



Buck Mountain Land Use

MASTER PLAN

August 2020

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PREPARED FOR



Rivanna Water and Sewer Authority
695 Moores Creek Lane
Charlottesville, VA 22902

PREPARED BY



Land Planning Design Associates
1006 E. Jefferson St. Suite B
Charlottesville, VA 22902
434.296.2108



VHB
351 McLaws Circle, Suite 3
Williamsburg, VA 23185
757.220.0500



PROS Consulting
10664 S. Indian Wells
Goodyear, AZ 85338
887.242.7760

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Executive Summary

The Rivanna Water Sewer Authority owns a 1,314 acre tract of land in northwestern Albemarle County, referred to in this report as the Buck Mountain property. The RWSA acquired the land in the 1970s and 1980s when it was considering developing a supplemental drinking water reservoir. That plan was abandoned due to regulatory restrictions and the property now serves as an environmental mitigation site associated with the RWSA's expansion of the Ragged Mountain Reservoir, as well as serving as watershed protection for the South Rivanna Reservoir. Sections of the land are leased back to the former property owners, who use it for a mix of pasture, hay fields, and passive forest recreation.

The RWSA is seeking to optimize all parts of its operation, and that includes evaluating the use and management of the Buck Mountain property so that it better serves the goals and priorities of the Authority and its ratepayers. This report analyzes the existing conditions of the site and feasibility of potential uses of the site, gathering relevant information into one document that RWSA can reference when deciding the path forward for the Buck Mountain property.

Site Use Opportunities

The size and variety of the Buck Mountain property allows for the possibility of many site uses, though each use would need to be sited appropriately.

The report analyzed the site constraints of the property, including site conditions (slope, land cover), infrastructure (roads, trails), regulatory restrictions (stream buffer, water protection ordinance), and environmental constraints (conservation easement, riparian buffer improvements). Mapping reveals that there are greater restrictions to active use and development along the bottom lands and stream corridors. More active or impactful uses can be located on the ridges. The lack of road access to most of the site means that the ridge parcels along Buck Mountain Road and Catterton Road are the most easily developed parcels, and could offer passage through to other developable parcels.

BUCK MOUNTAIN SITE CONDITIONS

SIZE:

1,314 acres

36 parcels

ZONING:

1,159 acres (88%)

RURAL AREA

115 acres (12%)

PLANNED UNIT
DEVELOPMENT

610 ac. (46%)

OF THE SITE HAS
CONSERVATION DEED
RESTRICTIONS

1.1 miles of ROAD
FRONTAGE

NO WATER/SEWER
CONNECTIONS

\$10,000,000*

LAND SALE VALUE

**The fair market value of each parcel may be higher or lower, dependent on access and other site features*

The report ranks the feasibility of a variety of uses based on RWSA objectives, regulatory compatibility, site compatibility, and operational compatibility. The highest scoring uses are shown to the right. The location of uses on the property is dependent upon land cover and site features. The fewest uses are possible within the deed restricted conservation areas. Uses that require road access, primarily development uses like campgrounds, wineries, or solar farms, are the most restricted by site conditions. Uses that require less active development, like divestment, land management, environmental research, and passive recreation, have the fewest site requirement restrictions.

SITE FEASIBILITY: HIGHEST SCORING USES

- hunting
- hiking
- environmental research
- fishing

Can Buck Mountain be a...

Future Reservoir?

Answer: Not likely

Existing environmental regulations and/or conditions would have to change for a reservoir to be possible.

Buck Mountain Reservoir plan was originally rejected because of finding an endangered mussel in the stream

Ragged Mountain Reservoir mitigation located on site would need to be shifted and rebuilt.

Extensive environmental review required for a reservoir.

RWSA must maintain ownership of all parcels if reservoir is ever to be built.

Can Buck Mountain be a...

Mitigation Bank?

Answer: Low return on investment

Majority of the suitable area for a stream/wetland bank was used during the Ragged Mountain Reservoir mitigation. Residual land would not be efficient to develop as a stream/wetland bank.

A nutrient bank in the upland areas of the site has low nutrient credit potential based on the current land cover and regional nutrient credit prices. Cost of investment is higher than credit revenue.

Dedicating the land as a mitigation bank limits additional uses into perpetuity.

RECREATION MARKET ANALYSIS SUMMARY

Albemarle County has higher than average market potential ratings for all outdoor activities, especially for backpacking, hiking, and mountain biking. This indicates that these uses would likely be successful if implemented at Buck Mountain.

The local restaurant market is oversaturated, indicating that a restaurant located on the Buck Mountain property would likely not be successful.

Forming partnerships with outside organizations would be the most efficient method for RWSA to develop uses on the site. The first step for finding a partner would be to issue a Request for Interest (RFI).

Master Plan Scenarios

There are three potential scenarios for the future of the Buck Mountain property. The scenarios require varying levels of investment and direct oversight by RWSA. They are presented in order of least to most continued involvement by RWSA. Due to the legal binding and responsibility RWSA has for the deeded conservation area within the Buck Mountain property, RWSA will be connected to the site in perpetuity in what ever way the land is used.

Scenario 1: Divestment

Level 1: RWSA sells entire Buck Mountain property. Any potential for a future reservoir on the property is removed.

Level 2: RWSA sells portions of the property that have the highest sale value and/or are outside of the future reservoir limits. RWSA is responsible for managing the remainder of the property.

Scenario 2: Land Management

RWSA maintains ownership and complete management of the property, potentially allowing leasing and land use agreements. There is minor revenue generation potential from leasing and access agreements. The management scenario that is closest to current conditions.

Scenario 3: Active Amenitization

Level 1: RWSA maintains ownership of the property and encourages passive recreational use of the site. There is the potential to partner with outside organizations for land management. There is potential for revenue generation.

Level 2: RWSA maintains ownership of the property and solicits active development of the property, changing land use and land cover from current condition. High potential for revenue generation.

Given the potential for change in water supply demand, environmental priorities, and the watershed protection mission, it is logical for RWSA to continue to own and manage the Buck Mountain property. Keeping the property under RWSA ownership allows RWSA to control the land use and protect the water quality contributing to the South Rivanna Reservoir. It would also be logical to attempt to capture some benefit from the property with uses and activities that align with, complement, and/or enhance the mission objects through direct management or partnerships with other organizations. Unless supplemental funding would be available to the RWSA for additional resources and staff time, it is important that the responsibility for cost and management efforts be borne by others, or that proposed uses be sustainable and essentially self-maintaining within the baseline of general land management.

Using the information collected in this report, RWSA can now select and proceed with the scenario best fits its goals, objectives, and values.

Background

The Rivanna Water Sewer Authority owns a 1,314 acre tract of land in northwestern Albemarle County, referred to in this report as the Buck Mountain property. The RWSA acquired the land in the 1970s and 1980s when it was considering developing a supplemental drinking water reservoir. That plan was abandoned due to regulatory restrictions and the property now serves as an environmental mitigation site associated with the RWSA's expansion of the Ragged Mountain Reservoir, as well as serving as watershed protection for the South Rivanna Reservoir. Sections of the land are leased back to the former property owners, who use it for a mix of pasture, hay fields, and passive forest recreation.

The RWSA is seeking to optimize all parts of its operation, and that includes evaluating the use and management of the Buck Mountain property so that it better serves the goals and priorities of the Authority and its ratepayers. This report analyzes the existing conditions of the site and feasibility of potential uses of the site, gathering relevant information into one document that RWSA can reference when deciding the path forward for the Buck Mountain property.

Priorities for the Buck Mountain Property

RWSA's priorities for the site are directly related to the organization's goals of providing a high-quality reliable water source for public use.

Rivanna Water Sewer Authority Priorities

#1 Water Supply

continuing to provide reliable water service

#2 Water Protection

continuing to provide the community with high quality water through environmental protection and stewardship

RWSA Goals Related to Buck Mountain

efficient use of RWSA resources

reduce direct management

manage liability potential

Site Analysis

To better understand the current site conditions and regulatory conditions that affect the future use of the Buck Mountain property, the master planning process begins with an analysis of existing site conditions. LPDA examined the zoning, land use, and operation of the site and VHB conducted an environmental assessment that is included as a supplement to this report.

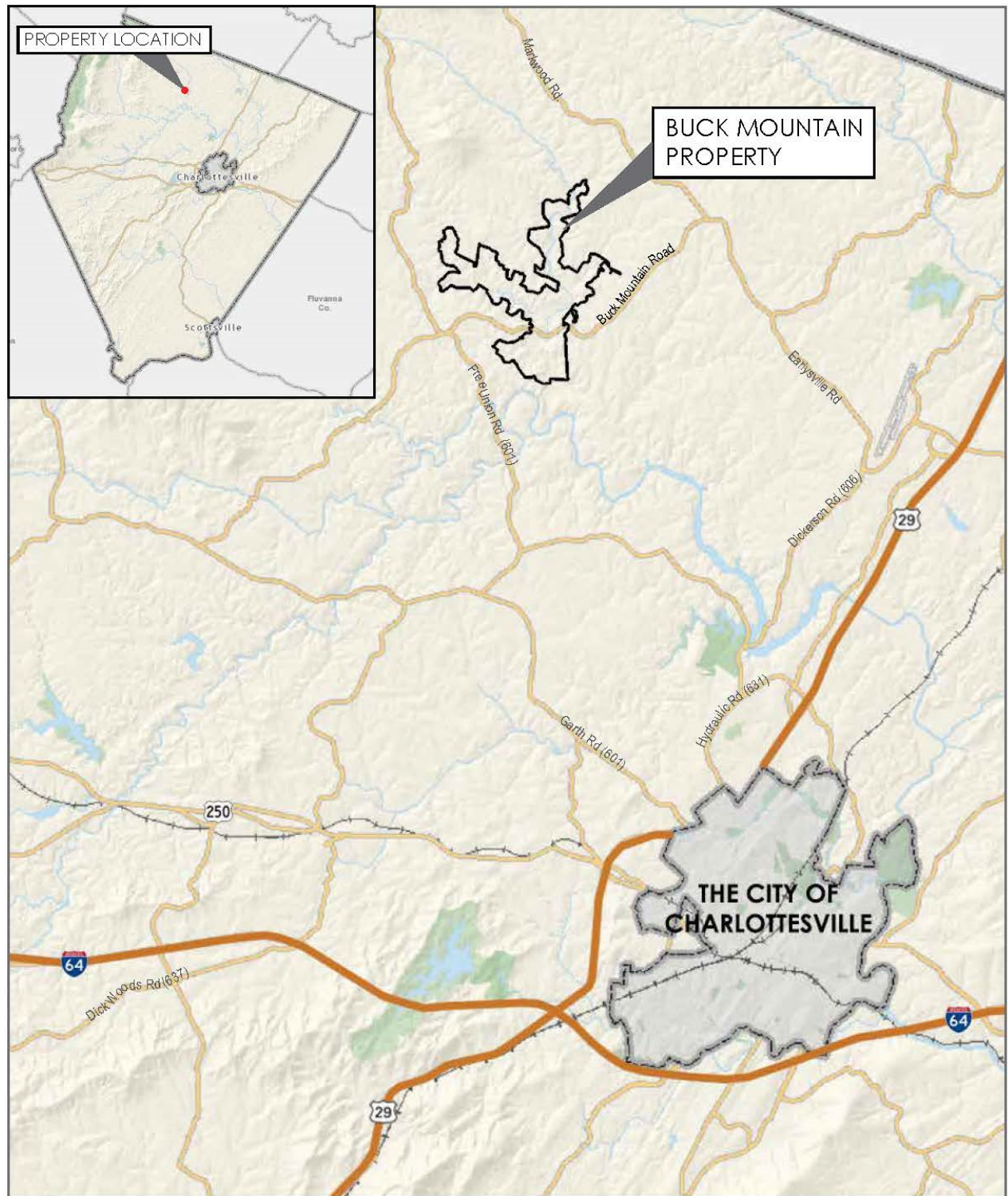


Figure 1: Buck Mountain Property locator map

Buck Mountain Land Use and Zoning

Zoning

The Buck Mountain property and vicinity is designated as a rural area in the 2015 Albemarle County Comprehensive Plan. The Buck Mountain property has two zoning types within and adjacent to it: Rural Area, 1,159 acres of the 1,314 RWSA property, and Planned Unit Development, 155 acres. Free Union, a small hamlet with an area of commercial zoning, is 1.5 miles to the west of the site.

Rural Area Zoning

A majority of the property and surrounding area is zoned Rural Area (RA). This zoning is intended to serve the following purposes:

- Preservation of agricultural and forestal lands and activities;
 - Water supply protection;
 - Limited service delivery to the rural areas; and
 - Conservation of natural, scenic, and historic resources.
- (A.C.V.A. §20-10.1)

By Right Uses

Certain Uses are permitted in zoning districts by right, without additional permits or requirements. The following uses are permitted by right in an RA district. These uses may be put in place by the property owner or by the lessee, dependent upon the lease agreement. RWSA needs to be aware that if the property was sold, then the new landowners could also use the land in the following ways, which may not be in accord with RWSA's overall purpose and goals. RWSA did condemn two properties when initially acquiring the land for a reservoir, but based on investigations by RWSA's attorney, that condemnation process did not place restrictions on the future use, development, or sale of those parcels under RWSA ownership.

- Residential, single-family or duplex
- Agriculture, forestry, fishery
- Game preserves and wildlife sanctuaries
- Water, sewer, energy, and communications distribution facilities
- Off-site veterinary
- Farm wineries, breweries, and distilleries
- Commercial stable
- Wind turbines
- Farm stands and farmers' markets
- Religious assembly of 200 people or less
- Borrow area/pit

Uses by Special Use Permit

Certain land uses are permitted within a zoning category if applied for and granted through a special use permit. The process involves a series of hearings and review by the Albemarle County Department of Community Development and Board of Supervisors. The uses that may be granted by a Special Use permit in the RA zoning are:

- Community center, clubs, lodges

- Fire and rescue squad stations
- Athletic facilities (swim, golf, tennis)
- Private schools
- Child day care centers
- Mobile home subdivision
- Horse show grounds
- Sawmills, planing mills, and woodyards
- Commercial kennel
- Veterinary services or animal hospital
- Day camp or boarding camp
- Sanitary landfill
- Country store with potential for gasoline sales
- Commercial fruit or agricultural produce packing plant
- Flood control dams or impoundments
- Restaurants within a historic structure
- Cemetery or crematorium
- Boat livery
- Public garage
- Gift, craft, or antique shop
- Religious assembly greater than 200 people
- Hydroelectric power generation
- Convent or monastery
- Special events
- Agricultural museum
- Animal shelter
- Solar energy systems

Planned Unit Development Zoning

Two parcels totaling 154 acres within the Buck Mountain property are zoned Planned Unit Development (PUD). These Buck Mountain parcels are contiguous with an adjacent subdivision of approximately 199 acres that is also zoned PUD. PUDs are intended to serve as residential communities with supporting commercial and industrial amenities if so zoned. The PUD within and adjacent to the Buck Mountain site is identified as residential, so there would be no commercial or industrial development permitted, though it is possible to apply for rezoning. It is unlikely that the parcels owned by RWSA that are zoned PUD would ever be developed to their residential capacity, as a majority of those parcels are within a deed restricted conservation easement. This deed restriction places severe constraints on the use and development within its boundaries.

By Right Uses

The by-right uses permitted in a PUD are all related to residential development and supporting amenities, including:

- Residential, single family, duplex, or multi-family dwellings
- Parks, playgrounds, and community centers
- Water, sewer, energy, and communication distribution facilities
- Stormwater management facilities included in the approved final site plan

Special Use Permit

The following uses are permitted by special use permit in the PUD, subject to all approval processes:

- Child day care center
- Fire, ambulance, and rescue squad stations
- Assisted living facilities
- Religious assembly use
- Wireless service facilities
- Farmers' markets

Residential Development Potential

Permitted Subdivisions

Zoning permits by-right residential development of properties. Parcels in the Rural Area District (RA) have development rights to be subdivided into five parcels, sized 2-20 acres. The subdivision is to be a maximum of 31 acres, to preserve the rural character of the district. Parcels 42 acres or larger may be subdivided into parcels of 21 acres or greater without using a development right. The five development rights per parcel were granted in 1980, so if a parcel has been subdivided since then, additional tax parcel research is required to determine the exact remaining development rights in a parcel.

Planned Unit Developments, PUD zoning, are permitted a greater density of units, 35 dwelling units per acre (du/acre), with 25% of the original land preserved as open space. Each PUD development must be approved by the County, so the final density may be much lower. Plan approval is also dependent on site factors like access, traffic studies, utility connections, and civic capacity (schools, fire). The PUD adjacent to the Buck Mountain property was developed at 0.3 - 0.75 units per acre (lots sized 1.5-3.0 acres), so it is likely that if the PUD zoned parcels within the Buck Mountain property were to be developed, it would be at a similar density. To show the potential range of development capacity, the parcel was analyzed at a 75% development area at both 0.5 du/acre and 35 du/acre.

Potential Residential Unit Development Analysis

The total potential residential development for the Buck Mountain property was analyzed. If the land was sold to private landholders or a development company, this would be the maximum potential units to be developed on the property. This is an important consideration for the future of the watershed and water quality. This is the total maximum development, assuming that each parcel holds the maximum allowable five subdivision rights. In practicality, the total development would be constrained by conservation restriction requirements and prior subdivision counts. As long as the residential construction site was outside of the conservation area, the rest of the lot could extend into the restricted portion. Therefore, as long as there was sufficient land for a residential construction site outside of the conservation easement, the full development potential was assumed for the parcel. A full development potential study would be required, including parcel history research, for the accurate development quantity. Special use permits would allow development at greater densities, but given the oversight and review required for that process, this analysis considered by-right maximum development potential only. The quantity analysis in this report is intended to give an overview of potential to give RWSA an understanding of the situation to base future decisions on.

The **Zoning and Development Potential Map** shows the zoning of the parcels within and surrounding the Buck Mountain property and the development potential of the parcels within the Buck Mountain

property. Total maximum potential development within the RA zoned parcels is 151 residential units. Maximum potential development in the PUD zoned parcels is 56 – 3,976 residential units. The grand potential maximum total is 207 – 4,127 residential units.

Land Sale Potential

The total assessed tax value of all the parcels is \$9,812,300. The fair market value of each parcel may be higher or lower, dependent on access and other site features. The 2019 tax assessed value for each parcel is shown on the **Zoning and Development Potential Map**. RWSA originally purchased the parcels for a combined sum of over \$6,000,000, and has since spent over \$4 million in improvements and management. RWSA would not recoup the money spent on the property by selling. Whether RWSA or another entity owns the property, RWSA will still be responsible in perpetuity for the maintenance and health of the area under conservation agreement.

Land Uses

On-site Land Uses

The primary land uses within the site are forest, pasture, and hay fields. There is also a residential historic structure, the Elliot House, which has been unoccupied since 2017, and a barn that a lessee uses to store farm equipment. These uses are all permitted by-right by the zoning ordinance.

An important factor affecting land use within the property boundaries is stream mitigation tied to the Ragged Mountain Reservoir expansion. This mitigation includes 570 linear feet of stream channel enhancements, 75,000 linear feet of riparian habitat preservation/enhancement along stream channels, and 93 acres of forested riparian buffer enhancement. Approximately 610 acres of the site was placed under conservation restrictions, which limits but does not prescribe land use within its boundaries. These mitigation features must remain in place and functional as long as they are tied to the Ragged Mountain mitigation, independent of who owns or manages the parcels they are located on.

LPDA conducted a site visit in February 2020 and noted amenities, opportunities, and constraints on the site. Refer to the **Existing Photo Inventory Map** for the location and condition of features and amenities.

Surrounding Land Uses

The properties surrounding and adjacent to the RWSA Buck Mountain property are residential, agricultural, and forestal. The residential properties are single family units, except for a 65-lot Planned Unit Development, Hickory Ridge, which adjoins the Elk Run arm of the Buck Mountain property. The agricultural land is pasture, including cattle and horses and hay fields. Ramiisol Vineyards, a vineyard and winery adjoins the Buck Mountain property. The vineyard does not currently contain a tasting room nor is it open to the public. Spring Breeze Farm, a riding stable, also adjoins the Buck Mountain property. The surrounding properties also include forested land, though at a lesser percentage that what exists on the Buck Mountain property. An equine veterinary practices is in the vicinity, though does not adjoin the property.

The small hamlet of Free Union lies 1.5 miles to the west of the property and contains a small commercial core of businesses and shops as well as residences.

Leases

RWSA leases all or portions of 14 parcels to nine (9) different tenants, often the original owners of the parcel before RWSA acquired the land. Refer to the **Leased Parcels Map** for the locations of leased parcels. The land is leased at the following schedule, adopted circa 2011.

Figure 2: Buck Mountain Leasing Schedule

Buck Mountain Leasing Schedule		Benchmark
Pasture	\$10.00/acre	\$17.50-\$20.00/acre
Forested	\$3.00/acre	\$13.00-\$21.00/acre
Deed Restricted Area	\$0/acre	\$9.40-\$15.00/acre

LPDA evaluated benchmark leasing rates for the area and found that RWSA is leasing at well below the regional average. USDA National Agricultural Statistics Service identified the 2019 average pasture lease rate in Albemarle County as \$17.50/acre and central Virginia's regional average as \$20.00/acre. Forested land leased for hunting in the region ranges from \$13.00/acre to \$21.00/acre. Passive recreation is permitted in the deed restricted area. LPDA found that the regional average daily lease rate for passive recreation site is 72% of the daily lease rate of hunting properties. The benchmark used is 72% of the regional rate for leased hunting land. Hunting and passive recreation land leasing prices are based on an evaluation of publicly advertised leasable land (April 2020).

RWSA could potentially generate additional revenue by increasing the leasing schedule to benchmark rates, though the additional revenue would be a small percentage of RWSA's overall operational budget. There is also the chance that some lessees would not renew their lease if the rate significantly increased, which would reduce the estimated revenue potential. RWSA gains management oversight and positive neighbor relations through the leasing program, and should consider these benefits as well as the revenue when evaluating a lease schedule revision.

Figure 3: Buck Mountain Leasing Revenue Potential

Buck Mountain Annual Leasing Revenue	
Current	\$1,886.48
Potential based on Benchmark	\$6,200 - \$8,800

The lessees are permitted to use the land outside of the conservation easement for pasture, hayfields, hunting, and passive recreation, but are not permitted to make any improvements, construction, timbering, or changes to the land cover. Pasture and hayfields are not permitted within the conservation easement. The lease is intended to provide quiet enjoyment of the leased land.

The tenant is responsible for maintaining the land, including maintaining trail access, gates, and fences. The tenants' active use and observation of the property provides security to the operation of the land. Tenants inform RWSA of unauthorized access and damage to the property, which is a beneficial service to RWSA. There is the potential that this relationship of maintenance and observation could be increased to the benefit of the management of the land.

Figure 4: Buck Mountain 2019 Lease Agreements

2019 Lease Agreements

Lessee	Parcel #	Parcel Tax ID	Total Parcel Acreage	Leased Acreage	Deed Restriction Ac. (no fee)	Annual Rent
David and Virginia Ashcom	30-1A	01700-00-00-35D4	159.96	19.68	37.035	\$ 150.00
Charles Durbin Jr.	29-34A	02900-00-00-034A	25.12	25.12	14.451	\$ 66.14
Phillip and Melissa Johnson	29-33E	02900-00-00-033E0	27.724	27.724	73.523	\$ 382.87
	17-21G	01700-00-00-021G0	24.507	24.507		
	17-22D	01700-00-00-022D0	18.186	18.186		
	29-33B1	02900-00-00-33B1	66.016	66.016		
June E. Mooney, Susan McCarson	18-10G	01800-00-00-1G0	27.362	27.362	10.81	\$ 162.75
Kenneth Wayne McCauley	29-35E	02900-00-00-35E0	1.348	1.348	0	\$ 4.00
Lawrence S. Miller and Deborah L. Miller	29-49A2	02900-00-00-049A2	59.868	59.868	30.38	\$ 114.54
	29-45A1	02900-00-00-45A1	2.581	2.581		
	29-49A1	02900-00-00-49A1	1.445	1.445		
Robyn North	17-35D4	01700-00-00-35D4	117.95	117.95	37.035	\$ 651.36
Harry Wellons	18-11A	01800-00-00-011A0	83.75	83.75	42.41	\$ 336.55
Gary Wilson	18-10F3	01800-00-00-010F3	8.56	8.56	5.437	\$ 18.27

Figure 5: Buck Mountain Lease Rates, Current and Potential

Leasee	Leased Acreage			
	Total	Preservation	Forest	Pasture
Ashcom	20	0	6.7	13.3
Durbin	25.12	14.451	5.793	4.876
Johnson	136.4	73.523	35.176	27.734
Mooney	27.36	10.81	0.396	16.156
McCauley	1.348	0	1.348	0
Miller	66.89	30.38	34.51	2
North	117.9	37.035	22.108	58.803
Wellons	83.74	42.41	10.97	30.364
Wilson	8.556	5.437	1.846	1.273

Leasee	Cost of leasing by usage type (\$ rate per acre)								
	Preservation			Forest			Pasture		
	Current (\$0)	Min (\$9.40)	Max (\$15)	Current (\$3)	Min (\$13)	Max (\$21)	Current (\$10)	Min (\$17.5)	Max (\$20)
Ashcom	\$ -	\$ -	\$ -	\$ 20.10	\$ 87.10	\$ 140.70	\$ 133.00	\$ 232.75	\$ 266.00
Durbin	\$ -	\$ 135.84	\$ 216.77	\$ 17.38	\$ 75.31	\$ 121.65	\$ 48.76	\$ 85.33	\$ 97.52
Johnson	\$ -	\$ 691.12	\$ 1,102.85	\$ 105.53	\$ 457.29	\$ 738.70	\$ 277.34	\$ 485.35	\$ 554.68
Mooney	\$ -	\$ 101.61	\$ 162.15	\$ 1.19	\$ 5.15	\$ 8.32	\$ 161.56	\$ 282.73	\$ 323.12
McCauley	\$ -	\$ -	\$ -	\$ 4.04	\$ 17.52	\$ 28.31	\$ -	\$ -	\$ -
Miller	\$ -	\$ 285.57	\$ 455.70	\$ 103.53	\$ 448.63	\$ 724.71	\$ 20.00	\$ 35.00	\$ 40.00
North	\$ -	\$ 348.13	\$ 555.53	\$ 66.32	\$ 287.40	\$ 464.27	\$ 588.03	\$ 1,029.05	\$ 1,176.06
Wellons	\$ -	\$ 398.65	\$ 636.15	\$ 32.91	\$ 142.61	\$ 230.37	\$ 303.64	\$ 531.37	\$ 607.28
Wilson	\$ -	\$ 51.11	\$ 81.56	\$ 5.54	\$ 24.00	\$ 38.77	\$ 12.73	\$ 22.28	\$ 25.46

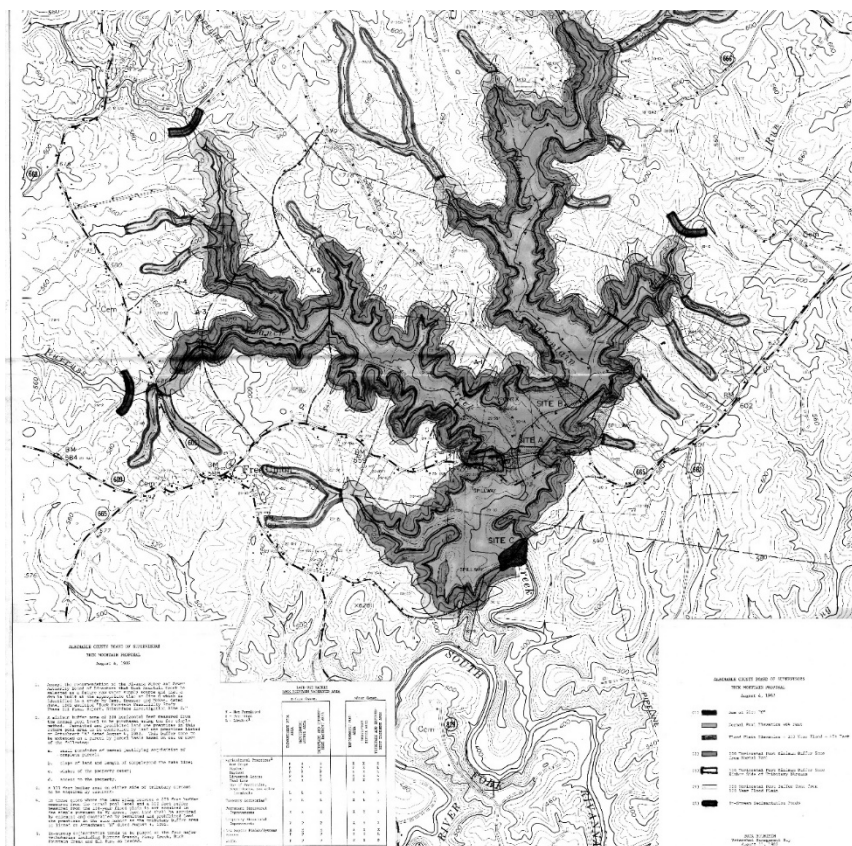
Leasee	Subtotals		
	Current	Min	Max
Ashcom	\$ 153.10	\$ 319.85	\$ 406.70
Durbin	\$ 66.14	\$ 296.48	\$ 435.94
Johnson	\$ 382.87	\$ 1,633.75	\$ 2,396.22
Mooney	\$ 162.75	\$ 389.49	\$ 493.59
McCauley	\$ 4.04	\$ 17.52	\$ 28.31
Miller	\$ 123.53	\$ 769.20	\$ 1,220.41
North	\$ 654.35	\$ 1,664.59	\$ 2,195.85
Wellons	\$ 336.55	\$ 1,072.63	\$ 1,473.80
Wilson	\$ 18.27	\$ 97.38	\$ 145.78

GRAND TOTAL	\$ 1,901.60	\$ 6,260.90	\$ 8,796.60
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Note: Current rate totals are calculated based on the lease rate schedule adopted in 2011. The actual rent payment for each lease may differ from the calculations and totals shown in this chart.

RWSA originally acquired the Buck Mountain property with the intent of constructing a drinking water supply reservoir. During plan development in the early 1980s an endangered species was discovered to be living in Buck Mountain Creek, so the plan for a reservoir was dismissed. There are significant legal and environmental impediments to ever constructing a reservoir on the property, but RWSA may wish to consider the potential for change of future conditions that would warrant the need for the construction of a drinking water reservoir on site. [Refer to the **Environmental Report, Appendix B**, for complete legal and environmental implications].

Considering the reservoir as a potential future land use impacts the potential of development or sale of the Buck Mountain property. All structures would need to be built above the pool elevation and no parcel or portion of a parcel within the pool could be sold. If RWSA wishes to hold open the future possibility of a reservoir on site, all use and development of the property in the meantime will need to be considered with this in mind.



1982 Buck Mountain Reservoir feasibility study map

Buck Mountain Infrastructure

The Buck Mountain parcel was acquired for the purpose of developing a dam and drinking water reservoir. The primary selection criteria at the time was elevation, not utilities or road access. Now that the RWSA is considering alternate uses, these other amenities rise in importance.

Roads

The site has limited road access. Much of the site consists of the back edges of private property with no road access. The property is bisected by three roads, which provide a measure of access: 0.6 miles along Buck Mountain Road (Rt. 665), 0.3 miles along Catterton Rd. (Rt. 667), and 0.2 miles along Allen Farm Lane (Rt. 666). The parcels were selected for their elevation rather than for other infrastructure or features. Considering alternate uses for the property increases the importance of other infrastructure like utilities and road access.

There is a limited network of ATV trails and old farm roads through the site, but these are discontinuous and do not provide RWSA with easy access to the entire site. RWSA currently depends on permission from a private landowner to use their driveway and a limited access agreement with a winery to pass through their property to access the western arm of the property.

Development of new roads through the conservation easement is not permitted without COE and DEQ approval. Trails are allowed to pass through the easement.

Development or active uses of the property are dependent upon convenient vehicular access, which is limited to the central core at the Buck Mountain – Catterton Road intersection and the Allen Farm Lane crossing.

Utilities

The property is not served by public water or sewer. Any development on the site would require a well and a septic field to fully service. Water access for fire emergency response is designated within the property, at the Buck Mountain Road and Allen Farm Lane crossings of Buck Mountain Creek.

Site Constraints Analysis

The Buck Mountain property is a large site with a diverse and varied set of existing conditions. The final master plan must consider the use potential of the parcels within the property, as well as the future of the overall conglomeration. Part of that use evaluation is done by overlaying a range of site conditions to see where overlaps are, which start to inform appropriate use categories.

LPDA developed a site constraints analysis map that examines existing conditions identified during the site visit, zoning and infrastructure inventory, and the environmental conditions assessment conducted by VHB. The **Constraints Analysis Map** overlays site conditions (slope, land cover), infrastructure (roads, trails), regulatory restrictions (stream buffer, water protection ordinance), and environmental constraints (conservation easement, riparian buffer improvements, future potential reservoir pool elevation).

The Constraints Analysis map reveals that there are greater restrictions to active use and development along the bottom lands and stream corridors. More active or impactful uses can be located on the ridges. The lack of road access to most of the site means that the ridge parcels along Buck Mountain Road and Catterton Road are the most easily developed parcels, and could offer passage through to other

developable parcels. The existing ATV trail network on site could be expanded, giving RWSA better access and increasing the use potential of the remainder of the site.

Land Use Compatibility Evaluation

Purpose

The compatibility evaluation matrix is intended to evaluate the feasibility and compatibility of many possible land uses considered for the Buck Mountain property. It does this in the context of RWSA objectives, physical attributes, operations, and regulatory requirements. The matrix evaluates the potential of use on the whole property, rather than a specific parcel. A follow-up mapping evaluation will show where which uses can be implemented on the property. The final scoring of each use shows which uses are more or less generally compatible and feasible to enact on site. It is possible that even low-scoring uses are still feasible, it may just be more difficult to implement it.

Uses

The potential uses that are evaluated are based on topics that have arisen during discussions with RWSA and as part of the Site Inventory and Analysis process. Related uses are clustered into categories and organized on a spectrum of least to most direct and prolonged involvement by RWSA.

One potential use that was investigated during the project was mitigation banking, both stream corridor mitigation and nutrient mitigation through upland forest establishment. These options were fully investigated by the VHB in the *Buck Mountain Environmental Report* ([Appendix B](#)). Investigation found that these uses would not be feasible on site. All impaired stream banks in the project area were improved as part of the Ragged Mountain Reservoir project, leaving no remainder for future banking credits. Upland nutrient banking would not provide many nutrient credits due to the site's current land cover – preserving forests or converting fields to forests does not result in many nutrient credits. Upland nutrient banking would be a poor return on investment. The balance of limited nutrient credit value to improvements, perpetual maintenance and responsibility, and elimination of future uses from the banked area is uneven and not a feasible option for RWSA. For this reason, though nutrient credit banking aligns with RWSA's objectives, it is not a feasible option for the Buck Mountain property and is not included in the land use compatibility evaluation.



The trails at Ragged Mountain Reservoir are maintained and operated by Albemarle County Parks and Recreation

Feasibility

There are many factors that determine the feasibility of establishing a use on the Buck Mountain property. This matrix evaluates factors in four categories: RWSA objectives, regulatory compatibility, site compatibility, and operations compatibility.

RWSA Objectives Compatibility

The three objectives evaluated are derived from the RWSA's Strategic Plan and stated mission goals. They are: water supply and protection, environmental stewardship, and increasing the number of green projects.

Regulatory Compatibility

These factors are related to the regulations and oversight that might apply to enacting any use to the property. They include if the use is allowed by zoning, either by-right or through special use permit, if permitting or site plan applications are not required, and if the use is permitted within the conservation deed restricted area.

Site Compatibility

The factors in this category relate to the physical properties of the site and if the use is compatible with that feature. Factors were phrased so that they would score higher if there was less encumbrance. It may be possible to install a use on site that does not score highly in one of these categories, but there will be more limitations or challenges to doing so. The feasibility factors evaluated in this category are: no access road required, no water/sewer required, compatible with steep slopes, and compatible with the construction of a reservoir in the future.

Management and Operations Compatibility

These factors relate to the management and operation of the uses on site. The evaluated factors are: regional market potential, potential for partnerships in the development and operation of the use, revenue generation potential, and limited long-term oversight by RWSA for the function of the use. The market potential is based on the Market Potential Index for Albemarle County developed by PROS using data from ESRI. The Market Analysis evaluates the recreation and restaurant market potential for a use. The use scored positively in this category if the market was unsaturated and local interest was higher than the national average.

Scoring

The matrix scores the compatibility of each use with the feasibility factor. The higher the use's score the greater its potential feasibility for development. The scoring was conducted in two methods, a simple 1-point scoring and a weighted scoring.

Simple Scoring

The simple score is a straightforward yes/no for compatibility. If the use is compatible with the feasibility factor it is given a 1. If it is incompatible it received no score (0). The advantage with this scoring system is that there is no subjectivity in the scoring. The highest possible total score a use could receive is 14. The highest scoring uses were hunting (12), environmental research (12), hiking (11), fishing (11), equestrian trails (10), property access agreements (10), and land leasing (10). The lowest scoring uses were archery (6), camping (7), and all development uses (7).

Weighted Scoring

The weighted scoring method gives a high potential score to certain factors. For example, the RWSA Objective “Water Supply and Protection” is the primary mandate of the RWSA, and is more important in the final use selection than “Road Access”. The factor with a greater importance is given a higher possible score. This allows factors of high determined importance or impact on feasibility to have greater sway on the final compatibility scoring. For example, “Water Supply and Protection” is given a weighted score of (5). Uses that are compatible with this factor are now (4) points higher than they would have been otherwise.

The weighting of factors also provides a sliding scale for compatibility. For example, Hiking Trails, if developed sustainably, are highly compatible with “Water Supply and Protection” and receive a score of (5). A brewery however causes more land and water quality impact and receives a score of (1). In the simple scoring system, both uses would have received (1), though they clearly have differing impacts on water supply and protection.

The factors with a scoring weight greater than (1) are “Water Supply and Protection”, (5); “Environmental Stewardship” (3); “By-Right Zoning”, (2); “Future Reservoir Potential”, (3); and “Market Potential”, (3). By-right zoning guarantees a use of the site, which is why it is given a weight of (2). If the use requires a special permit, it is given a (1). Future Reservoir Potential is given a weight of (3), as determined based on past meetings with RWSA about future water supply. This score is not graduated, it is either (3) or (0). Market Potential is weighted at (3) in consideration that if there is weak market demand for a use then it will not be successful long term. Compatibility of each uses is scored 0-3, depending on the rating of the MPI conducted by PROS. If the use has high market potential it scores (3), if moderate market potential it scores (2), if limited market potential it scores (1), and if no market potential it scores (0).

Weighted scoring gives prominence to important feasibility factors and shows greater nuance of a use’s feasibility on the site. The total score gives greater information about the realistic feasibility of constructing a use. A difficulty with weighted scoring is its subjectivity, both in which items are weighted, the level of weight accorded, and the scoring within the range. There are a greater number of nuances to the process that could be contested.

The highest possible total weighted score is 25 points. The highest scoring uses in the weighted evaluation are hiking trail (22), hunting (22), environmental research (21), mountain biking trails (20), fishing (20), and equestrian trail (19).. The lowest scoring are development (7,8) and selling the land (8).

Figure 6: Use Compatibility Analysis (Simple)

USES	FEASIBILITY														
	RWSA Objectives Compatability			Regulatory Compatability			Site Compatability				Operations Compatability				Score
	Water Supply and Protection	Environmental Stewardship	Increase # of "green projects"	Zoning (By-right-2; SUP-1)	No Permitting/Site Plan Application	Encumbrance (dedeod conservation)	No road access required	No water/sewer required	Steep slope compatible	Future reservoir potential	Market potential	Partnership potential	Revenue generation potential	Lmtld long-term RWSA oversight req	
Max Score:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Divestment															
Sell Land					1	1	1	1	1		1		1	1	8
Land Management															
Property Access Agreements	1	1			1	1		1	1	1	1	1	1		10
Land Leasing	1	1			1	1	1	1	1	1	1		1		10
Passive Recreation															
Hiking Trail	1	1		1	1	1	1	1	1	1	1	1			11
Equestrian Trail	1	1		1	1	1	1	1	1	1	1				10
Mountain Biking Trail	1	1		1			1	1	1	1	1	1			9
Fishing	1	1		1	1	1	1	1	1	1	1		1		11
Hunting	1	1		1	1	1	1	1	1	1	1	1	1		12
Active Recreation															
Archery	1			1				1		1	1	1			6
Camping	1			1						1	1	1	1	1	7
Development															
Brewery/winery/distillery	1			1						1	1	1	1	1	7
Restaurant	1			1						1	1	1	1	1	7
Environmental Center	1			1						1	1	1	1	1	7
Other (horse stable, vet, etc zoning permitted)	1			1						1	1	1	1	1	7
Resource Development															
Solar	1	1	1	1				1		1	1	1	1	1	9
Wind	1	1	1	1				1		1	1	1	1	1	9
Silviculture	1			1				1	1	1	1	1	1		8
Environmental Research	1	1	1	1		1	1	1	1	1	1	1	1		12
Plant nursery	1	1	1							1	1	1	1	1	8

One point is given to the use if it is compatible with the evaluation category

14 is the maximum possible score

The higher the score, the more compatible the use is with the property

Figure 7: Use Compatibility Analysis (Weighted)

	USES	FEASIBILITY														Score
		RWSA Objectives Compatibility			Regulatory Compatibility			Site Compatibility				Operations Compatibility				
		Water Supply and Protection	Environmental Stewardship	Increase # of "green projects"	Zoning (By-right-2; SUP-1)	No Permitting/Site Plan Application	Encumbrance (deducted conservation)	No road access required	No water/sewer required	Steep slope compatible	Future reservoir potential	Market potential	Partnership potential	Revenue generation potential	Lmtd long-term RWSA oversight req	
RWSA Involvement ↑ LOW ↓ HIGH	Max Score:	5	3	1	2	1	1	1	1	1	3	3	1	1	1	25
	Divestment															
	Sell Land					1	1	1	1	1		1		1	1	8
	Land Management															
	Property Access Agreements	5	3			1	1		1	1	3	1	1	1		18
	Land Leasing	5	3			1	1	1	1	1	3	1		1		18
	Passive Recreation															
	Hiking Trail	5	3		2	1	1	1	1	1	3	3	1			22
	Equestrian Trail	5	3		2	1	1	1	1	1	3	1				19
	Mountain Biking Trail	5	3		2			1	1	1	3	3	1			20
	Fishing	5	3		2	1	1	1	1	1	3	1		1		20
	Hunting	5	3		2	1	1	1	1	1	3	2	1	1		22
	Active Recreation															
	Archery	5			2				1		3	1	1			13
	Camping	3			1						3	3	1	1	1	13
	Development															
	Brewery/winery/distillery	1			2						1	1	1	1	1	8
	Restaurant	1			1						1	1	1	1	1	7
	Environmental Center	1			1						1	1	1	1	1	7
	Other (horse stable, vet, etc zoning permitted)	1			1						1	1	1	1	1	7
	Resource Development															
	Solar	4	2	1	1				1		3	3	1	1	1	17
	Wind	4	2	1	2				1		3	3	1	1	1	18
	Silviculture	1			2				1	1	3	3	1	1		13
	Environmental Research	5	3	1	2		1	1	1	1	3	1	1	1		21
Plant nursery	4	2	1							3	1	1	1	1	14	

Points are given to the use if it is compatible with the evaluation category

The feasibility factors are weighted by importance, with more important factors given a higher maximum score. Scoring is assigned within the point range based on limiting factors

The higher the score, the more compatible the use is with the property. The maximum possible points a use can receive is 25

Land Use Potential Mapping

There are four potential land use types on the Buck Mountain property that inform what land use can be implemented on any specific location. The four types are A: Field, B: Forest, C: Conservation Area, and D: Road Access (overlay). These descriptions were identified based on a series of related site features. Only certain types of uses are appropriate for each of these themed areas. The **Land Use Potential Map** delineates the locations of these four use areas. RWSA can cross reference the map and Land Type Compatibility Analysis chart (Figure 8) to locate uses on the site.

Figure 8 is the *Land Type Compatibility Analysis*. This chart examines which land use is compatible in each of the four mapped land types. If the use is incompatible with the land type it is blank and red, if compatible it is checked green, and if the land use is a requirement for the use it is double checked dark green.

Land Area A – Field

The land type is identified on the map as any open field or pasture that is outside of the conservation deed restricted area. There is a total of approximately 226 acres of Land Area A in the project area.

All of the potential land uses are compatible with Land Area A – Fields, except for fishing. Fishing requires a river channel, which is only found in Land Area C – Conservation Restrictions. Silviculture is possible within Land Area A – Fields if the land is planted with appropriate timber species and harvested when mature.

The map locates steep slope areas within the project area, some of which overlay Land Area A – Field. RWSA must refer to the Use Compatibility Analysis chart when developing the site determine if a use that is possible in Land Area A must be positioned to avoid the steep slope.

Land Area B – Forest

This land type is identified on the map as any existing forest that is outside of the deed restricted area. There is a total of approximately 475 acres of Land Area B – Forest in the project area.

Figure 8: Land Type Compatibility Analysis

USES	LAND TYPE COMPATABILITY			
	A - Field	B - Forest	C - Conservation Restrictions	D - Road Access Overlay
Divestment				
Sell Land	✓	✓	✓	✓
Land Management				
Property Access Agreements	✓	✓	✓	✓
Land Leasing	✓	✓	✓	✓
Passive Recreation				
Hiking Trail	✓	✓	✓	✓
Equestrian Trail	✓	✓	✓	✓
Mountain Biking Trail	✓	✓	✓	✓
Fishing			✓	
Hunting	✓	✓	✓	✓
Active Recreation				
Archery	✓	✓		✓✓
Camping	✓	✓		✓✓
Development				
Brewery/winery/distillery	✓			✓✓
Restaurant	✓			✓✓
Environmental Center	✓			✓✓
Other (horse stable, vet, etc zoning permitted)	✓			✓✓
Resource Development				
Solar	✓			✓✓
Wind	✓			✓✓
Silviculture	✓	✓		✓✓
Environmental Research	✓	✓	✓	✓
Plant nursery	✓			✓✓

Scoring:

□ = incompatible

✓ = compatible

✓✓ = requirement

There are additional limitations to the use possibilities within this land area. Besides fishing limitations, as with Land Area A – Field, development and resource development uses are limited. Silviculture is possible, but building construction, solar, wind, and plant nurseries require open areas. It would be possible for the forest to be cleared to allow this development, though replacing trees with other land cover would have a greater impact on the watershed and water quality than developing fields.

The map locates steep slope areas within the project area, some of which overlay Land Area B – Forest. RWSA must refer to the Use Compatibility Analysis chart when developing the site determine if a use that is possible in Land Area B must be positioned to avoid the steep slope.

Land Area C – Conservation Restrictions

This land type encompasses all of the deed restricted land within the project area, a total of 610 acres. This land area has the greatest limitations for which uses can be located within its boundaries. Only selling the land, land management actions, passive recreation, and environmental research are possible within Land Area C – Conservation Restrictions.

Land Area D – Road Access Overlay

Land Area D is an overlay hatch extending from where a parcel adjoins a road to the conservation restricted area, Land Area C. The road access overlay hatch covers both Land Area A – Field and Land Area B – Forest. The distinction is that some land uses that are compatible with Area A or B require road access, and therefore must be sited within the Land Area D – Road Access Overlay.

One of the deed restrictions within the conservation area is that no roads may be constructed within it, effectively blocking the complete use potential of certain parcels that are otherwise designated Land Area A or B. There is a possibility that those locked parcel portions could be accessed by access easements granted by neighboring landowners, or that an existing farm road or trail through the conservation area could be improved. However, these options would require negotiation with land owners and the USACE and Virginia DEQ, and a successful outcome is not guaranteed. Therefore, road access is listed as a requirement for certain uses. All uses within the active recreation, development, and resource development categories must be sited within Land Area D – Road Access Overlay area. The other uses are unaffected by the overlay.

Figure 9: Parcels with road access

Parcel #	total acreage	road access acreage	total contiguous road access acreage
29-35+ (2)	104.39	38.27	59.59
30-3A	3.64	3.64	
30-1A (1)	165.56	17.68	
30-1A (2)	165.56	70.56	82.7
30-1A (3)	165.56	5.79	
29-35F (1)	21.56	6.35	
29-35F (2)	21.56	5.09	30.93
29-35C (1)	14.72	8.88	
29-35C (2)	3.27	2.34	
29-35+ (1)	104.39	6.47	
29-35C (3)	10.54	8.15	
18-10F1 (1)	8.54	1.5	1.5
18-10F1 (2)	8.54	0.99	17.06
18-10G	27.36	16.07	
30-37C+	5.15	5.15	5.15

Figure 9 charts the acreage of each parcel within the overlay area, as well as identifying contiguous parcels within overlay areas. The contiguous areas expand the potential for development and provide a greater footprint for any of the land uses. RWSA may wish to lease or otherwise develop contiguous overlay parcels to make them more effective for the identified use.

Master Plan Scenarios

There are three potential scenarios for the future of the Buck Mountain property. The scenarios require varying levels of investment and direct oversight by RWSA. They are presented in order of least to most continued involvement by RWSA. Due to the legal binding and responsibility RWSA has for the deeded conservation area within the Buck Mountain property, RWSA will be connected to the site in perpetuity.

The scenarios provide a range of possible land uses within a certain theme. Not all land uses must be developed when selecting a scenario. It is also possible to import land uses from different scenarios, as fits RWSA's goals and requirements.

Scenario 1: Divestment

In this scenario RWSA divests themselves of some or all of the Buck Mountain property, offering the parcels to the original land owners first, and if they refuse, selling on the open market.

Level 1 of divestment would be to sell all of the properties. RWSA involvement with the Buck Mountain property would cease, except for perpetual responsibility for the conservation restricted area connected with the Ragged Mountain Reservoir. RWSA would be responsible for the expense and effort of management, maintenance, and security of the conservation area.

Level 2 of divestment would be to sell some parcels and continue to own the remainder of the Buck Mountain property. Parcels to be sold may be selected based on original land owner request, market value (developability potential, road access, outside of conservation easement), and/or exclusion from the potential reservoir's pool elevation. *Refer to the **Land Use Potential Map** for properties with road access, the **Zoning and Development Potential Map** for assessed parcel value, and the **Potential Reservoir Map** to identify properties above the reservoir pool elevation.* The Elliot House property and surrounding parcels (29-35H, 29-35C, 29-35D, and 29-35F) have the highest potential for market sale, as they have direct access to Buck Mountain Road, a significant portion of the land is outside of the conservation easement and contiguous with the road frontage, and these portions of the property would remain dry and accessible by road if the reservoir was constructed. However, the entirety of the parcels is within the reservoir buffer zone, so if a reservoir was constructed, use of the property would be severely restricted. The combined assessed value of these parcels is \$655,600 and their combined size is 46.1 ac. The average value is \$14,200/ac.

HIGH SALE POTENTIAL PARCELS

The Elliot House property and surrounding parcels (29-35H, 29-35C, 29-35D, and 29-35F) have the highest potential for market sale, as they have direct access to Buck Mountain Road, a significant portion of the land is outside of the conservation easement and contiguous with the road frontage, and useable portions of the property would remain dry and accessible by road if the reservoir was constructed. The combined assessed value of these parcels is \$655,600 and their combined acreage is 46.1 acres. The average value is \$14,200/ac.

It may be possible for RWSA to subdivide parcels, selling portions rather than a parcel's entirety, but the property deeds would need to be researched to determine subdivision rights. Any parcels sold would need to be considered in context of the RWSA's long-term property master plan, to ensure that the sale of parcels would not negatively impact the continued use and management of the remainder of the site.

Potential Uses

If this scenario is followed, the primary use of the site would be the divestment. Under the divestment scenario each parcel could be used and or developed by right, by special use permit or rezoned in accordance with the Albemarle County zoning ordinance and comprehensive plan. These uses range from residential development to agriculture to construction of a house of worship. Land use composure would likely look much like surrounding area.

In a Level 2 divestment scenario, the remainder of the property may be managed according to Level 2: Management or Level 3: Active Development.

Advantages

By selling the land, RWSA reduces their involvement with a large parcel of property, saving staff time and organizational resources. Land holding, except related to reservoirs, is not part of the function of RWSA, so this option would eliminate extraneous responsibilities. RWSA would receive a cash inflow of approximately \$10 million for selling all of the land.

Disadvantages

Selling the land eliminates RWSA's control over a portion of the watershed supplying a drinking water reservoir. RWSA would be unable to direct the land use of the properties, which could involve clearing forests and commercial and residential development, all of which would have a negative impact on water quality. It would also be near to impossible for RWSA to purchase the property back at some point in the future, should circumstances change and an additional reservoir need to be built.

Scenario 2: Land Management

This scenario is closest to the current operation of the Buck Mountain property. RWSA maintains ownership of the property and full management of the property. RWSA can choose to lease parcels to adjacent landowners and to allow access through agreement from outside organizations, both of which are currently done. An expansion of use from the current situation would be the potential to lease the land or develop a use agreement for environmental research.

If this scenario is selected, RWSA will need to take a more active role in managing the land and resources than is currently done. There will need to be a forest management plan to ensure the high quality function of the landscape (deer management, invasive species management). RWSA will need to invest in the property, including constructing ATV trails for full maintenance access of the property, installing and repairing gates and fencing, and posting boundary and trespassing signs. As pasture and field lease holders let their leases expire, RWSA may wish to consider managed succession in those fields. Managed succession would convert the fields, which require regular mowing, into healthy stratified forests. Forests require less active maintenance and reduce water runoff, compared to fields. Refer to the *Environmental Report (Appendix B)* prepared by VHB for a full recommendation list. This active management role will require dedication of RWSA resources, including budget and staff time.

Working with lease holders and groups with access agreements does offer partnership potential for some of the land management, including surveillance and land inspection. Requirements to this effect can be included in the lease and access agreements. It is recommended that RWSA revise the leasing schedule to be more consistent with market rates, especially considering that hunting is permitted by lessees.

Potential Uses

If this scenario is followed, potential uses include leasing land parcels, granting access easements to organizations, and use agreements for environmental research. Partners for environmental research could be universities or schools looking for field sites, or local environmental groups or companies that are interested in plant cataloguing or propagation.

Advantages

A major advantages to the land management scenario is that RWSA maintains control over the land and its water quality and there is potential for a reservoir to be constructed if water needs and environmental regulations change at a future point. Managing the land in its current land cover maintains the current high quality watershed feeding Ragged Mountain Reservoir. This scenario does require active management by RWSA, but the scope is limited.

Disadvantages

The Land Management scenario requires RWSA to be responsible for maintaining a large tract of land with all the associated responsibilities of maintenance, patrolling, funding, and staff time. This is an expansion to the primary objective of providing high quality reliable drinking water service. However, maintaining a high quality watershed does positively affect this primary objective.

Scenario 3: Active Amenitization

In the active amenitization land use scenario, RWSA maintains ownership of the land while expanding the active uses on site. Some of these uses could generate income for RWSA, provide land management partners, and change existing land cover. This option allows the greatest number of uses on the property. If RWSA selects this option, it would need to commission a development master plan for the site, which would include selecting the programs, locating them on site, and developing cost estimates. Many of the uses would function best as partnerships, as the use would be an expansion beyond RWSA's current purview of water supply and service. Once RWSA has determined the programming and location through the master plan process, RWSA can publish a Request for Information (RFI) seeking an applicant to develop and manage the proposed program. The RFI defines RWSA's goals and stipulations; the applicant conducts a market analysis, develops a business plan, and oversees operation. Additional information about the partnership selection and agreement process can be found in the **Appendix C: Recreation Market and Partnership Analysis Report** developed by PROS Consulting.

Uses:

There are two levels of active amenitization. Level 1 includes leasing the land, access agreements, and passive recreation on site. Level 2 is more intensive, comprising all the Level 1 activities as well as development and resource development site uses.

'Level 1-Active Amenitization' is very similar to 'Scenario 2: Land Management', except that it encourages public use of the site. A similar example is how the Ragged Mountain property is operated. A Level 1 Active Amenitization scenario would be a good neighborly relations opportunity. A policy of restricting

hunting, fishing, motorized vehicle access (including ATVs), and fires while permitting walking and horseback riding would be in alignment with the rural character of the area while still protecting watershed quality. It is common for watershed property to allow general public access, sometimes even permitting hunting in certain areas.

Level 2 has a more noticeable impact on the property, changing land use and land cover from the current conditions. Construction and resource development may also affect the water quality within the watershed of South Rivanna Reservoir.

Advantages

Developing active uses on the site brings the potential for income generation from the development partners or by sale of resources. Income will vary based on the use and the agreement developed with the partners.

With each use partner, RWSA will also gain a land management partner and can shift responsibilities of land management to an organization better suited to the task.

Instituting new uses on the site will open the Buck Mountain property as a public resource, which serves the wider community and increases goodwill towards RWSA.

Some of the active land development uses are green projects, like solar and wind energy generation, which fulfills one of RWSA's strategic goals of increasing the number of green projects.

Disadvantages

The primary disadvantage of any of these expanded uses of the property is that they are outside of, or tangential to, RWSA's stated objective of drinking water supply and service. All of these uses would require additional resources contributed by RWSA, including staff and funding. Securing additional resources, either through partnerships or budgetary grants, will be key.

Silviculture may be a use that offsets RWSA input with additional budget, but at a larger cost of reduced watershed quality and drinking water quality. Even a well-managed forestry plan still results in a reduction of mature forest land cover and disturbance to the ground surface. Limiting silviculture to upland and gently sloping areas and securing an additional water quality buffer around the harvested lands would reduce the potential impact to watershed quality.

Figure 10: Master Plan Scenarios

Scenario 1: Divestment		Potential Land Uses:
Pros:	Reduces RWSA involvement with a large land holding to the bare minimum required by the conservation easement RWSA gains sale money, approximately \$10 million	Sell the land
Cons:	RWSA loses control over future of land use, which could potentially be detrimental to drinking water quality Potential for reservoir is lost	
Scenario 2: Land Management		Potential Land Uses:
Pros:	RWSA maintains control of the land, directing land use and reserving the potential for a reservoir Limited active management required by RWSA Most similar to current use	Parcel leasing Access agreements Environmental research
Cons:	RWSA is responsible for actively maintaining a large property Expansion beyond primary task of water supply and service	
Scenario 3: Active Development		Potential Land Uses:
Pros:	Potential for income generation Partnership potential for land management responsibilities Open the Buck Mountain property as a publicly accessible resource Increase number of RWSA green projects, a strategic goal	Parcel leasing Access agreements Environmental research Passive recreation Development Resource Development
Cons:	Uses are outside of RWSA's primary scope and objectives Uses require additional RWSA resources including budget and staff time Potential reduction in watershed quality, reducing Ragged Mountain Reservoir water quality Public may protest use of property for other than original goals of reservoir and watershed protection	

Site Feature Scenarios

There are several features on the Buck Mountain property that require special consideration by RWSA, either because they pose a hazard potential or require additional resources to maintain. This report summarizes the background and conditions of each feature and provides potential scenarios to address each feature. The recommend scenario is marked with a box.

Allen Farm Lane Bridge

At the northeastern tip of the Buck Mountain property Buck Mountain Creek is crossed by Allen Farm Lane, a private road that provides access to ten (10) residential properties. The Allen Farm Lane bridge over Buck Mountain Creek is a one-lane low-water concrete bridge with curbs. There is an adjacent ford that provides passage to heavy vehicles. When RWSA acquired the Buck Mountain property they also accepted responsibility for maintaining the bridge. RWSA commissioned a structural analysis in 2005 and 2019 which shows that the bridge is structurally sound but required minor repairs. A load analysis has not been conducted, but the structural analysis confirmed



Allen Farm Lane low-water bridge and ford

that the bridge is sufficient for normal car traffic. This is a low-water bridge located within the 100-year floodplain and is covered by water several times a year during major storm events. As a local governmental entity, RWSA has sovereign immunity, which provides liability related to any accidents on the bridge. It is unclear at this time if RWSA accepted responsibility for maintaining the bridge when it acquired the property. It is also unclear if RWSA is responsible for providing constant access to the properties in all weather conditions, or if because the low-water crossing bridge was an existing condition when residents bought the property, they assumed that risk. Further deed research is required to determine what level of access and responsibility RWSA assumes by the ownership of the bridge on this private road.

Scenario 1: Existing Condition to Remain

RWSA would leave the situation as it currently exists. RWSA has confirmed that the bridge is structurally sound and will continue to check and maintain the bridge. Property owners were aware of the road access when they purchased property, so the maintenance of the existing crossing type maintains purchase conditions. LPDA recommends that RWSA pursue this option

Scenario 2: Provide Alternate Access

RWSA would provide alternate access to the residential properties. Constructing a new bridge would cost several million dollars, which is impractical. Allen Farm Lane connects to Buck Mountain Ford Lane (Rt. 776) to the west. Through access is not currently possible, as Allen Farm Lane crosses gated private property (parcels 17-35G1 and/or 17-35M), RWSA may be able to negotiate an access easement with the private property owner(s) and invest in improving the road surface. This would provide emergency access to the Allen Farm Lane residences independent of flood conditions.

Farm Pond and Dam

One of the parcels in the Buck Mountain property contains a farm pond with an earthen dam. The dam and pond are on parcel #17-35D4. The dam and pond were constructed by the original property owner, who live adjacent to the dam and would like the pond to remain in place. The pond currently functions as a water source for horses pastured in the parcel. RWSA is responsible for the dam and its maintenance. The dam is currently in poor condition, with trees growing on the downstream side of the earthen dam. The dam falls under the Virginia Department of Conservation and Recreation (DCR) dam safety permitting program and does not meet DCR dam safety standards. RWSA has applied for an exemption based on the pond's size and agricultural use, but DCR has not confirmed the status as of July 2020. RWSA has determined that there are no residences within the dam break inundation zone, which decreases the liability of the dam. RWSA's liability for drowning in the pond is limited, because as a local government entity RWSA is protected by sovereign immunity.



Farm pond and earthen dam

Scenario 1: Maintain Dam

Maintaining the dam in its current design is only possible if DCR grants an agricultural use exemption for the dam. RWSA would perform routine maintenance on the dam, including keeping the culvert open and removing trees from the earthen dam. This scenario requires the least total resource dedication by RWSA, though would require long-term maintenance, and would satisfy the wishes of the adjacent land owner. The pond would gradually silt up over time until it returned to a stream channel. As the dam would have limited impact if it failed, fosters good neighbor relations, and requires limited lifetime maintenance, LPDA recommends RWSA proceed with this option.

Scenario 2: Improve Dam to Virginia Department of Conservation and Recreation Standards

RWSA could improve the dam to meet DCR standards, either because required by DCR or to reduce the risk of dam failure. RWSA estimates that it would cost approximately \$50,000 to bring the dam into compliance. After investing in improving the dam,

POND AND DAM COSTS

Maintenance:

\$5,000/year – regular mowing and clearing

Improvement and Operation to DCR

Standards:

<\$10,000 – install trash rack over riser pipe, remove debris and riser to deter beavers

~\$60,000 – install new spillway siphon system for reservoir level control with built-in reservoir drain (beaver-proof)

\$10,000-\$20,000 – performance of dam break inundation study and PMP analysis (potential for grant funding)

\$300/6-year – recurring 6-year operations and maintenance certificate

\$5,000/year – regular mowing and clearing

Staff time – compliance with dam safety regulations

Total: \$75,000-\$90,000 initial investment,
~\$6,000/annual upkeep

Removal:

~\$150,000-\$300,000 – breach the dam*

**based on similar 2018 estimate*

RWSA would continue to be responsible for the long-term maintenance of the dam. The pond would remain in place, provide enjoyment for the adjacent property owner and water access for pastured livestock. The pond would gradually silt up over time until it returned to a stream channel.

Scenario 3: Remove Dam

Removing the dam would eliminate lifetime maintenance by RWSA as well as any potential liability for dam failure or drowning in the pond. The pond would need to be dewatered and the silt removed and disposed of properly. If horses or other livestock were continued to be pastured on the property an alternate water source would need to be constructed, potentially funded by the lessee. Breaching the dam would cost approximately \$150,000-\$350,000. (Cost based on cost estimate of breaching the Ivy MUC Dam, which has a similar size and impoundment, provided by Schnabel in January 2018).

Elliot House

The Elliot House is a 2-story home constructed in the late 19th century with several additions constructed about 1905. It is located on parcel #29-35H, street address 1880 Buck Mountain Road. The house has driveway access to Buck Mountain Road, though with poor visibility. There is a well, but no other structures on the property. RWSA leased the house as a residence until approximately 2012. The decision to stop leasing was made because the structure required significant structural repair and RWSA did not deem those repairs an efficient use of resources. The house and property were closed and locked at that point. Deterioration of the structure has continued, as well as some minor acts of vandalism, in the years since.



The Elliot House is currently unoccupied

The Elliot House is a documented historical resource, but is not designated as historically significant. This means that there are no restrictions to what can be done to the structure, as long as the associated project does not require state or federal action, such as a wetland permit.

Scenario 1: Demolish House

The Elliot House has no direct benefit to RWSA, either as office or rental space. RWSA would demolish the house after coordinating with the Virginia Department of Historic Resources (DHR) to allow DHR to gather additional data on the house before it is removed. It is also recommended that RWSA consult with a professional archaeologist on any activity that may affect this historic resource. After the site is documented, the house would be demolished, potentially with some salvage of materials. Demolishing the structure is the simplest way to remove the potential liability of the property. The disadvantage would be the reduction of the regional cultural landscape. The house is built in the local vernacular style and adds value to the area's character.

Scenario 2: Sell Property

Selling the property removes RWSA's involvement and liability while potentially preserving the house. RWSA would advertise and sell the property and house to an outside individual or party. Ideally, the new owner would invest funds in refurbishing the house. The house has historic charm and is well sited for

access to the interior of the Buck Mountain property, increasing its appeal to a partner organization. In this scenario RWSA gains the sale value of the house and property and the liability and responsibility of the structure is removed. However, by selling the house and property on the open market RWSA relinquishes control of both the future use of the land and the house. There is the potential that the new owners would raze the house and develop the site in an incompatible use to the larger Buck Mountain master plan. If RWSA can identify a compatible organization to sell the property to, LPDA recommends this option.

Scenario 3: Stabilize and Seek Partner

This scenario balances RWSA's investment in the property with the highest and best use of the property. RWSA would commission a limited architectural assessment of the building to determine the building's stability, necessary improvements, and associated costs. If the assessment reveals major structural flaws, the house would be demolished, in accordance with Scenario 1. If the house is solid, then RWSA would stabilize and seal it and begin searching for a partner to refurbish the property. The partner search would be conducted by issuing a Request for Information (RFI). There is the potential that the house could be rehabilitated as the headquarters, visitors center, or educational camp for the primary land management partner of the full Buck Mountain property. The house has historic charm and is well sited for access to the interior of the Buck Mountain property, increasing its appeal to a partner organization.

Scenario 4: Full Refurbishment by RWSA

In this scenario RWSA would fully refurbish the house and seek a tenant, either residential, office, or commercial, to occupy the property. It is recommended that RWSA consult with a professional archaeologist prior to beginning any refurbishment project. The house, as a vernacular amenity, would be preserved and RWSA would gain additional observation of the Buck Mountain property as a whole. However, this scenario involves significant financial investment by RWSA and an expansion of RWSA's responsibilities to "landlord". This scenario would only be practical if additional funding and resources are appropriated for the construction and long-term maintenance of the Elliot House.

Conclusion

The Buck Mountain property has been under RWSA's control for almost 50 years but there has not been a cohesive action plan since the reservoir was rejected. There is an opportunity now to optimize the use of this resource and align the management of the property to serve the larger goals of RWSA. This report is the first step in that process, bringing together into one document all of the information about the site and providing in depth details that RWSA can refer to when making their final decision about the future of the property.

Given the potential for change in water supply demand, environmental priorities, and the watershed protection mission, it is logical for RWSA to continue to own and manage the Buck Mountain property. Keeping the property under RWSA ownership allows RWSA to control the land use and protect the water quality contributing to the South Rivanna Reservoir. It would also be logical to attempt to capture some benefit from the property with uses and activities that align with, complement, and/or enhance the mission objects through direct management or partnerships with other organizations. Unless supplemental funding would be available to the RWSA for additional resources and staff time, it is important that the responsibility for cost and management efforts be borne by others, or that proposed uses be sustainable and essentially self-maintaining within the baseline of general land management.

Consultant Recommendations

*Based on an analysis of the property, regional recreation market, and objectives of the RWSA, LPDA recommends the property be developed to **Scenario 3: Active Amenitization (Level 1)**.*

RWSA would maintain possession of the nearly the entire property, preserving high quality watershed land and keeping future water resource options open. The Elliot House would be the single parcel sold. The buyer would be compatible organization that would refurbish the structure. The focus of the Buck Mountain property would be on environmental uses. RWSA would have a primary partnership with a recreational management organization to manage all or a majority of the Buck Mountain property. That portion of the property would be developed and managed by the partner entity and open to that entity's user base. The partnership entity might be a parks department, outdoor education group, outdoor recreation business, or hunting club. Developing a land use partnership will allow RWSA to transfer a majority of the land management responsibility to an organization better equipped for the task and perhaps also generate revenue.

RWSA may also choose to grant concurrent use agreements in addition to the primary land management partnership, potentially signing access agreements with local horseback riding organizations, allowing parcels to be leased to adjacent property owners, or partnering with environmental research organizations. These agreements may serve RWSA with increased public goodwill, revenue generation, land management services, and/or furthering of the Authority's environmental stewardship objectives.

RWSA may also choose to separate out specific parcels from the overall land management partnership and develop them in a more specialized manner. Solar farming, wind generation, and plant nursery development would all generate revenue while furthering the Authority's objectives of water supply and protection, environmental stewardship, and increasing green projects. These uses can be implemented at a later time, should RWSA choose. The first step would be advertising a request for proposals for the identified use. Based on the site and the regional market, solar generation would likely be the most feasible, though given the wooded and hilly nature of the site, the scale and cost of initial investment may not make solar a viable option. LPDA does not recommend the Buck Mountain site be used for silviculture. Timber harvesting will reduce the function of the site as a watershed quality improvement area and increase the vulnerability of the site to invasive species degradation.

The Elliot House contributes to the character and history of the region, though it is not historically significant. The highest and best use for it would be to be refurbished and used by an outside organization, perhaps as the headquarters or visitors center for the primary land management partnership entity.

Next Steps

This report analyzes the conditions of the Buck Mountain property, evaluates the compatibility of a series of potential land uses, and then offers three potential scenarios for the future of the property. LPDA has offered their recommendation for the site's future use for RWSA's consideration. RWSA can now select and proceed with the scenario and land uses that best fits its goals, objectives, and values.

APPENDIX A

Land Use Analysis Maps



Excellent Mountain Views



Earthen Dam and Constructed Pond

LEGEND

-  RIPARIAN FOREST RESTORATION AREA
-  CONSERVATION DEED RESTRICTION
-  ATV TRAILS AND DIRT ROAD



The Elliot House, built in 1905 and listed on the Virginia Historical Resources, has been unoccupied for three years and is falling into a state of disrepair



Unauthorized ATV riding damages riparian restoration efforts



Allen Lane low water crossing limits resident and emergency access



Established farm road beds and ATV trails offer limited access routes through the site



Exposed rock outcropping alongside the farm road bed



Streambank erosion in mitigation area requires RWSA maintenance. Most mitigation improvements are in good condition.

Access to northern property area. The landowner has granted permission for RWSA access on private drive

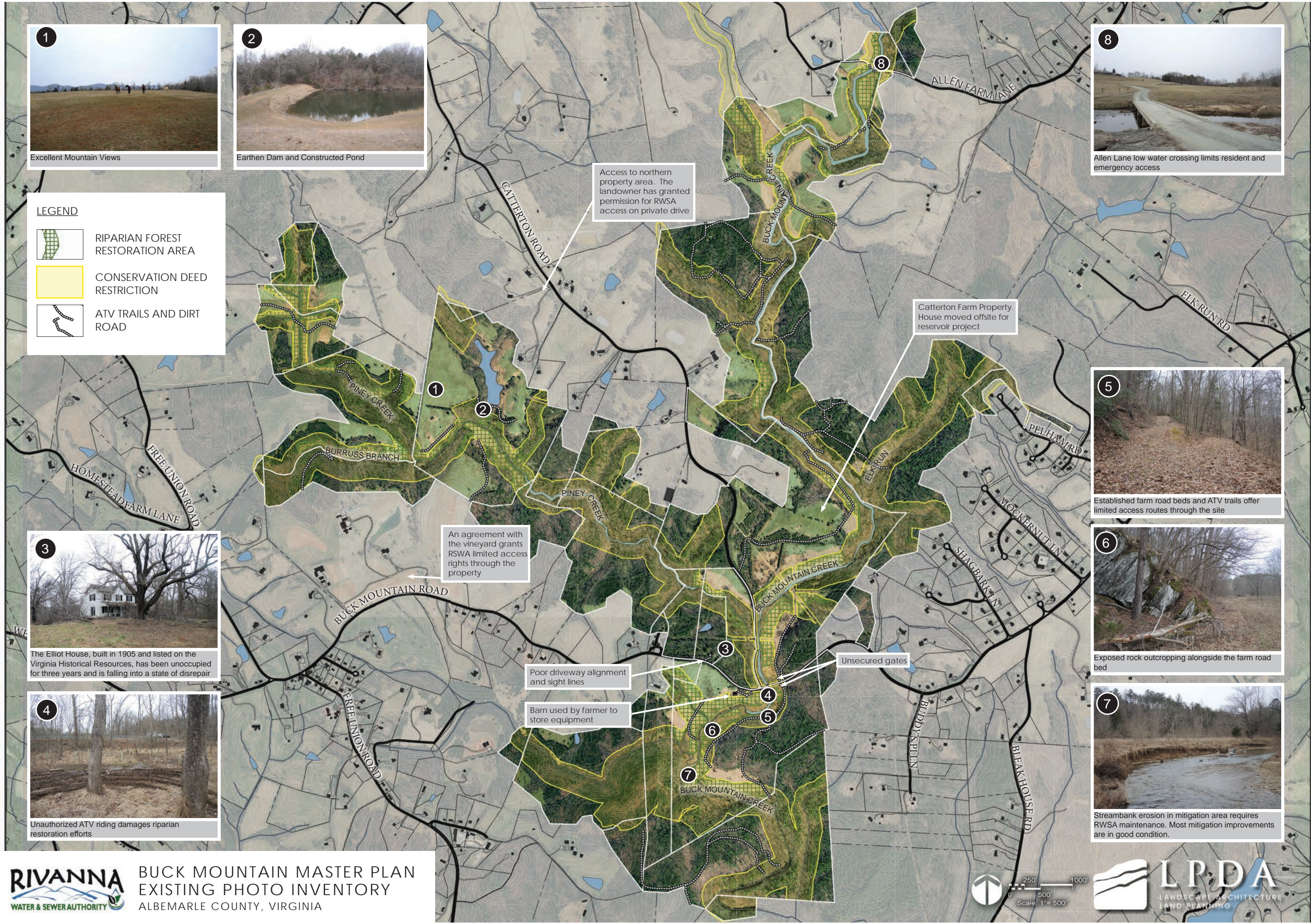
Catterton Farm Property. House moved offsite for reservoir project







An agreement with the vineyard grants RWSA limited access rights through the property

Poor driveway alignment and sight lines

Barn used by farmer to store equipment

Unsecured gates





Planned Unit Development (PUD), inside project limits

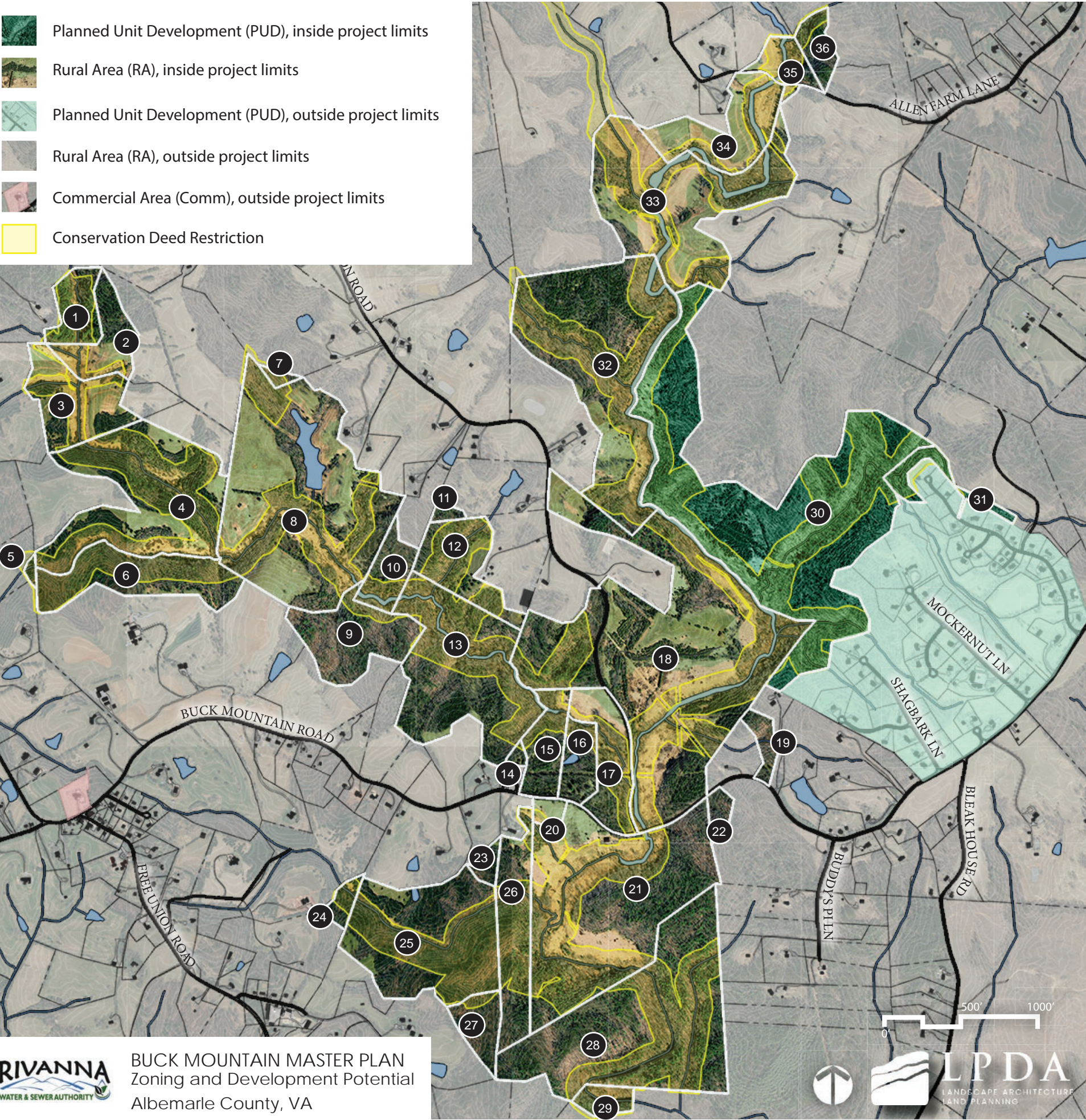
Rural Area (RA), inside project limits

Planned Unit Development (PUD), outside project limits

Rural Area (RA), outside project limits

Commercial Area (Comm), outside project limits

Conservation Deed Restriction



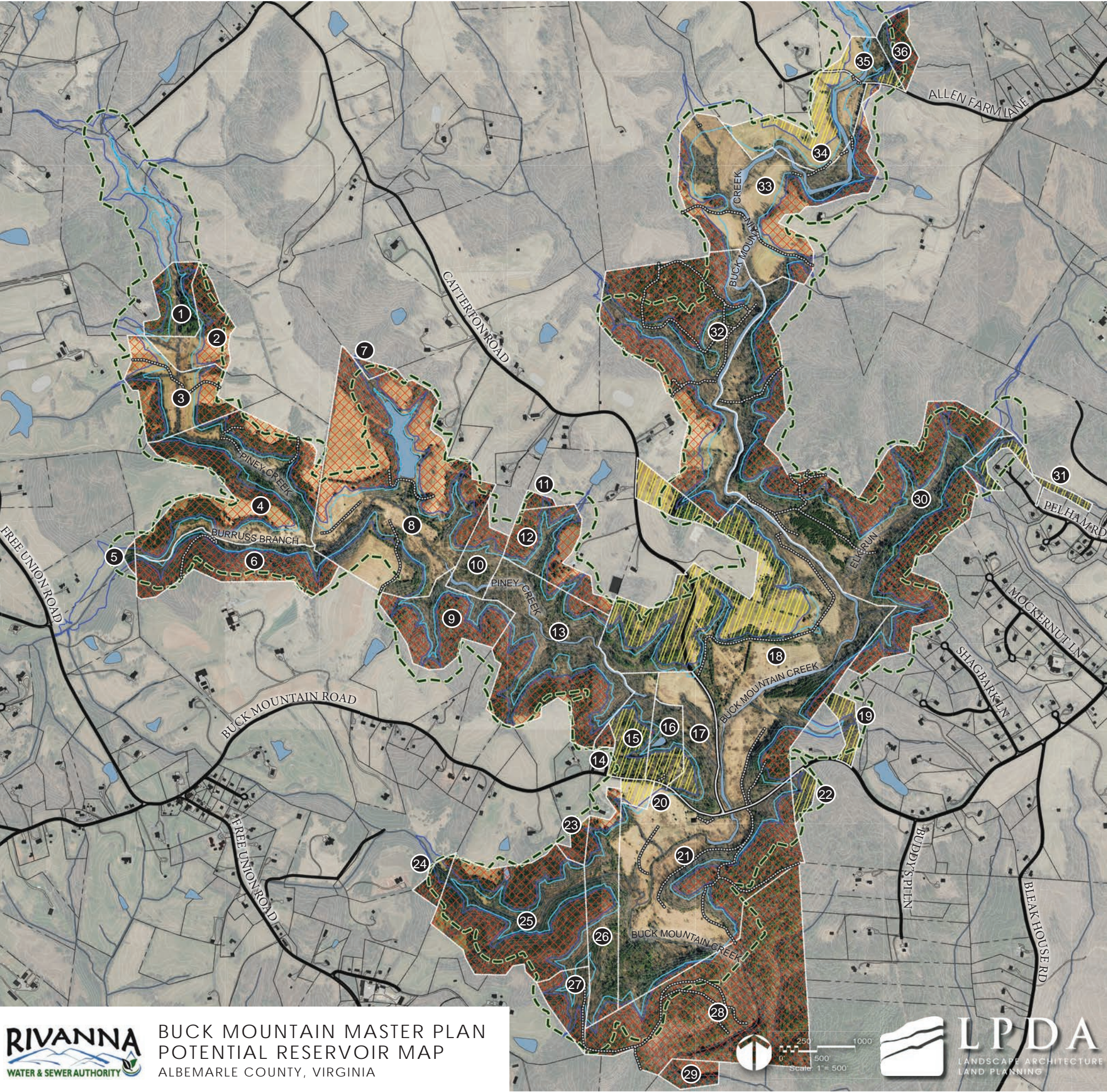
Key ID	Parcel Tax ID	Zoning	Acres	Parcel Development Potential	Tax Assessed Value
*1	01700-00-00-022C0	RA	17.7	0	\$172,200
2	01700-00-00-022D0	RA	18.19	5	\$176,900
3	01700-00-00-021G0	RA	24.51	5	\$233,600
4	02900-00-00-033B1	RA	66.02	7	\$369,100
*5	02900-00-00-031B1	RA	0.95	0	\$12,700
6	02900-00-00-033E0	RA	27.72	5	\$148,100
7	01700-00-00-035D3	RA	1.5	1	\$21,400
8	01700-00-00-035D4	RA	117.95	10	\$1,207,700
9	02900-00-00-033F0	RA	28.07	5	\$252,400
10	02900-00-00-033C0	RA	10.72	5	\$60,300
11	02900-00-00-034C1	RA	1.82	1	\$16,600
12	02900-00-00-034A0	RA	25.12	5	\$256,000
13	02900-00-00-036A0	RA	63.01	7	\$388,000
14	02900-00-00-035E0	RA	1.35	1	\$87,400
15	02900-00-00-035D0	RA	16.39	5	\$187,000
16	02900-00-00-035H0	RA	9.02	4	\$324,700
17	02900-00-00-035F0	RA	19.68	5	\$126,600
18	08000-00-00-00A0	RA	159.96	12	\$1,384,700
19	03000-00-00-037C0	RA	4.24	2	\$30,300
20	02900-00-00-035C0	RA	1.01	1	\$17,300
21	02900-00-00-035O0	RA	110.74	9	\$708,500
22	03000-00-00-003A0	RA	3.14	1	\$44,900
23	02900-00-00-049A1	RA	3.17	1	\$43,500
24	02900-00-00-045A1	RA	2.58	1	\$40,600
25	02900-00-00-049A2	RA	59.87	7	\$453,200
26	02900-00-00-035G0	RA	26.01	5	\$133,000
27	02900-00-00-050A0	RA	6.1	3	\$48,400
28	03000-00-00-00200	RA	98.88	9	\$578,700
*29	03000-00-00-010A1	RA	5.75	0	\$30,800
30	03000-00-00-38A0	PUD	151.48	56	\$884,200
*31	03000-00-00-041A0	PUD	3.2	0	\$45,700
32	01700-00-00-035B1	RA	91.02	8	\$945,900
33	01800-00-00-011A0	RA	81.57	8	\$220,600
34	01800-00-00-01G0	RA	27.36	5	\$87,800
35	01800-00-00-01of1	RA	8.56	4	\$19,300
36	01800-00-00-019A3	RA	8.03	4	\$54,200
RA - TOTAL POTENTIAL DWELLING UNITS:				151	
PUD - TOTAL POTENTIAL DWELLING UNITS:				56 - 3976	
TOTALS				207-4,183	\$9,812,300

* Note: Acres in conservation restrict development potential

Residential Area (RA): By-right zoning permits a parcel to be divided into 5 lots, minimum of 2 acres each. Land may be divided into parcels larger than 21 acres without counting towards the 5 lot total.

Note: Calculation is the maximum potential division rights. Additional research required to determine the accurate division rights for each parcel.

Planned Unit Development (PUD): By-right zoning permits up to 35 dwelling units per acre with 25% of land left as open space. However, due to site restrictions like access and utilities, the maximum reasonable density is calculated in line with the adjacent development, 2 acre lots on 75% of the property.



Key ID	Parcel Tax ID	Parcel Acres	Total Dry Acres (outside potential reservoir)	Dry Acres Connected to Road Frontage	Dry Acres Outside 300' Buffer
1	01700-00-00-022C0	17.7	3.84	0	0
2	01700-00-00-022D0	18.19	9.68	0	0
3	01700-00-00-021G0	24.51	13.17	0	0
4	02900-00-00-033B1	66.02	39.2	0	1.13
5	02900-00-00-031B1	0.95	0.39	0	0
6	02900-00-00-033E0	27.72	23.56	0	2.5
7	01700-00-00-035D3	1.5	1.4	0	0
8	01700-00-00-035D4	117.95	53.7	0	12.35
9	02900-00-00-033F0	28.07	17.72	0	0
10	02900-00-00-033C0	10.72	3.26	0	0
11	02900-00-00-034C1	1.82	1.56	0	0
12	02900-00-00-034A0	25.12	14.46	0	0
13	02900-00-00-036A0	63.01	23.29	0	0.2
14	02900-00-00-035E0	1.35	1.42	0	0
15	02900-00-00-035D0	16.39	8.72	8.72	0
16	02900-00-00-035H0	9.02	4.55	4.49	0
17	02900-00-00-035F0	19.68	2.25	2.25	0
18	08000-00-00-00A0	159.96	62.24	55.54	3.96
19	03000-00-00-037C0	4.24	4.59	4.59	0.37
20	02900-00-00-035C0	1.01	2.94	2.94	0
21	02900-00-00-035O0	110.74	24.13	0	5.23
22	03000-00-00-003A0	3.14	3.09	3.09	0
23	02900-00-00-049A1	3.17	2.92	2.92	0
24	02900-00-00-045A1	2.58	2.95	2.95	0.12
25	02900-00-00-049A2	59.87	41.08	41.08	2.79
26	02900-00-00-035G0	26.01	6.92	0	0
27	02900-00-00-050A0	6.1	4.92	0	0
28	03000-00-00-00200	98.88	95.31	0	72.1
29	03000-00-00-010A1	5.75	5.73	0	5.73
30	03000-00-00-38A0	151.48	70.49	0	1.73
31	03000-00-00-041A0	3.2	5.19	5.03	2.14
32	01700-00-00-035B1	91.02	52	52	10.13
33	01800-00-00-011A0	81.57	20.20	0.00	0
34	01800-00-00-016G0	27.36	9.32	9.32	0
35	01800-00-00-010f1	8.56	2.26	2.26	0
36	01800-00-00-019A3	8.03	5.96	0	0.08
TOTALS		1302	644	197	121

LEGEND

DRY AREA OUTSIDE POTENTIAL RESERVOIR

DRY AREA CONNECTED TO ROAD FRONTAGE

464 CONTOUR - NORMAL POTENTIAL RESERVOIR POOL ELEVATION

474 CONTOUR - FLOOD POTENTIAL RESERVOIR POOL ELEVATION

BUFFER - 300' OFFSET FROM 474 CONTOUR

A minimum buffer zone of 300 horizontal feet measured from the normal pool level is required around the potential reservoir. Land uses prohibited within this buffer zone include the following:

- Permanent structural improvements

Temporary structural Improvements

New septic fields/systems

Access

Wells
- Row crops

Pasture

Hayland

Livestock access

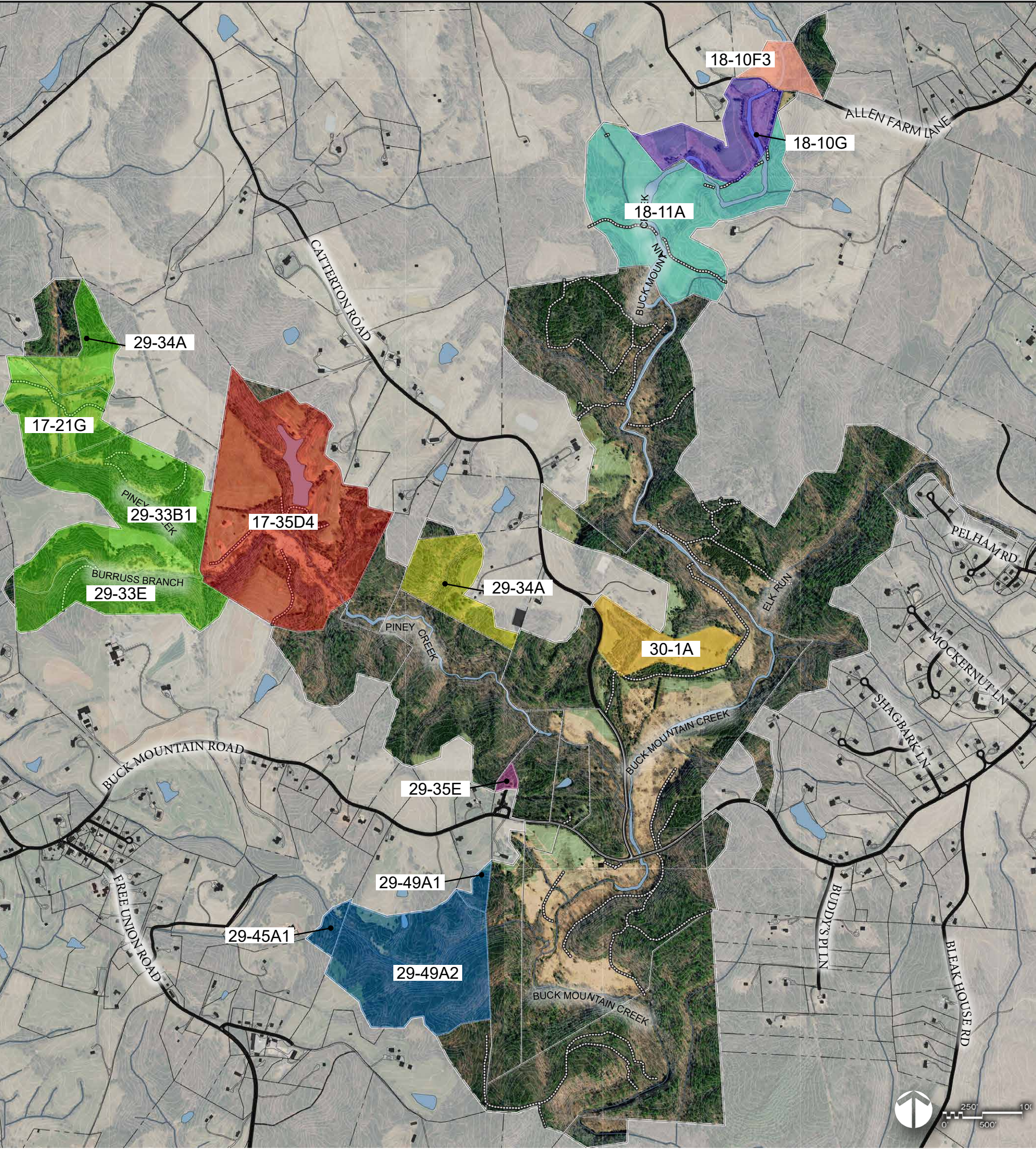
Feedlots

Land uses limited within this buffer zone include the following:

- Forestry activities

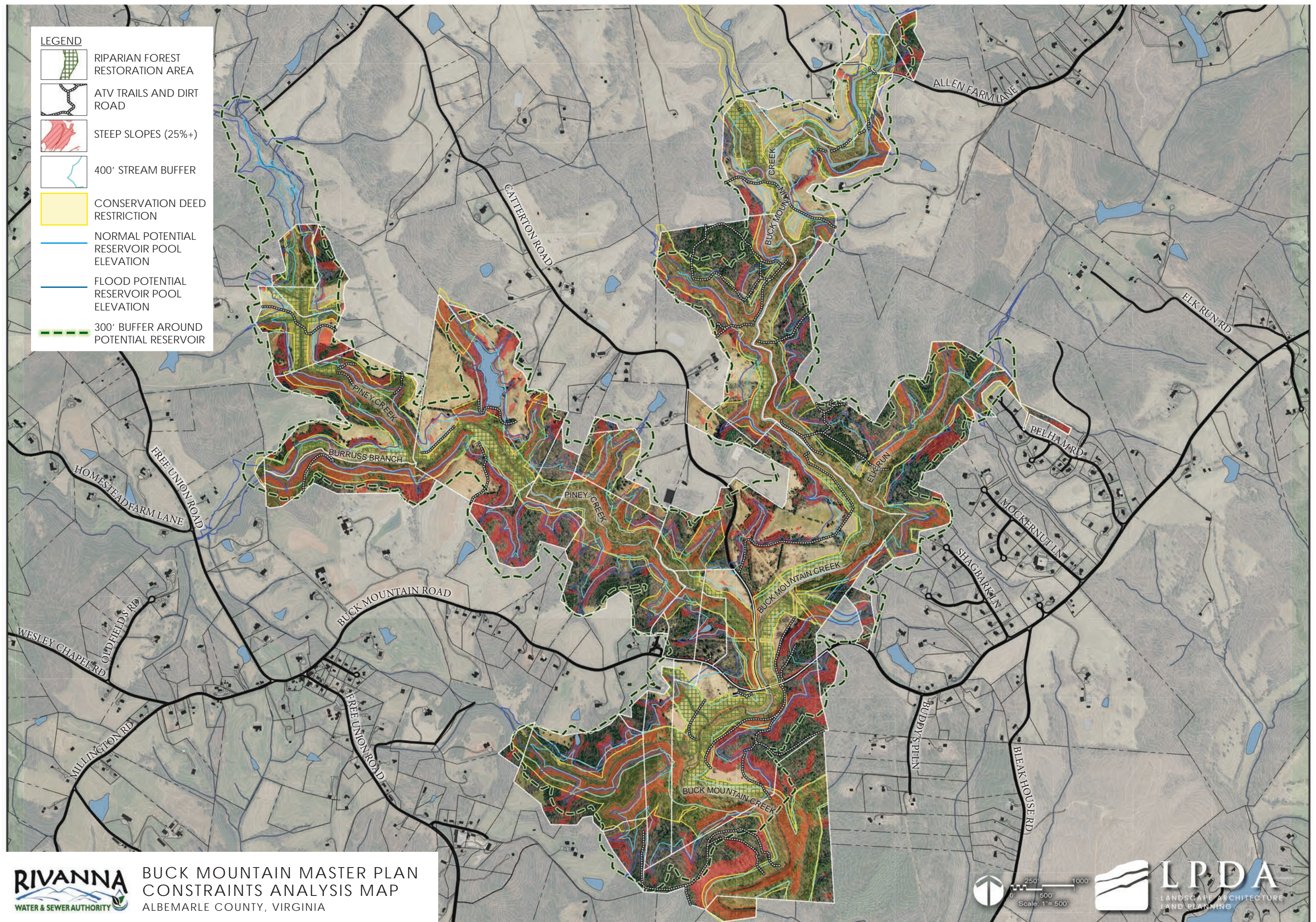
Use of pesticides, fertilizers and other chemicals

Reservoir design and restrictions per Buck Mountain proposal to Albemarle County Board of Supervisors, August 4, 1982.



Lessee	Parcel #	Parcel Tax ID	Total Parcel Acreage	Leased Acreage
Robyn North	17-35D4	01700-00-00-35D4	117.95	117.946
Charles Durbin Jr.	29-34A	02900-00-00-034A	25.12	25.12
Phillip and Melissa Johnson	29-33E	02900-00-00-033E0	27.72	27.724
	17-21G	01700-00-00-021G0	24.51	24.507
	17-22D	01700-00-00-022D0	18.186	18.186
	29-33B1	02900-00-00-33B1	66.02	66.016
David and Virginia Ashcom	30-1A	01700-00-00-35D4	159.96	20

Lessee	Parcel #	Parcel Tax ID	Total Parcel Acreage	Leased Acreage
June E. Mooney, Susan McCarson	18-10G	01800-00-00-1G0	27.36	27.362
Kenneth Wayne McCauley	29-35E	02900-00-00-35E0	1.35	1.348
Lawrence S. Miller and Deborah L. Miller	29-49A2	02900-00-00-049A2	59.87	59.868
	29-45A1	02900-00-00-45A1	2.58	2.581
	29-49A1	02900-00-00-49A1	1.445	1.445
Harry Wellons	18-11A	01800-00-00-011A0	83.75	83.75
Gary Wilson	18-10F3	01800-00-00-010GO	8.56	8.56



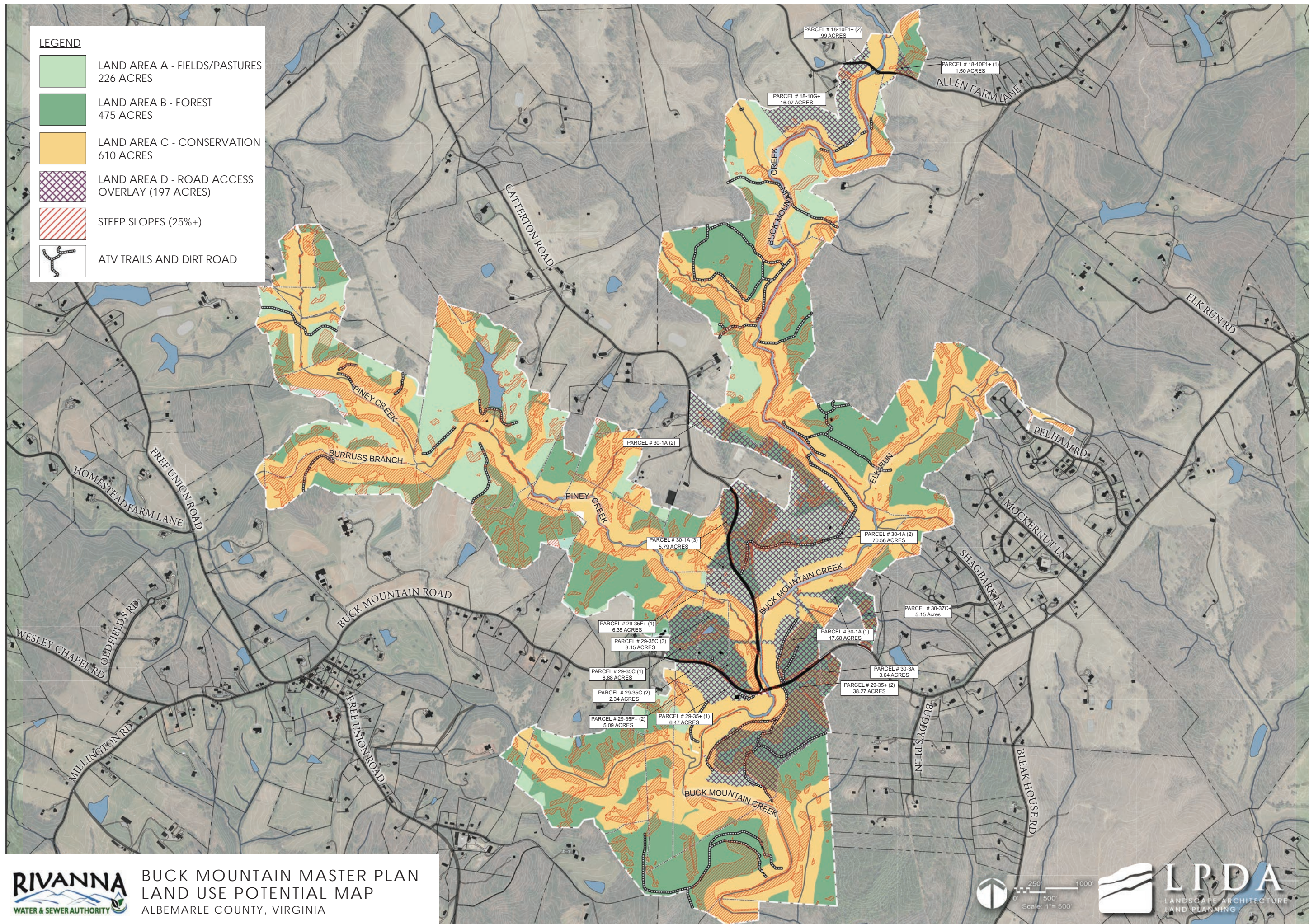
LEGEND

- RIPIARIAN FOREST RESTORATION AREA
- ATV TRAILS AND DIRT ROAD
- STEEP SLOPES (25%+)
- 400' STREAM BUFFER
- CONSERVATION DEED RESTRICTION
- NORMAL POTENTIAL RESERVOIR POOL ELEVATION
- FLOOD POTENTIAL RESERVOIR POOL ELEVATION
- 300' BUFFER AROUND POTENTIAL RESERVOIR



LEGEND

- LAND AREA A - FIELDS/PASTURES
226 ACRES
- LAND AREA B - FOREST
475 ACRES
- LAND AREA C - CONSERVATION
610 ACRES
- LAND AREA D - ROAD ACCESS
OVERLAY (197 ACRES)
- STEEP SLOPES (25%+)
- ATV TRAILS AND DIRT ROAD



APPENDIX B

Buck Mountain Environmental Report

Buck Mountain Property

Environmental Supplement to Land Use Master Plan

PREPARED FOR



Rivanna Water and Sewer Authority
695 Moores Creek Lane
Charlottesville, VA 22902

PREPARED BY



351 McLaws Circle
Suite 3
Williamsburg, VA 23185
757-220-0500

May 2020

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1

Introduction and Regulatory History of Buck Mountain Property

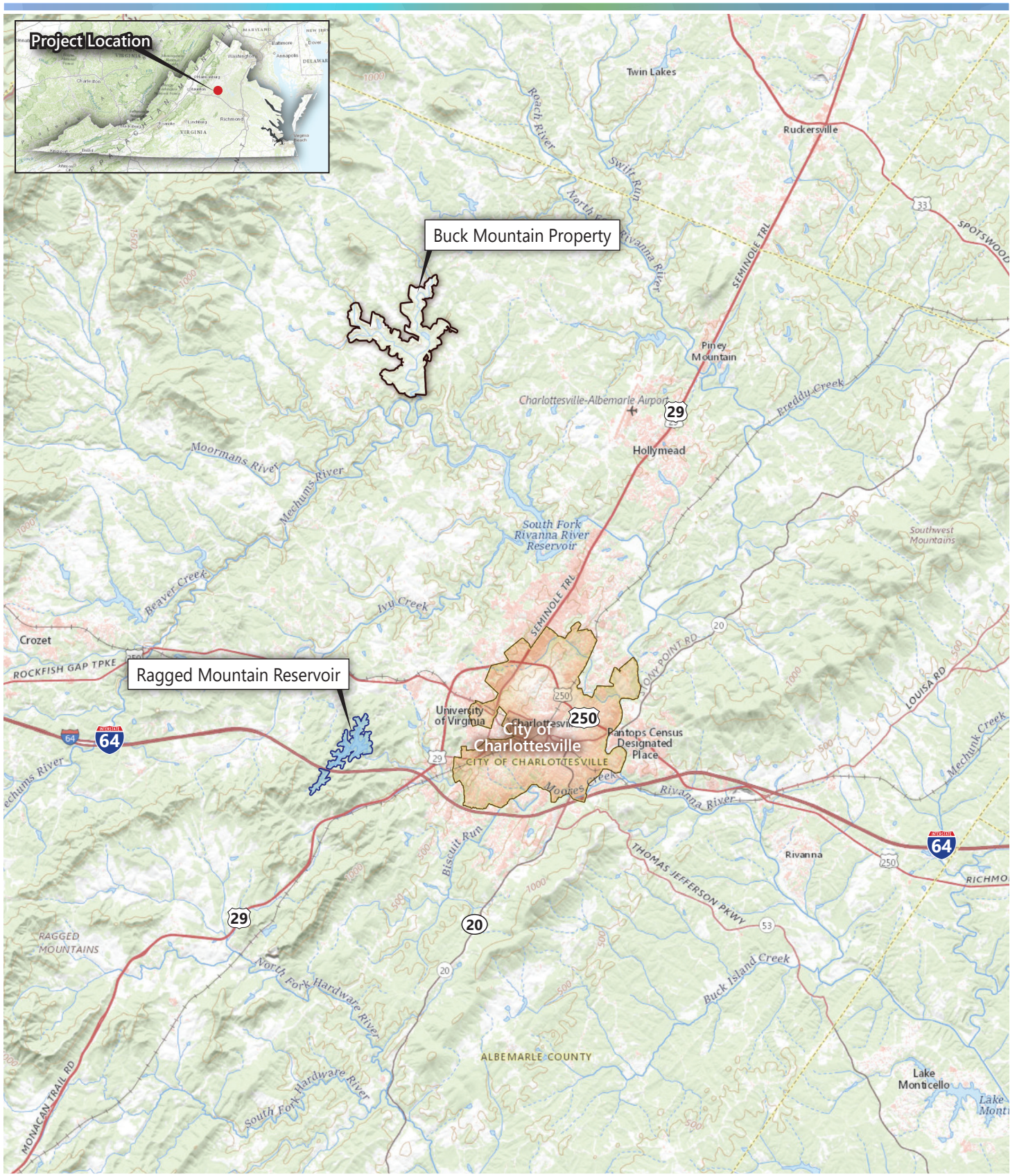
Introduction

The Rivanna Water and Sewer Authority (RWSA) owns a 1,314-acre tract of rural property east of Buck Mountain in the northern part of Albemarle County. The primary uses of the property include conservation to protect water quality and pasture leases to local farmers. RWSA wishes to investigate various land-use options available and how ownership/management of the property fits within their core mission as a water and solid waste service provider. The purpose of this document is to provide supplemental information related to environmental regulatory issues that may affect those land-use options under consideration. The last chapter is a section that provides some additional insight into long-term land management.

Regulatory History

The Buck Mountain property was first considered for a water supply reservoir in the 1970s when property acquisition began. During the final planning stages of the reservoir after property acquisition was accomplished, regulatory constraints resulted in RWSA turning towards an alternative supply of water. The Ragged Mountain Reservoir Expansion Project was developed as a means of meeting the future local water supply needs (Figure 1). In 2008, RWSA obtained regulatory permits to increase water storage at the existing Ragged Mountain Reservoir by increasing the pool level 45 feet. These permits were soon modified to include a 9-mile pipeline connecting the existing South Fork Rivanna Reservoir on the north side of Charlottesville with the Ragged Mountain Reservoir. This pipeline provided RWSA flexibility in moving raw water between water supply reservoirs. The permits for the Ragged Mountain Reservoir and pipeline were issued conditioned upon compensatory mitigation for impacts to 12,392 linear feet of streams and 2.63 acres of wetlands¹

¹ DEQ VWP Individual Permit No. 06-1574; USACE Permit- NAO 2006-0300206-V1574



Upon evaluating different stream mitigation options costing as much as \$6 million, RWSA determined that performing stream mitigation at the Buck Mountain property was the most cost effective approach to satisfy the Ragged Mountain stream mitigation need, while also gaining a beneficial use of the Buck Mountain property since it's use as a future reservoir was no longer considered. A stream restoration and buffer enhancement plan at Buck Mountain was developed, approved by the agencies, and implemented.

Stream channel enhancement included improvements to approximately 570 linear feet of unstable stream bank along Buck Mountain Creek just south of Buck Mountain Road (Route 665). Stream enhancement features were designed to reduce excessive sediment inputs and promote improvements to aquatic habitat quality, particularly for the endangered James spinymussel (*Pleurobema collina*). The design plan was structured to ensure that the stream bank stabilizing measures remain self-sustaining, and a methodology to assess the post-construction efforts was initiated based on detailed field observations and reporting, which will occur over a 10-year period.

Stream buffer enhancement and/or preservation of riparian habitat occurred along approximately 74,000 linear feet of perennial and intermittent streams bisecting the property. This included approximately 93 acres of forested riparian buffer enhancement established at various locations along Buck Mountain Creek, Piney Creek, Burruss Branch, and Elk Run, adjacent to several first and second order tributaries (Figure 2). Work to enhance the buffers included the planting of hardwood species in areas generally void of woody species within the specified conservation easement width (variable by lease), where agriculture and livestock grazing had previously been the primary land uses. In addition, new fencing was installed to exclude cattle from the streamside enhancement buffer.

Preservation of these enhancement areas was achieved throughout the course of the permit approval process, with the land eventually placed in restrictions tied to each constituent's deed and protected in perpetuity. Details of the deed restrictions and the implications to land use are provided later in Chapter 4 of this document.

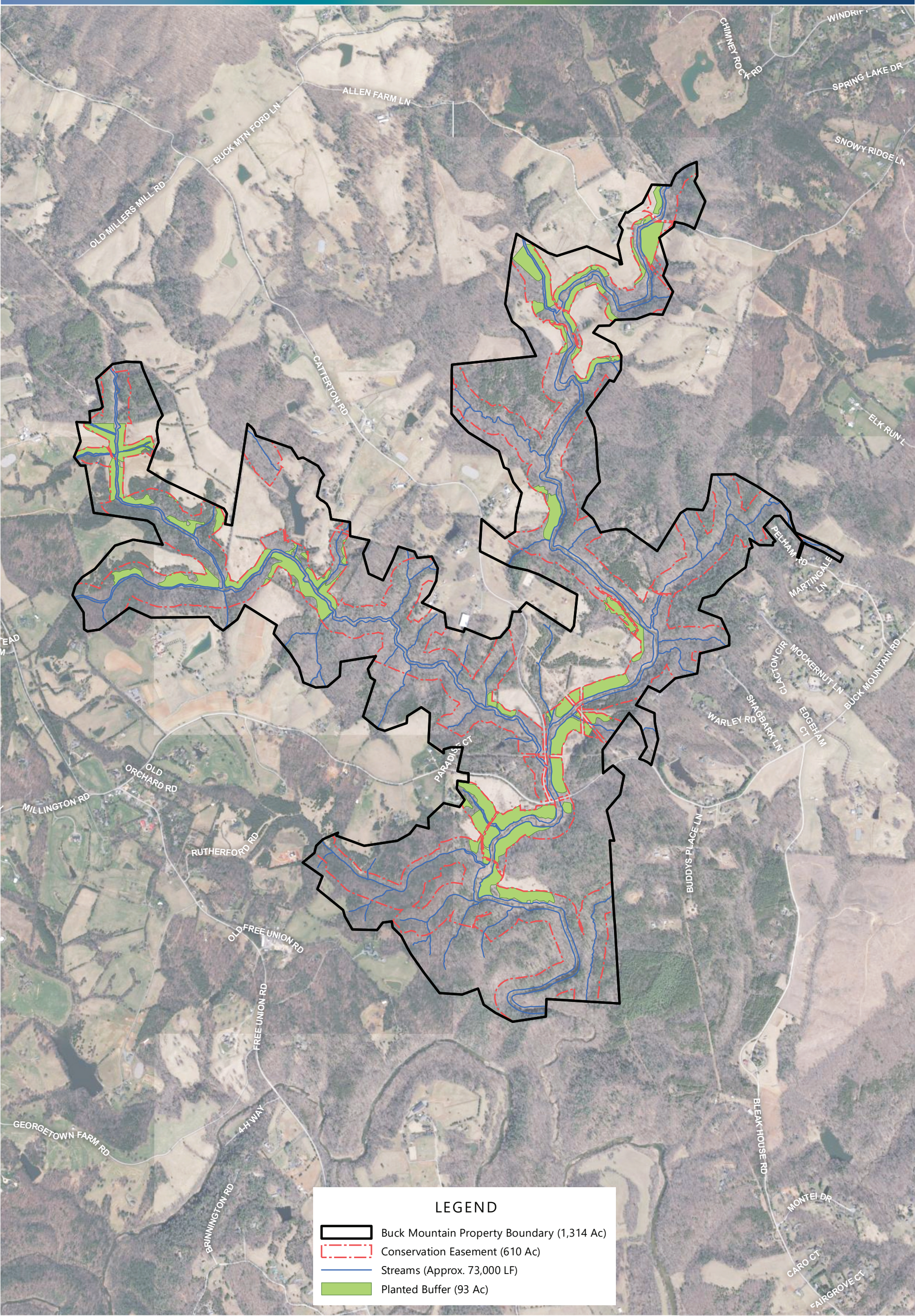


FIGURE 2
**Planted Buffers, Streams and
Conservation Area Map**

2

Regulatory Setting

Regulatory authority has been given to numerous governmental agencies whose purpose is to oversee land use activities for the protection of water resources, rare animals and plants, and cultural resources of significance. This section is an overview of those agencies and their mandate relative to potential land uses at the Buck Mountain Property.

Jurisdictional Waterbodies, Streams, and Wetlands

Section 404 of the Clean Water Act

Waterbodies, streams, and wetlands that serve to provide surface water connectivity to a navigable waterway are regulated at the federal level by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) (33 CFR 320-332), which provides for the protection of water quality in Waters of the U.S., including wetlands, and instructs the USACE to issue permits for activities that result in the discharge of dredged or fill material into these areas. Under current regulation, non-tidal waters of the U.S. include lakes, ponds, and ephemeral, intermittent, and perennial stream tributaries provided there is the presence of a definitive bed and bank that maintains an observable ordinary high water mark (OHWM). Wetlands as defined by the USACE in 33 CFR 328.3 and by the US Environmental Protection Agency (EPA) in 40 CFR 230.3 are “those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils.”

Virginia State Water Control Law

Within the State of Virginia, activities conducted in state waters and wetlands are regulated by the Virginia Wetlands Act of 1972 and State Water Control Law enacted in 2001 (§ 62.1-44.2 *et seq.*). The Virginia Department of Environmental Quality (DEQ), through the State Water Control Board, regulates wetlands and water resources in Virginia. Permitting for wetlands and water impacts involves the issuance of permits related to development activities, certain surface water withdrawals, and certain groundwater withdrawals.

With regard to the protection of surface waters, the following activities are regulated and cannot occur without a Virginia Water Protection permit unless otherwise excluded from permitting:

- a. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions;
- b. Filling or dumping;
- c. Permanent flooding or impounding; or
- d. New activities that cause significant alteration or degradation of existing wetland acreage or functions; or alter the physical, chemical, or biological properties of state waters and make them detrimental to the public health, animal, or aquatic life, or to the uses of such waters for domestic or industrial consumption, for recreation, or for other uses unless authorized by a certificate issued by the Board.

Water Quality (Section 401)

Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a state or authorized tribe where the discharge would originate issues a Section 401 water quality certification verifying compliance with existing water quality requirements or waives the certification requirement. Some of the major federal licenses and permits subject to Section 401 include:

- Section 402 and 404 permits (in non-delegated states),
- Federal Energy Regulatory Commission (FERC) hydropower licenses, and
- Rivers and Harbors Act Section 9 and 10 permits.

In Virginia, the DEQ administers the Virginia Water Protection Permit Program which serves as Virginia's Section 401 certification program for federal Section 404 permits issued under the authority of the CWA.

Stream Buffers

Albemarle County zoning ordinance includes protective measures for stream riparian zones above and beyond typical erosion and sedimentation control measures. Applicable to the Buck Mountain property, Chapter 17 of the ordinance states:

"If the development is located within a water supply protection area or other rural land, stream buffers shall be retained if present and established where they do not exist on any lands subject to this chapter containing perennial or intermittent streams, contiguous nontidal wetlands, and flood plains. The stream buffer shall extend to whichever of the following is wider: (i) one hundred (100) feet on each side of any perennial or intermittent stream and contiguous nontidal wetlands, measured horizontally from the edge of the contiguous nontidal wetlands, or the top of the stream bank if no wetlands exist; or (ii) the limits of the flood plain. The stream buffer

shall be no less than two hundred (200) horizontal feet wide from the flood plain of any public water supply impoundment.”

Stormwater Management

Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) program to limit pollutant discharges into streams, rivers, and bays. In the Commonwealth of Virginia, the DEQ administers the program as the Virginia Pollutant Discharge Elimination System (VPDES). The DEQ issues VPDES permits for all point source discharges to surface waters, to dischargers of stormwater from Municipal Separate Storm Sewer Systems (MS4s), and to dischargers of stormwater from Industrial Activities. The DEQ also issues Virginia Stormwater Management Program (VSMP) permits to dischargers of stormwater from Construction Activities. The EPA maintains authority to review applications and permits for "major" dischargers, a distinction based on discharge quantity and content.

Currently, three laws apply to land disturbance activity in Virginia: The Stormwater Management Act (Va. Code Ann. § 62.1-44.15:24 *et seq.*), Erosion and Sediment Control Law (Va. Code Ann. § 62.1-44.15:51 *et seq.*), and Chesapeake Bay Preservation Act (Va. Code Ann. § 62.1-44.15:67 *et seq.*). A project conducted on the Buck Mountain site will be required to adhere to the Stormwater Management Act and the Erosion and Sediment Control Law. Albemarle County is not a county required by state statute to implement the Chesapeake Bay Preservation Act, although the county enacted their own streamside riparian protection ordinance.

Below is the list of water quality compliances that would be anticipated to be required for a project at Buck Mountain:

- If the proposed activity will disturb more than 1 acre of the project area, compliance with VSMP and a Stormwater Pollution Prevention Plan (SWPPP) will be required for this project;
- A land disturbance permit may be required from Albemarle County;
- Erosion and Sediment Control Plan may be required from Albemarle County;
- A stormwater management plan submitted to Albemarle County would be required to document compliance with water quality and quantity control in accordance with new VDEQ Stormwater Regulations Runoff Reduction Method; and
- Letter of Map Amendment & Letter of Map Revision based on fill within the 100-year floodzone may be required for any construction activities within FEMA floodzone in accordance with National Flood Insurance Program (NFIP) regulations.

Virginia Marine Resources Commission

The Virginia Marine Resources Commission (VMRC), as provided in Chapter 12 of Title 28.2 of the Code of Virginia, is the State agency responsible for issuing permits for encroachments in, on, or over State-owned submerged lands throughout the Commonwealth. Virginia is one of six "low water states" and, as such, maintains ownership of

all submerged lands channelward of the mean low water mark in tidal waters and channelward of the ordinary high water mark on naturally occurring non-tidal perennial streams, creeks, and rivers having a drainage area greater than 5 square miles.

Protected Species

The federal Endangered Species Act of 1973 (ESA) protects animal and plant species on the verge of extinction. An endangered species as “any species which is in danger of extinction throughout all or a significant portion of its range.” The ESA also defines a threatened species as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The current list of federally protected wildlife is provided within the 50 CFR part 17.11 *Endangered and Threatened Wildlife*, amended January 2, 2020. The current list of federally protected plants is provided within 50 CFR part 17.12 *Endangered and Threatened Plants*, amended October 1, 2019. Protection is also provided to bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 USC 668-668C). The ESA provides regulatory authority to the US Fish and Wildlife Service (USFWS) for the administration of the ESA over terrestrial and freshwater aquatic plants and animals and to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) for the administration of the ESA over marine and anadromous species.

The Virginia Endangered Species Act (Va. Code Ann. § 29.1-564 *et seq.*), passed in 1979, protects state-listed wildlife species. This act assigns the regulatory responsibility for listing and protecting endangered and threatened wildlife in Virginia to the Virginia Department of Game and Inland Fisheries (VDGIF). Virginia prohibits the “taking, transportation, possession, sale, or offer for sale within the Commonwealth of any fish or wildlife” appearing on the federal list of threatened or endangered species. In addition, the State Board of Game and Inland Fisheries may issue a regulation declaring that species not appearing on the federal list are threatened or endangered in Virginia, and may also issue regulations prohibiting their taking, transportation, processing, or sale (Va. Code Ann. § 29.1-566). Exceptions to the taking, possession, and transportation prohibitions may be made for “zoological, educational, or scientific purposes and for propagation of such fish or wildlife in captivity for preservation purposes.” (Va. Code Ann. § 29.1-568).

The Virginia Endangered Plant and Insect Act (Va. Code Ann. § 3.1-1020-1030) protects state listed plant species. The act assigns the regulatory responsibility of the listing and protection of endangered and threatened plants to the Virginia Department of Agriculture and Consumer Services (VDACS) Office of Plant Protection. Under this law, the state board is authorized to issue regulations listing plant or insect species as threatened or endangered and restricting actions with respect to these species (Va. Code Ann. § 3.2-1002(A)). Individuals may not “dig, take, cut, process, or otherwise collect, remove, transport, possess, sell, offer for sale, or give away” plant or insect species listed by law or regulation as threatened or endangered, except on their own land (Va. Code Ann. § 3.2-1003). The law provides an exception for permits issued by the Commissioner in limited circumstances (Va. Code Ann. § 3.2-1004). The Commissioner may undertake programs necessary for the

management of threatened or endangered plant or insect species (Va. Code Ann. § 3.2-1001).

Forest Management

Forest management activities in Virginia are not highly regulated, and forest owners are relatively free to implement silvicultural practices they deem to be in their best interest. However, Virginia law generally has three main provisions placed upon a landowner.

1. Landowners are required to notify the Virginia Department of Forestry (VDOF) prior to the start of a silvicultural operation.
2. A landowner is required to provide assurances that forest regeneration is planned to replace cutover lands.
3. A silvicultural operation must comply with forestry best management practices protecting water quality.² Virginia law provides VDOF the authority to protect streams from excessive sedimentation originating from forestry operations by instituting Special Orders or Emergency Special Orders requiring corrective measures with the possibility of civil penalties.

² Virginia's Forestry Best Management Practices for Water Quality Technical Manual, 2011

3

Site Description

The Buck Mountain property lies in the Piedmont geologic province where the rural landscape is generally a patchwork of single-family woodlots, farms, and pastures. Elevations range from approximately 410 feet above mean sea level at the southern end of the property associated with Buck Mountain Creek near the confluence with the South Fork Rivanna River to around 500 feet at the northern end. The confluence of Buck Mountain Creek and South Fork Rivanna River is situated approximately 4.75 meandering miles upstream from the South Fork Rivanna Reservoir, another drinking water supply reservoir managed by RWSA. According to the Soil Survey of Albemarle County from 1985, the property is part of colluvial terraces formed at the foothills of the Blue Ridge geologic province carved by numerous streams, Buck Mountain Creek being the predominate stream channel on the property. General soil types include the Braddock, Thurmont, and Unison soil mapping units. These soils are deep, well drained with clayey or loamy subsoils.

Vegetation

Within the study area, numerous natural, disturbed, and anthropogenic vegetation communities and habitat types were identified. Approximately 61 % of the property is forested with mature trees, 17 % comprises young forest stands regenerating within old pastures, and 16 % of the property is fallow fields, pastures, and lawns. The identified communities are delineated in Figure 3 and the acreages for each community/habitat are provided in Table 1, below.

Table 1: Acreages for Vegetation Communities and Habitats Identified within the Buck Mountain Study Area

Vegetation Community/Habitat		Acres (ac.)	Percentage
Eastern White Pine-Hardwood Forest	Natural	15.1	1.15
Mountain/Piedmont Basic Woodland	Natural	30.2	2.30
Mountain/Piedmont Acidic Woodland	Natural	16.8	1.27
Montane Mixed Oak and Oak-Hickory Forest	Natural	200.2	15.22
Pine-Oak/Heath Woodland	Natural	374.6	28.49

Vegetation Community/Habitat		Acres (ac.)	Percentage
Piedmont Mountain Small Stream Alluvial Forest	Natural	162.9	12.39
Open Water	Natural	4.6	0.35
Stream Channels/Corridors	Natural	56.3	4.28
Successional Mixed Conifer	Modified	70.5	5.36
Successional Mixed Hardwood	Modified	136.6	10.39
Successional Shrubland	Modified	10.7	0.81
Fallow Pasture	Modified	30.0	2.28
Maintained Pasture	Modified	161.6	12.29
Maintained Lawns	Modified	17.8	1.36
Paved Roads	Anthropogenic	6.2	0.47
All-Terrain Vehicle Trails	Anthropogenic	12.3	0.93
Fords/Crossing	Anthropogenic	0.3	0.03
Utility Corridors	Anthropogenic	8.2	0.63
Total		1,314.7	100.00

Eastern White Pine Hardwood Forest

Onsite communities defined as eastern white pine hardwood forests totals approximately 15.1 acres in size. These communities are dominated by mature white pine (*Pinus strobus*), with other pine species, such as Virginia pine (*Pinus virginiana*) and shortleaf pine (*Pinus echinata*), and mixed hardwood species, such as white oak (*Quercus alba*) and northern red oak (*Quercus rubra*), which comprise a much smaller proportion of the overstory. Trees in these areas are generally mature, with trunks ranging from 15 to 20 inches in diameter at breast height (DBH). This community type occurs at the northwesternmost tip of the Piney Creek section of the property.

Mountain/Piedmont Basic Woodland

Mountain/piedmont basic woodland communities comprise approximately 30.2 acres located adjacent to Piney Branch and Burruss Run. These upland areas are dominated by eastern red cedar (*Juniperus virginiana*) and Virginia pine with a co-dominance of hardwoods. This community occurs at the tops of ridges and along many side slopes. Relatively young trees with trunks ranging from 3 to 10 inches in DBH populated most of these areas.

Mountain/Piedmont Acidic Woodland

Mountain/piedmont acidic woodland communities occur in relatively low abundance totaling 16.8 acres at the southern end of the property. Dominant species include pines, including pitch pine and Virginia pine with some shortleaf pine, and a smaller proportion of white oak, northern red oak, and chestnut oak (*Quercus montana*). Most of these areas consisted of stands with smaller, less mature trees ranging from 3 to 6 inches DBH.

Montane Mixed Oak and Oak Hickory Forest

The montane mixed oak and oak hickory forest varies across the site but are most consistent with the “drier type” for this vegetation community. This community exhibits a high occurrence of chestnut oak throughout with northern red oak, white oak, red hickory (*Carya ovalis*), and shagbark hickory (*Carya ovata*). In general, oaks comprised a larger proportion of the overstory than hickories. This community can be found across much of the ridge slopes covering approximately 200.2 acres most of which are found south of Piney Creek and Burruss Run. Trees varied in stem sizes from 5 to 24 inches in DBH, with most between 10 and 20 inches.

Pine-Oak/Heath Woodland

Onsite communities identified as pine oak/heath woodland exhibit wide distribution across the study area and comprised a total of approximately 374.6 acres. A large portion of the acreage occurs south of Buck Mountain Road, with other areas occurring adjacent to Piney Creek and Elk Run. The overstory consisted primarily of pitch pine, Virginia pine, chestnut oak, northern red oak, and white oak. Understory species included sassafras (*Sassafras albidum*), mountain-laurel (*Kalmia latifolia*), and black huckleberry (*Gaylussacia baccata*). Fire generally influences the species composition, cover, and distribution within this community; however, onsite habitats did not exhibit signs of burning indicating recent fire suppression. A higher than typical abundance of hardwood species also suggests that natural wildfire has been suppressed within the study area. Most observed areas consist of mature trees with trunks ranging from 5 to 15 inches in DBH.

Piedmont/Mountain Small-Stream Alluvial Forest

Piedmont/mountain small-stream alluvial forest occurs frequently within the study area covering approximately 162.9 acres in the lower elevations associated with Buck Mountain Creek, Elk Run, and Piney Creek. Trees within this community include American sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), hackberry (*Celtis occidentalis*), sweetgum (*Liquidambar styraciflua*), silver maple (*Acer saccharinum*), ironwood (*Carpinus caroliniana*), and spicebush (*Lindera benzoin*) generally ranging between 5 to 15 inches in DBH with robust understories dominated by invasive and non-native species including Chinese privet (*Ligustrum sinense*) and multiflora rose (*Rosa multiflora*). Most of these areas are located within the deed restricted buffers.

Stream Channel and Open Water

Stream systems present onsite included Buck Mountain Creek, Piney Creek, Burruss Run, and Elk Run, and numerous unnamed tributaries to the named systems. The stream habitat consisted of defined and identifiable perennial, intermittent, and ephemeral stream channels with bed and bank definition and exhibiting an ordinary high water mark. Stream channels total approximately 73,876 LF and 56.3 acres. Open water communities onsite consist of two impoundments likely used as livestock and/or agricultural water supplies. Both ponds drain to Piney Creek. Stream channel and open water communities total approximately 4.6 acres in size.

Successional Mixed Conifer

Successional mixed conifer communities include scattered fallow farm fields and other previously cleared land that have been reclaimed by a dominance of young coniferous species. Virginia pine, shortleaf pine, pitch pine, and red cedar dominated this community. Successional mixed conifer covered approximately 70.48 acres and occur primarily along the Buck Mountain Creek drainageway.

Successional Mixed Hardwood

These communities include areas of fallow farm fields and other previously cleared land that have been reclaimed by a dominance of young hardwood species to include the planted buffer areas. A total of approximately 136.6 acres of the study area is comprised of this community. Hardwood species in this community type include white oak, red maple, sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), and various hickories (*Carya* spp.). Non-native and invasive species such as princess tree (*Paulownia tomentosa*) and tree-of-heaven (*Ailanthus altissima*) also comprise a significant proportion of the community.

Successional Shrubland

This community consists of fallow farm fields and other previously cleared land that have been reclaimed by a dominance of shrub species, predominately non-native, invasive species such as tree of heaven, multiflora rose, and autumn olive (*Elaeagnus umbellata*). Native shrub species present within this community type included common witch-hazel (*Hamamelis virginiana*), black locust (*Robinia pseudoacacia*), and hawthorn (*Crataegus* spp.). This community covers a total of approximately 10.7 acres of the study area. One area occurs south of Buck Mountain Road and the other areas are found along the Piney Creek drainageway.

Fallow Pasture

A total of approximately 30.0 acres of pasture that is not actively utilized by livestock was identified within the study area. Fescue (*Lolium arundinaceum*) and early successional shrubs such as Chinese privet dominated this community. These areas occur north of Buck Mountain Road along the Buck Mountain Creek drainageway.

Maintained Pasture

This community included livestock pasture that was actively maintained for grazing. These areas were fenced along the boundaries to retain cattle or other livestock from entering deed-restricted buffer areas. Active, maintained livestock pasture accounted for a total of approximately 161.6 acres of the study area.

Maintained Lawn

Maintained lawns include grassed areas regularly mowed for aesthetics/yards. These areas consist of fescue and other lawn grasses as well as typical lawn weeds. This community type

comprises approximately 17.8 acres of the study area and occurs adjacent to the farm pond north of Piney Creek.

Paved Roads

While not technically part of the RWSA ownership, paved roadways are included in the general, overall perspective of the property as an important component to land access. Public roadways comprise a total of approximately 6.2 acres of the land shown in Figure 3 associated with Buck Mountain Road.

All-Terrain Vehicle Trails

All-terrain vehicle (ATV) trails occur throughout the property typically associated with farming/livestock operations. These trails are distinguished separately from improved dirt roads but could be used by standard four-wheel drive vehicles in most areas under dry conditions. These trails totaling over 8 miles comprise a total of approximately 12.3 acres of land area.

Fords/Crossings

Fords and stream crossings consisted of shallow waterway crossings maintained for use by vehicles, ATVs and/or livestock. The conditions of these crossings vary substantially across the study area, with several having been unmaintained and washed away. These areas totaled approximately 0.3 acres.

Utility Corridors

Utility rights-of-way corridors are found primarily just north of Buck Mountain Road totaling approximately 8.2 acres. Vegetation within these areas vary greatly depending on the degree of maintenance. These occur just north of Buck Mountain Road.

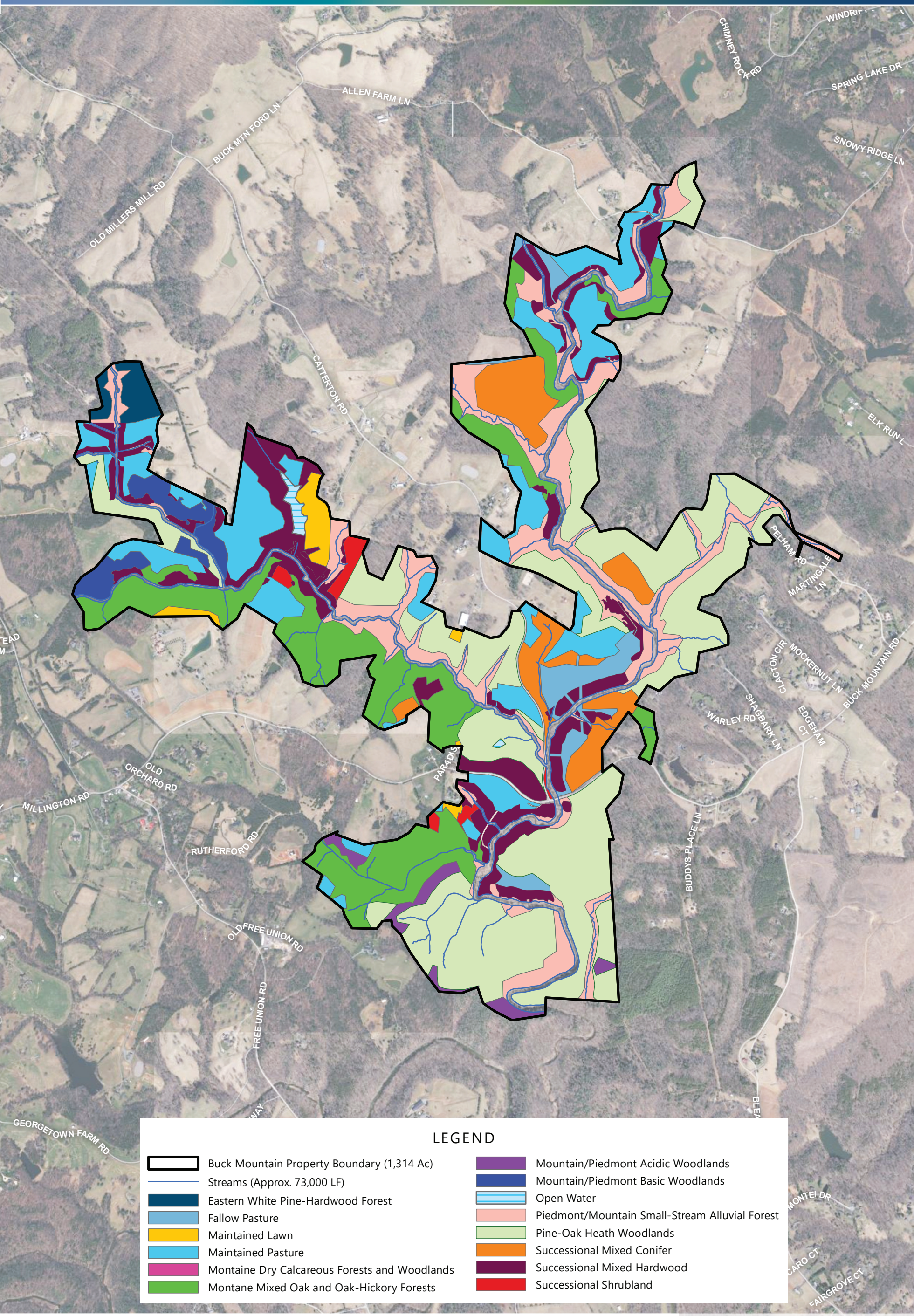


FIGURE 3
Vegetation Communities

Threatened and Endangered Species

Searches using the US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system, the Virginia Natural Heritage Resources Data search of the Virginia Department of Conservation and Recreation (DCR), and the Virginia Fish and Wildlife Information Service (VaFWIS) of the Virginia Department of Game and Inland Fisheries (DGIF), were used to determine the potential presence of threatened or endangered species with the study area. The results of these database searches are provided in Appendix A, and they indicate the James spiny mussel (*Pleurobema collina*), federally and state endangered, and the northern long-eared bat (NLEB) (*Myotis septentrionalis*), federally and state threatened, may be present onsite.

The James spiny mussel is a freshwater mussel identified by a shiny yellow shell with or without one to three short spines. Like other mussels, it is a filter feeder. This species inhabits a variety of silt-free substrates within free-flowing streams with a range of flow regimens. It primarily occurs in small headwater tributaries within the James and Dan river basins. Surveys have indicated it is present in West Virginia, Virginia, and North Carolina.

Onsite, it is indicated as potentially present within Buck Mountain Creek and Piney Creek. This species was confirmed present by Virginia Department of Game and Inland Fisheries biologists at the Buck Mountain Road stream crossing. No further formal surveys for the species have been conducted within the study area. The James spiny mussel is considered a short-term brooder, and DGIF recommends a time of year restriction of May 15 through July 31 for in stream work.

NLEBs spend winter hibernating in various sized caves and mines with constant temperatures, high humidity, and no air currents. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags. During the summer they can be impacted by activities that involved tree removal. In order to avoid impacts to NLEBs, USFWS and DGIF recommend restrictions prohibiting tree removal within 150 feet of a documented maternity roost from June 1 through July 31 and prohibiting tree removal within 0.25 miles of a documented hibernaculum. The current VDGIF records indicate no known maternity sites or hibernacula in the vicinity of the Buck Mountain property.

The Center for Conservation Biology Bald Eagle Mapper was searched for bald eagle nests near the study area. The mapper identified no eagle nest within or adjacent to the study area.

Cultural Resources

A Virginia Cultural Resources Information System (VCRIS) of the Virginia Department of Historical Resources (DHR) search was completed to determine the potential presence of historical or archeological resources within the study area. The results of the search indicated there were two documented historical resources present within the study area boundaries, the Elliot House (#002-0343) and the Catterton Farm (#002-0368). According to DHR records, the Elliot House is a two-story wooded home built in the late 19th century with

multiple additions dated around 1905. A drilled well exists approximately 70 to 80 feet deep, and there are no other structures. While the age of the house dictates it to be viewed as historic (older than 50 years), the structure is not historically significant. The Catterton Farm main structure was recorded in the archives but is no longer present on the property. It is believed to have been relocated offsite. The VCRIS reports and Figure 6 mapping showing the location of these resources are included in Appendix B.

With the understanding the RWSA owns the Elliot House, no law prohibits its removal unless RWSA is involved with a project requiring state or federal action, such as a wetland permit. Under state and federal rules, the agency issuing the permit would be required to coordinate with DHR under Section 106 of the Historic Preservation Act. If no agency action is required, it would be advisable that RWSA coordinate with DHR to allow DHR to gather additional data on the house before it is removed. VHB suggests RWSA consult with a professional archaeologist on any project affecting a historic resource.

4

Land Use Discussion and Regulatory Constraints

The Buck Mountain property was chosen as the source of stream mitigation for the Ragged Mountain project that included deed restrictions covering 610 acres of stream riparian areas. All other land comprising 704 acres do not have land-use restrictions related to the Ragged Mountain Reservoir mitigation (Figure 4). This important distinction is discussed in this section in the context of land-use implications for both restricted and non-restricted areas.

Deed Restricted Area

During the wetland permit application review process, the regulatory agencies approved protection of streamside riparian buffers for RWSA as a necessary component for the Ragged Mountain stream impacts. The protection measures are legally secured via a deed restriction covering the stream buffers that extend approximately 100 to 200 feet from the streams at Buck Mountain (referred to as "Preservation Area").

The restrictions include:

1. Destruction or alteration of waters of the United States, waters of the State, natural vegetation, or natural contours of the land;
2. Construction, maintenance or placement of any structures or fills including, but not limited to, buildings mobile homes, fences, signs, other than those which currently exist;
3. Ditching, land clearing or discharge of dredged or fill material, including diking, damming, filling, excavating, grading, plowing, flooding/ponding, draining, mining, drilling, placing of trash and yard debris or removing/adding topsoil, sand, or other materials;
4. Permitting livestock to graze, inhabit or otherwise enter the Preservation Area;

5. Cultivating, harvesting, cutting, logging, planting, and pruning of trees and plants, or using fertilizers and spraying with biocides.

Those activities that are not restricted include:

- Activities which are reasonably necessary to the establishment, planting, preservation, maintenance and monitoring of the vegetated buffer and maintenance of the Preservation Area, including instream structures and improvements for site access. Should disturbances to trees/vegetation occur due to these activities, the area will be restored as per the mitigation plan;
- Construction, placement, and maintenance of boardwalks, wildlife management structures, observation decks, informative signs, livestock crossings, equipment fords, utilities, or unpaved foot, bicycle or equestrian trails, provided that any such structures permit the natural movement of water and preserve the natural contours of the ground and are approved in writing by the Corps and the DEQ.

The deed allows for amendments under the following conditions.

The covenants contained herein shall not hereafter be altered in any respect without the express written approval and consent of the Owner, or its successor in interest, and the Corps and the DEQ. The Owner or its successor may apply to the Corps and DEQ for vacation or modification of this Declaration, however, after their recording, these restrictive covenants may only be amended or vacated by a recorded document signed by the Corps and DEQ and the Owner and its successor in interest.

Very few structural improvements are present within the Preservation Area that would qualify for continued maintenance under part 2 above. Other than unimproved roads and pasture fences, the rural landscape, terrain, and remoteness of the land render it an unfavorable location for most forms of structures to include residential homes, barns, and sheds. Because the deed restriction eliminates forestry and agriculture (logging, plowing, and livestock grazing), use of the Preservation Area becomes limited to passive recreational uses such as bike, pedestrian, and equestrian trails.

Non-Restricted Areas

For those areas not under the deed restriction, typical development activities common to the area such as single-family residential, agriculture, wineries, equestrian centers and the ilk would have very few regulated environmental restrictions, particularly since no streams fall within the non-restricted areas that could otherwise trigger some form of wetland/waters permitting or trigger endangered species impact concerns. These forms of land uses if proposed would involve typical plan review at the local level to insure compliance with county zoning, stormwater regulations, and other local regulations affecting building setbacks, etc.

Silviculture

Forest management practices would be a permissible activity outside of the Preservation Area in accordance with county zoning. Approximately 475 acres of forested lands occur outside of the restricted riparian areas. RWSA may wish to prepare a forest management plan for review by the Virginia Department of Forestry (VDOF) to ensure compliance with Virginia's Forestry Best Management Practices for Water Quality (2011). Such a plan would state forestry management objectives, identify sensitive natural areas, and provide specific plans for forest roads, timber harvesting, reforestation, and forest protection measures.

Additionally, loggers will require road access that provides a stable surface for trucks loaded with logs. The Buck Mountain Property contains very few such roads, which would require that a logger build new roads to access timber. Interpretation of the deed restriction would prohibit the construction of new roads crossing the stream bottoms, which would force loggers to access some tracts through neighboring parcels. It is unclear from the deed restriction language whether an existing ATV trail and stream ford could be improved to handle haul trucks. This would be a question RWSA would need bring to the USACE and Virginia DEQ since it technically requires fill material (gravel) and changes to grades to make the ATV trails passable by trucks.

Some portions of the non-restricted forested areas occur on steep slopes. While there are no regulatory prohibitions governing the harvest of trees on steep slopes, a logging operation would nevertheless be required to abide by forestry best management practices for water quality. RWSA could require a logger to skid trees to a loading deck using cables rather than traditional skidders. Cable logging is a softer, less impacting approach to removing trees than large rubber-tired skidders.

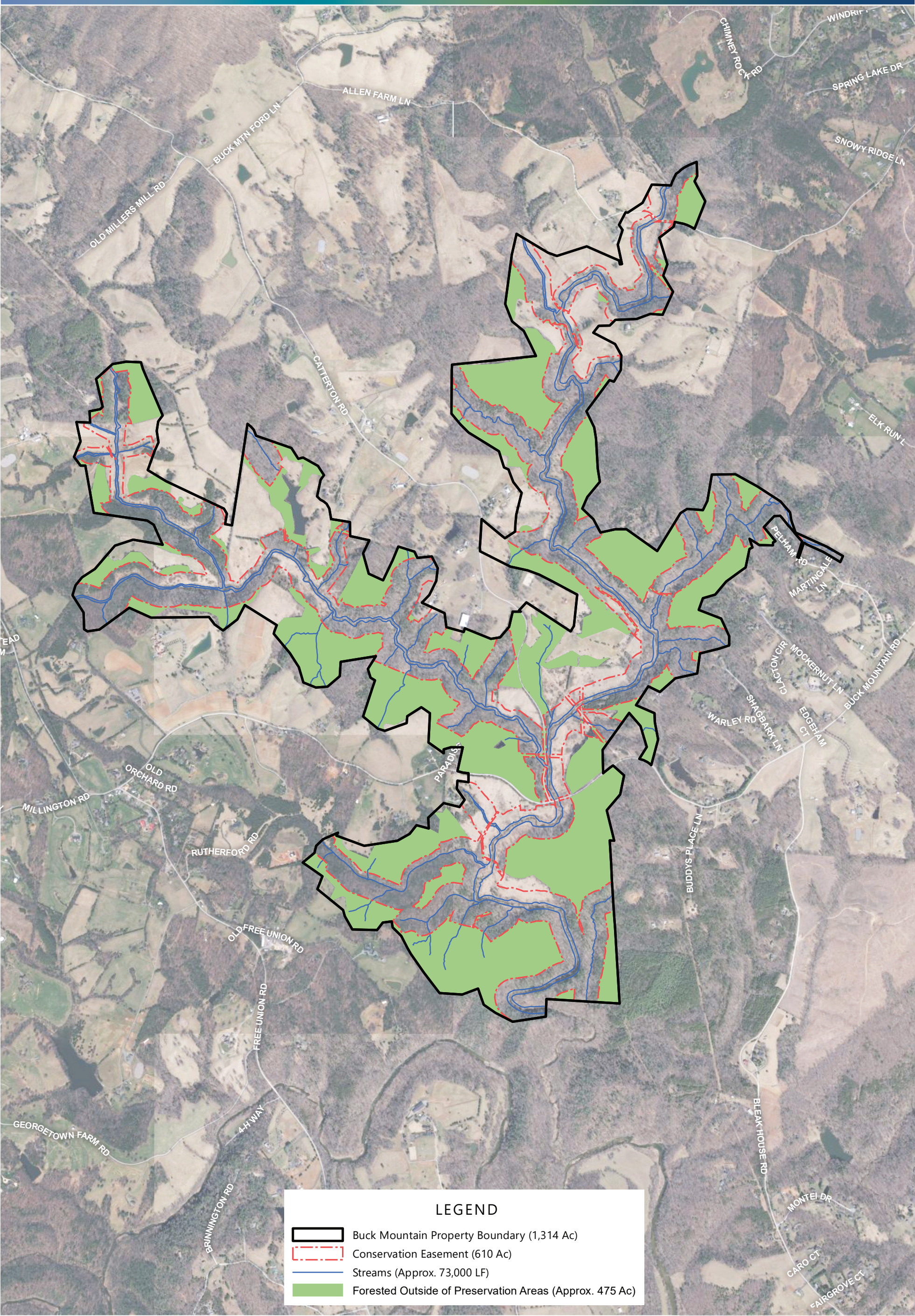


FIGURE 4
Forested Areas Outside of
Conservation Areas

Potential Future Reservoir

One particular question drawing attention is whether the Buck Mountain property can ever be used for a future drinking water supply reservoir. This section addresses this question in the context of the wetland/stream permitting process, notwithstanding Virginia dam safety requirements.

While the notion of a future reservoir is not completely beyond the realm of possibility, overcoming the environmental constraints and bearing the costs necessary to secure regulatory permits would be very difficult. First, the Buck Mountain property is inexorably connected to the regulatory decision-making that justified issuance of Individual Permits for the Ragged Mountain Reservoir improvements. For there to be a new reservoir at Buck Mountain, this connection would need to be severed, thereby re-opening regulatory oversight of the Ragged Mountain Reservoir to satisfy the stream mitigation necessary to compensate for the 12,392 linear feet of stream impacts. RWSA would need to re-establish a new stream mitigation plan for Ragged Mountain for agency approval and seek a modification to the original permit. This would not be done until such time that the agencies would approve the use of Buck Mountain for a reservoir and only then would they sign documents to vacate the deed restrictions.

The work necessary to permit Buck Mountain for a new reservoir would include two layers of environmental review: 1) preparation of a National Environmental Policy Act (NEPA) document; and 2) the submittal of a Joint Permit Application (JPA). These steps are described more fully below.

- The project would trigger a federal action [i.e., issuance of a permit by the U.S. Army Corps of Engineers (USACE)] that would require NEPA compliance. In all likelihood, the USACE would determine that a new reservoir of this magnitude would require an Environmental Impact Statement (EIS), the most comprehensive form of NEPA review, because of the high amount of stream impacts, the presence of a federally endangered species, and the significance of the project on a regional level. An EIS is a planning document that the USACE, as the lead federal agency, would place the burden of preparing on RWSA similar to what occurred to Newport News Waterworks in their efforts to permit the King William Reservoir about 20 years ago. The EIS process, likely lasting longer than two years, would address these topics.
 - Purpose and Need – This section would be dedicated to providing sufficient documentation justifying the need for a new water source. The needs analysis would include a determination of consumer use and water volume requirements projected into the future. The purpose of the project (supply volume and reservoir size) would be tied to the needs assessment.
 - Alternatives Analysis – This section of the EIS would identify and thoroughly describe all possible alternatives that would satisfy the project need to include one or a combination of surface water withdrawal, groundwater withdrawal, and/or reservoir storage. The alternatives analysis would be structured around satisfying federal and state rules requiring that RWSA avoid and minimize environmental impacts by selecting the least damaging,

practical alternative (referred to as LEDPA). RWSA would be required to demonstrate to the agencies' satisfaction that a Buck Mountain reservoir would be the LEDPA as the preferred alternative. The results of this analysis at the conclusion of the EIS process would be eventually carried over to the state and federal permitting process to impact the streams and ponds on the property (discussed below).

- Affected Environment – This section of the EIS would summarize the existing conditions of the site relative to:
 - Wetlands and Streams
 - Fish and Wildlife
 - Vegetation
 - Special Status (Listed) Species
 - Floodplain Values and Flood Hazards
 - Water Supply and Conservation
 - Water Quality
 - Cultural Resources
 - Land Uses and Adjacent Landowners
 - Public Health and Safety
 - Socioeconomic
 - Environmental Justice
- Environmental Consequences – This section would evaluate the primary, secondary, and cumulative impacts for each of the impact topics listed in the Affected Environment section as a result of constructing a new reservoir, as well as all mitigative measures to reduce and offset impacts. Because of the presence of the endangered James spinymussel, the USACE would initiate formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act. This would require a survey in the channels to determine the relative abundance of individual mussels. Using this information, a Biological Assessment (BA) would be prepared by RWSA that describes the project, the physical attributes of the project area, and how the action may affect the listed species. The second step would involve a review of the BA by the USFWS to render a Biological Opinion (BiOp) summarizing impacts, assessing mitigative measures, and determining whether the project would jeopardize the continued existence of the species.
- Completion of the Administrative Record and Signing the Record of Decision (ROD) - Once the draft EIS is prepared, it would be made available for public review and comment. RWSA would gather, review, and process all comments (both agency and general public comments), and incorporate any comments/edits into the draft EIS to create a final document for USACE signature via a Record of Decision (ROD).

Once the EIS process is completed, RWSA would prepare a Joint Permit Application (JPA) to receive permits to construct the reservoir. Permits would be required from the USACE and Virginia Department of Environmental Quality (VDEQ) for impacts to area stream channels and wetlands. The Virginia Marine Resources Commission (VMRC) would also require a permit for construction of the dam and impacts to state bottomlands (defined as any channel having a drainage basin greater than 3,200 acres). A new Buck Mountain reservoir would also require an incidental “take” permit from the USFWS for impacts to the James spiny mussel. The BA and BiOp process described above would address the incidental taking. USFWS could possibly require the capture and relocation of James spiny mussel individuals to other suitable habitats as a mitigative measure.

The last component of the permitting process is compensatory mitigation. Impacts to streams would approximate 73,876 linear feet of high-quality channels, each of which would need to be evaluated using the Unified Stream Methodology (USM) scoring system to determine the mitigation requirement. Assuming an average mitigation ratio of 1.3 linear feet of stream mitigation per 1.0 linear foot of stream impact, the mitigation requirement would approximate 96,038 stream mitigation credits. This would be added to the approximate 17,000 linear feet of stream credits necessary to replace the stream impacts at the Ragged Mountain Reservoir for a total of 113,038 credits, equivalent to 21.4 miles of stream restoration. Currently, the cost of stream mitigation at a private bank or the Virginia Aquatic Trust Fund (an in-lieu fee mitigation program) runs around \$400 to \$450 per credit. Using the lower cost estimate, the RWSA would need to budget approximately \$45.2 million to pay the stream mitigation cost for a Buck Mountain Reservoir.

Potential Mitigation Bank

Another land use that has been discussed is a mitigation bank. There are generally two types of mitigation banks: wetland/stream banks and stormwater nutrient banks. A mitigation bank is a property set aside for either the design and restoration of wetlands/streams or stormwater management features that remove stormwater nutrients/sediments. The regulatory agencies would oversee the creation of a new mitigation bank, they would decide how many acres or linear feet of wetlands/streams are restored or how many pounds of nutrient removal could be achieved, and they would determine how many credits that bank could sell. The banker then would receive a permit to begin selling those credits in an open market to individuals who need mitigation credits for their own project impacts (developers, DOT, etc). A bank performing wetland/stream restoration to create wetland/stream credits cannot also claim nutrient/sediment credits from the wetland/stream restoration and sell nutrient credits, and vice versa.

Conditions at the Buck Mountain property were evaluated for the potential use as either a wetland/stream mitigation bank or a stormwater nutrient bank. First, we will discuss the topic of stream/wetland bank. The property contains over 13,000 LF of streams that are already being preserved as mitigation for the Ragged Mountain property. The residual land outside of the restricted area contains gently to steep sloping uplands having no opportunities for wetland creation or stream restoration that would provide significant numbers of credits worthy of the effort and cost to create a mitigation bank.

A nutrient bank is one that treats runoff from impervious surfaces and/or plowed agricultural fields within a watershed using stormwater designed BMPs and conversion to forests to lower the nutrient load of the discharging water. The Virginia DEQ has established nutrient removal rates for various land-uses based landscape conditions (soil type, vegetation density, slope, etc.). The amount of nutrient removal is typically measured using the elements nitrogen and phosphorus. Below is a table showing general phosphorus removal rates in pounds per acre per year for different actions.

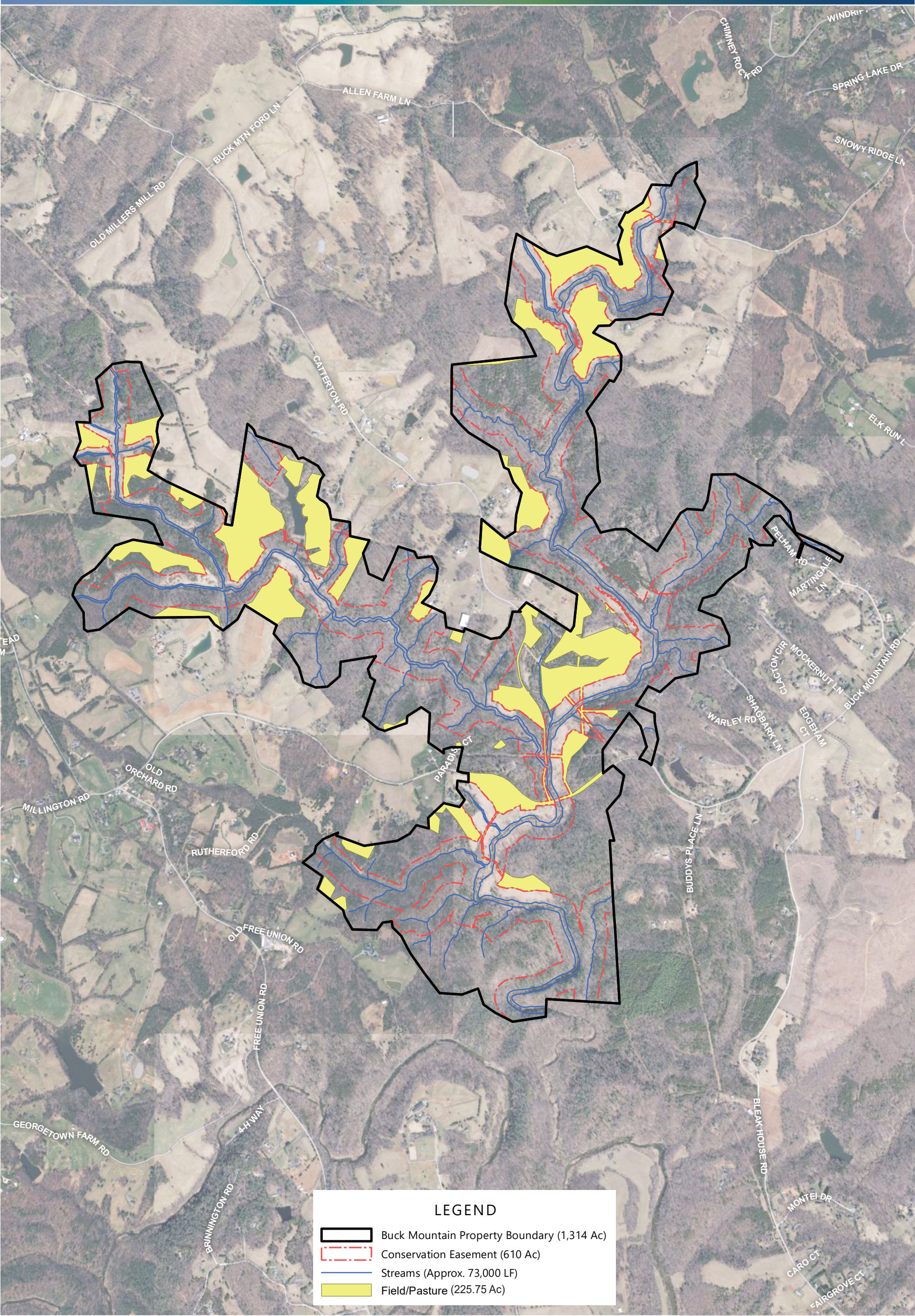
Table 2: Stormwater Management Estimated Phosphorus Removal Rates

Land Cover	Stormwater Measure	Credits Gained (lbs Phosphorus Removed per Acre)
Unmaintained meadow	Converted to Forest	0.0
Mowed Lawn or Pasture	Converted to Forest	0.50 ³
Cropland	Converted to Forest	1.22 ³
Impervious	BMP Retention	2.08 ⁴

The Buck Mountain Property lies in a rural area with very little impervious surfaces. Also, there are no crop fields. The property is mostly forested providing the highest degree of natural stormwater filtration. Approximately 223 acres of pastures/fields could be converted to forested areas providing some reduction in nutrient loads, but the reductions in nutrient loads gained by converting pastures to forests are minimal (Figure 5). The Virginia DEQ cites a removal rate in areas west of Interstate 95 as 0.5 lbs of phosphorus per acre per year for converting pasture to forest. Assuming a best case that all open fields landward of the preservation areas are active pasture (223 acres), converting all of this acreage to forest would yield a total of 111.5 lbs of phosphorus removal. VHB understands the general price for a 1-lb credit of phosphorus ranges between \$10,000 to \$15,000 in the Charlottesville market area. The projected gross revenue to be gained at Buck Mountain, therefore, for a nutrient mitigation bank on the highest end would be \$1,672,500. Assuming 300 one-gallon nursery stems per acre would be planted (66,900 trees) at \$40 per stem installed (cost to include 1-year warranty), the cost of planting the trees would be over \$2.6M. Added to this cost would be fees to apply for and secure the mitigation bank permits, agency coordination, monitoring survivorship of planted trees, additional fencing, legal fees, and administrative costs for marketing and managing the mitigation bank. Given these costs, VHB believes that creating a profitable nutrient bank using the non-restricted clearings would not be practical.

³ Virginia Department of Environmental Quality. 2005. Trading Nutrient Reductions from Nonpoint Source Best Management Practices in the Chesapeake Bay Watershed: guidance for Agricultural Landowners and Your Potential Trading Partners. https://deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/VANPSTradingManual_2-5-08.pdf

⁴ https://www.swbmp.vwrrc.vt.edu/wp-content/uploads/2017/11/GM16-2001-Virginia-Runoff-Reduction-Method_V3.pdf



5

Land Management Implications

With ownership comes responsibilities as stewards of public land to properly manage the natural resources, maintain the improvements, and keep the property clean and free of nuisance debris. It requires a dedicated workforce and budget to handle routine items and repair/replace unexpected damages.

The first consideration in managing the Buck Mountain property is establishing goals and objectives. Within the framework of the deed restrictions at the Buck Mountain property, the riparian buffer areas may not offer much choice. But for the remaining sections of land, one or more objectives such as wildlife habitat improvements, timber production, water quality, public recreation, income from lease agreements, etc. are possibilities. Much depends on the intensity of changes RWSA wishes to employ compared to existing conditions, costs to implement the actions proposed, and how proposed land uses fit within the context of RWSA's mandated purpose. Once those goals and objectives are established, next would come a written management plan.

This section is intended to provide RWSA some basic considerations of managing the property over the long term that may help with future land-use decisions. For purposes of this discussion, VHB offers the following considerations generalized under two categories: Ecological Management and Infrastructure Management.

Ecological Management Considerations

The Buck Mountain property offers a wide range of ecological systems and habitat types. For the most part, these systems are in relatively good condition. But while the Buck Mountain property may appear to be somewhat self-sustaining with regard to ecological processes, a "leave it untouched" approach can be detrimental to the long-term ecology of the site. With the deed restrictions in place, this approach can be especially true since the deed restrictions provide a simple excuse to do nothing. However, VHB has observed properties having virtually no natural resource management goals in place (namely public parks) become near biological deserts because of poor attention given to clear signs of changing conditions. In particular, public lands are prime areas for deer to find refuge and invasive plants to proliferate because of over-browsing. Too often deer population densities explode over 10 times what the ecological system can sustain. The end results become low biological

diversity; forests that can't regenerate because of deer over-browsing; understories that comprise almost 100 percent of invasive species such as Nepalese browntop (*Microstegium vimineum*), Japanese barberry (*Berberis vulgaris*), and multiflora rose (*Rosa multiflora*); and poor wildlife habitat for other species. Once that happens, it becomes almost impossible to reverse because of the intensity of management activities and costs. As RWSA considers long-term ownership of the Buck Mountain property, avoiding such an ecological condition should be a management goal. VHB suggests RWSA perform a flora and fauna inventory to establish baseline conditions, determine the degree to which invasive species are present, and continue to monitor the ecological conditions to spot undesirable changes so that corrective actions can be taken early. RWSA may need to be prepared for intensive steps such as deer removal and invasive species control to retain an ecological balance. RWSA would also need to have plans in place in response to natural disasters such as wildfires, tree diseases/insect infestations, and storm damage, as these events can often promote invasive species outbreaks.

Infrastructure Management

The Buck Mountain property does not retain an overwhelming amount of improvements that require significant upkeep and replacement. Most are roads, trails, and fences. For a passive management approach, perhaps simple upkeep of existing infrastructure is all that is desired. Issues such as repairing washed out dirt roads and culverts, cleaning debris after a wind storm, and replacing a vandalized gate are the undesirable and often overlooked realities to managing land, Buck Mountain being no exception. RWSA will need to consider to what degree performing these duties on a routine basis becomes an unacceptable burden to daily operations, or whether these realities are embraced as a part of normal operations.

While not every aspect of managing property infrastructure at Buck Mountain can be detailed in this report, VHB wishes to outline just a few for RWSA consideration.

Improved Dirt Roads

Improved dirt roads are scattered across the property in short segments totaling approximately one mile (Figure 5). Routine maintenance would be necessary to prevent and repair ruts, potholes, and eroded gullies, particularly on steeper slopes. Proper equipment and skilled operators are necessary for this job, mostly likely supplied by a local contractor. Gravel may need to be hauled in to improve road surfaces. Depending on the stability of the base material, road maintenance is usually an annual task. Frequent visits to the property to inspect roads, particularly after heavy rainfall events, are suggested to spot areas in need of minor repair before further instability of the roadbed causes the road to be impassable and repair costs become overly expensive. RWSA may wish to examine the need for additional improved roads (i.e., engineered designed gravel) to reach other sections of the property so as not to rely on adjacent property owners for access.

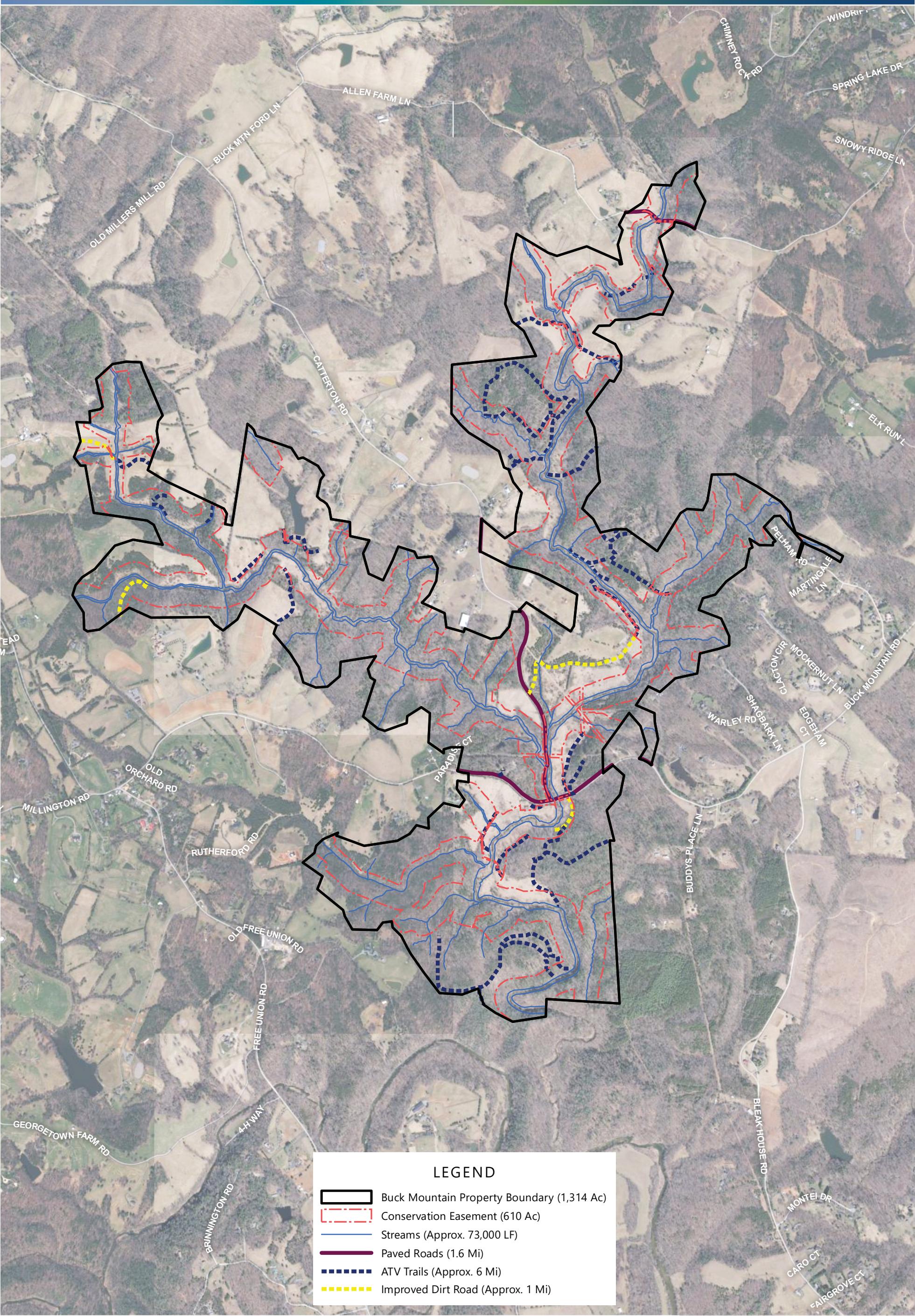


FIGURE 6
Roads and ATV Trails

ATV Trail

VHB estimates approximately 8 miles of ATV trails/unimproved roads are present within the property boundaries (Figure 6). Many of the ATV trails are in a condition that they could be used by four-wheeled drive trucks but continued use by heavy vehicles can quickly cause trails to deteriorate. It may be advisable to rate each trail in terms of surface condition (wet, dry, mudholes, etc.) and pinpoint those trails not usable by larger vehicles. ATVs are a great source of transportation across rough terrain to gain access to places trucks can't reach. It is recommended that RWSA consider establishing an ATV trail network that, once on the property, personnel can gain access across the entire property (stream crossings included) without having to exit the property and re-enter somewhere else.

Fencing and Gates

While not fully measured, an estimated 10 miles or more of fences and 23 gates were observed on the property. Most of the fencing runs along the boundaries of the planted mitigation areas within the deed restricted riparian zones and leased pastureland. The estimated lifespan of a typical barbed wire fence and gate is 20 years. A simplified management objective, therefore, would be to expect replacement of one-twentieth of the fences each year and 1 gate every year. RWSA should perform inspections of all fences and gates every year to determine if damaged has been caused by natural events or vandalism.

Property Boundaries

The Buck Mountain property has approximately 17 miles of property boundary which may require routine upkeep. Management of the boundary lines can range from doing nothing to painting the boundary lines and posting "No Trespassing" signs. Most public parks maintain their boundary lines with posted signs at a minimum that enables legal enforcement of trespass laws. If RWSA wishes to have identifiable boundary lines in the field, all lines would need to be painted and new signs posted, and RWSA could expect refreshing sections of line every five years.

Since RWSA is obligated to protect the deed restricted areas from prohibited activities, this adds another element to the boundary issue. RWSA should consider whether the preservation areas should also be identified in the field and posted as well, which would add another 30 miles to maintain.

In summary, managing large tracts of land is time consuming, expensive, and challenging. Routine maintenance and upkeep can be overburdensome enough, let alone contending with unexpected situations like wildfires, storm damage, washouts and vandalism. While the list above provides a simple overview of considerations for the field, RWSA will need to consider in-office activities as well to include day-to-day administrative duties, long term planning, risk assessments/liabilities, and the degree to which legal assistance is needed.

Appendices

Appendix A

Listed Species Information

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

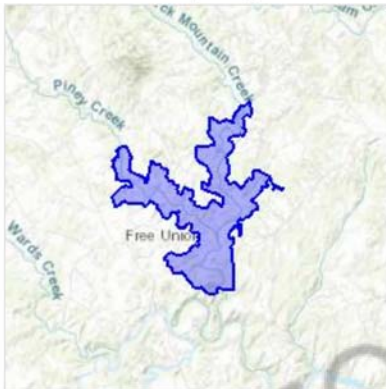
Project information

NAME

Buck Mountain Master Plan

LOCATION

Albemarle County, Virginia



DESCRIPTION

Develop master planning document for the Buck Mountain Creek property owned by Rivanna Water and Sewer Authority including environmental constraints and development options.

Local office

Virginia Ecological Services Field Office

☎ (804) 693-6694

📅 (804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

<http://www.fws.gov/northeast/virginiafield/>

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
James Spiny mussel <i>Pleurobema collina</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2212	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

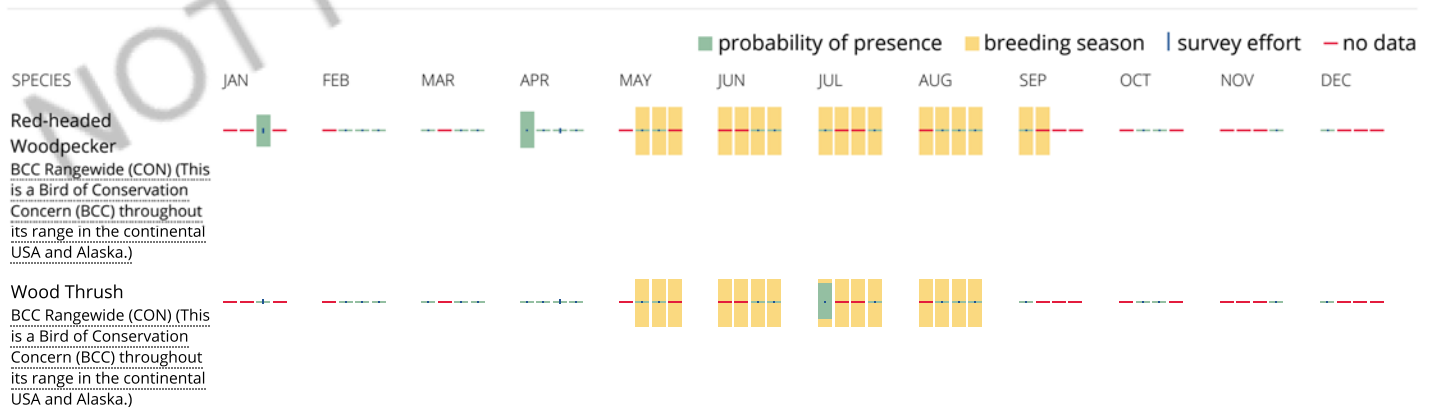
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern \(BCC\)](#) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is

simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[Palustrine](#)

RIVERINE

[Riverine](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal

zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Web Project ID: WEB0000012840

Client Project Number: 34603.00

PROJECT INFORMATION

TITLE: Buck Mountain Master Plan

DESCRIPTION: Develop master development plan including environmental restraints for Buck Mountain Creek property owned by Rivanna Water and Sewer Authority.

EXISTING SITE CONDITIONS: Stream mitigation site with enhanced buffers. Much of the buffer area had been clear cut, but was planted as mitigation for the expansion of the ragged mountain reservoir. Currently all mitigation areas on the property are protected by deed restrictions

QUADRANGLES: Free Union

COUNTIES: Albemarle

Latitude/Longitude (DMS): 38° 8' 59.2906" N / 78° 32' 40.7008" W

Acreage: 1,314 acres

Comments:

REQUESTOR INFORMATION

Priority: N

Tier Level: Tier II Plus

Tax ID:

Contact Name: Sean Murray

Company Name: VHB

Address: 351 McLaws Circle, Suite 3

City: Williamsburg

State: VA

Zip: 23185

Phone: 8134316043

Fax: 757-220-8544

Email: seanmurray@vhb.com

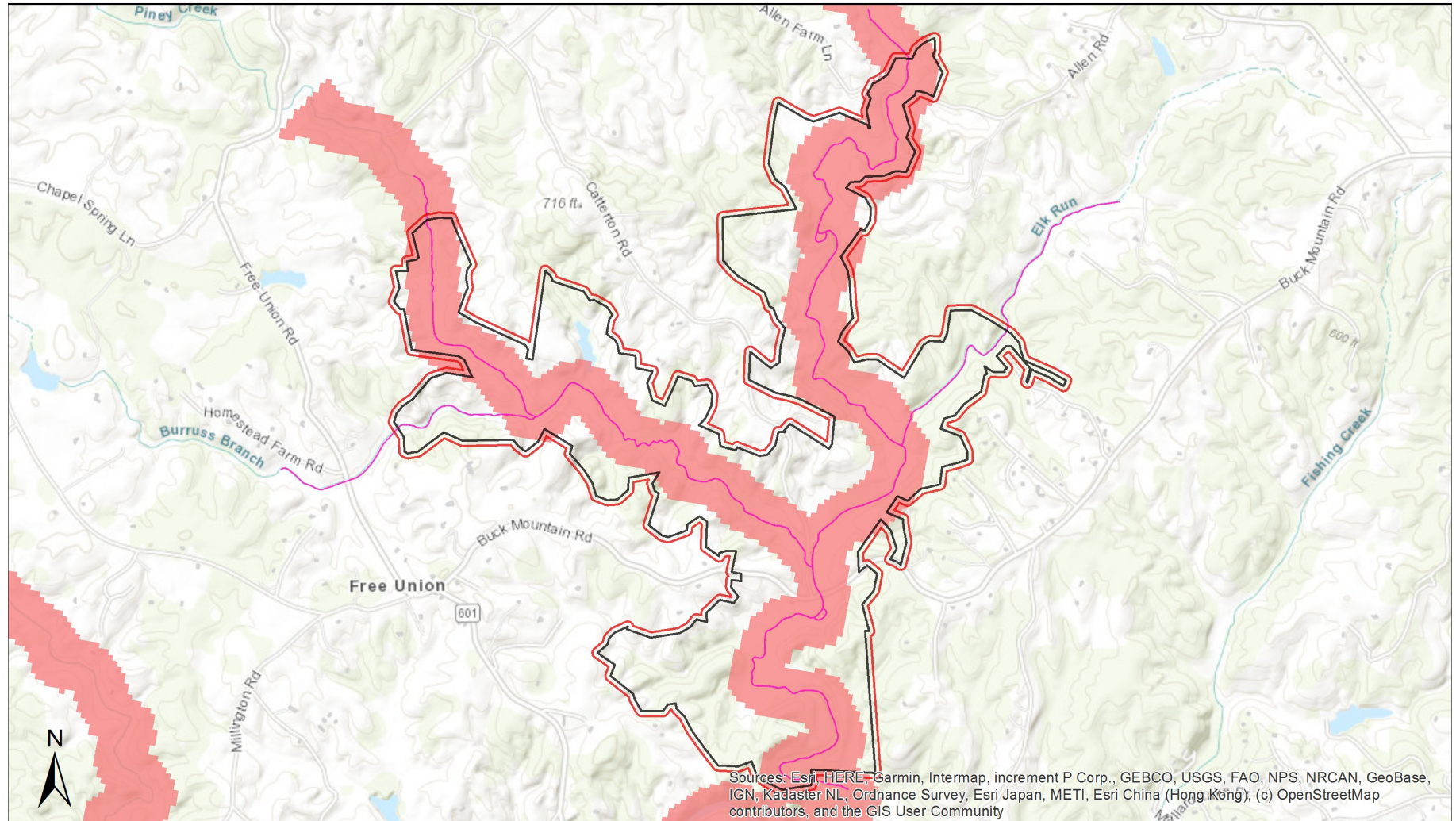
Conservation Site	Site Type	Brank	Acreage	Listed Species Presence
ELK RUN SCU	SCU	B2	19	FL
Natural Heritage Screening Features Intersecting Project Boundary				

Site Name	Group Name	Common Name	Scientific Name	GRANK	SRANK	Fed Status	Species of Concern	State Status	EO Rank	Last Obs Date	Precision
ELK RUN SCU	Aquatic Natural Community	NB-Rivanna Second Order Stream	NB-Rivanna Second Order Stream	G2?	S2?				C	2011-01	
MOORMANS RIVER - DOYLES RIVER SCU, ROCKY CREEK SCU, ELK RUN SCU	Invertebrate Animal	James Spiny mussel	Parvaspina collina	G1	S1	LE		LE	BC	2003-06-24	S

Natural Heritage Resources Intersecting Project Boundary

Intersecting Predictive Models
James Spiny mussel
Predictive Model Results

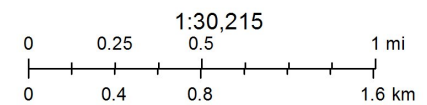
Buck Mountain Master Plan



- Project Boundary
- Buffered Project Boundary
- Conservation Site
- SCU
- NH_Screening_Layer**
- Predictive Models
- NH Screening Features

Quads: Free Union

Counties: Albemarle



Company: VHB

Lat/Long: 380859 / -783240



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

The project mapped as part of this report has been searched against the Department of Conservation and Recreation's Biotics Data System for occurrences of natural heritage resources from the area indicated for this project. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics files, NATURAL HERITAGE RESOURCES HAVE BEEN DOCUMENTED within the submitted project boundary including a 100 foot buffer and/or PREDICTED HABITAT MODELS FOR NATURAL HERITAGE RESOURCES intersect the project area.

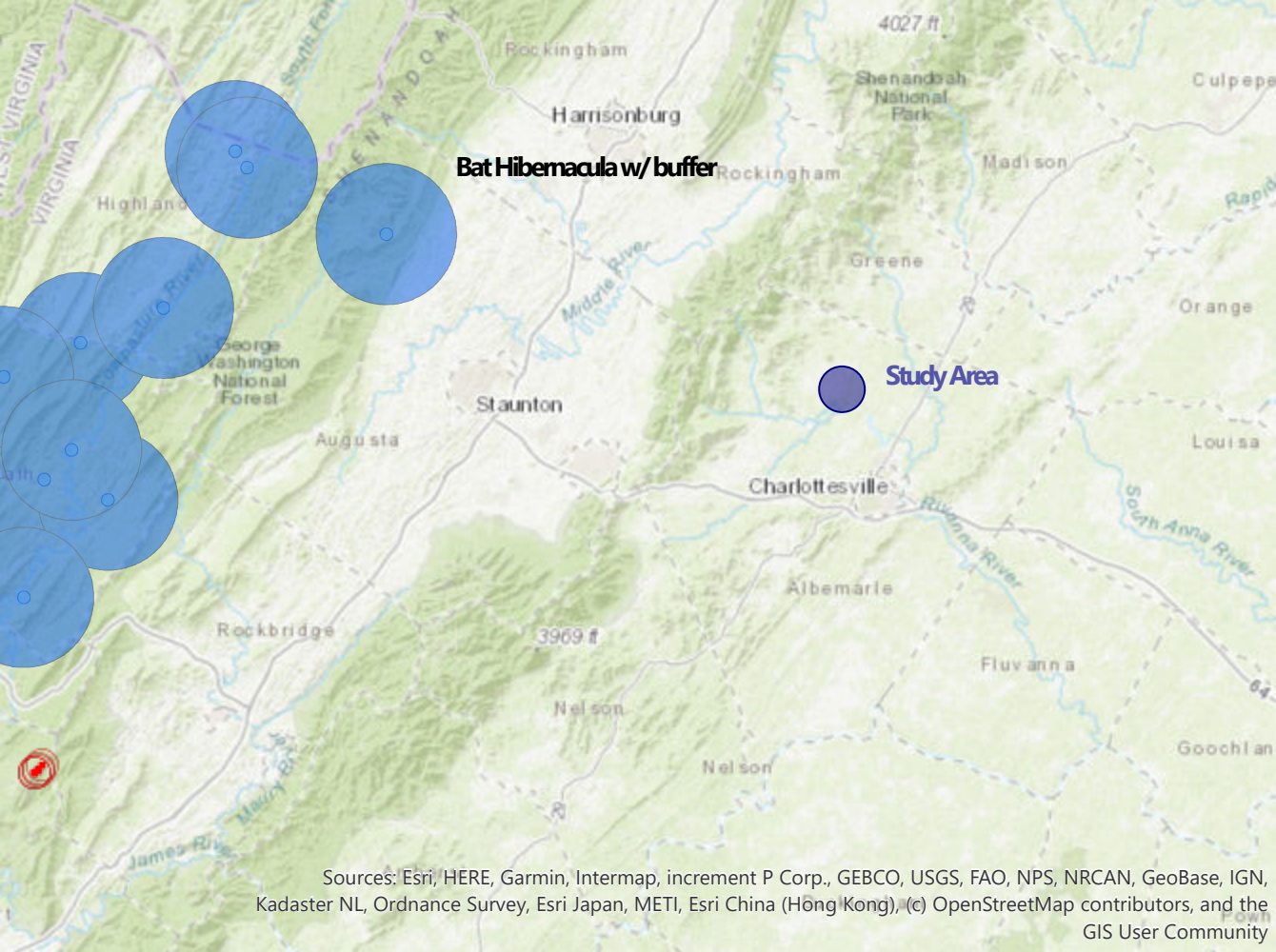
You have submitted this project to DCR for a more detailed review for potential impacts to natural heritage resources. DCR will review the submitted project to identify the specific natural heritage resources within the proposed project area including a 100 foot buffer. Using the expertise of our biologists, DCR will evaluate whether your specific project is likely to impact these resources. DCR's response will indicate whether any negative impacts are likely and, if so, make recommendations to avoid, minimize and/or mitigate these impacts. If the potential negative impacts are to species that are state- or federally-listed as threatened or endangered, DCR will also recommend coordination with the appropriate regulatory agencies: the Virginia Department of Game and Inland Fisheries for state-listed animals, the Virginia Department of Agriculture and Consumer Services for state-listed plants and insects, and the United States Fish and Wildlife Service for federally listed plants and animals. If your project is expected to have positive impacts we will report those to you with recommendations for enhancing these benefits.

There will be a charge for this service for "for profit companies": \$60, plus an additional charge of \$35 for 1-5 occurrences and \$60 for 6 or more occurrences.

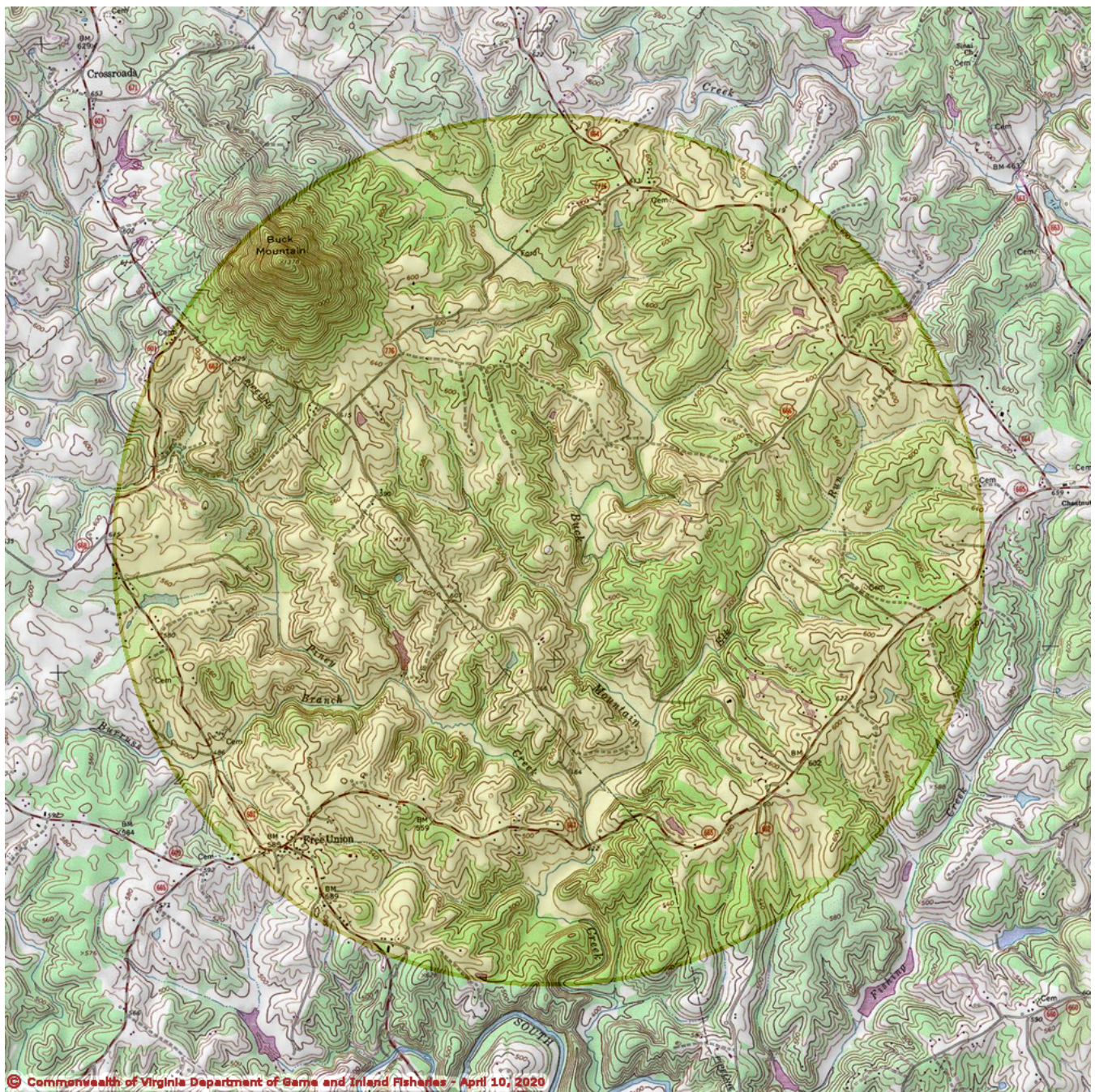
Please allow up to 30 calendar days for a response, unless you requested a priority response of 5 business days at an additional surcharge of \$500 or 15 calendar days at an additional surcharge of \$300. An invoice will be provided with your response.

We will review the project based on the information you included in the Project Info submittal form, which is included in this report. Also any additional information including photographs, survey documents, etc. attached during the project submittal process and/or sent via email referencing the project title (from the first page of this report).

Thank you for submitting your project for review to the Virginia Natural Heritage Program through the NH Data Explorer. Should you have any questions or concerns about DCR, the Data Explorer, or this report, please contact the Natural Heritage Project Review Unit at 804-371-2708.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



VaFWIS Initial Project Assessment Report

Compiled on

4/10/2020, 4:25:48 PM

[Help](#)

Known or likely to occur within a **2 mile radius around point 38,10,26.4 -78,32,29.7**
in **003 Albemarle County, VA**

[View Map of
Site Location](#)

481 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 22) (22 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes	BOVA,TEWaters,Habitat,SppObs
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri- colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
060173	FPST	Ia	Pigtoe, Atlantic	Fusconaia masoni		BOVA
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA
040092		Ia	Eagle, golden	Aquila chrysaetos		BOVA
040306		Ia	Warbler, golden- winged	Vermivora chrysoptera		BOVA

100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA
040052		IIa	Duck, American black	Anas rubripes		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA
040140		IIa	Woodcock, American	Scolopax minor		BOVA
040203		IIb	Cuckoo, black-billed	Coccyzus erythrophthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA
040304		IIc	Warbler, Swainson's	Limnothlypis swainsonii		BOVA

To view **All 481 species** [View 481](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need;

II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;

III=VA Wildlife Action Plan - Tier III - High Conservation Need;

IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (24 Reaches - displaying first 20)

[View Map of All Threatened and Endangered Waters](#)

T&E Waters Species							
Stream Name	Highest TE *	BOVA Code, Status *, Tier **, Common & Scientific Name				View Map	
(0106134)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes

Buck Mountain Creek (0100623)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0102188)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0102371)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0104122)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0106135)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0106160)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0133058)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0135956)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0136001)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (0140099)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (090354)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (093508)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (095512)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (095521)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (095923)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (096414)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (096423)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (097618)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Buck Mountain Creek (098103)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
	FESE						Yes

Buck Mountain Creek (099280)		060017	FESE	Ia	Spinymussel, James	Parvaspina collina	
Piney Creek (0101017)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
Piney Creek (0124113)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes

To view All 24 Threatened and Endangered Waters records [View 24](#)

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species (4 Reaches)

[View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Stream Name	Highest TE [*]	Tier Species BOVA Code, Status [*] , Tier ^{**} , Common & Scientific Name					View Map
Buck Mountain Creek (20802041)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
		060081	ST	Ila	Floater, green	Lasmigona subviridis	
Buck Mountain Creek (20802042)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
		060081	ST	Ila	Floater, green	Lasmigona subviridis	
Piney Creek (20802041)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes
		060081	ST	Ila	Floater, green	Lasmigona subviridis	
	FESE						Yes

Piney Creek (20802041)		060017	FESE	Ia	Spinymussel, James	Parvaspina collina	
Piney Creek (20802041)	FESE	060017	FESE	Ia	Spinymussel, James	Parvaspina collina	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

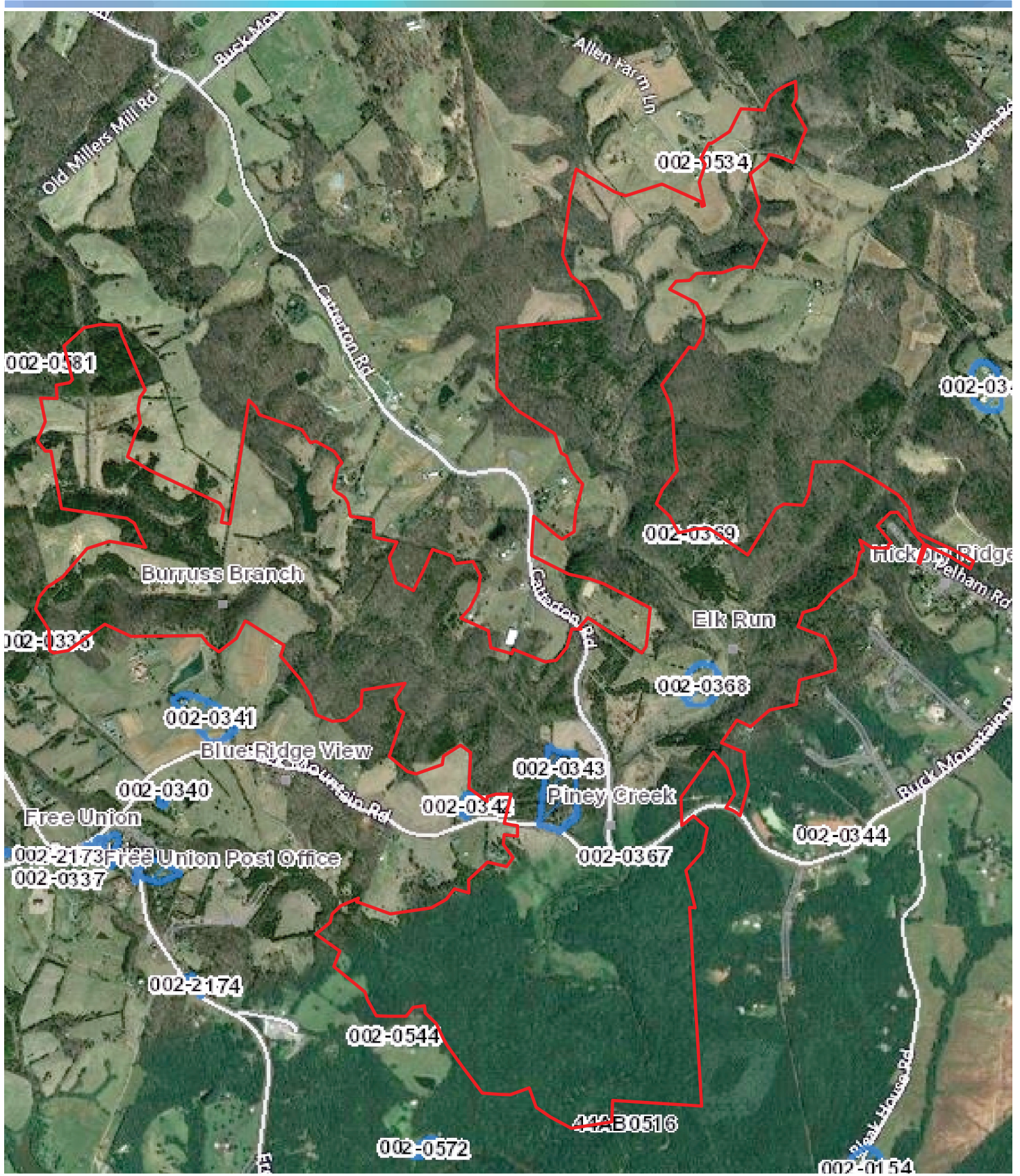
N/A

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Appendix B

Virginia Department of Historic Resources Archive Review





Legend

-  Architecture Resources
-  Architecture Labels
-  Individual Historic District Properties
-  Archaeological Resources
-  Archaeology Labels
-  DHR Easements
-  USGS GIS Place names
-  County Boundaries



Feet

0 50 100 150 200
1:2,500 / 1"=208 Feet

Title: Architecture Labels

Date: 3/31/2020

DISCLAIMER: Records of the Virginia Department of Historic Resources (DHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of field observations over time and may not reflect current ground conditions. The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Map may contain errors and is provided "as-is". More information is available in the DHR Archives located at DHR's Richmond office.

Notice if AE sites: Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 1880 Buck Mountain Road (Route 665)
Historic	Elliot House
Historic/Current	H. Elliot House

Property Evaluation Status

Not Evaluated

Property Addresses

Current - 1880 Buck Mountain Road Route 665

County/Independent City(s): Albemarle (County)

Incorporated Town(s): *No Data*

Zip Code(s): 22940

Magisterial District(s): *No Data*

Tax Parcel(s): 29-35H

USGS Quad(s): FREE UNION

Additional Property Information

Architecture Setting: Rural

Acreage: 10

Site Description:

1976/1980: The property is located 1.8 mile east of the intersection of Routes 609 and 665 near Free Union in western Albemarle County. The house sits on a ridge above Route 665 on an open lawn and is in good condition.

1976: The well that was drilled in the latter nineteenth century still services the house and has not a single piece of man-made wall as it was drilled through seventy feet of hard rock and ten feet of soft rock. There are no outbuildings associated with this property. [27 acres]

1980: The property is now 10 acres.

2019: Located at 1880 Buck Mountain Road at Catterton Road near Free Union.

Surveyor Assessment:

1976: The majority of this house was built around 1905 by an Elliot in whose family the property had been for many years. The kitchen portion is the oldest, as that was a late nineteenth century addition to an earlier house that was later destroyed; the current house is built on much of the same foundation.

1980: Presently owned by George and Constance Palmer.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	<i>No Data</i>

Primary Resource Information

Resource Category: Domestic

Resource Type: Single Dwelling

NR Resource Type: Building

Historic District Status: *No Data*

Date of Construction: Ca 1905

Date Source: Site Visit

Historic Time Period: Reconstruction and Growth (1866 - 1916)

Historic Context(s): Architecture/Landscape, Domestic

Other ID Number: *No Data*

Architectural Style: Other

Form: L-Plan

Number of Stories: 2.0
Condition: Good
Interior Plan: Central Passage, Single Pile
Threats to Resource: Major Alteration, Neglect

Architectural Description:

1976: The current house is a two story, three bay, single pile, L-shaped building. It is wood frame built on a stone foundation and is completely stuccoed and has a returned cornice. The roof is gabled and pedimented over the central bay. Of special interest is the single chimney on the side that indicates that the house was built in different stages. Built in the late 1800's, 1905. The house is in good condition.

1980: This early 20th century building has been completely remodeled. Frame with stucco on rubblestone foundation; two stories; tin gable roof. No apparently threats.

2019: Stucco house with gable roof; two story; center gable and an arched porch. Could have originally been an I-house that was "modernized" over the years with additions and new doors and windows. Chamfered square stair newel post with rectangular banisters.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	4/4
Chimneys	Exterior side	Stucco	Other
Windows	Sash, Double-Hung	Wood	6/6
Porch	1-story, 3-bay	Wood	Other
Roof	Gable	Metal	Standing Seam
Structural System and Exterior Treatment	Frame	Wood	Stuccoed
Windows	Sash, Double-Hung	Wood	8/8
Windows	Fixed	Wood	Other
Foundation	No Data	Stone	Other

Secondary Resource Information

Historic District Information

Historic District Name: No Data
Local Historic District Name: No Data
Historic District Significance: No Data

CRM Events

Event Type: Survey:Volunteer

Project Review File Number: No Data
Investigator: K. Edward Lay
Organization/Company: UVA
Photographic Media: Digital
Survey Date: 7/16/2019
Dhr Library Report Number: No Data
Project Staff/Notes:
No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: No Data
Investigator: Margaret P. Mickler
Organization/Company: VA Dept. of Historic Resources
Photographic Media: Film
Survey Date: 5/1/1980

Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: MacLeod & Wenger- UVA

Organization/Company: UVA

Photographic Media: Film

Survey Date: 10/1/1976

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Buck Mountain Road Survey, fall of 1976 - Building #46: Student project documented under the direction of K. Edward Lay, Assistant Dean of Architecture, UVA.

Bibliographic Information

Bibliography:









Patrick W. O'Bannon, Donna J. Seifert
Route 29 Corridor Study, City of Charlottesville and Albemarle County, Phase II Historic Architectural Investigations
John Milner Associates - 1991
DHR Project No. 1990-0396
DHR Report No. AB-052

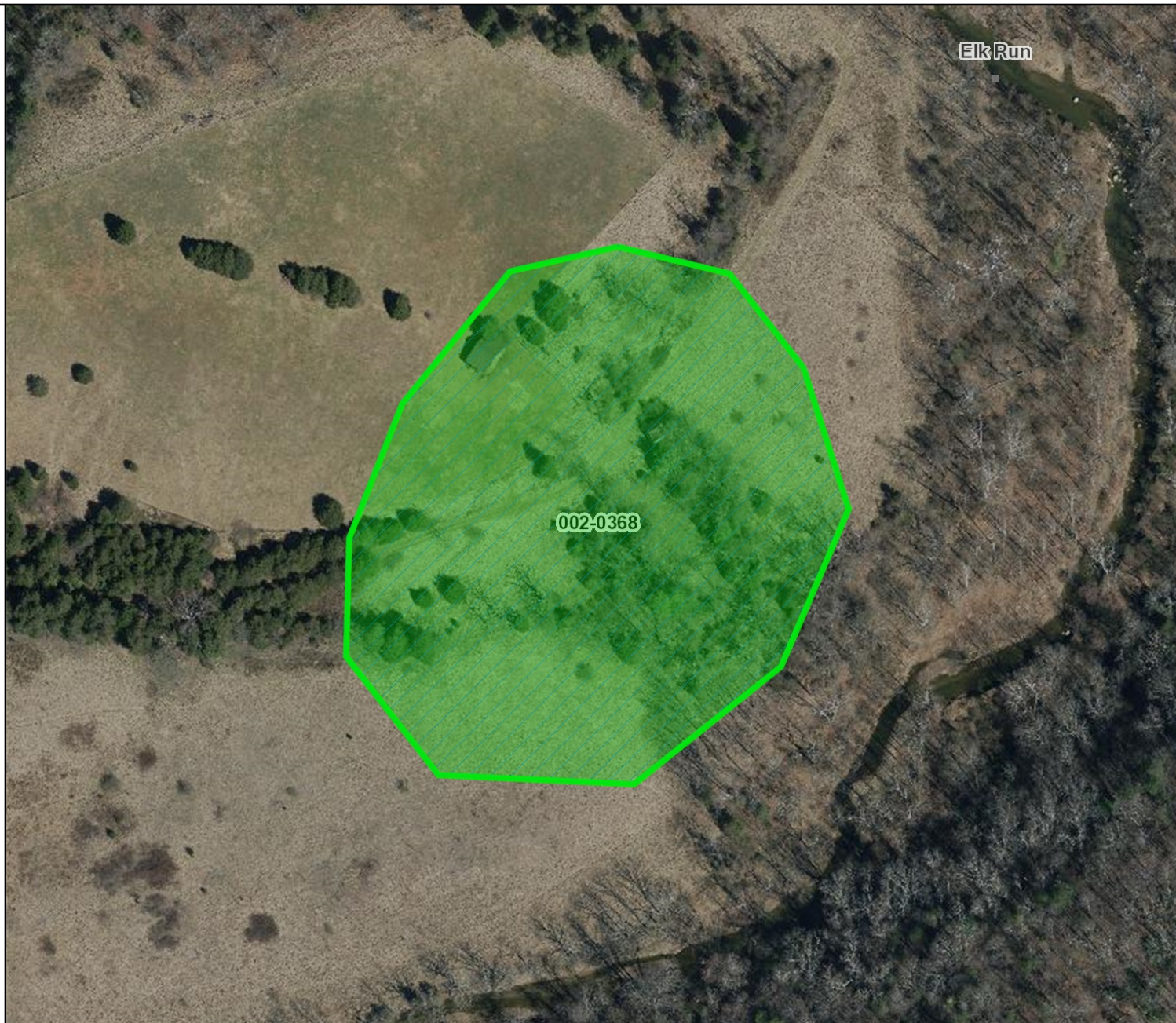
Property Notes:

Jan 2018 - DHR Archives note: This property was mis-identified previously as the John H. Elliot House, which is a different property in Albemarle County. The eligibility determination from 1990 for the John H. Elliot property has been removed from this record.



Legend

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Title: Architecture Labels

Date: 3/31/2020

DISCLAIMER: Records of the Virginia Department of Historic Resources (DHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of field observations over time and may not reflect current ground conditions. The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Map may contain errors and is provided "as-is". More information is available in the DHR Archives located at DHR's Richmond office.

Notice if AE sites: Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
Function/Location	House, Route 665
Historic	Catterton Place
Historic/Current	Catterton Farm

Property Evaluation Status

Not Evaluated

Property Addresses

Current - Route 665

County/Independent City(s): Albemarle (County)

Incorporated Town(s): No Data

Zip Code(s): No Data

Magisterial District(s): No Data

Tax Parcel(s): No Data

USGS Quad(s): FREE UNION

Additional Property Information

Architecture Setting: Rural

Acreage: 152

Site Description:

The property is located 2.2 miles east of the intersection of Routes 609 and 665 on Route 665. The house sits in a well-maintained yard at the edge of a ridge above Elk Run.

There is a kitchen and a tobacco barn situated to the immediate north of the main dwelling. A 20th century outbuilding is located to the east of the main dwelling.

Surveyor Assessment:

The original Catterton house still stands about a half mile north across the Buck Mountain Creek. The present house is said to have been built c. 1826 by Michael Catterton, the grandfather of the owner (as per 1980 survey). The land has been in the continuous possession on the Catterton family since they settled the property in the 1730s and the land was granted to them by the King of England.

Surveyor Recommendation: No Data

Ownership

Ownership Category	Ownership Entity
Private	No Data

Associate

Property Associate Name	Property Associate Role
Catterton, Michael	Owner

Primary Resource Information

Resource Category: Domestic

Resource Type: Single Dwelling

NR Resource Type: Building

Historic District Status: No Data

Date of Construction: Ca 1826

Date Source: Site Visit

Historic Time Period: Early National Period (1790 - 1829)

Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture

Other ID Number: No Data

Architectural Style: Other

Form: No Data

Number of Stories: 2.0

Condition: N/A
Interior Plan: Hall-Parlor
Threats to Resource: Relocation

Architectural Description:

The house is a two story, four bay, single pile structure with a small kitchen wing. The western two front bays were built before the two eastern, or right, bays. One of the middle rooms on the first floor contains a totally enclosed staircase. The second floor contains three rooms. On either side of the house are large brick chimneys, the fireplaces to which have refinely but elaborately carved wooden mantel pieces, which now have been stripped of their paint and finished with a wood stain. Across the western, or left, two front bays is a one story porch. The entire house is wood frame and built on a stone foundation with a green, standing seam tin, gabled roof. The house is painted white and trimmed in green. Was in good condition - moved for reservoir project.

Exterior Components

Component	Component Type	Material	Material Treatment
Foundation	Solid/Continuous	Stone	Rubble, Random
Windows	Sash, Double-Hung	Wood	6/6
Roof	Gable	Metal	Standing Seam
Structural System and Exterior Treatment	Frame	Wood	Weatherboard
Windows	Sash, Double-Hung	Wood	9/6
Chimneys	Exterior End	Stone	Rubble, Random

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Tobacco Barn
Date of Construction: 1830Ca
Date Source: Site Visit
Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Deteriorated
Threats to Resource: Deterioration

Architectural Description:

There were originally four tobacco barns; only one remains today. This barn is of mortise and tenon construction, has two rows of tie beams, one set of collars, rests upon rubblestone foundations, and is sheathed in new weatherboards.

This frame barn has weatherboard siding, a standing seam metal gable roof, and a vertical board door. It is in a very weathered state. circa 1830-1860.

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Domestic
Resource Type: Kitchen
Date of Construction: Ca
Date Source: *No Data*
Historic Time Period: *No Data*
Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*

Architectural Description:

The kitchen has squared (hewn pine) logs, square notched with mud chinking, covered with later weatherboards in the front. It rests on rubblestone piers (three per elevation), has a two bay front (there is only one opening at the rear), central rubblestone chimney, gable roof with unfinished loft, and is built on a slope. There is a shed addition to the rear.

Interior Plan: Two-Room

Number of Stories: 1

Secondary Resource #3

Resource Category: Domestic
Resource Type: Outbuilding, Domestic
Date of Construction: Ca
Date Source: No Data
Historic Time Period: No Data
Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style: No Data
Form: No Data
Condition: No Data
Threats to Resource: No Data
Architectural Description:
No Data
Number of Stories: No Data

Historic District Information

Historic District Name: No Data
Local Historic District Name: No Data
Historic District Significance: No Data

CRM Events

Event Type: Survey:Phase II/Intensive

Project Review File Number: No Data
Investigator: Mickler, Margaret P.
Organization/Company: Unknown (DSS)
Photographic Media: No Data
Survey Date: 5/1/1980
Dhr Library Report Number: No Data
Project Staff/Notes:
No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: No Data
Investigator: Macleod and Wenger- UVA
Organization/Company: Unknown (DSS)
Photographic Media: No Data
Survey Date: 1/1/1976
Dhr Library Report Number: No Data
Project Staff/Notes:

Buck Mountain Road Survey: Project documented by students under the direction of K. Edward Lay, Assistant Dean of the Architecture School, UVA.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: No Data
Investigator: O'Dell, Jeff
Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: *No Data*

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Hand-drawn sketch of plan and notes on the log kitchen. Handwriting is illegible and much of the writing is crossed out. No survey date provided.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

APPENDIX C

Recreation Market and Partnership Analysis

BUCK MOUNTAIN MASTER PLAN

Recreation Market and Partnership Analysis

JULY 16, 2020

RIVANNA WATER AND SEWER AUTHORITY

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Chapter One - COMMUNITY PROFILE

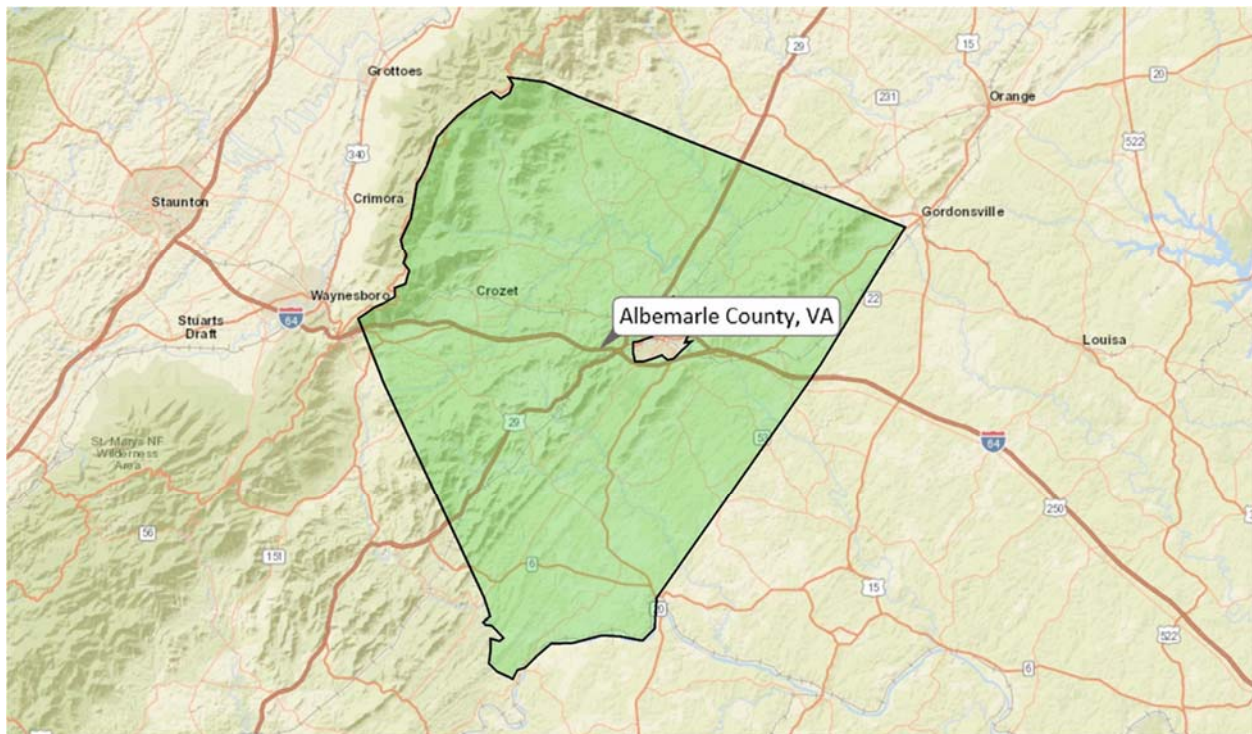
1.1 DEMOGRAPHIC ANALYSIS

The Demographic Analysis provides an understanding of the population of Albemarle County, Virginia. This analysis is reflective of the total population, and its key characteristics such as age segments, income levels, race, and ethnicity.

It is important to note that future projections are all based on historical patterns and unforeseen circumstances during or after the time of the projections could have a significant bearing on the validity of the final projections.

1.2 METHODOLOGY

Demographic data used for the analysis was obtained from U.S. Census Bureau and from ESRI, the largest research and development organization dedicated to Geographical Information Systems (GIS) and specializing in population projections and market trends. All data was acquired in September 2017 and reflects actual numbers as reported in the 2010 Censuses and estimates for 2017 and 2022 as obtained by ESRI. Straight line linear regression was utilized for projected 2027 and 2032 demographics. The County of Albemarle County boundaries utilized for the demographic analysis are shown below.



1.2.1 RACE AND ETHNICITY DEFINITIONS

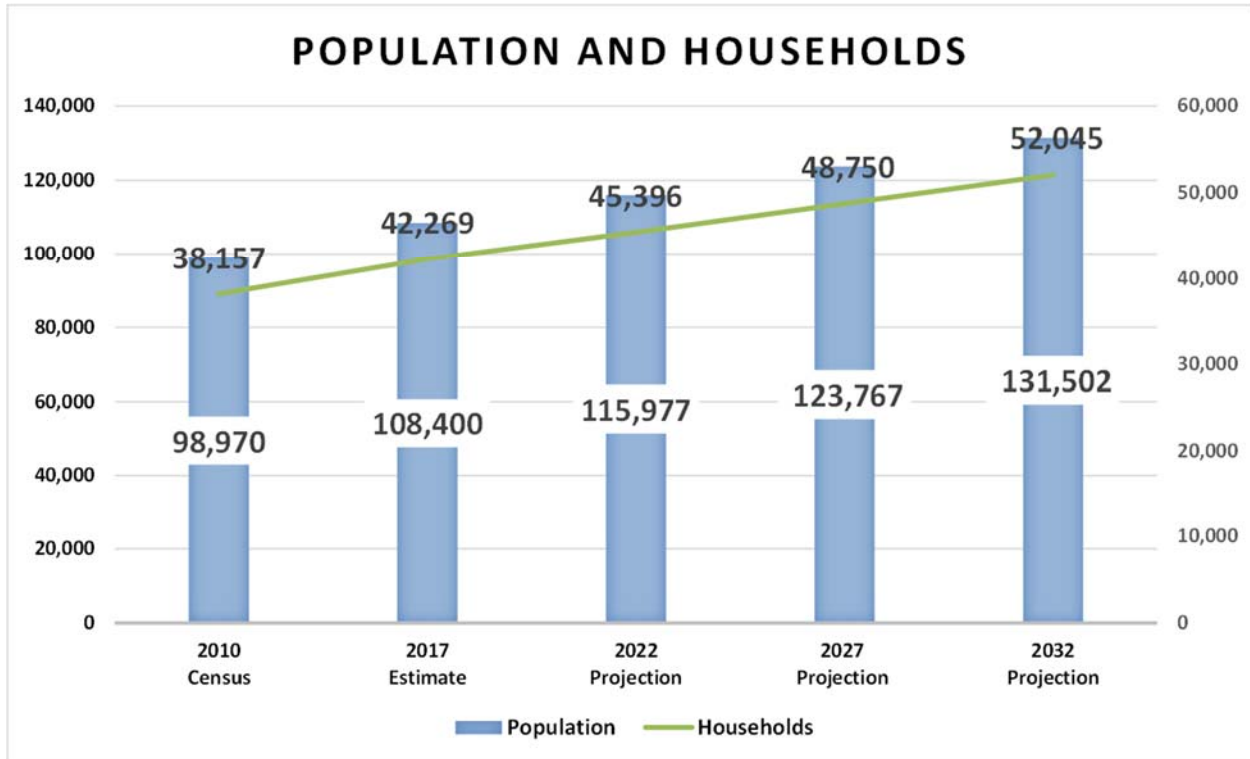
The minimum categories for data on race and ethnicity for Federal statistics, program administrative reporting, and civil rights compliance reporting are defined as below. The Census 2010 data on race are not directly comparable with data from the 2000 Census and earlier censuses; caution must be used when interpreting changes in the racial composition of the US population over time. The latest (Census 2010) definitions and nomenclature are used within this analysis.

- American Indian - This includes a person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment
- Asian - This includes a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam
- Black - This includes a person having origins in any of the black racial groups of Africa
- Native Hawaiian or Other Pacific Islander - This includes a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands
- White - This includes a person having origins in any of the original peoples of Europe, the Middle East, or North Africa
- Hispanic or Latino - This is an ethnic distinction, a subset of a race as defined by the Federal Government; this includes a person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race

1.3 ALBEMARLE COUNTY POPULACE

1.3.1 POPULATION

The County's population has experienced a growing trend in recent years and is currently estimated at 108,400 individuals. Projecting ahead, the total population is expected to continue to grow over the next 15 years. Based on predictions through 2032, the service area is expected to have 131,502 residents living within 52,045 households.

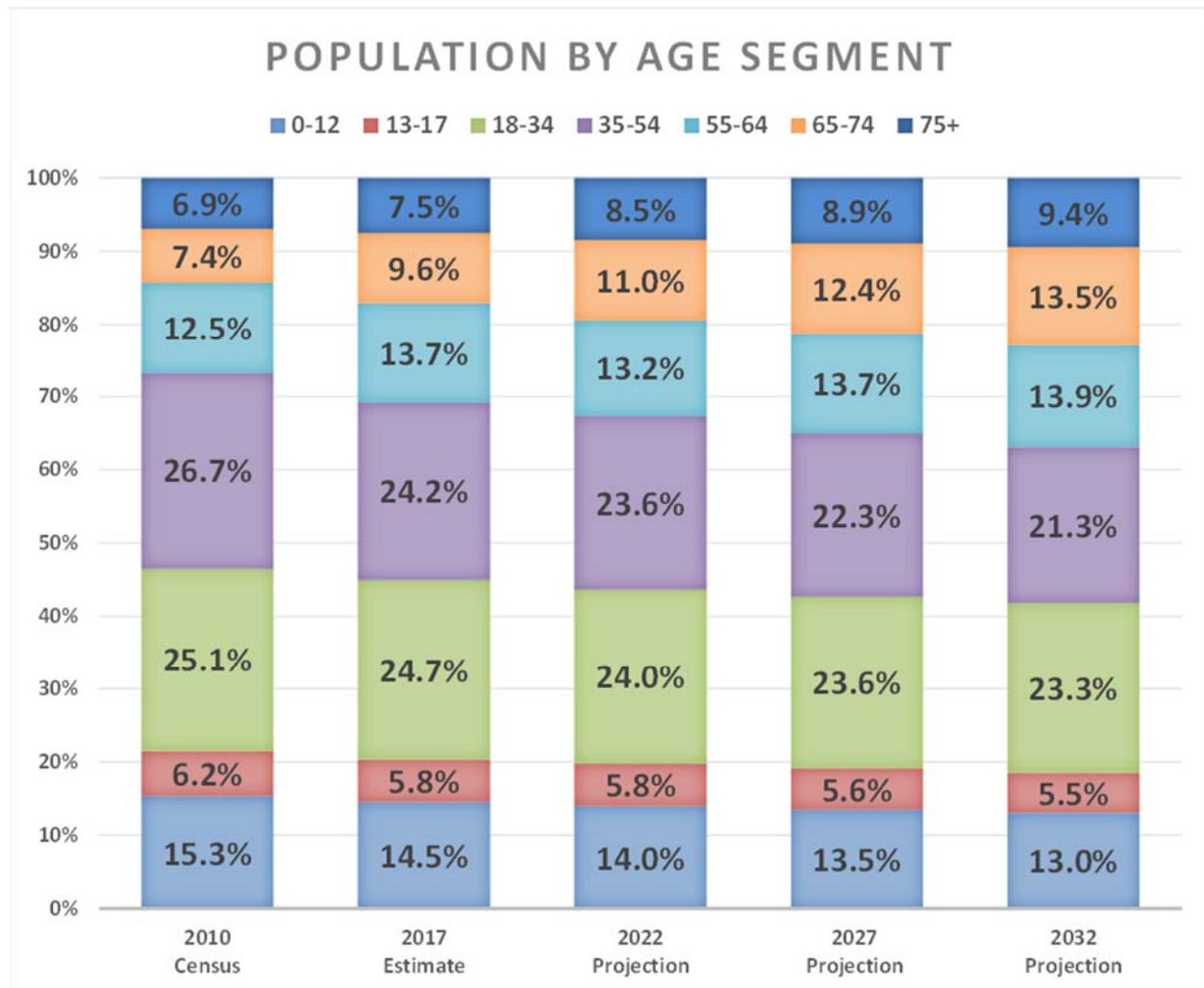


1.3.2 AGE SEGMENT

Evaluating the population by age segments, the service area exhibits a fairly balanced distribution among the major age segments. Currently, the largest age segment is the 55+, making up 30.8% of the population.

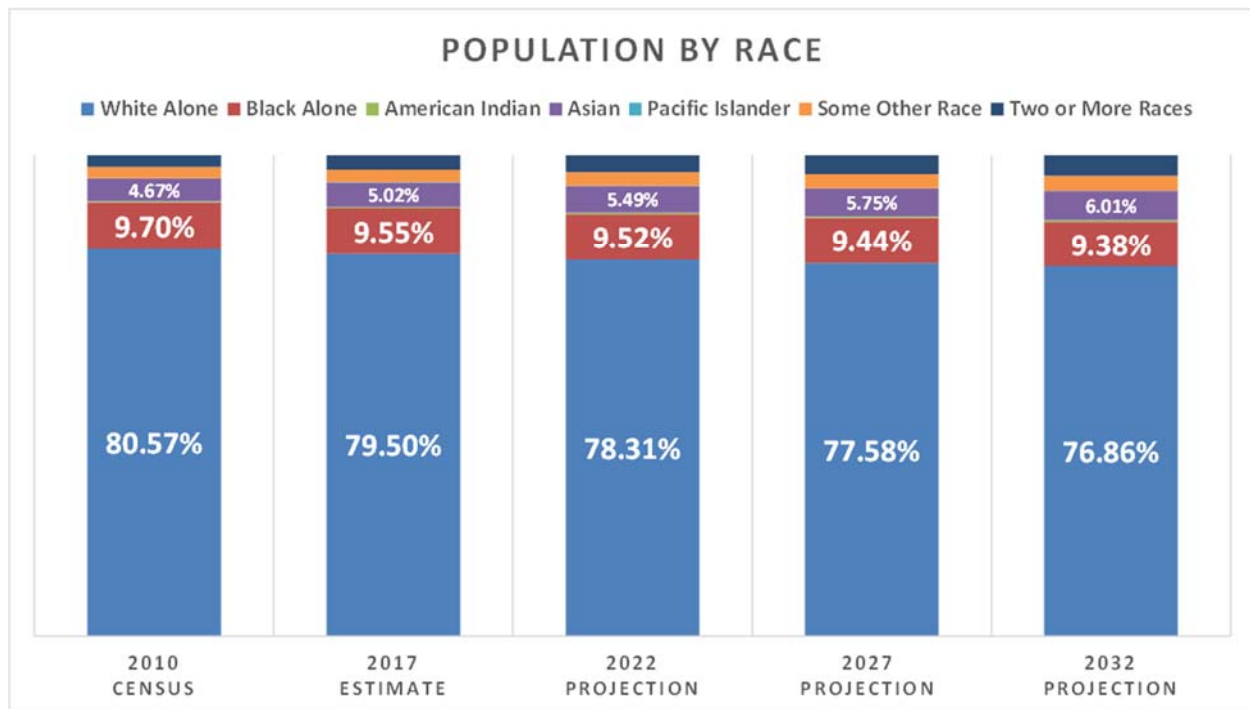
The overall age composition of the population within the County is projected to undergo an aging trend. While most of the younger age segments are expected to experience decreases in population percentage; those who are 55 and older are projected to continue increasing over the next 15 years, making up 36.8% of the population by 2032. This is assumed to be a consequence of a vast amount of the Baby Boomer generation shifting into the senior age segment.

Given the differences in how the active adults (55 and older) participate in recreation programs, the trend is moving toward having at least two to three different program age segments for older adults. When developing the park and recreation system, the County should evaluate recreation experiences that would cater to active adults who are 55-64, 65-74, and 75+ age segments.

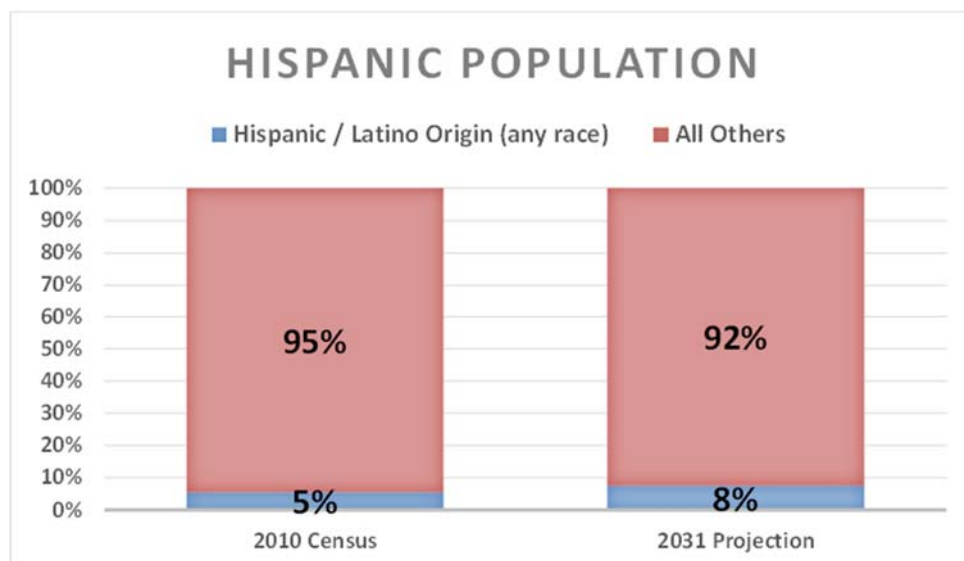


1.3.3 RACE AND ETHNICITY

In analyzing race, the service area's current populations are predominately White Alone. The 2017 estimates show that 79.5% of the service area's population falls into the White Alone category, while the Black Alone category (9.55%) represents the largest minority. The predictions for 2021 expect that the service area's population by race will stay relatively unchanged with the most growth occurring in the Asian segment.

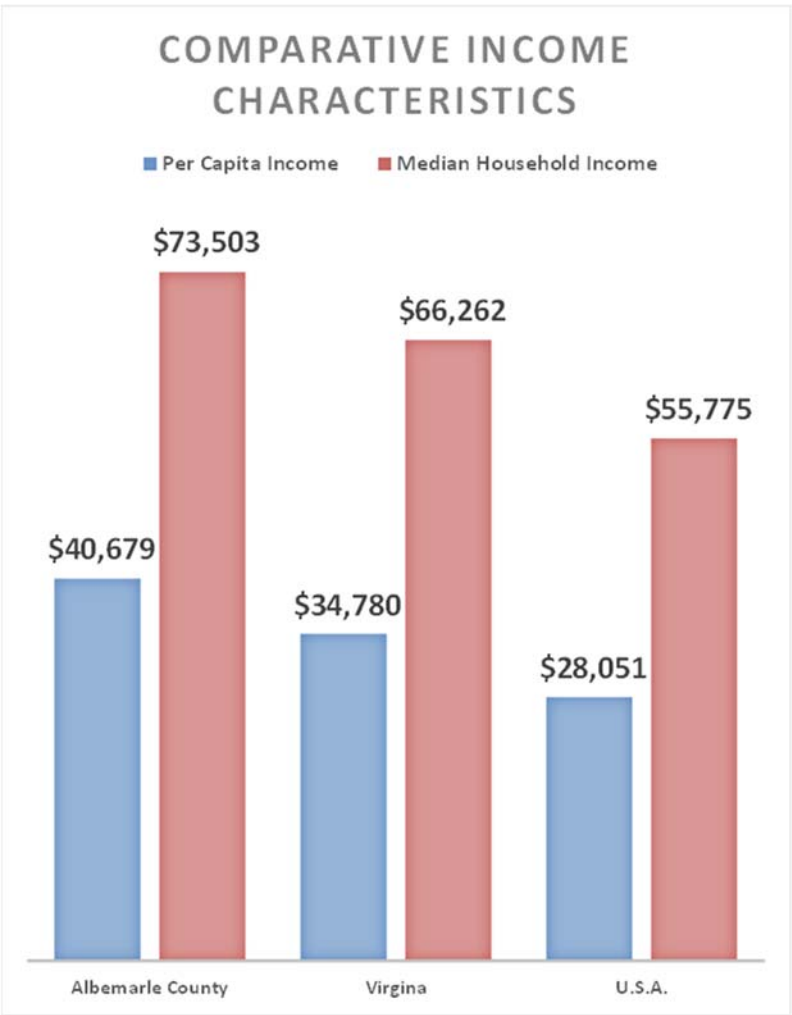


Based on the 2010 census, those of Hispanic/Latino origin represent 5% of the County's total population. The Hispanic/Latino population is expected to experience a slight increase to 8% by 2032.



1.3.4 HOUSEHOLDS AND INCOME

As seen in chart below, the County’s per capita and median household income levels is well above state and national averages.



ALBEMARLE COUNTY DEMOGRAPHIC IMPLICATIONS

The following implications are derived from the analyses provided above. Each implication is organized by the outlined demographic information sections.

POPULATION

The population is significantly increasing and is projected to experience 21% population growth over the next 15 years. With a growing population, park and recreation services must continue to grow to keep up with the population. Additionally, development will continue over the next 15 years and the parks and recreation system will need to strategically invest, develop, and maintain parks and facilities in relation to current and future housing development areas.

AGE SEGMENTATION

Albemarle County has a very broad age segmentation with the largest group being 55+ with the second largest group being 18-34. This is significant as providing access to services and programs will need to be focused on multitude of age segments simultaneously and equally challenging as age segments have different likings towards activities. Equal distribution across all age segments will require the County to continue to provide programs, services, parks and facilities that appeal to all residents of the community.

RACE AND ETHNICITY

A slightly diversifying population will likely focus the County on providing traditional and non-traditional programming and service offerings while always seeking to identify emerging activities and sports

HOUSEHOLDS AND INCOME

With a median and per capita household income above the state and national averages, it would be important for the County to prioritize providing offerings that are first class with exceptional customer service while seeking opportunities to create revenue generation.

Chapter Two - RECREATION TRENDS ANALYSIS

The Trends Analysis provides an understanding of national, regional, and local recreational trends as well as recreational interest by age segments. Trends data used for this analysis was obtained from Sports & Fitness Industry Association's (SFIA), National Recreation and Park Association (NRPA), and Environmental Systems Research Institute, Inc. (ESRI). All trends data is based on current and/or historical participation rates, statistically valid survey results, or NRPA Park Metrics.

2.1 METHODOLOGY

The Sports & Fitness Industry Association's (SFIA) *Sports, Fitness & Recreational Activities Topline Participation Report 2020* was utilized in evaluating the following trends:

- National Recreation Participatory Trends.
- Core vs. Casual Participation Trends.
- Non-Participant Interest by Age Segment.



The study is based on findings from surveys carried out in 2019 by the Physical Activity Council (PAC), resulting in a total of 18,000 online interviews. Surveys were administered to all genders, ages, income levels, regions, and ethnicities to allow for statistical accuracy of the national population. A sample size of 18,000 completed interviews is considered by SFIA to result in a high degree of statistical accuracy. A sport with a participation rate of five percent has a confidence interval of plus or minus 0.32 percentage points at a 95 percent confidence level. Using a weighting technique, survey results are applied to the total U.S. population figure of 302,756,603 people (ages six and older).

The purpose of the report is to establish levels of activity and identify key participatory trends in recreation across the U.S. This study looked at 122 different sports/activities and subdivided them into various categories including: sports, fitness, outdoor activities, aquatics, etc.

CORE VS. CASUAL PARTICIPATION

In addition to overall participation rates, SFIA further categorizes active participants as either core or casual participants based on frequency of participation. Core participants have higher participatory frequency than casual participants. The thresholds that define casual versus core participation may vary based on the nature of each individual activity. For instance, core participants engage in most fitness activities more than 50-times per year, while for sports, the threshold for core participation is typically 13-times per year.

In a given activity, core participants are more committed and tend to be less likely to switch to other activities or become inactive (engage in no physical activity) than casual participants. This may also explain why activities with more core participants tend to experience less pattern shifts in participation rates than those with larger groups of casual participants.

2.2 NATIONAL TRENDS IN OUTDOOR RECREATION

PARTICIPATION LEVELS

Results from the SFIA report demonstrate a contrast of growth and decline in participation regarding outdoor/adventure recreation activities. Much like the general fitness activities, these activities encourage an active lifestyle, can be performed individually or within a group, and are not as limited by time constraints. In 2019, the most popular activities, in terms of total participants, from the outdoor/adventure recreation category include: Day Hiking (49.7 million), Road Bicycling (39.4 million), Freshwater Fishing (39.2 million), and Camping within ¼ mile of Vehicle/Home (28.2 million), and Recreational Vehicle Camping (15.4 million).



Hiking
(Day)
49.7 Million



Bicycling
(Road)
39.4 Million



Fishing
(Freshwater)
39.2 Million



Camping
(<¼mi. of Car/Home)
28.2 Million



Camping
(Recreational Vehicle)
15.4 Million

FIVE-YEAR TREND

From 2014-2019, BMX Bicycling (55.2%), Day Hiking (37.2%), Fly Fishing (20.1%), Salt Water Fishing (11.6%), and Mountain Bicycling (7.2%) have undergone the largest increases in participation. The five-year trend also shows activities such as In-Line Roller Skating (-20.5%), Archery (-11.7%), and Adventure Racing (-9.5%) experiencing the largest decreases in participation.

ONE-YEAR TREND

The one-year trend shows activities growing most rapidly being BMX Bicycling (6.1%), Day Hiking (3.8%), and Birdwatching (3.8%). Over the last year, activities that underwent the largest decreases in participation include: Climbing (-5.5%), In-Line Roller Skating (-4.4%), and Camping with a Recreation Vehicle (-3.5%).

CORE VS. CASUAL TRENDS IN OUTDOOR RECREATION

A majority of outdoor activities have experienced participation growth in the last five- years. Although this a positive trend, it should be noted that all outdoor activities participation, besides adventure racing, consist primarily of casual users. This is likely why we see a lot of fluctuation in participation numbers, as the casual users likely found alternative activities to participate in.

National Participatory Trends - Outdoor / Adventure Recreation					
Activity	Participation Levels			% Change	
	2014	2018	2019	5-Year Trend	1-Year Trend
Hiking (Day)	36,222	47,860	49,697	37.2%	3.8%
Bicycling (Road)	39,725	39,041	39,388	-0.8%	0.9%
Fishing (Freshwater)	37,821	38,998	39,185	3.6%	0.5%
Camping (< 1/4 Mile of Vehicle/Home)	28,660	27,416	28,183	-1.7%	2.8%
Camping (Recreational Vehicle)	14,633	15,980	15,426	5.4%	-3.5%
Fishing (Saltwater)	11,817	12,830	13,193	11.6%	2.8%
Birdwatching (>1/4 mile of Vehicle/Home)	13,179	12,344	12,817	-2.7%	3.8%
Backpacking Overnight	10,101	10,540	10,660	5.5%	1.1%
Bicycling (Mountain)	8,044	8,690	8,622	7.2%	-0.8%
Archery	8,435	7,654	7,449	-11.7%	-2.7%
Fishing (Fly)	5,842	6,939	7,014	20.1%	1.1%
Skateboarding	6,582	6,500	6,610	0.4%	1.7%
Roller Skating, In-Line	6,061	5,040	4,816	-20.5%	-4.4%
Bicycling (BMX)	2,350	3,439	3,648	55.2%	6.1%
Climbing (Traditional/Ice/Mountaineering)	2,457	2,541	2,400	-2.3%	-5.5%
Adventure Racing	2,368	2,215	2,143	-9.5%	-3.3%
NOTE: Participation figures are in 000's for the US population ages 6 and over					
Legend:	Large Increase (greater than 25%)	Moderate Increase (0% to 25%)	Moderate Decrease (0% to -25%)	Large Decrease (less than -25%)	

2.3 NATIONAL TRENDS IN WATER SPORTS / ACTIVITIES

PARTICIPATION LEVELS

The most popular water sports / activities based on total participants in 2019 were Recreational Kayaking (11.4 million), Canoeing (8.9 million), and Snorkeling (7.7 million). It should be noted that water activity participation tends to vary based on regional, seasonal, and environmental factors. A region with more water access and a warmer climate is more likely to have a higher participation rate in water activities than a region that has a long winter season or limited water access. Therefore, when assessing trends in water sports and activities, it is important to understand that fluctuations may be the result of environmental barriers which can greatly influence water activity participation.



Kayaking
11.4 Million



Canoeing
9.0 Million



Snorkeling
7.7 Million



Jet Skiing
5.1 Million



Sailing
3.6 Million

FIVE-YEAR TREND

Over the last five years, Stand-Up Paddling (29.5%) and Recreational Kayaking (28.5%) were the fastest growing water activity, followed by White Water Kayaking (9.9%) and Surfing (8.9%). From 2014-2019, activities declining in participation most rapidly were Water Skiing (-20.1%), Jet Skiing (-19.6%), Scuba Diving (-13.7%), Wakeboarding (-12.7%), and Snorkeling (-12.5%).

ONE-YEAR TREND

Similarly, to the five-year trend, Recreational Kayaking (3.3%) and Stand-Up Paddling (3.2%) also had the greatest one-year growth in participation, from 2018-2019. Activities which experienced the largest decreases in participation in the most recent year include: Boardsailing/Windsurfing (-9.7%), Sea Kayaking (-5.5%), and Water Skiing (-4.8%).

CORE VS. CASUAL TRENDS IN WATER SPORTS/ACTIVITIES

As mentioned previously, regional, seasonal, and environmental limiting factors may influence the participation rate of water sport and activities. These factors may also explain why all water-based activities have drastically more casual participants than core participants, since frequencies of activities may be constrained by uncontrollable factors. These high casual user numbers are likely why a majority of water sports/activities have experienced decreases in participation in recent years.

National Participatory Trends - Water Sports / Activities					
Activity	Participation Levels			% Change	
	2014	2018	2019	5-Year Trend	1-Year Trend
Kayaking (Recreational)	8,855	11,017	11,382	28.5%	3.3%
Canoeing	10,044	9,129	8,995	-10.4%	-1.5%
Snorkeling	8,752	7,815	7,659	-12.5%	-2.0%
Jet Skiing	6,355	5,324	5,108	-19.6%	-4.1%
Sailing	3,924	3,754	3,618	-7.8%	-3.6%
Stand-Up Paddling	2,751	3,453	3,562	29.5%	3.2%
Rafting	3,781	3,404	3,438	-9.1%	1.0%
Water Skiing	4,007	3,363	3,203	-20.1%	-4.8%
Surfing	2,721	2,874	2,964	8.9%	3.1%
Wakeboarding	3,125	2,796	2,729	-12.7%	-2.4%
Scuba Diving	3,145	2,849	2,715	-13.7%	-4.7%
Kayaking (Sea/Touring)	2,912	2,805	2,652	-8.9%	-5.5%
Kayaking (White Water)	2,351	2,562	2,583	9.9%	0.8%
Boardsailing/Windsurfing	1,562	1,556	1,405	-10.1%	-9.7%
NOTE: Participation figures are in 000's for the US population ages 6 and over					
Legend:	Large Increase (greater than 25%)	Moderate Increase (0% to 25%)	Moderate Decrease (0% to -25%)	Large Decrease (less than -25%)	

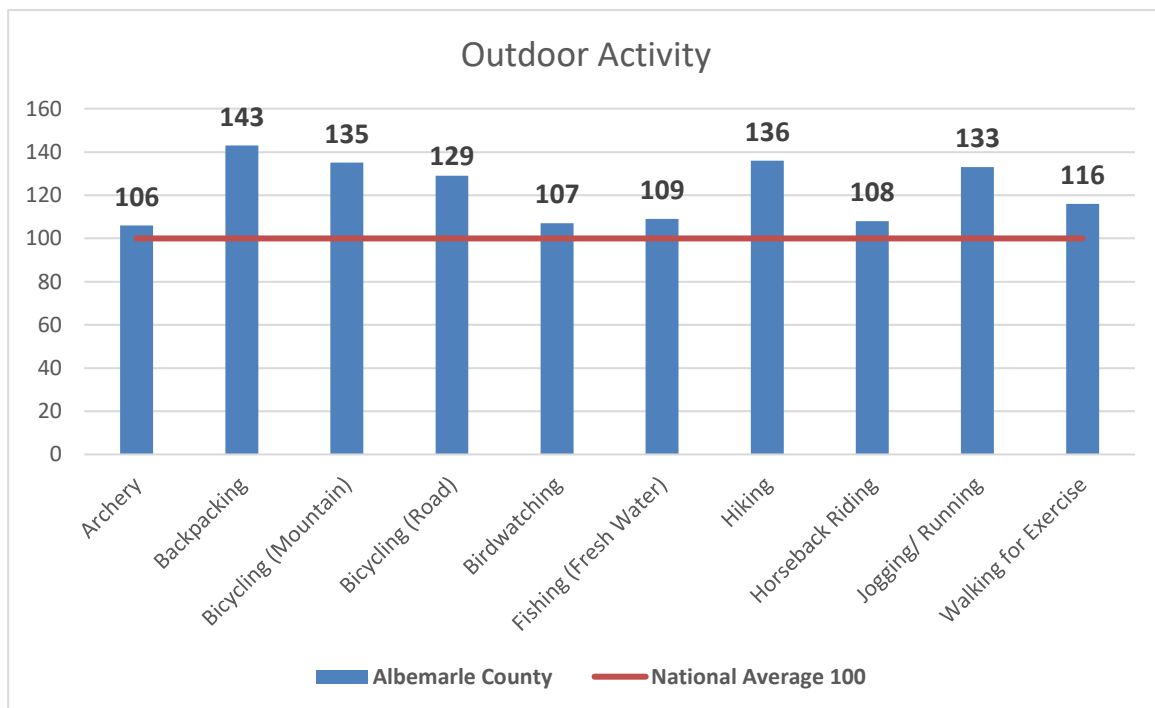
2.4 LOCAL MARKET POTENTIAL

The following charts show sport and leisure market potential data from ESRI. A Market Potential Index (MPI) measures the probable demand for a product or service within the County and its surrounding service area. The MPI shows the likelihood that an adult resident of the target area will participate in certain activities when compared to the US National average. The national average is 100, therefore numbers below 100 would represent a lower than average participation rate, and numbers above 100 would represent higher than average participation rate. The service area is compared to the national average in outdoor activity.

Overall, Albemarle County demonstrate rather high market potential index (MPI) numbers; this is particularly noticeable when assessing the outdoor activity market potential table. All activities from the outdoor activity market potential table have MPI scores of 100+. These overall high MPI scores show that Albemarle County has particularly strong participation rates when it comes to outdoor recreational activities. This becomes significant for when the consideration is given to constructing new amenities at Buck Mountain as it provides a strong tool to estimate utilization.

High index numbers (100+) are significant because they demonstrate that there is a greater potential that residents of the service area will actively participate in offerings provided at Buck Mountain.

2.4.1 OUTDOOR ACTIVITY



2.5 BUCK MOUNTAIN COMPATIBILITY USE ANALYSIS

The following chart identifies the compatibility of potential uses at Buck Mountain. As noted in the chart, both active and passive recreation uses scored as high or higher than any of the other potential uses that were evaluated.

		FEASIBILITY														
		RWSA Objectives				Regulations			Site Requirements			Market Analysis				Score
USES		Water Supply and Protection	Public Engagement	Increase # of "green projects"	Future reservoir potential	Zoning: By-right	Zoning: Special Use Permit	Conservation easement compatible	No road access required	No water/sewer required	Steep slope compatible	Market potential	Partnership potential	Revenue generation potential	Lmtd long-term RWSA oversight req	
	Divestment															
	Sell Land		1					1	1	1	1	1		1	1	8
	Land Management															
	Property Access Agreements	5	1		3			1		1	1	1	1	1		15
	Land Leasing	5	1		3			1	1	1	1	1		1		15
	Passive Recreation															
	Hiking Trail	5	2		3	2		1	1	1	1	3	1			20
	Equestrian Trail	5	1		3	2		1	1	1	1	1				16
	Mountain Biking Trail	5	2		3	2			1	1	1	3	1			19
	Fishing	5	2		3	2		1	1	1	1	1		1		18
	Hunting	5	2		3	2		1	1	1	1	2	1	1		20
	Active Recreation															
	Archery	5	2		3	2				1		1	1		1	15
	Camping	3	2		3		1					3	1	1	1	15
	Development															
	Brewery/winery/distillery	1	2		1	2						1	1	1	1	10
	Restaurant	1	2		1		1					1	1	1	1	9
	Environmental Center	1	2		1		1					1	1	1	1	9
Other (horse stable, vet, etc zoning permitted)	1	1		1		1					1	1	1	1	8	
Resource Development																
Solar	4		1	3		1			1		3	1	1	1	15	
Wind	4		1	3	2				1		3	1	1	1	16	
Silviculture	1			3	2				1	1	3	1	1		13	
Plant nursery	4	1	1	3							1	1	1	1	13	

2.6 SUMMARY

There is a high level of synergy between the national and local recreation trends and the compatibility of recreation uses at Buck Mountain. RWSA should consider formally activating portions of Buck Mountain for active and passive recreational uses via partnerships.

Chapter Three – STRATEGIC PARTNERSHIPS

Today's economic climate and political realities require the Rivanna Water and Sewer Authority to seek productive and meaningful partnerships in order to deliver high quality services at Buck Mountain. The following sections provide an overview of opportunities and strategies for developing partnerships within the community.

3.1 POLICY FRAMEWORK

The initial step in developing multiple partnerships in the community that expand upon existing relationships is to have an overall partnership philosophy that is supported by a policy framework for establishing and managing these relationships. The policies recommended below will promote fairness and equity within existing and future partnerships while helping staff members to avoid conflicts internally and externally. The recommended partnership principles are as follows:

- All partnerships require a working agreement with measurable outcomes and evaluation on a regular basis. This should include reports to the RWSA on the performance of the partnership vis-à-vis the agreed-to goals and objectives.
- All partnerships should track costs associated with the partnership investment to demonstrate the appropriate shared level of equity.
- A partnership culture should emerge and be sustained that focuses on collaborative planning on a regular basis, regular communications, and annual reporting on performance.

The following policies are recommended for implementation by RWSA as it relates to Buck Mountain.

3.2 PARTNERSHIP POLICIES AND PRACTICES

Partnerships can be pursued and developed with other public entities, such as neighboring cities, schools, colleges, state or federal agencies; private, non-profit organizations; and private, for-profit organizations.

3.2.1 ALL PARTNERSHIPS

- Each partner will meet with or report to RWSA staff on a regular basis to plan activities and shared activity-based costs.
- Partners will establish measurable outcomes and work through key issues in order to meet the desired outcomes.
- Each partner will focus on meeting the balance of equity agreed to and will track investment costs accordingly.
- Measurable outcomes will be reviewed at least annually and shared with each partner, with adjustments made as needed.
- A working partnership agreement will be developed and monitored together on a quarterly or as-needed basis.
- Each partner will assign a liaison for communications and planning purposes.
- If conflicts arise between partners, the Executive Director of RWSA or his/her designee, along with the other partner's highest-ranking officer assigned to the agreement will meet to resolve the issue(s) in a timely manner. Any exchange of money or traded resources will be based on

the terms of the partnership agreement. Each partner will meet with the other partner's respective board or managing representatives annually to share updates and report the outcomes of the partnership agreement.

3.2.2 PUBLIC/PUBLIC PARTNERSHIPS

The policy for public/public partnerships is evident with RWSA based on their working with the City of Charlottesville, Albemarle County and the State of Virginia. Working together on the development, sharing, and/or operating of facilities and programs at Buck Mountain will be as follows:

- Each partner will meet with the RWSA Board and staff annually to plan and share activity-based costs and equity invested by each partner in the partnership
- Partners will establish measurable outcomes and work through key issues to focus on for the coming year between each partner to meet the outcomes desired
- Each partner will focus on meeting a balance of 50% equity for each agreed-to partnership and track investment costs accordingly
- Each partner will assign a liaison to serve each partnership agency for communication and planning purposes
- Measurable outcomes will be reviewed quarterly and shared with each partner, with adjustments made as needed
- Each partner will act as an agent for the other partner, thinking collectively as one, not two separate agencies for purposes of the agreement
- Each partner will meet with the other partner's respective board or owner annually, to share results of the partnership agreement
- A working partnership agreement will be developed and monitored together on a quarterly or as-needed basis
- If conflicts arise between partners, the Executive Director of RWSA along with the other public agency's highest ranking officer will meet to resolve the partnership issue. It should be resolved at the highest level or the partnership will be dissolved
- No exchange of money between partners will be made until the end of the partnership year. A running credit will be established that can be settled at the end of the planning year with one check or will be carried over to the following year as a credit with adjustments made to the working agreement to meet the 50% equity level desired

3.2.3 PUBLIC/NOT-FOR-PROFIT PARTNERSHIPS

The partnership policy for public/not-for-profit partnerships with RWSA and the not-for-profit community of service providers is seen in associations working together in the development and management of facilities and programs at Buck Mountain. These principles are as follows:

- The not-for-profit partner agency or group involved with RWSA must first recognize that they are in a partnership with the Department to provide a public service or good; conversely, the Department must manage the partnership in the best interest of the community as a whole, not in the best interest of the not-for-profit agency

- The partnership working agreement will be year-to-year and evaluated based on the outcomes determined for the partnership agencies or groups during the planning process at the start of the partnership year. At the planning workshop, each partner will share their needs for the partnership and outcomes desired. Each partner will outline their level of investment in the partnership as it applies to money, people, time, equipment, and the amount of capital investment they will make in the partnership for the coming year
- Each partner will focus on meeting a balance of 50% equity or as negotiated and agreed upon as established in the planning session with RWSA. Each partner will demonstrate to the other the method each will use to track costs, and how it will be reported on a monthly basis, and any revenue earned
- Each partner will appoint a liaison to serve each partnering agency for communication purposes
- Measurable outcomes will be reviewed quarterly and shared with each partner, with adjustments made, as needed
- Each partner will act as an agent for the other partner to think collectively as one, not two separate agencies. Items such as financial information will be shared if requested by either partner when requested to support a better understanding of the resources available to the partnership
- Each partner will meet the other's respective board on a yearly basis to share results of the partnership agreement
- If conflicts should arise during the partnership year, the Executive Director of RWSA and the highest-ranking officer of the not-for-profit agency will meet to resolve the issue
- It should be resolved at this level, or the partnership will be dissolved. No other course of action will be allowed by either partner
- Financial payments by the not-for-profit agency will be made monthly to RWSA as outlined in the working agreement to meet the 50% equity level of the partnership

3.2.4 PARTNERSHIPS WITH PRIVATE, FOR-PROFIT ENTITIES

The recommended policies and practices for public/private partnerships that may include businesses, private groups, private associations, or individuals who desire to make a profit from the use of Buck Mountain are detailed below. These can also apply to partnerships where a private party wishes to develop a facility, provide a service, or has a contract to provide a task or service on the RWSA's behalf at Buck Mountain. These partnership principles are as follows:

- Upon entering into an agreement with a private business, group, association, or individual, the RWSA staff and leadership should recognize that the importance of allowing the private entity to meet its financial objectives within reasonable parameters that protect the mission, goals, and integrity of RWSA.
- As an outcome of the partnership, RWSA must receive a designated fee that may include a percentage of gross-revenue dollars less sales tax on a regular basis, as outlined in the contract agreement.
- The working agreement of the partnership must establish a set of measurable outcomes to be achieved, as well as the method of monitoring those outcomes. The outcomes will include

standards of quality, financial reports, customer satisfaction, payments to RWSA, and overall coordination for the services rendered.

- Depending on the level of investment made by the private contractor, the partnership agreement can be limited to months, one year, or multiple years.
- If applicable, the private contractor will provide a working management plan annually to ensure the outcomes desired by RWSA. The management plan will be negotiated if necessary. Monitoring the management plan will be the responsibility of both partners. The Department should allow the contractor to operate freely in its best interest, as long as the agreed-to outcomes are achieved and the terms of the partnership agreement are adhered to.
- The private contractor should not lobby the RWSA Board for initial establishment or renewal of a contract. Any such action will be cause for termination of the contract. All negotiations must be with the Department Director or that person's designee.
- RWSA has the right to advertise for privately- contracted partnership services or to negotiate on an individual basis using a bid process based on the professional level of the service to be provided.
- If conflicts arise between both partners, the highest-ranking officers from both sides will try to resolve the issue before turning to litigation. If no resolution can be achieved, the partnership shall be dissolved.

3.3 PARTNERSHIP OPPORTUNITIES

The recommended partnership policies encourage four classifications of partner - public not-for-profit, public for-profit, private not-for-profit, and private for profit. This section of the partnership plan further organizes partners within these classifications as having an area of focus relevant to the type of service/benefits being received and shared. The five areas of focus are:

- Operational Partners - Other entities and organizations that can support the efforts of the Rivanna Water and Sewer Authority to maintain facilities and assets, promote amenity- and recreation-usage, support site needs, provide programs and events, and/or maintain the integrity of natural/cultural resources through in-kind labor, equipment, or materials.
 - *KEY POTENTIAL PARTNER: ALBEMARLE COUNTY PARKS AND RECREATION DEPARTMENT*
- Vendor Partners - Service providers and/or contractors that can gain brand association and popularity as a preferred vendor or supporter of the in exchange for reduced rates, services, or some other agreed-upon benefit.
 - *KEY STRATEGY: ISSUE A REQUEST FOR INTEREST (RFI)*
- Service Partners - Organizations and/or friends-of-recreation groups that support the efforts of the RWSA to provide programs and events at Buck Mountain, including serving specific constituents in the community collaboratively.
 - *KEY STRATEGY: ISSUE A REQUEST FOR INTEREST (RFI)*