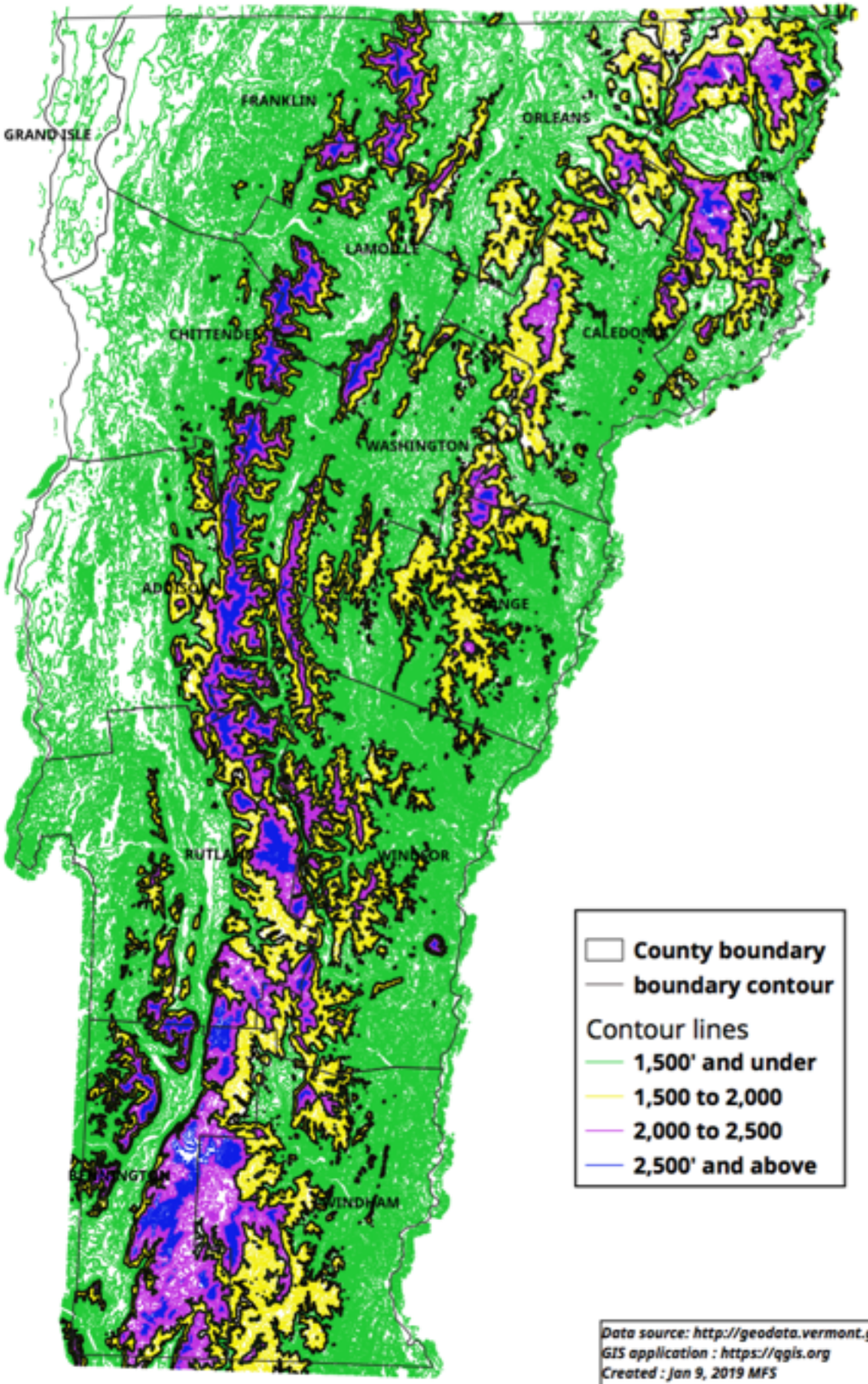
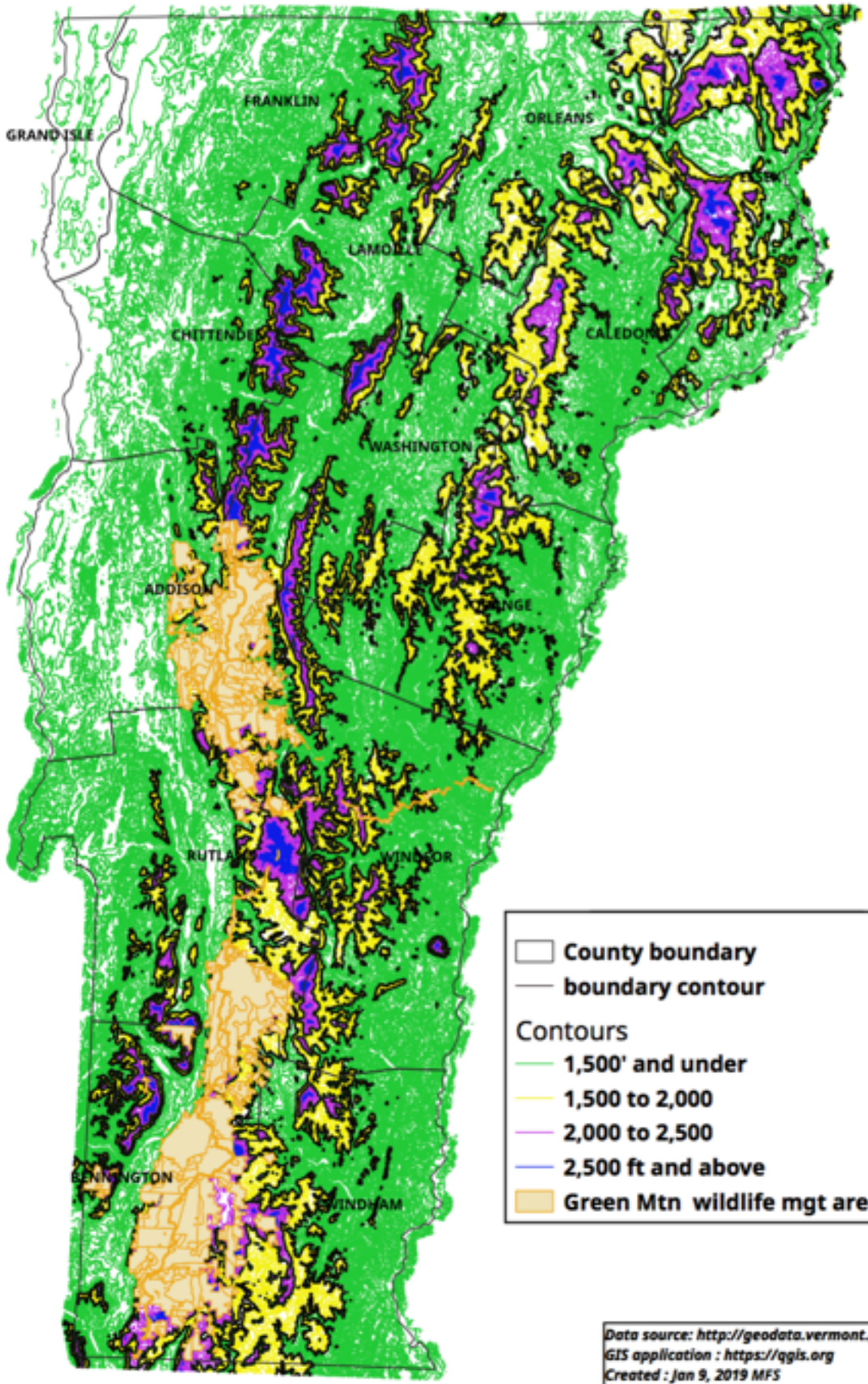


Map 4



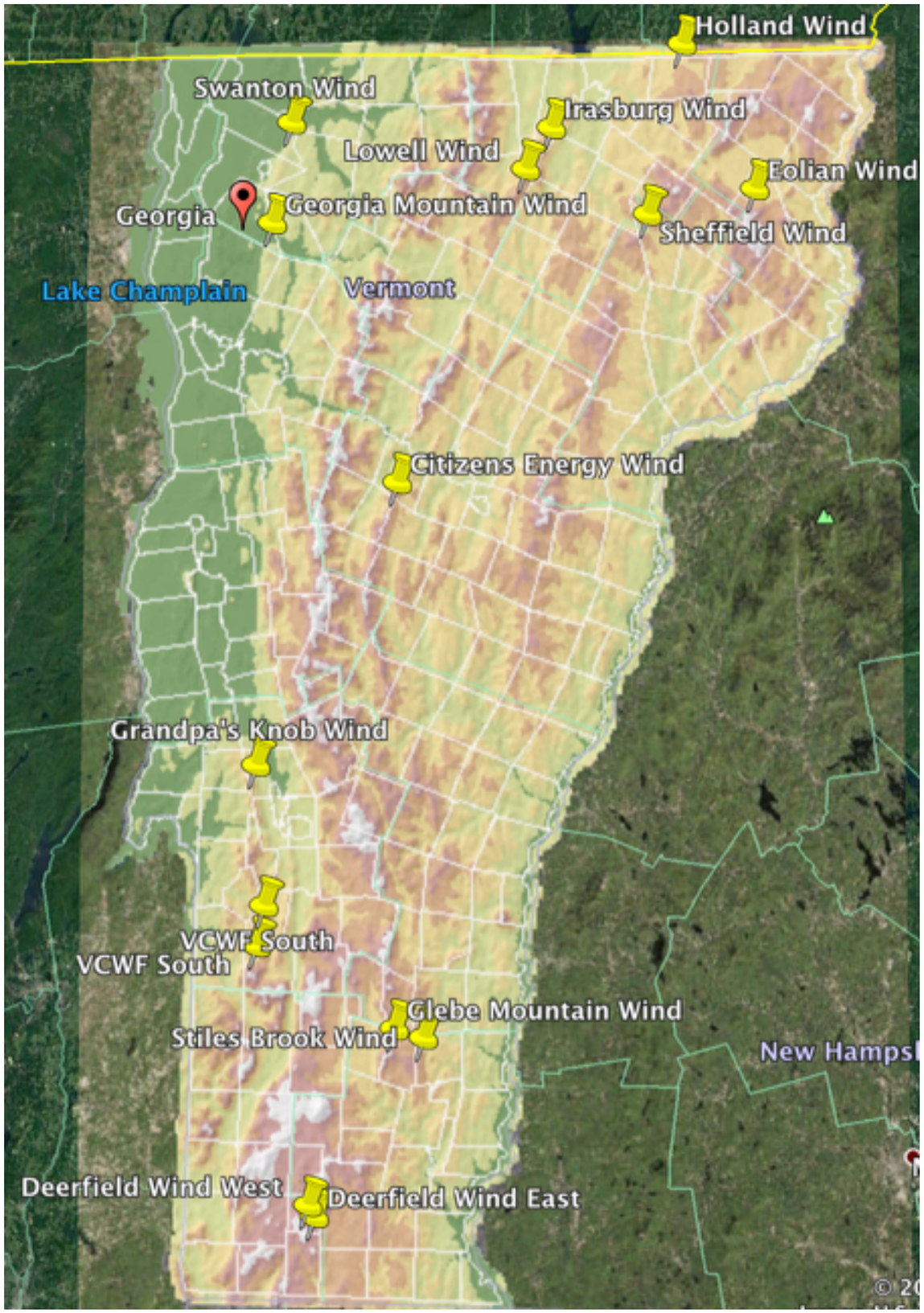
Data source: http://geodata.vermont.gov/
GIS application : https://qgis.org
Created : Jan 9, 2019 MFS

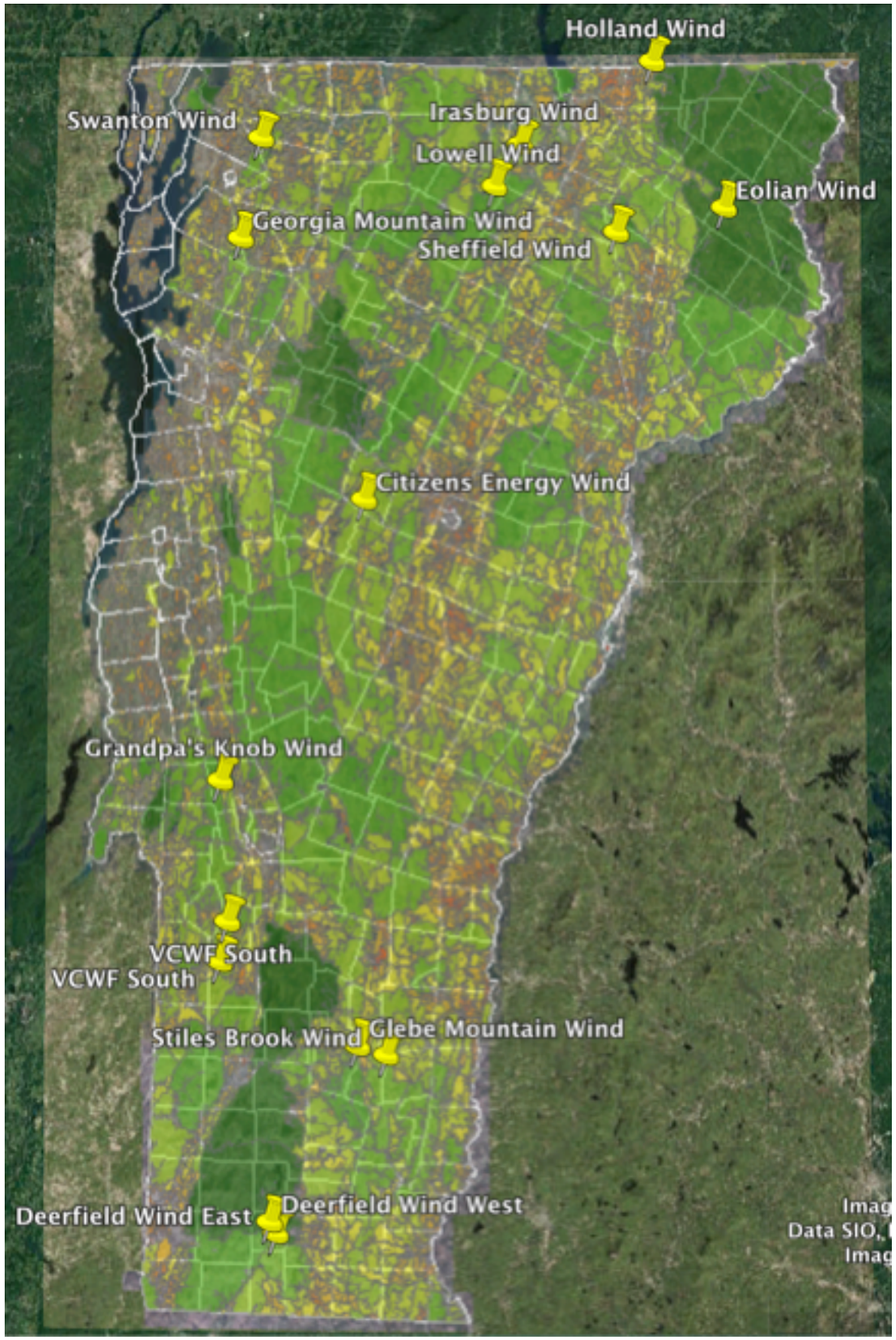
Map 5



Data source: http://geodata.vermont.gov/
GIS application : https://qgis.org
Created : Jan 9, 2019 MFS
MFS

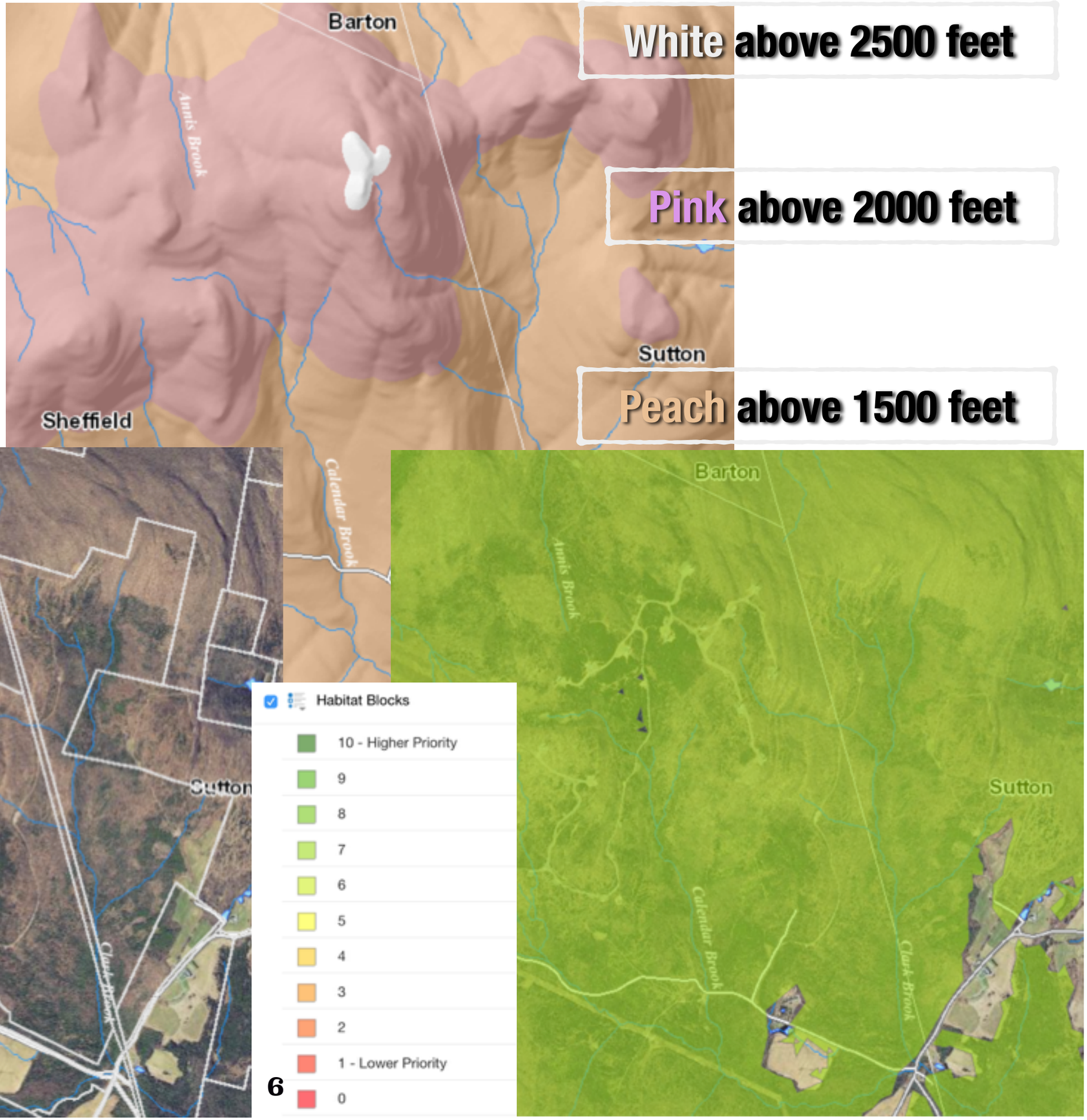
Elevation, Habitat Blocks and Wind Projects

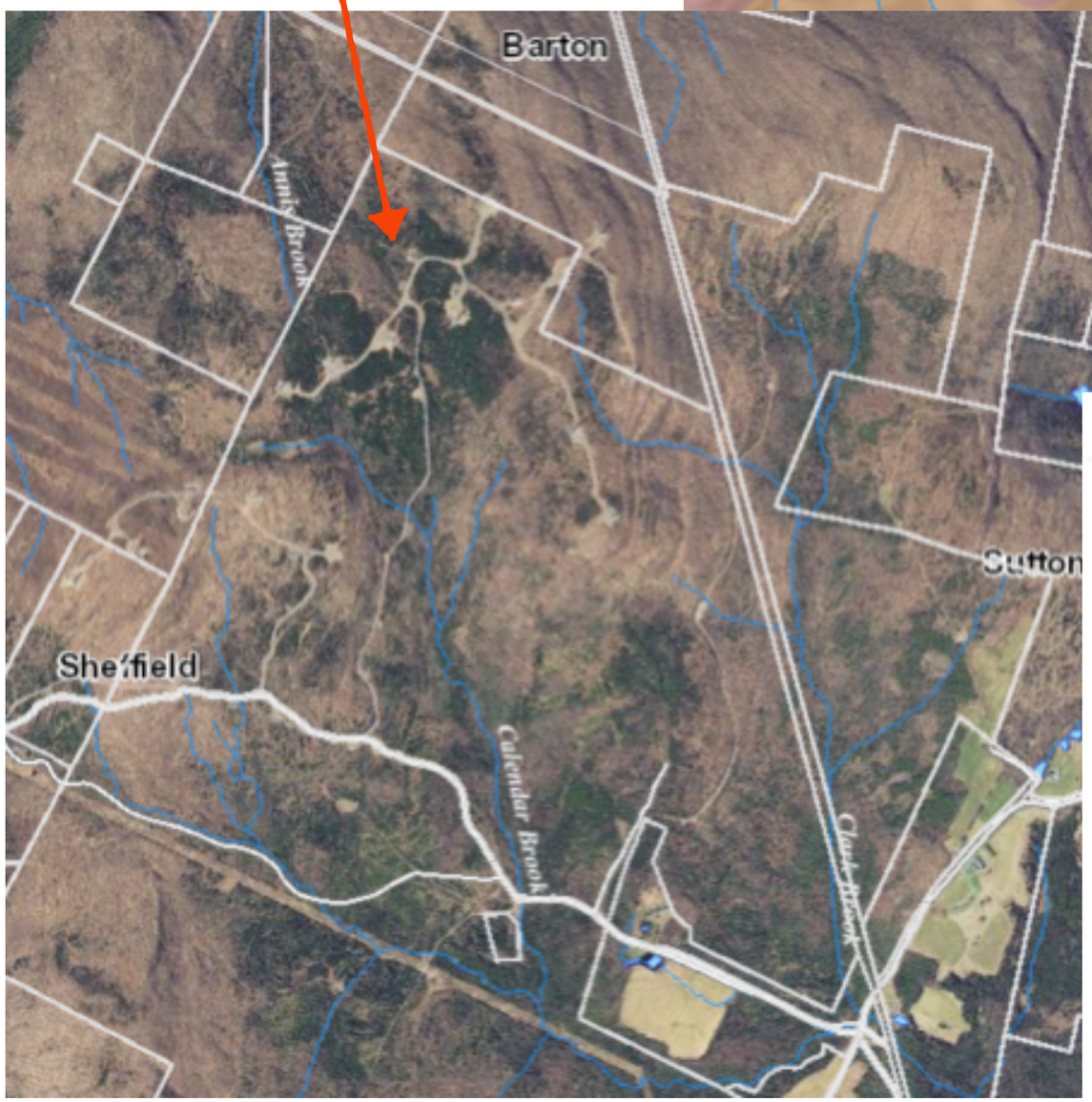




Sheffield Wind

5 1/2 miles
of new
roads





Water Quality Issues
High Elevation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
http://www.fws.gov/northeast/newenglandfieldoffice

Ref: VTS000080 5535-INDC

March 21, 2008

Mr. Peter Laflamme
Vermont Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

Dear Mr. Laflamme:

This is in response to the draft NPDES permit for Signal Wind Energy to discharge sediment and other construction-related pollutants to unnamed tributaries to Annis, Calendar, Clark, Nation, and Miller Brooks; and to an unnamed tributary to Willoughby Brook related to the construction of the Sheffield Wind Project in Sheffield, Vermont.

Turbidity

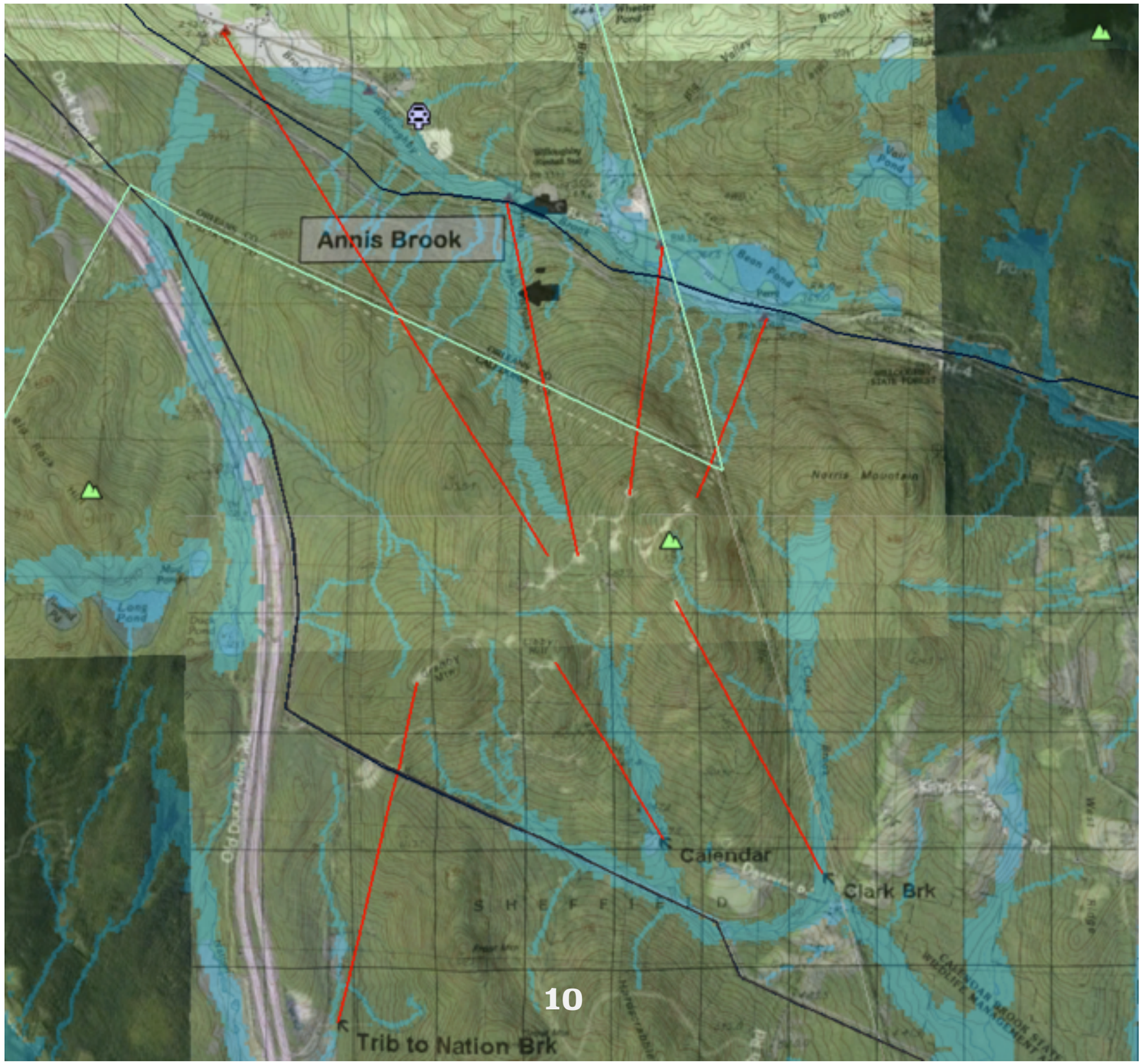
10 and 11 of the draft permit, the standard or action level for compliance monitoring is 25 NTU at points where visibly discolored stormwater runs off the construction site. Since the receiving waters are small headwater streams with some considerable variability in flow, and/or wetlands, it seems plausible that runoff from the construction site could constitute a substantial percentage of the flow in these waters particularly during the ascending phase of a precipitation event. Hence, our question is, given the nature of these receiving waters, how does the 25 NTU action level where runoff leaves the construction site ensure compliance with the full support or 10 NTU instream standard?

It seems difficult to reconcile the permit limits with the water quality standards criteria because 1) it is not clear what existing and designated uses are recognized and how full support of uses is measured in these waters, and 2) it is not clear who is responsible for measuring turbidity levels to establish the annual average under dry weather base-flow conditions. Specifically, do fish, macroinvertebrate or other reference conditions exist for these headwater systems? Are fish or macroinvertebrate biocriteria even applicable in the traditional sense? If these biocriteria exist, would they only be applied during late summer flow conditions like wadeable stream protocols or following episodic events of stormwater runoff from the construction site? Regarding the

Temperature

Another closely aligned question concerns compliance with temperature criteria. The standard for cold-water fish habitat is 1°F above ambient temperature. We assume section d. in the temperature criteria of the water quality standards does not apply as no mixing zone is specified in the draft permit. The visibly discolored water referenced above could be affected, e.g., warmed, by air temperature and by sunlight especially after convective-type storms during the growing season. It occurs to us that some of these receiving streams could be dry at the time of the discharge. At other times or places, the flow might be from surface runoff. Yet at other times and places, the receiving waters may be flowing due to ground water discharge. In each of these cases, the ambient temperature of the receiving waters could be different, as could the rate of stream flow and discharge volume from the construction site and temperature. Given that, the only monitoring specified in the draft permit is for turbidity as discussed above, how can the Department be certain that the temperature criteria will be complied with during project construction when it is not called out in the permit or addressed in monitoring protocols? The fact that temperature is not mentioned in the permit would seem to make it less likely that an inspector would take note and prompt the Department to utilize the provisions in Part II.D.2. of the permit to address the issue.

Sheffield Stormwater Monitoring Locations



Effects of Flow Redirection and Underestimation of Runoff at Sheffield Wind Site

Effects of Flow Redirection and Underestimation of Runoff at Sheffield Wind Site

Effects of Flow Redirection and Underestimation of Runoff at Sheffield Wind Site

Concentrated Flow where there was none before.

Effects of Flow Redirection and Underestimation of Runoff at Sheffield Wind Site

12” sediment in stream just downstream of by-pass pipe photographed above

Caledonian Record

6/4/2011 9:23:00 AM

Vt. Official: Sheffield's Wind Site In Compliance

Robin Smith
Staff Writer

SHEFFIELD -- The First Wind site on Sheffield Mountain is "substantially in compliance" with its storm-water runoff control permit, even after the massive deluge hit the area last week.

Kevin Burke, a Vermont Department of Environmental Conservation environmental analyst, conducted a scheduled inspection of the site beginning 8 a.m. May 27 -- the morning after floods destroyed roads and flooded property throughout Caledonia County and other parts of central Vermont.

He walked and rode on ATVs on access roads that led to the sites being prepared for the industrial turbines in the First Wind project on Sheffield Mountain, Burke said Friday.

He filed a report saying that the erosion controls in place match the requirements of First Wind's storm-water runoff control permit.

"Site looked excellent, especially after 4.5 inches rain in last 24 hours," Burke wrote in a two-page report. "No changes necessary other than typical maintenance. The site is in substantial compliance with permit."

Burke had scheduled the site visit with First Wind officials before the storm hit last week, making the inspection a timely coincidence to see how well erosion controls worked in severe storm conditions.

+ click to enlarge

COURTESY OF VERMONT DEC

A dump truck lumbers along access road A at the Sheffield wind project site on May 27, the day after 4.5 inches of rain fell in parts of Caledonia County.

There was some storm damage to runoff controls, Burke said. Runoff breached what's called a silt fence near the entrance to the Duck Pond Road site. The flowing water "jumped a conveyance channel along a fence" which would have directed the water to a sediment pond, Burke said.

Instead the water ran into a town ditch, he said.

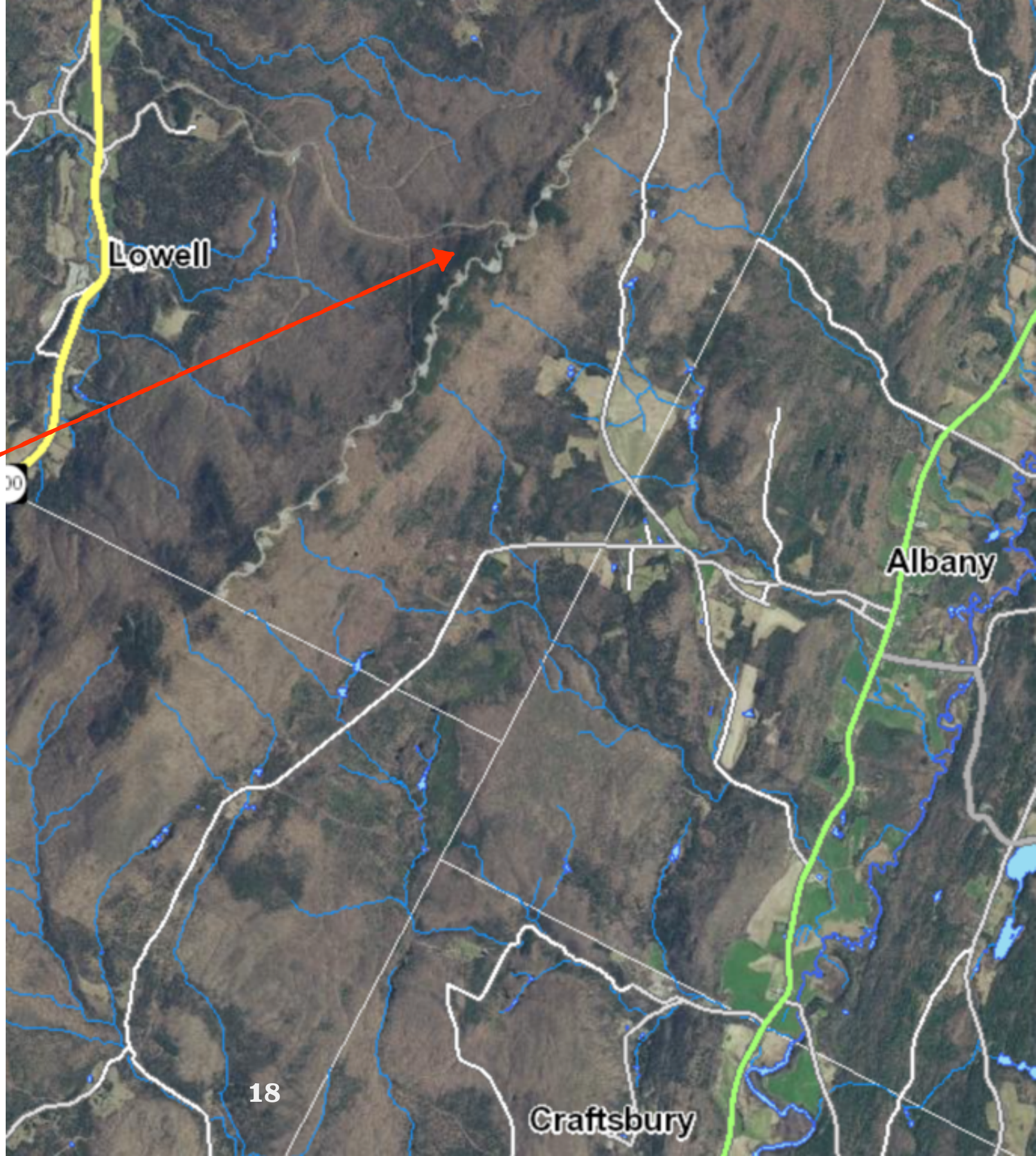
Burke saw locations where more mulch was needed. He also said that sediment ponds handled the silt in the runoff as designed.

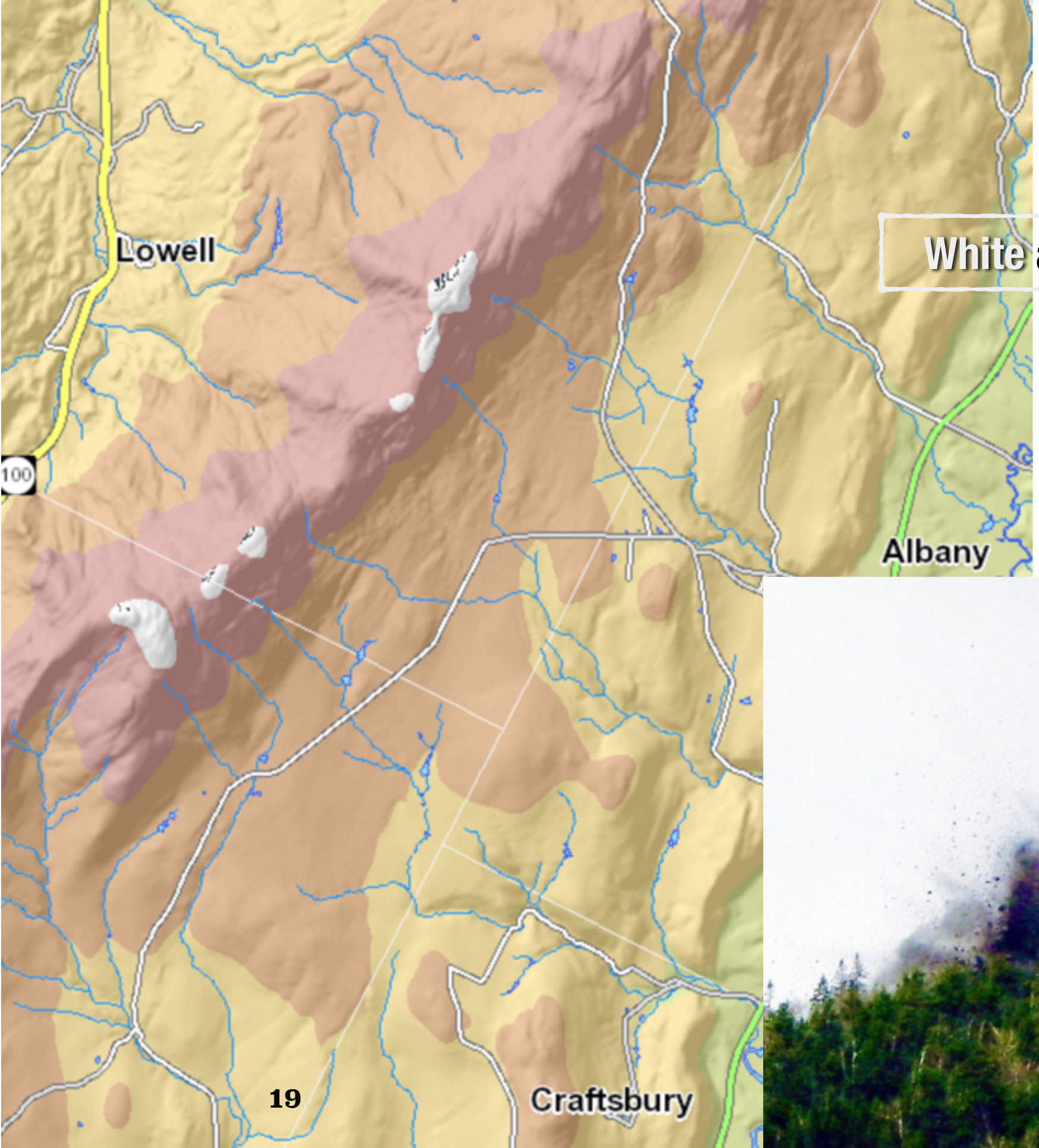
Logging roads, in place before First Wind began construction of the access roads and turbine pads, had run-off problems, Burke said. Some of those logging roads have sent runoff into the First Wind site, he said.

The management of erosion on those logging roads "could have been better," he said. The logging operation is governed under a separate permit that has different standards.

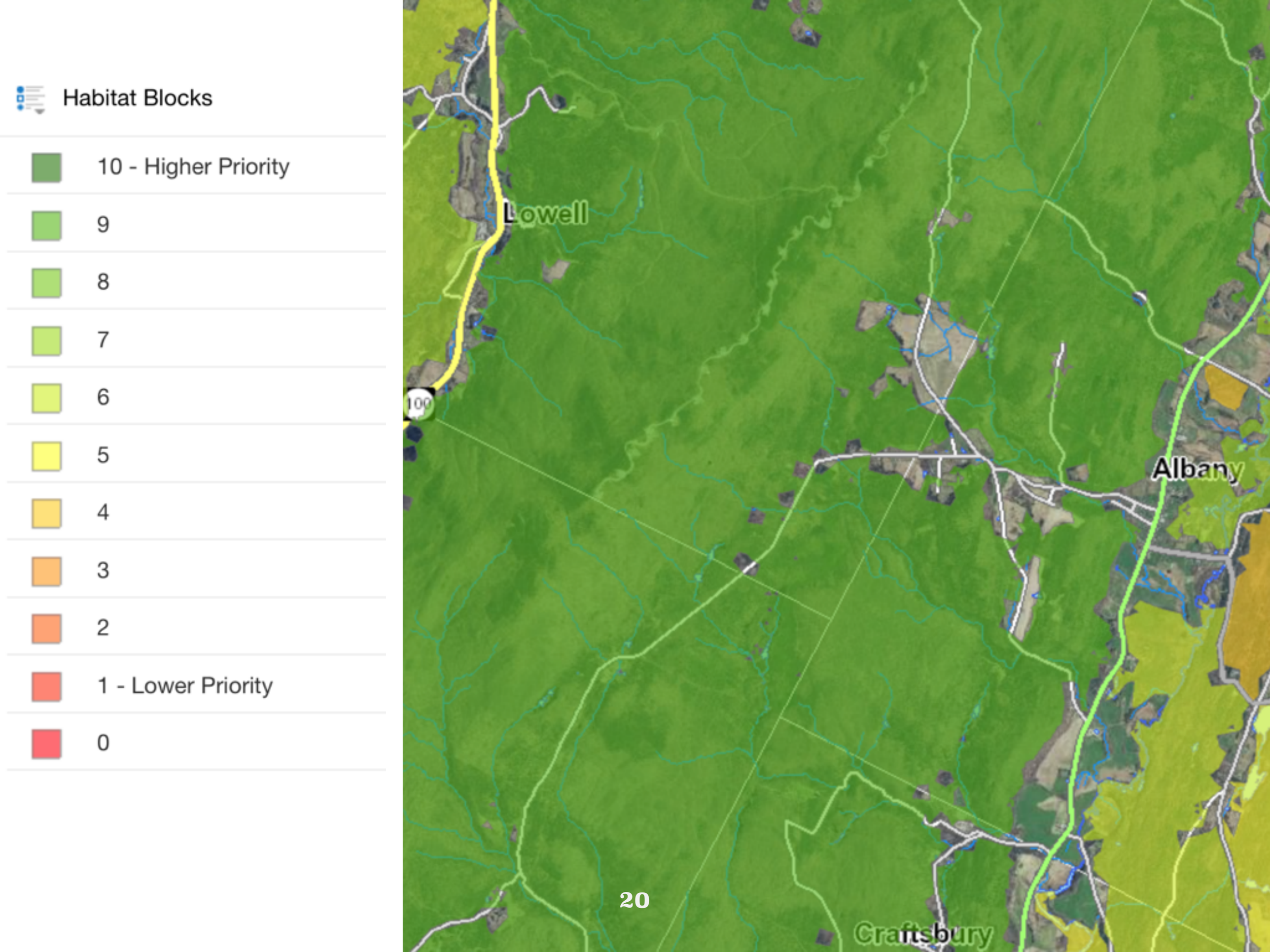
Lowell Wind

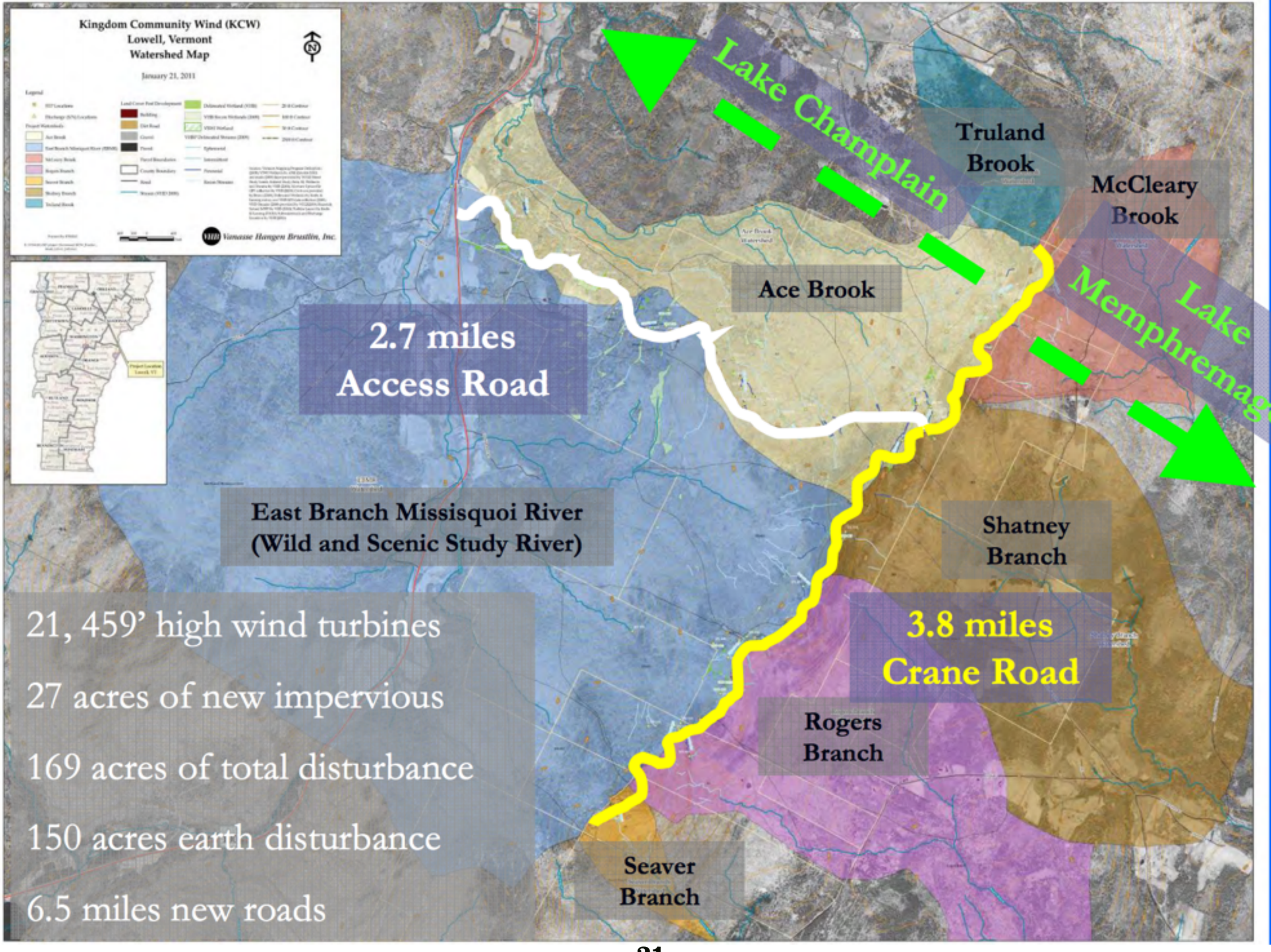
6.5 miles new roads



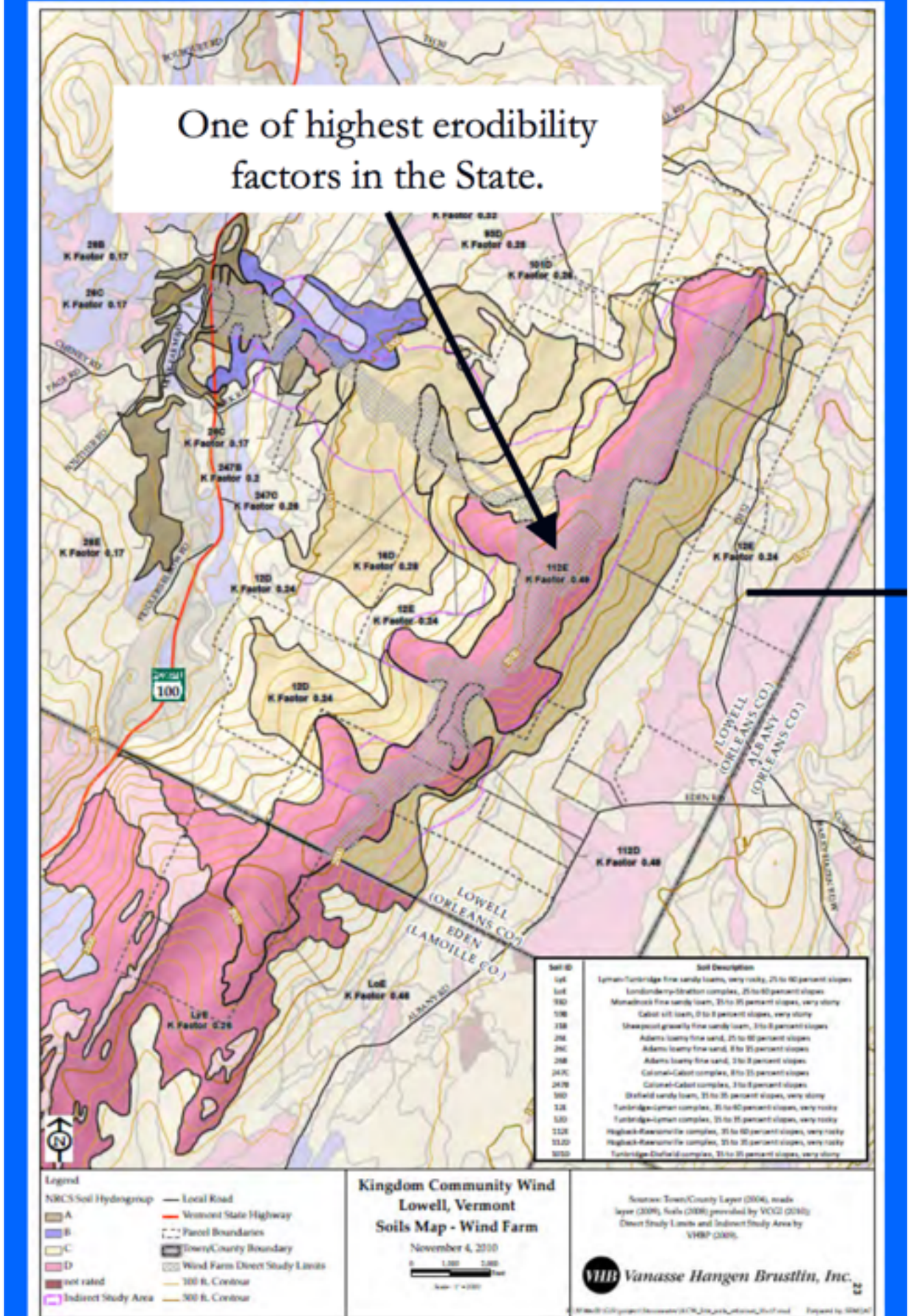


White **above 2500 feet**

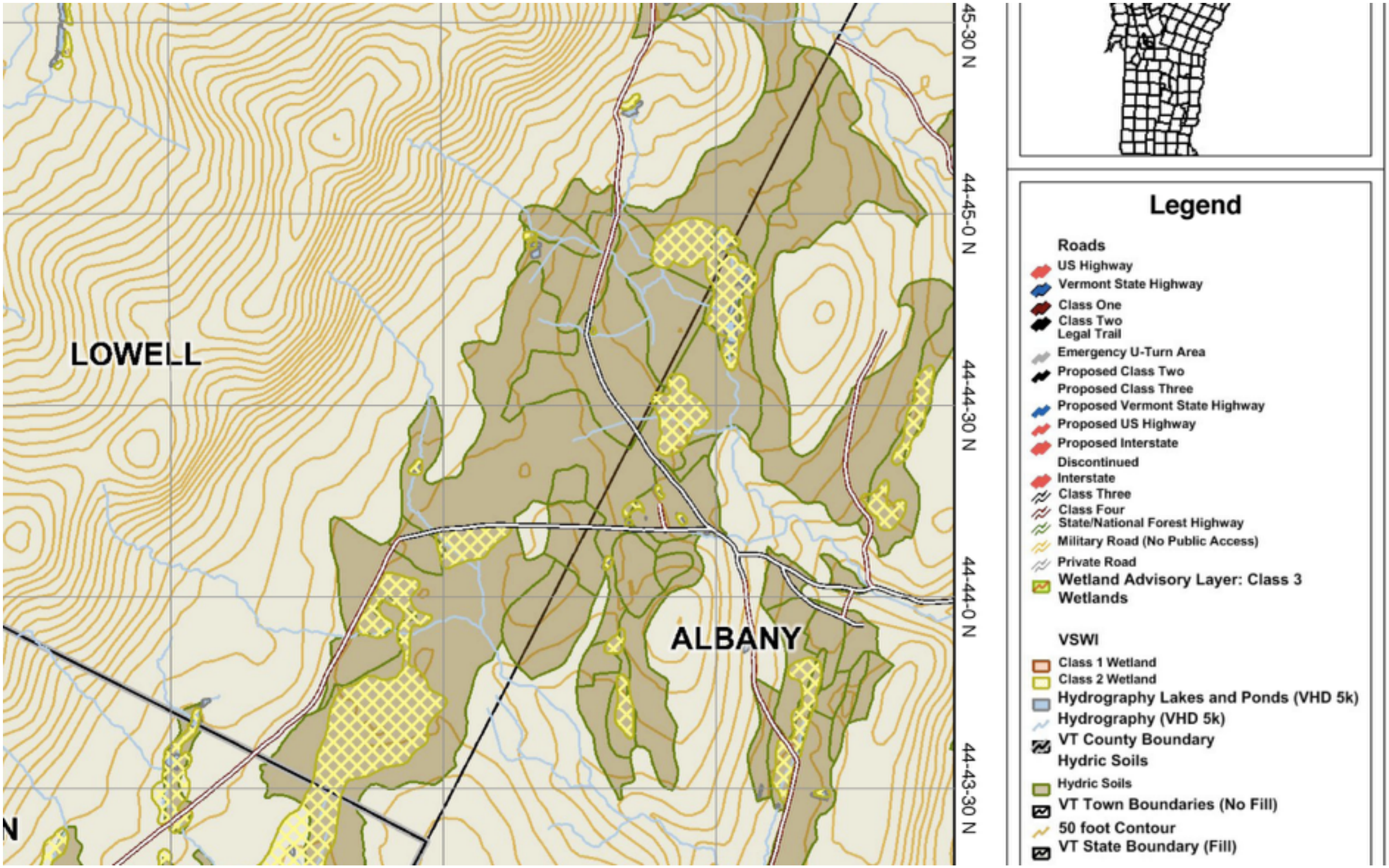

Habitat Blocks
10 - Higher Priority
9
8
7
6
5
4
3
2
1 - Lower Priority
0
Lowell
100
Albany
Craftsbury
20

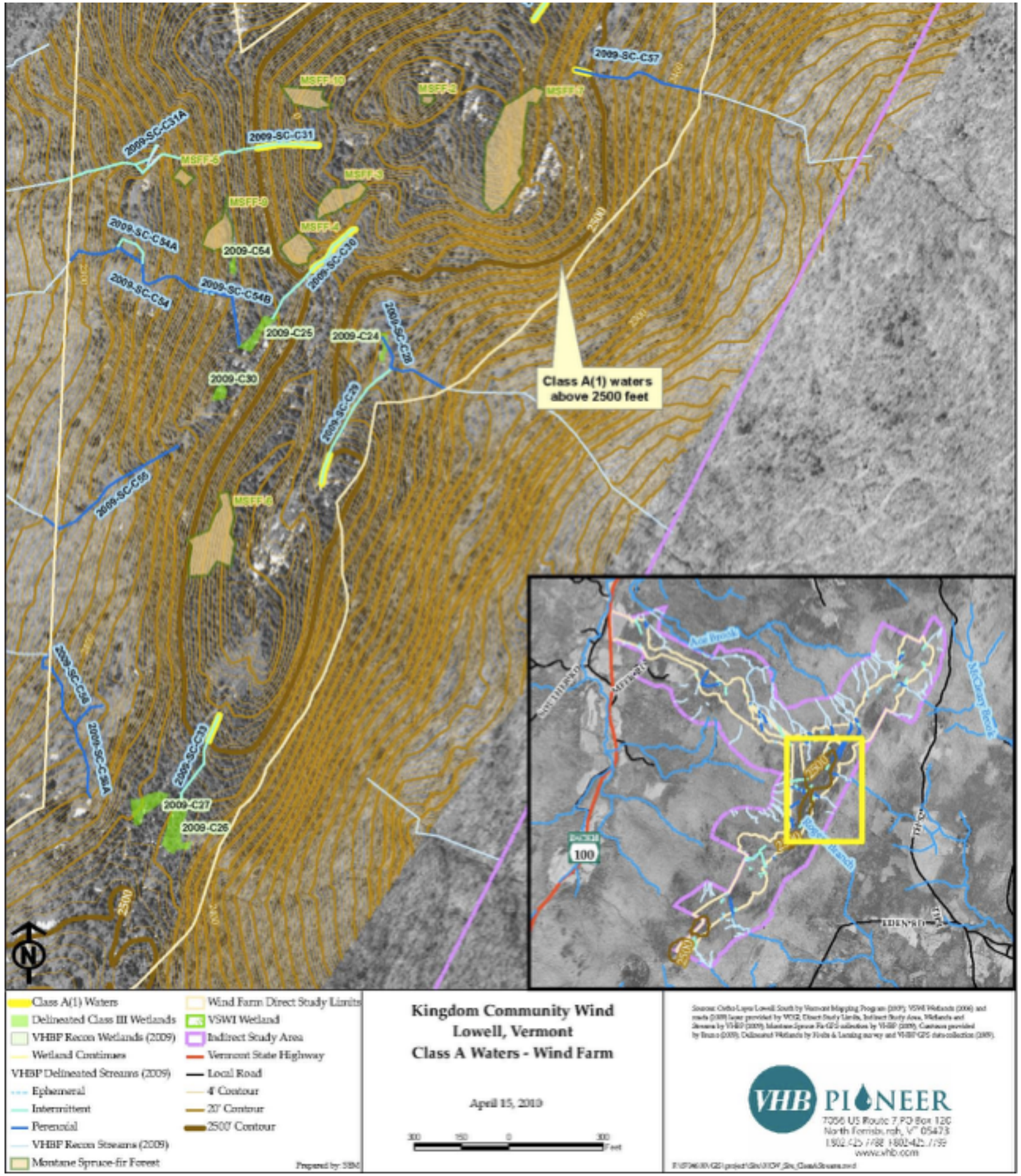

Kingdom Community Wind (KCW)
Lowell, Vermont
Watershed Map
January 21, 2011
Vanasse Hangen Brustlin, Inc.
Lake Champlain
Truland Brook
McCleary Brook
Lake Memphremagog
Ace Brook
2.7 miles
Access Road
East Branch Missisquoi River
(Wild and Scenic Study River)
Shatney Branch
3.8 miles
Crane Road
Rogers Branch
Seaver Branch
21, 459' high wind turbines
27 acres of new impervious
169 acres of total disturbance
150 acres earth disturbance
6.5 miles new roads

Erodibility Factor (USDA)

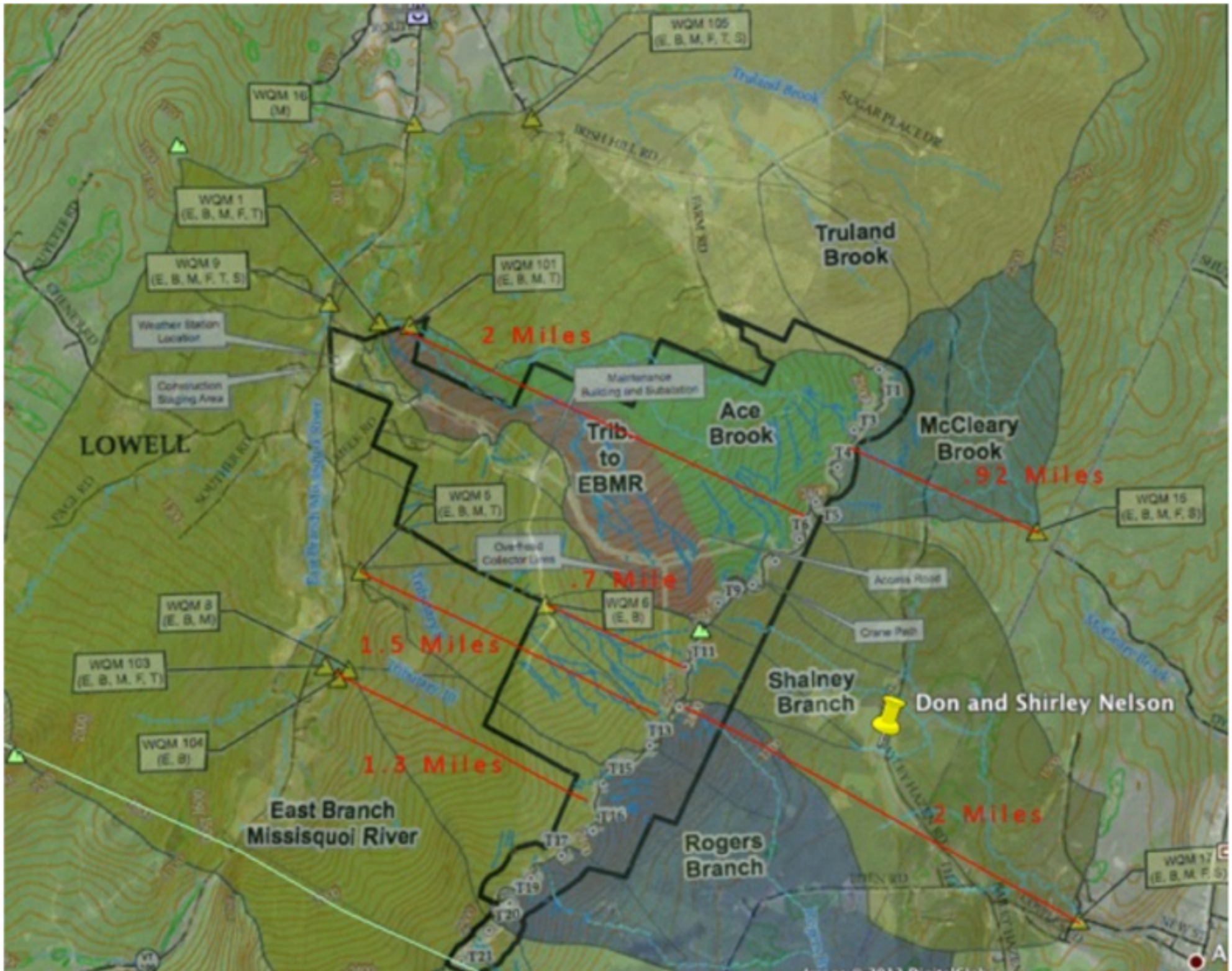


Lowell Wind
Class 2 Wetlands and Hydric Soils




MSFF-10
MSFF-2
MSFF-7
2009-SC-C57
2009-SC-C31A
2009-SC-C31
MSFF-5
MSFF-3
MSFF-9
MSFF-4
2009-SC-C34A
2009-C54
2009-SC-C36
2009-SC-C34
2009-SC-C34B
2009-C25
2009-C24
2009-SC-C28
2009-C30
2009-SC-C29
2009-SC-C56
MSFF-6
Class A(1) waters above 2500 feet
2009-SC-C58
2009-SC-C35A
2009-SC-C33
2009-C27
2009-C26
2500
100
Class A(1) Waters
Delineated Class III Wetlands
VHBP Recon Wetlands (2009)
Wetland Continues
VHBP Delineated Streams (2009)
Ephemeral
Intermittent
Perennial
VHBP Recon Streams (2009)
Montane Spruce-fir Forest
Wind Farm Direct Study Limits
VSWI Wetland
Indirect Study Area
Vermont State Highway
Local Road
4' Contour
20' Contour
2500' Contour
Kingdom Community Wind
Lowell, Vermont
Class A Waters - Wind Farm
April 15, 2010
300 150 0 300
Feet
VHB PIONEER
7056 US Route 7 PO Box 120
North Ferrisburgh, VT 05473
1.802.425.7788 1.802.425.7799
www.vhb.com

The headwaters of this mountain will be irreparably harmed. The monitoring thousands of feet downstream of the project to comply with the Water Quality Certificate will not detect the impacts to the headwater streams.



THE INTERSECTION

BEFORE

AFTER

Bald Peak

PRE-WIND LOWELL MOUNTAIN
MAY 2011

POST-WIND SAME PLACE ON LOWELL MOUNTAIN
JULY 2016

HIGH UP ON LOWELL MOUNTAIN BELOW THE INTERSECTION WITH THE ACCESS ROAD AND THE RIDGELINE ROAD

2011
Wetland East of Crane Path Road

2016

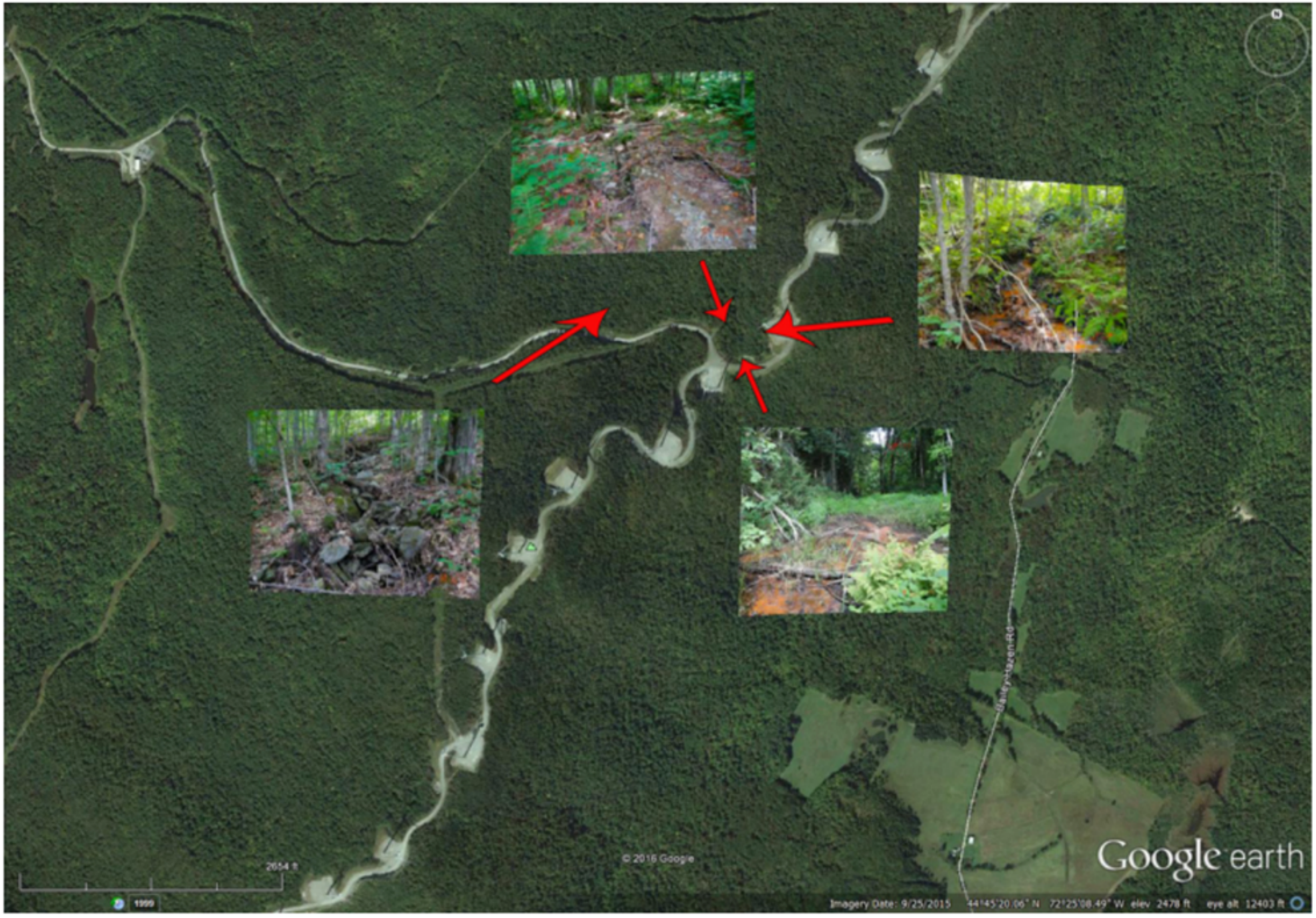
The wetland is mostly dry now, with a die-back of sphagnum moss. This wetland was very special because it flowed both north and south. While parts of Vermont are in drought, this area is experiencing relatively normal rainfall.

1. The “wet” ponds are predominantly dry or are not holding the volume of water necessary to provide water quality treatment as required by the VT Stormwater Management Manual. Further, it is highly probable that instead of flowing through the outlet structure, stormwater is simply passing through the rock berms bypassing the water quality and peak flow attenuation necessary. This seepage is also highly likely causing the iron seeps to form (see below).

Stormwater ponds and level spreaders receive sedimentation that is regularly cleaned out and deposited uphill and seeded.

2. The iron seeps that are being found at the project perimeter, and specifically downslope of stormwater management features is being caused by stormwater or intercepted groundwater flowing over sulfide bearing rock and leaching out metals, and in particular iron.

When this occurs, the seep is comprised of a low pH (acid) floc that will both smother vegetation, wetlands and stream substrates, but also create an environment that will preclude vegetative growth. The preclusion of vegetative growth will lead to more soil instability and subsequent erosion.


Bailey Mason Rd
2654 ft
1999
© 2016 Google
Imagery Date: 9/25/2015 44°45'20.06" N 72°25'08.49" W elev 2478 ft eye alt 12403 ft
Google earth

3. The photographs also reveal that the level spreaders and the wet ponds are causing erosion of the hillside and, in particular, the "vegetated buffers" that were claimed by KCW to reduce the flow of stormwater and prevent erosion. In fact, downstream of the level spreaders, the opposite is occurring.

The concentration of water in the vegetated buffers and other mountainside areas is exactly what Princeton Hydro stated would happen, not sheet flow down to the receiving wetlands and streams.

A) The concentrated flow means the stormwater model that KCW used to show that they met the stormwater peak flow attenuation requirements of the VSMM is fatally flawed and is not meeting the standards and is increasing stormwater runoff from the KCW site. The Water Quality Certification monitoring thousands of feet downstream of the project will not detect increases in flood waters that could impact downstream properties.

B) The concentrated flow is clearly eroding the forest floor in the vegetated buffers and mountainside receiving areas. This will continue to degrade the hillside and create larger and larger rills and gullies.

INVASIVE SPECIES

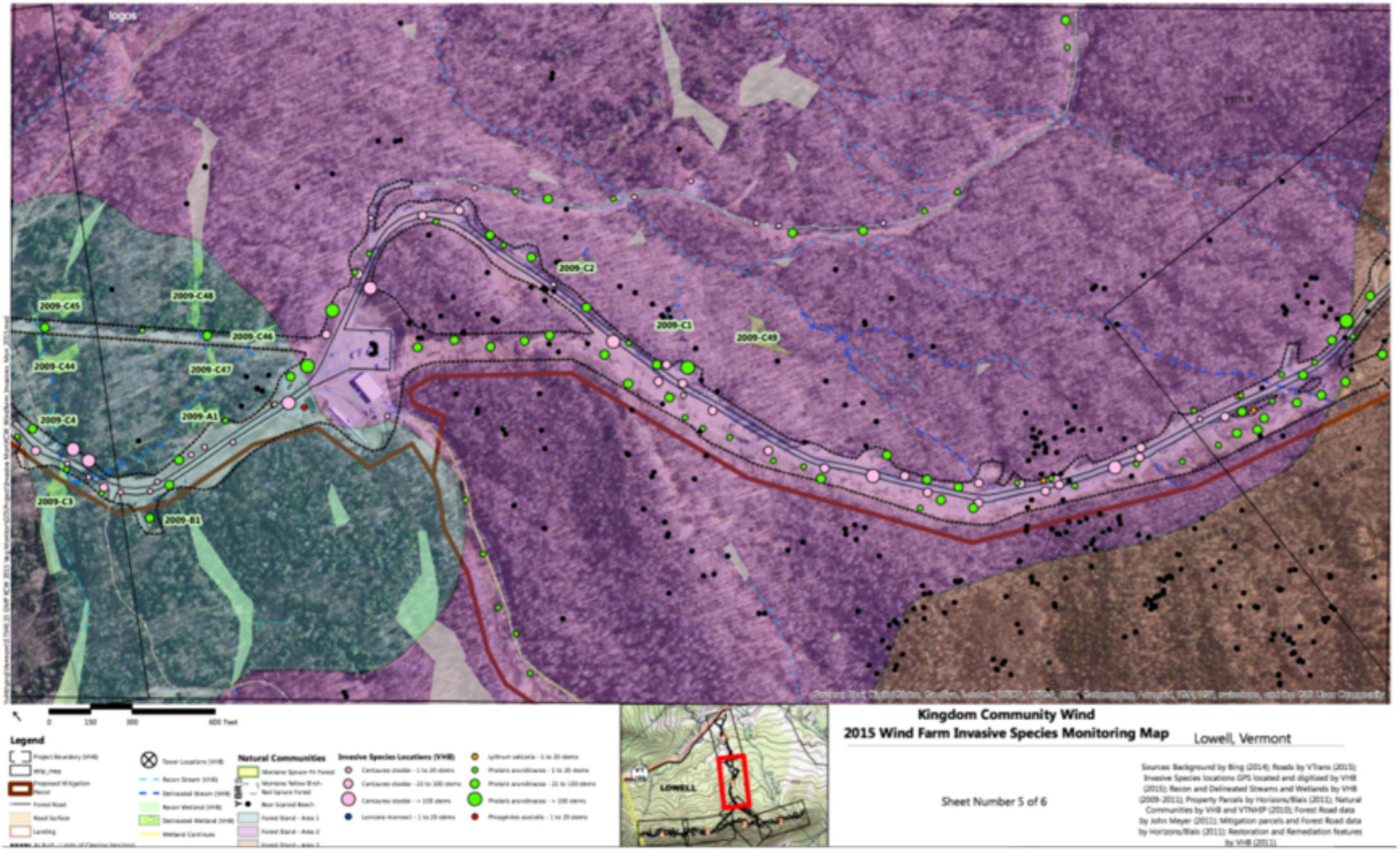
The evidence of the extensive use of herbicides on the site shows that the project is promoting the growth of invasive species of plants, which will likely be required to be eradicated in perpetuity. The project is promoting the growth of such invasives that will eventually spread deep into the prior relatively unfragmented forest.

According to the 2015 Invasive Species Report,

> "A total of 51.5 gallons of mixture was applied at the designated sites across the entire KCW invasive plant monitoring area including the restored logging roads (see 2015 Invasive Vegetation Monitoring Maps). A two way mix was used for the application: Milestone VM Plus and Rodeo at 4 percent."

Milestone VM Plus contains chemicals that are moderately toxic to aquatic organisms and have very high potential for mobility in soils.

This image from the [2015 invasive species report] shows the area of the intersection of the access road with the ridgeline road, along with the chart from the same report that shows that the invasive species are increasing and spreading every year. These invasives will eventually make their way to the interior forest.



RESULTS

Based on Year 3 monitoring, three Class B noxious weeds, purple loosestrife (*Lythrum salicaria*), Morrow's honeysuckle (*Lonicera morrowii*) and common reed (*Phragmites australis)* were observed and documented. Two species listed on the Watch List, reed canary grass (*Phalaris arundinacea)*, and spotted knapweed (*Centaurea stoebe),* were also observed and documented. The occurrences of these five plant species are depicted on the maps provided on pages 1 through 6 of the Attachment and in Table 1 below. No invasive plants were observed outside the area of disturbance.

Table 1. Summary of Invasive Plant Population Occurrences – KCW Wind Farm

Species	Year 1 (2013)			Year 2 (2014)			Year 3 (2015)		
	Population Size <20 Stems	Population Size 21-99 Stems	Population Size >100 Stems	Population Size <20 Stems	Population Size 21-99 Stems	Population Size >100 Stems	Population Size <20 Stems	Population Size 21-99 Stems	Population Size >100 Stems
Phalaris arundinacea	30	32	8	104	99	53	160	137	25
Phragmites australis	-	-	-	4	-	-	3	-	-
Centaurea stoebe	-	-	-	26	12	9	41	63	14
Lonicera morrowii	-	-	-	-	-	-	1	-	-
Lythrum salicaria	1	-	-	14	1	-	9	-	-
Sub-Total:	**31**	**32**	**8**	**148**	**112**	**62**	**214**	**200**	**39**
Total:	**71**			**316**			**453**		


08.06.2016

Montane Yellow Birch forest is now turbine 13

ANR's Eric Sorensen testified to the PSB in the GMP Lowell Wind case:

> This project will result in the construction of 6.5 miles of 65 to 205 foot wide, mostly rock- blasted road and turbine pads in mature montane forests along a ridgeline in one of the larger blocks of unfragmented habitat in the region.
>
> At the construction site for this Project there will not merely be a change in vegetation type, but instead there will be a complete conversion from mature montane forests to industrial wind farm.
>
> This area will be permanently altered by removal of soil, bedrock blasting, and regrading. We cannot predict what will grow on this disturbed site after decommissioning, but we can be confident that it will not be the mature Montane Spruce-Fir Forest or Montane Yellow Birch-Red Spruce Forest that occurs there now.

Ecologist Sorensen's testimony is proving to be accurate. The Montane Yellow Birch Forest is experiencing group mortality which is not normal.


07.19.2016


07.31.2017 02:21


07.31.2017 03:19

Georgia Mountain Wind

Georgia Mountain Wind

Peach above 1500 feet

Habitat Blocks

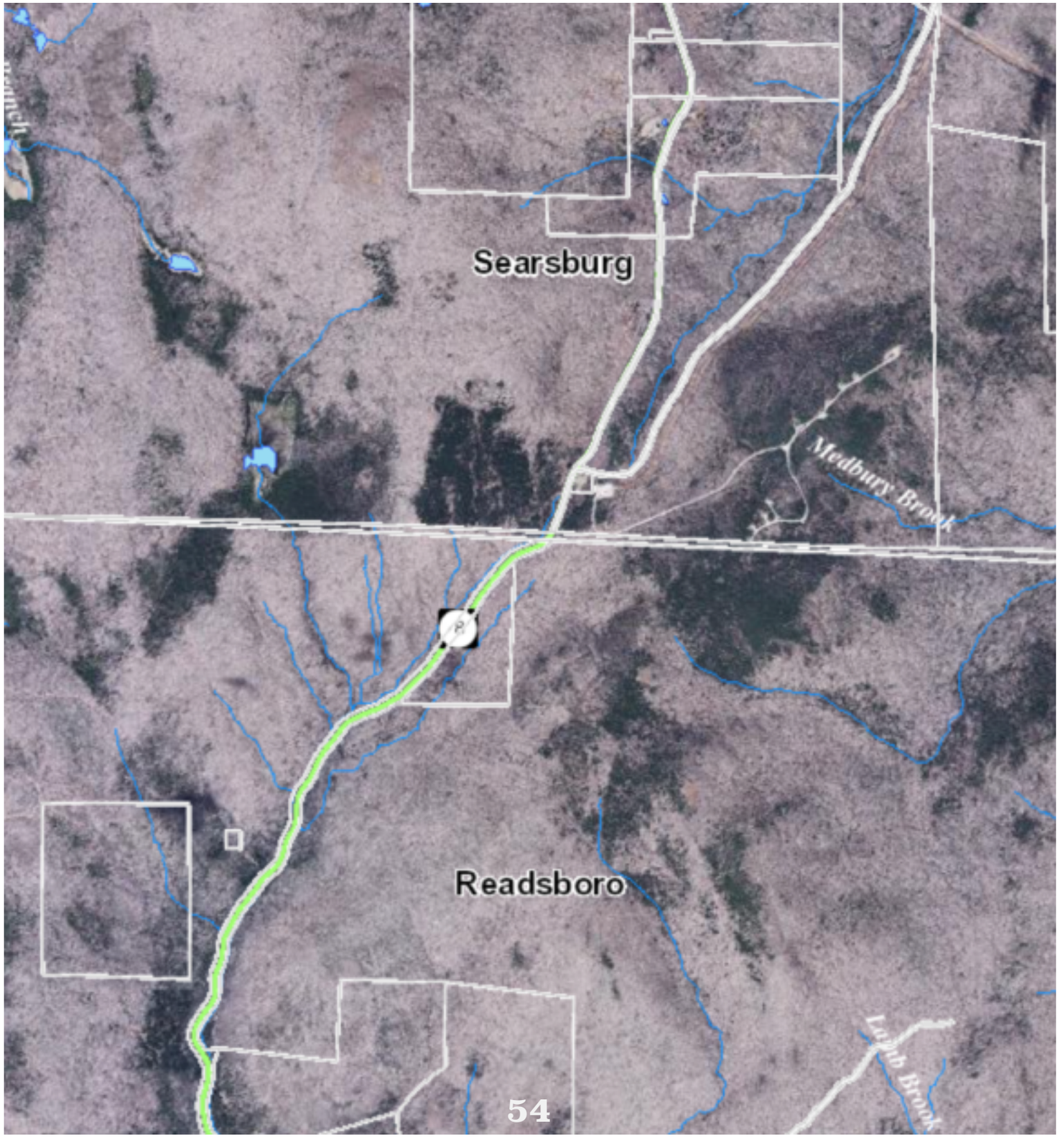
- 10 - Higher Priority
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1 - Lower Priority
- 0


Georgia
Mountain
Stormwater
Pond

Deerfield Wind

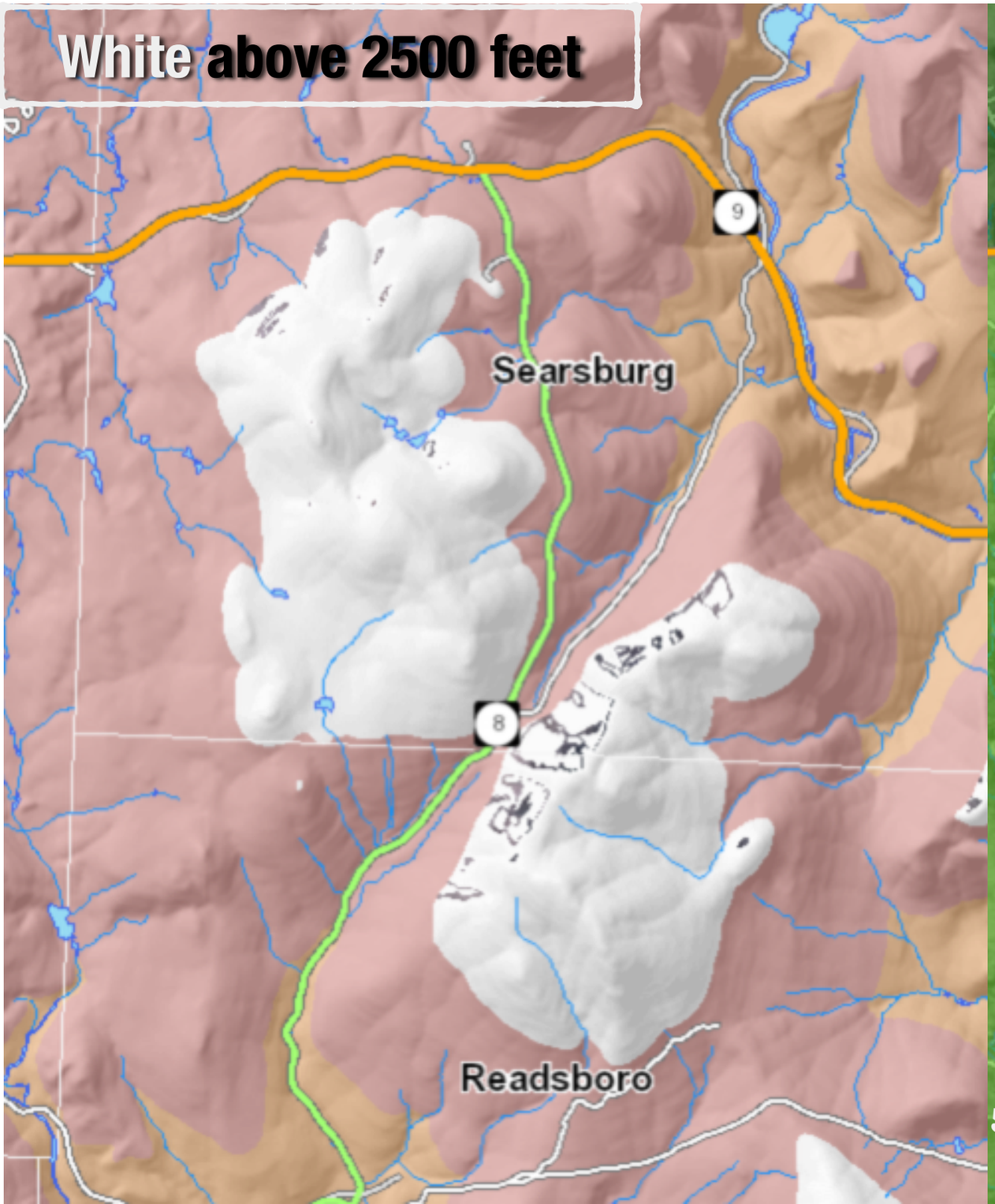
on USFS lands

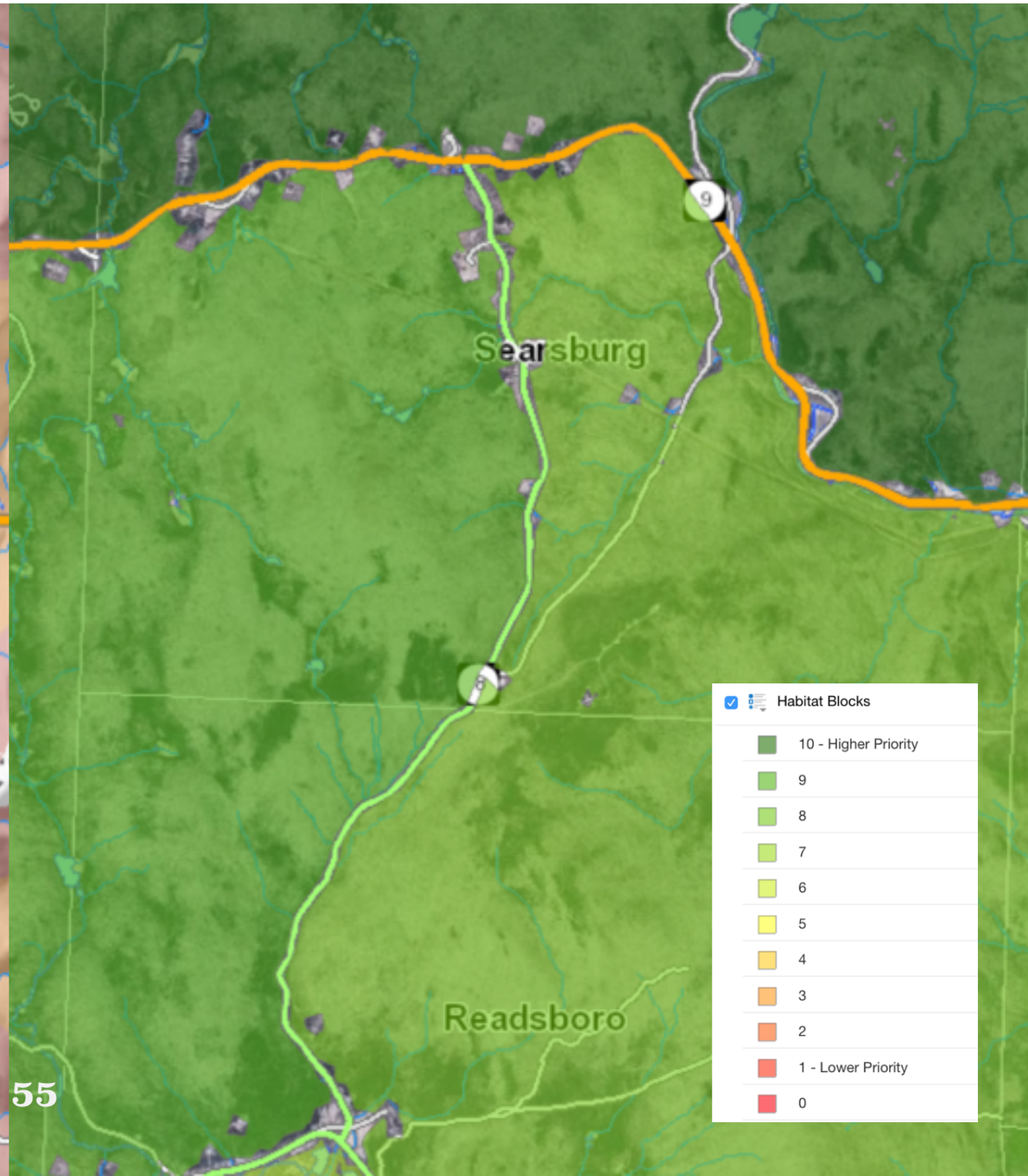
5 miles new roads



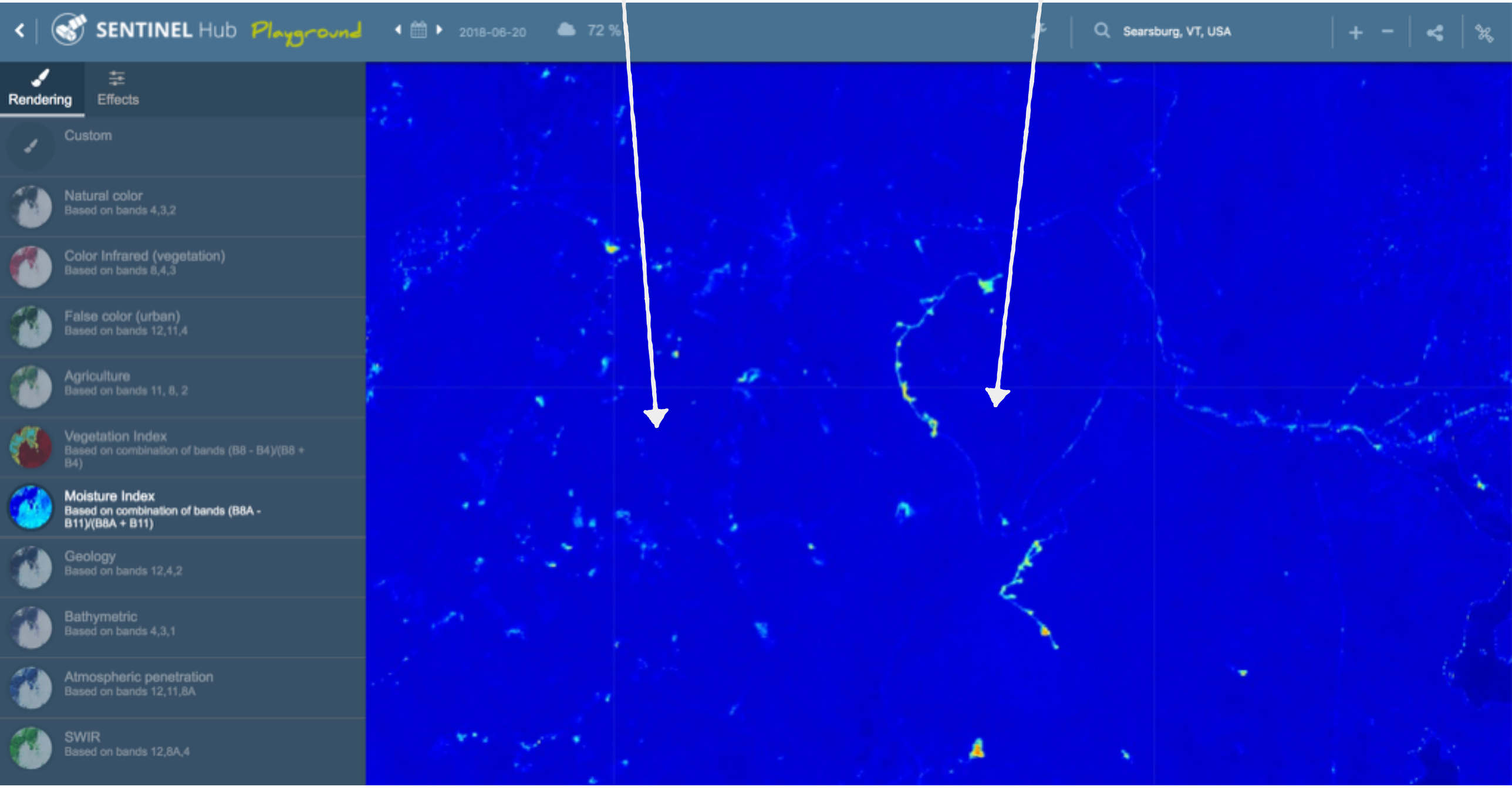
Deerfield Wind

Green Mountain National Forest





George D. Aiken Wilderness, Deerfield Wind




06.01.2012

11. Deerfield shall file a proposal, for approval by the Board, for the land it proposes to conserve as a mitigation measure for the impact of the Project on bears. The proposal shall conserve at least 144 acres of land that is comparable to the remote, high elevation area of concentrated beech stands impacted by the Project. Deerfield may not commence site preparation or construction until the Board has approved the mitigation proposal, unless otherwise authorized by the Board.

12. Deerfield shall conduct a multi-year study on the impact of the Project on bears. Deerfield shall file a proposed study protocol for approval by the Board.

13. Deerfield shall file a detailed proposal describing how it will minimize indirect impacts to bears. Such a proposal shall address, at a minimum, gating the access roads, utilizing remote cameras to deter illegal entry, patrols by law enforcement, limiting activity at the Project during certain time periods, and preserving bear crossing areas along the access roads.

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7250

Amended Petition of Deerfield Wind, LLC, for a certificate of public good authorizing it to construct and operate a 15-turbine, 30 MW wind generation facility, and associated transmission and interconnection facilities, on approximately 80 acres in the Green Mountain National Forest, located in Searsburg and Readsboro, Vermont, with 7 turbines to be placed on the east side of Route 8 on the same ridgeline as the existing GMP Searsburg wind facility (Eastern Project Area), and 8 turbines along the ridgeline to the west of Route 8 in the northwesterly orientation (Western Project Area)	))))))))))

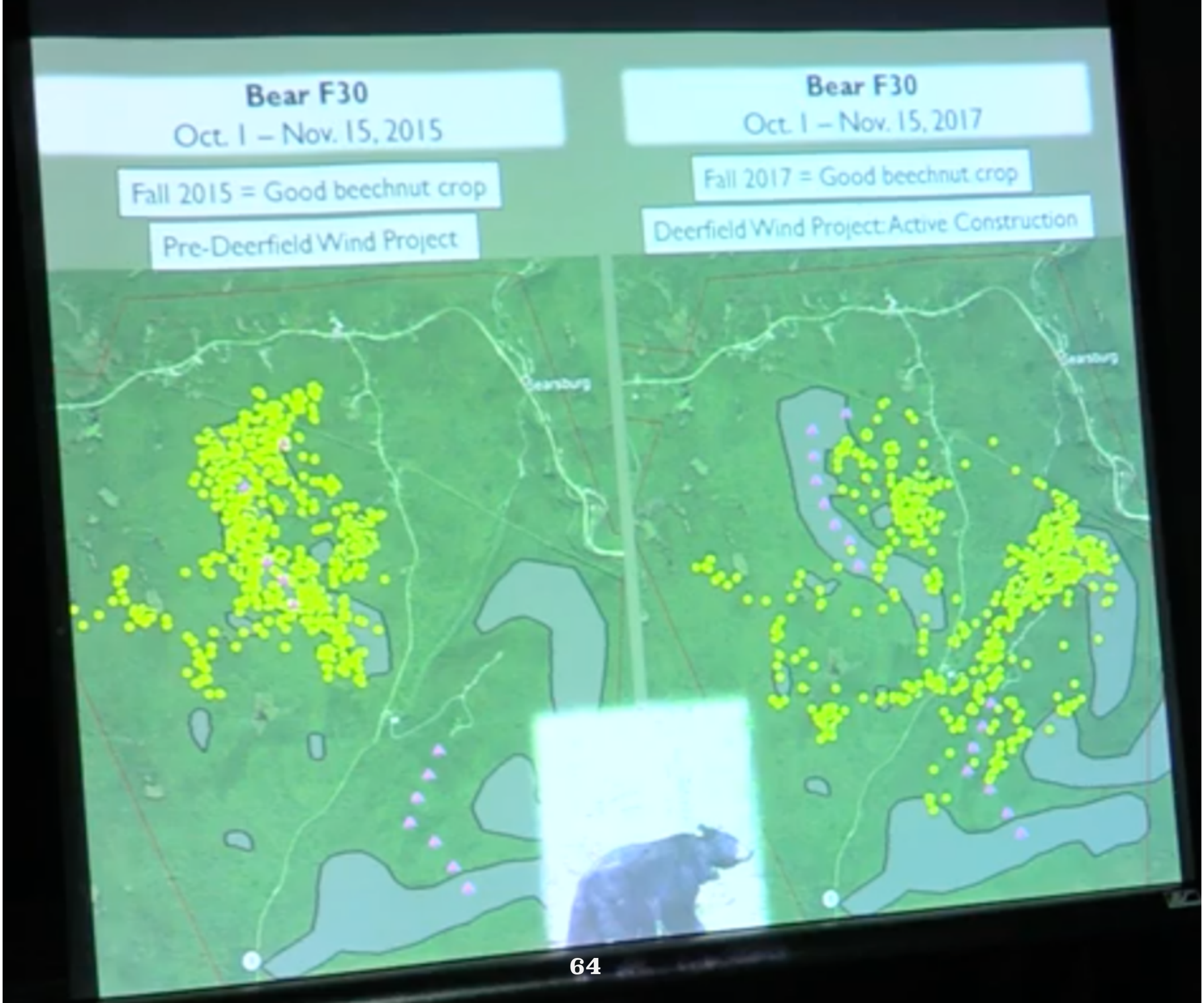
Order entered: 8/4/2016

Docket No. 7250 Pages 5 and 6

The Mitigation Stipulation provides funding that will be dedicated by ANR for conservation and/or land purchases to comply with Condition 11 **regardless of the length of time that it takes to accomplish that objective.** This will include the **funds that would otherwise have been spent acquiring the Stratton Conservation Easement if ANR is unable to incorporate acceptable bear habitat conservation measures in that agreement.** The Stipulating Parties concur that this means that suitable mitigation projects (i.e., purchase or conservation easements) may not be identified or finalized prior to construction or operation of the Project. The Stipulating Parties agree that the funds will be sufficient for full compliance with Condition 11 of the Amended CPG. In reaching this conclusion, the Stipulating Parties considered a range of cost estimates for each component of the Mitigation Stipulation. **ANR represents that it would be able to conserve the full 144 acres required by Condition 11 using the funds provided under the Mitigation Stipulation.**

Deerfield Wind Bear Study
February 11, 6:00 PM at the Woodford Town Hall
1391 VT Route 9—Woodford

Surrounding the Deerfield Wind Project are some of the largest concentrations of bear scarred beech left in Vermont. The Deerfield Wind Black Bear Study is designed to better understand impacts that large-scale wind development has on bear use of these important feeding sites. The Vermont Fish and Wildlife Department has been tracking radio collared bears in the Woodford area for a number of years now and along with learning about the impacts of the wind project we're also learning about how bears move across the landscape and interact with other types of human development. Jaclyn Comeau, the wildlife biologist with the Vermont Fish and Wildlife Department who oversees the Deerfield Wind Black Bear Study, will discuss the study and preliminary findings.


Bear F30
Oct. 1 – Nov. 15, 2015
Fall 2015 = Good beechnut crop
Pre-Deerfield Wind Project
Bear F30
Oct. 1 – Nov. 15, 2017
Fall 2017 = Good beechnut crop
Deerfield Wind Project Active Construction


2017 = Good beechnut crop
erfield Wind Project Active Construction
Dover
Woodford
Pittsfield
Washington
Windsor
Peru
Florida
Bear M20
October 11 2017 – November 11 2017
Approximately 140 km. (87 mi.)

Solar and Wetlands

ANR-Issued Class II Wetlands Permits For Solar Sites

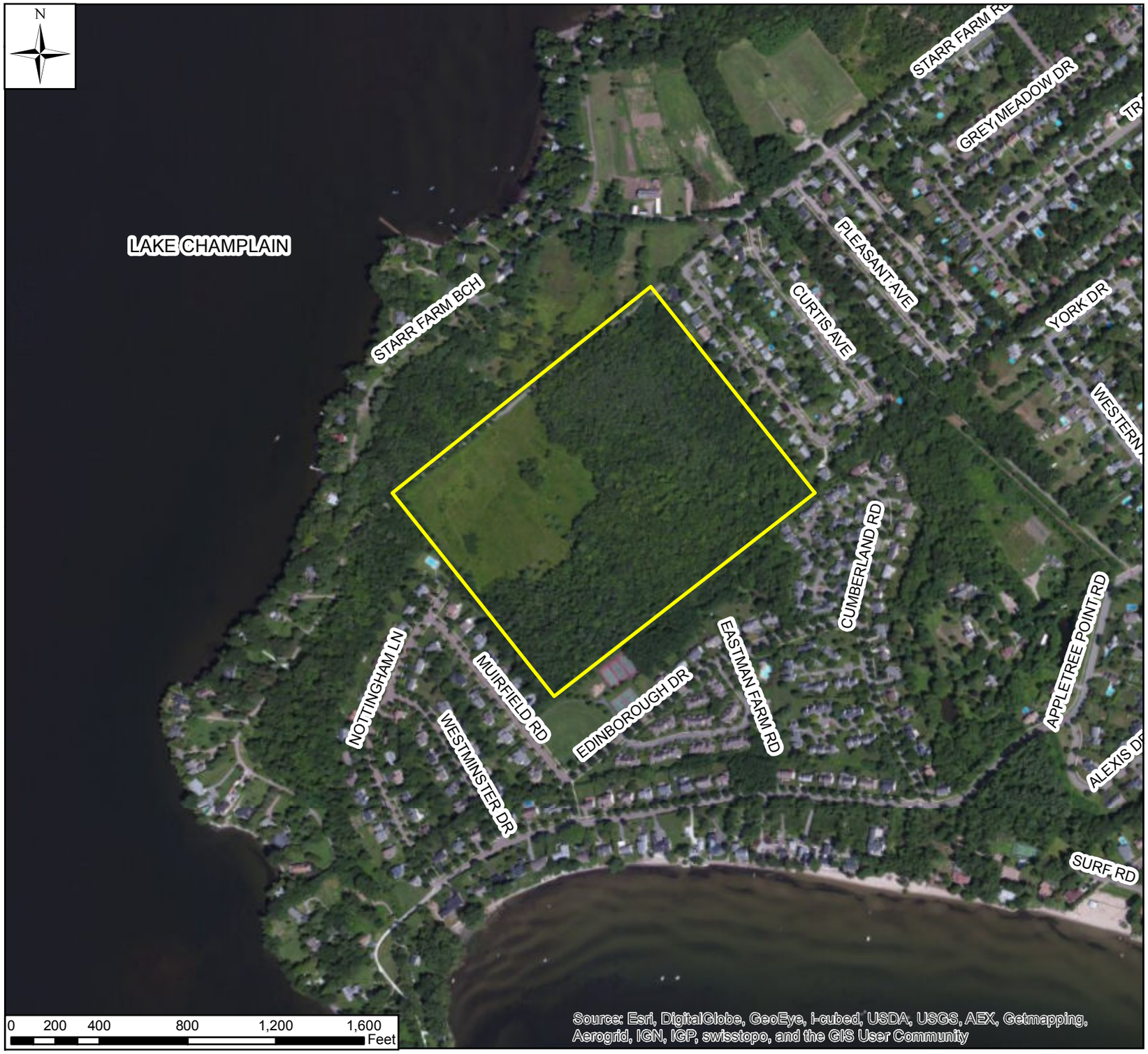
60 Class II Wetlands Permits – 2/1/10 – 1/12/18

46,580.9 sq. ft. Fill (1.06 acres)
23,932 sq. ft. Temporary Wetland Impact
109,564 sq. ft. Permanent Class II Wetland Impact
57,481 sq. ft. Temporary 50 Ft. Buffer Impact
434,403.4 sq. ft. Permanent 50 Ft. Buffer Impact

Class II Wetlands Permits
Solar Sites

	Date	Town	Name	Fill	Temp. Cl	Permanent Class II Wetl	Temp. Buff	50 Foot Buffer Zone	Project Size
2	5/8/15	Burlington	South Forty Solar	91		52136		65404	2.5 MW solar array
3	5/23/17	Waterford	Bullrock Deutsche-Eco Waterford Duck Lazar Solar			16313		13950	500 kW solar array
4	12/13/17	Cabot	BDE Cabot Lazar Solar	1911		12907		7357	500 kW ground mounted solar project
5	6/2/14	Barton	Barton Solar	1649	7819	8574	9908	29030	1.89 MW solar electric generation facili
6	2/22/13	Sheldon	EGP Solar 1			7290		18820	2.2 MW Solar Array
7	4/5/17	Ferrisburgh	Suncommon			6893		1220	after the fact construction of a solar arr
8	5/23/12	Hartford	CRL Solar	43		3464		71037	2.2 MW Solar Array
9	9/27/16	New Haven	BDE New Haven Lazar Solar	3345		1335	345	14447	a solar project with driveway access an
10	10/8/13	Rutland City	NRG Residential Solar Solutions			375			150 kW ground mounted solar installati
11	8/20/14	Middlebury	Sun Edison		500	151	2500	400	2.2 MW Solar generation facility
12	11/6/15	Underhill	Edward Beebe			52		350	bury utility line
13	9/9/10	South Burlington	Chittenden County Solar Partners			40		4715	382 solar panels
14	12/15/14	Williamstown	Williamstown Old Town Road Solar			19		30	500 kW solar facility
15	1/22/15	St. George	Philip Beliveau			10		84	buried electrical cable
16	1/17/17	Hinesburg	Encore Renewable Energy			4		713	1.3 MW solar facility
17	9/8/16	New Haven	SSE New Haven Solar II		39	1	2817	50	350 kW solar array and after the fact 15
18	2/1/10	Warren	Yestermorrow School					1150	six PV trackers and power pole
19	3/8/12	Cambridge	Smugglers Notch Resort	535	1117		920	140	Solar Array
20	11/21/12	Williston	Town of Williston		588		1200		26 solar trackers
21	12/7/12	Coventry	New England Waste Services of Vermo	39.4			2100	208.4	2.2 MW solar array
22	4/10/13	South Burlington	Claire Solar Partners				6740	80	20 solar trackers
23	7/23/13	Putney	Soveren Solar		1090			58	a solar farm
24	12/9/13	Rutland	Green Mountain Power/RRMC					550	150 kW PV system
25	3/21/14	Clarendon	Clarendon Solar Farm	14880				2640	2.0 MW solar array
26	4/9/14	Waterbury	Village of Waterbury Solar I		105		175		500 kW solar array
27	6/2/14	Rutland Town	Rutland Renewable Energy					1983	access road for solar energy project
28	6/30/14	Rutland	NextSun Energy	2310			7032		1.83 MW solar generation facility
29	6/30/14	Rutland	NextSun Energy Rutland	605	100		256	2944	1.75 MW solar generation facility
30	9/24/14	Rutland	Charter Hill Solar	252				4915	1 MW photovoltaic facility
31	12/12/14	Berlin	Vincent Illuzzi	35.5	3504				solar project
32	2/13/15	Proctor	Proctor GLC Solar					16491	500 kW solar facility
33	4/9/15	Craftsbury	AllEarth Services	1	18		378	8	eleven solar trackers and underground
34	7/1/15	Benson	Aaron Kelly					350	150 kW solar array system

South Forty Solar, Burlington on Forested Class II Wetland



TRUDELL CONSULTING ENGINEERS
802.879.6331 www.tcevt.com

Project Location

Legend

Project Parcel

Notes

Sources: Bing aerial photography (2012);
VT E911 Roads (2011);
Project Parcel by TCE (2013).

Disclaimer: The accuracy of information presented is determined by its sources.TCE is not responsible for any errors or omissions that may exist. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not a replacement for surveyed information or engineering studies.

South Forty Solar Farm
Sunset Cliff Road
Burlingtron, VT

Location Map

Project: 2013113
Prepared By: LMJ
02/21/14
1 Inch = 500 Feet

Barton Solar
on Class II Wetland

Vermonters for a Clean Environment

789 Baker Brook Road Danby, Vermont 05739
vce@vce.org 802-446-2094

April 30, 2014

Shannon Morrison
VT DEC Watershed Management Division
One National Life Dr., Main Bldg., 2nd Fl.
Montpelier, Vermont 05620-3522

RE: Comments on Wetlands Application from Barton Solar LLC (PSB Docket 8148)

Dear Ms. Morrison,

Vermonters for a Clean Environment offers the following comments on the application by Barton Solar LLC to construct a 1.89 MW solar facility in Barton, Vermont.

Our review of the relevant state rules and regulations, and the details of the Barton Solar proposal, indicates that this project should not be given a wetlands permit for construction and operation of the project. The project poses impacts to a Class II wetland's functions and values that are unduly adverse, and the application contains significant deficiencies. Therefore the state wetlands rule directs your office to decline to issue a wetlands permit for this project.

VCE Comments to ANR on draft Wetlands Permit

Storm and Flood Water Storage, Water Quality Protection
The project location currently serves as a receiving area for stormwater runoff from I-91. The application fails to address the inevitable soil compaction that will result from the installation of the solar array.

Mounting poles will require a skid steer with a hydraulic driver/hammer to install the 560 posts. Delivery of the posts will also introduce compaction via delivery trucks or track vehicles. It is not enough to use low ground pressure equipment to reduce impacts, as the repetitive loading and turning of the delivery vehicles will create soil compaction. Wet soils have also been found to have a significantly higher rate of compaction than drier soils. The fact that this project is predominantly being constructed on top of existing Class II wetlands is evidence enough that soil compaction will result. As a result of soil compaction, overall soil health will decrease, and as a result vegetation density will be reduced.

The resulting effects of compaction for the overall site will reduce groundwater recharge and reintroduction of stormwater runoff to the groundwater regime. Additionally, the shading impacts of the solar array will have detrimental effects on the plant communities within the solar farm, and thus increase stormwater runoff.

The permanent impact calculation should encompass the entire array area's limits, and not just the area of each pole. Compaction created by equipment traffic during construction by the time the project is complete will essentially be permanent. Similarly, the impacts of the trenching for the conduit corridor should not be considered a "temporary impact". Between the inevitable compaction and the fact that the developer will have to dig up the trench and backfill it will permanently change the hydrology of the trench width.

The compaction of the project site during and after construction will adversely affect water quality protection by compaction of existing soils resulting in lower groundwater recharge, lower densities of vegetation, and, subsequently a lower ability to treat stormwater runoff and protect water quality.

References:

Cook, L.M., McCuen, R.H. (2011). "The hydrologic response of solar farms", *Journal of Hydrologic Engineering* (posted ahead of print). 1-23, doi: 10.1061/(ASCE)HE.1943-5584.0000530.

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Gregory, J.H., Dukes, M.D., Jones, P.H., Miller, G.L. (2006), "Effect of urban soil compaction on infiltration rate", *Journal of Soil and Water Conservation*, Soil and Water Conservation Society, 61(3), pgs 117-124

Hakansson, I., and Medvedev, V.W. (1995), "Protection of soils from mechanical overloading by establishing limits for stresses caused by heavy vehicles", *Soil and Tillage Research*, 35(1-2), 85-97, http://dx.doi.org.ezproxy.library.wisc.edu/10.1016/0167-1987(95)00476-9

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Lowery, B, and Schuler, R.T. (1994), "Duration and effects of compaction on soil and plant growth in Wisconsin", *Journal of Soil and Tillage Research*, 29(2-3), 205-210.

Ocean County Soil Conservation District (2001), "Impact of soil disturbance during construction on bulk density and infiltration in Ocean County, New Jersey", *Ocean County Soil Conservation District*, Retrieved from Ocean County Soil Conservation District website: http://www.ocscd.org/soil.pdf

Randrup, T.B., Dralle, K. (1997), "Influence of planning and design on soil compaction in construction sites", *Landscape and Urban Planning*, 38, 87-92, doi 10.1016/S0169-2046(97)00024-8.

Silt along route 16. Note culvert located on Northern property drive.

This is the silt coming from ditch that runs east to west and

Sediment build up in ditch that runs along Route 16.

Neighboring Farmer Dug a Ditch to the Stream to Drain the Sediment Coming off Barton Solar Site

NDE 4,17,15

Notice of a Finding of No Significant Impact (FONSI)

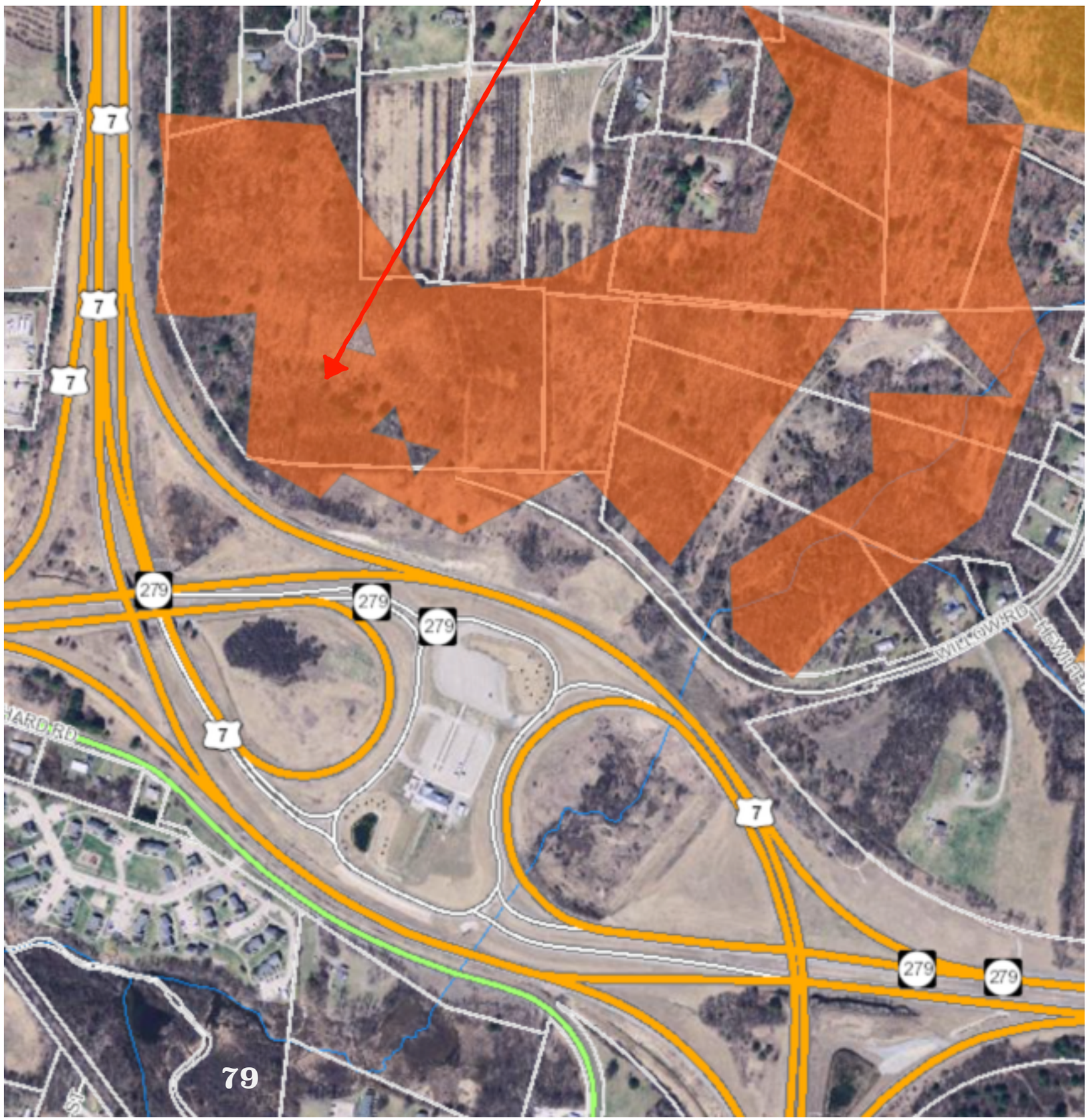
USDA Rural Development's Rural Energy for America Program (Rural Business Service) has received an application for financial assistance from Barton Solar LLC to purchase and install a 1.89MW solar array system that will be located on Glover Road in Barton, VT. The construction of the system will impact 18,042 square feet of wetlands and 38,938 square feet of wetland buffer zone. The proposed construction has been designed and sited to minimize impact.

As required by the National Environmental Policy Act, the Rural Utilities Service has assessed the potential environmental effects of the proposed project and has determined that the proposal will not have a significant effect on the human environment and for which an Environment Impact Statement will not be prepared. The basis of this determination is an appeal determination from the National Appeals Division (NAD) regarding practicable alternatives.

Copies of the Environmental Assessment are available for review at USDA Rural Development, Vermont State Office located at: 87 State Street, Suite 324, 3rd Floor, Montpelier, Vt. 05602. For further information please contact Jonathan Harries at (802) 828-6035. Any person interested in commenting on this FONSI may submit comments to the address above by April 30, 2015. A general location map of the proposal is shown below.

Solar
Forests and Wildlife

Solar Projects In Permitting Process on Forested Parcel



Solar Project Already Constructed on Prime Ag Soils

Solar Project Under Construction on Forested Parcel

Trees Have Aesthetic Value and Improve Property Values

Trees Improve Our Air Quality

Trees Increase Water Retention and Quality

Trees Reduce Energy Costs

Trees Provide Habitat for Wildlife

Back to Home Page

Trees Improve Our Air Quality

Urban forests help to improve our air quality. Heat from the earth is trapped in the atmosphere due to high levels of carbon dioxide (CO2) and other heat-trapping gases that prohibit it from releasing the heat into space. This creates a phenomenon known today as the "greenhouse effect." Therefore, trees help by removing (sequestering) CO2 from the atmosphere during photosynthesis to form carbohydrates that are used in plant structure/function and return oxygen back into the atmosphere as a byproduct. Roughly half of the greenhouse effect is caused by CO2. Therefore, trees act as carbon sinks, alleviating the greenhouse effect.

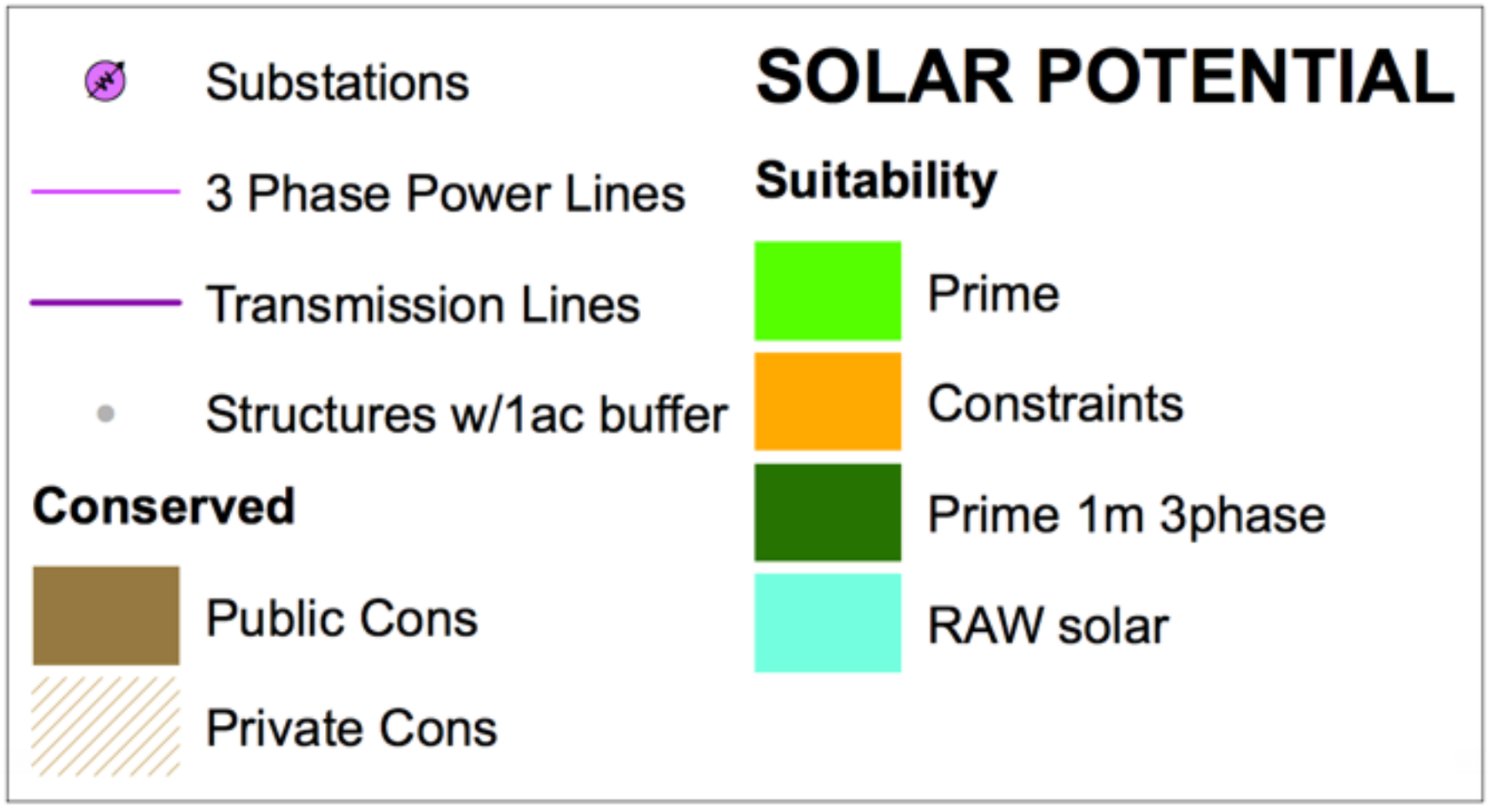
On average, one acre of new forest can sequester about 2.5 tons of carbon annually. Young trees absorb CO2 at a rate of 13 pounds per tree each year. Trees reach their most productive stage of carbon storage at about 10 years at which point they are estimated to absorb 48 pounds of CO2 per year. At that rate, they release enough oxygen back into the atmosphere to support two human beings. Planting 100 million trees could reduce an estimated 18 million tons of carbon per year and consequently save American consumers $4 billion each year on utility bills.

Trees also reduce the greenhouse effect by shading houses and office buildings. This reduces the need for air conditioning by up to 30 percent which in turn reduces the amount of fossil fuels burned to produce electricity. The combination of CO2 removal from the atmosphere, carbon storage in wood and the cooling effect makes trees extremely efficient tools in fighting the greenhouse effect. Planting trees remains one of the most cost-effective means of drawing excess CO2 from the atmosphere. If every American family planted one tree, the amount of CO2 in the atmosphere would be reduced by one billion pounds annually. This equates to almost 5 percent of the amount that human activity pumps into the atmosphere each year.

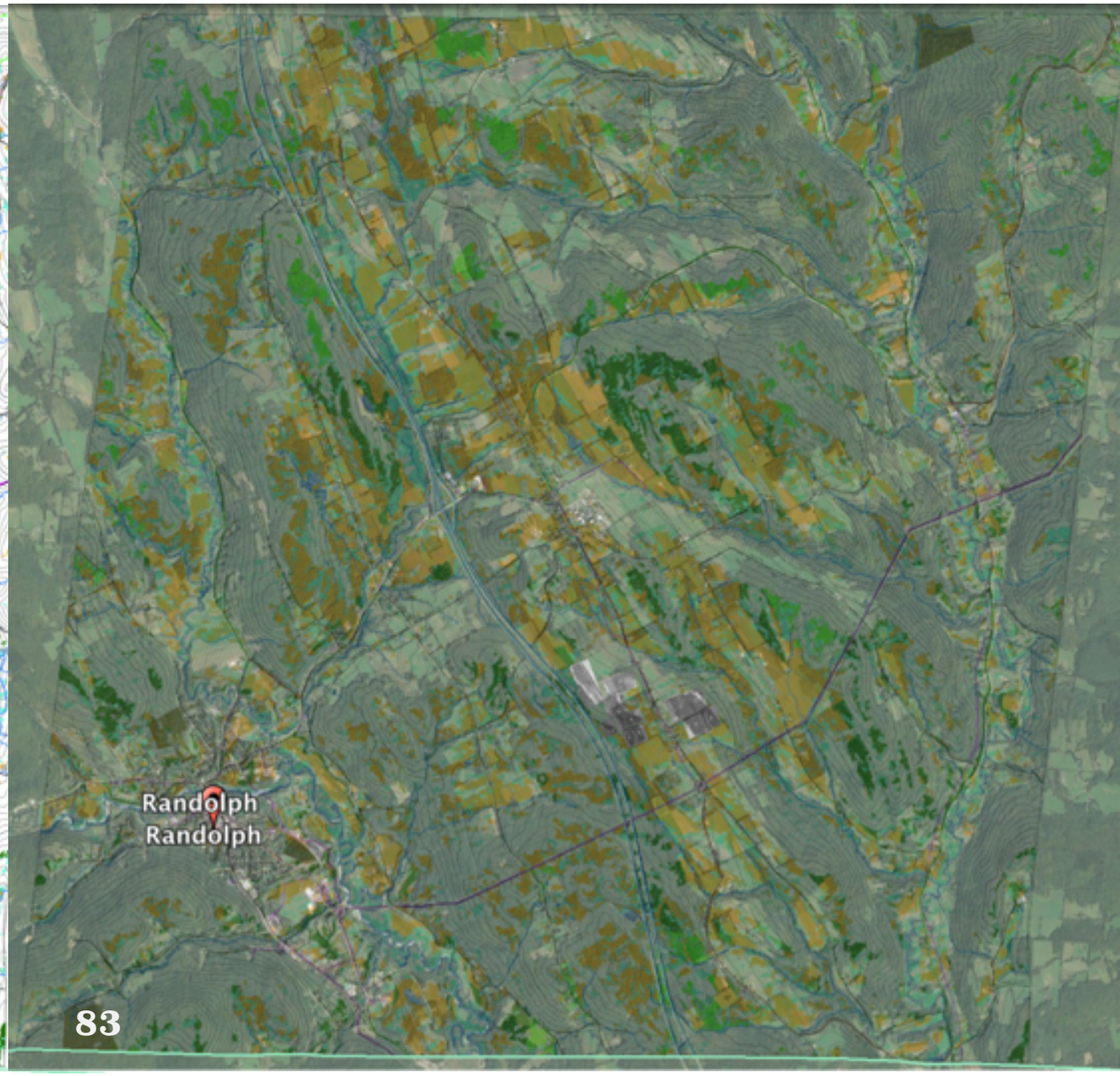
Enhanced Energy Planning for Solar

b. Areas that are considered prime solar potential on the Solar Energy Potential map of this Town Plan is considered preferred.

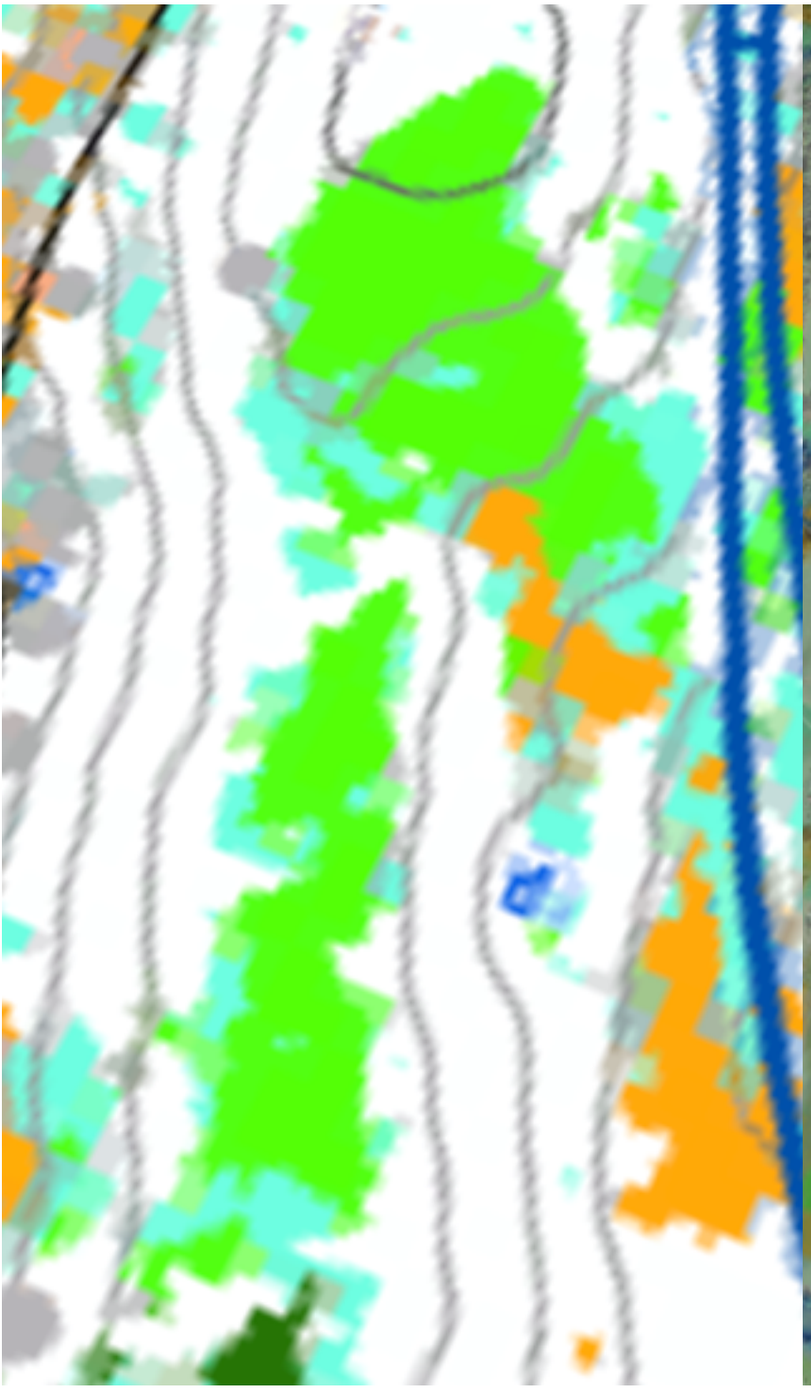
c. Areas that are mapped with constraints on the Solar Energy Potential map of this Town Plan will be conditionally approved by joint letter of the Planning Commission and Selectboard.

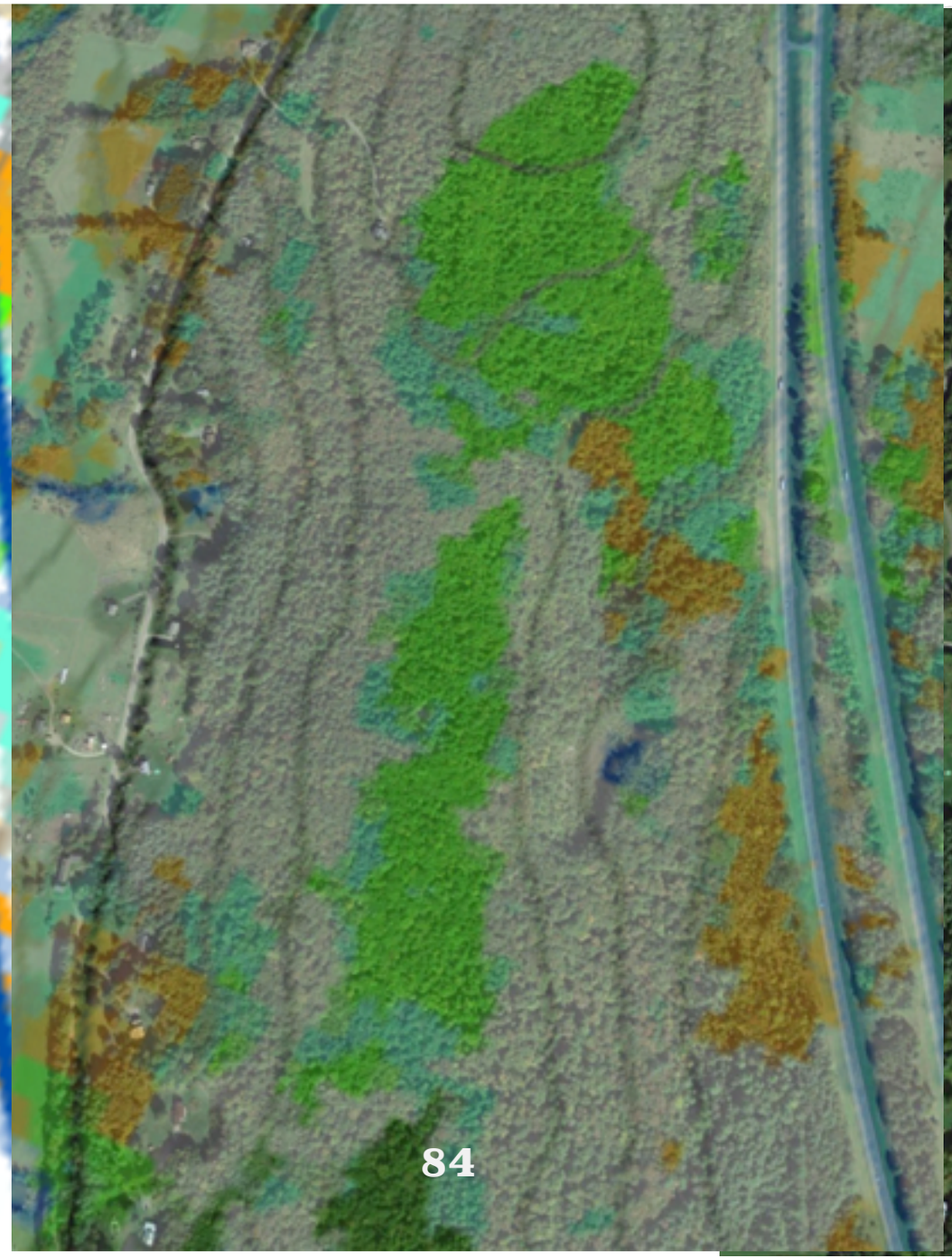


“Prime” Solar in Light Green

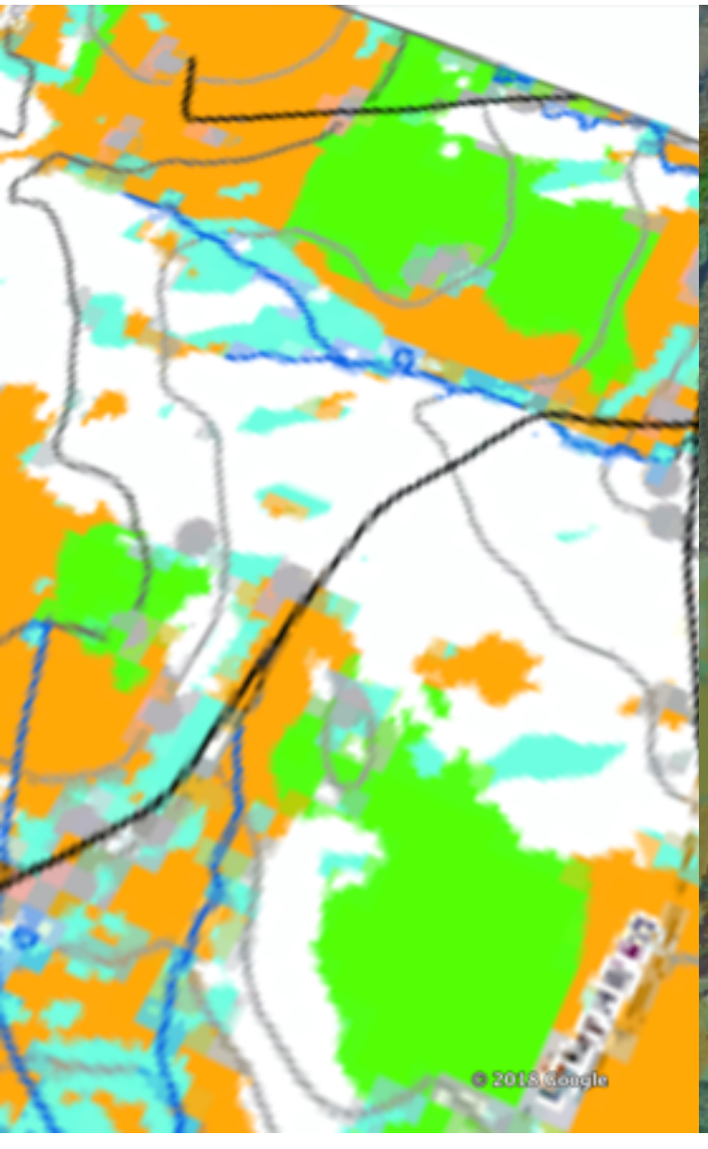


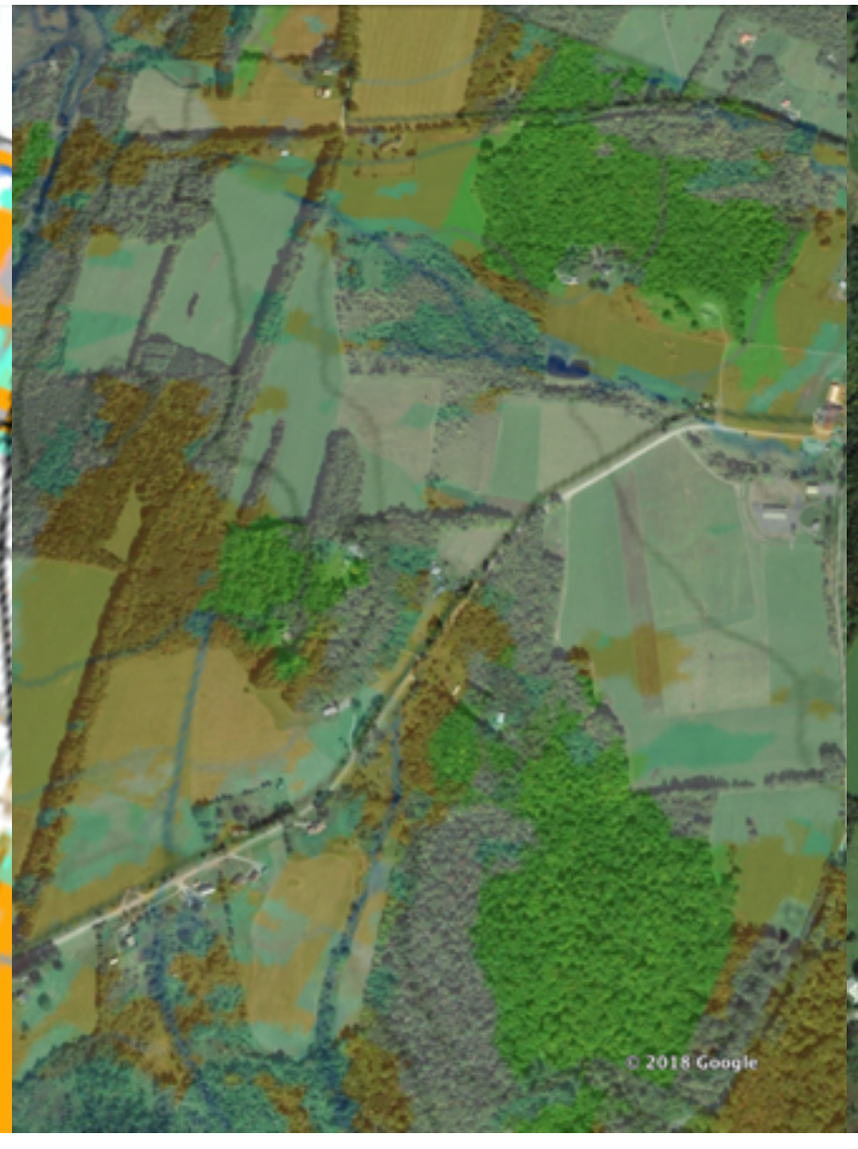
“Prime” Solar Sites Forested



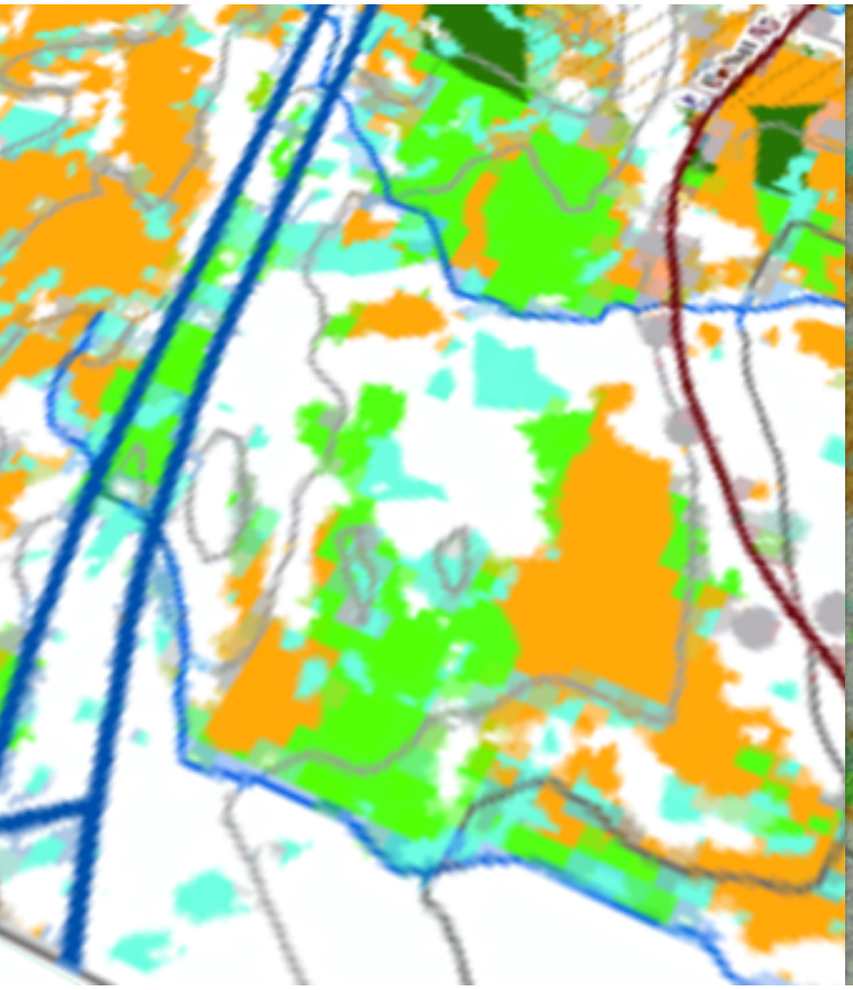


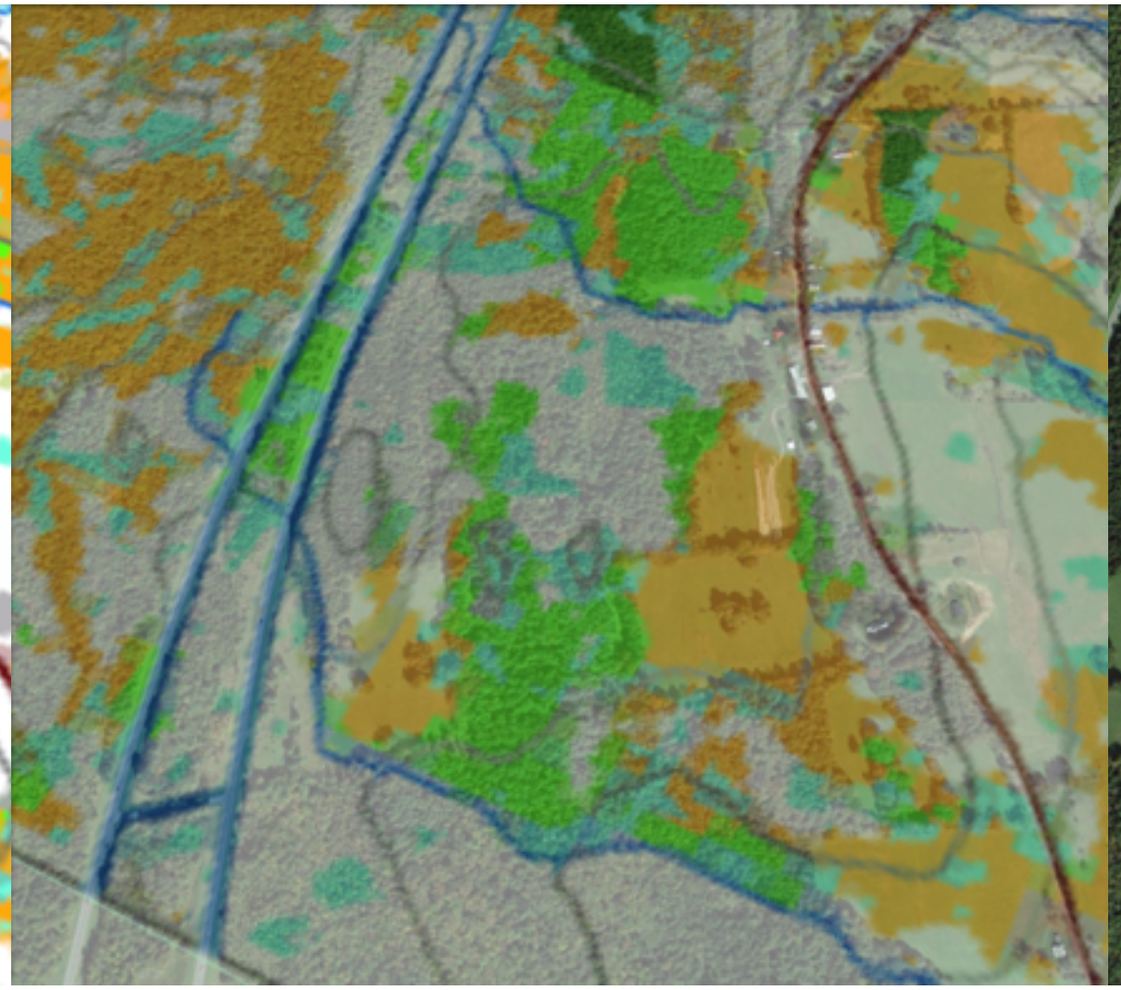
“Prime” Solar Sites Forested





“Prime” Solar Sites Forested





Questions?