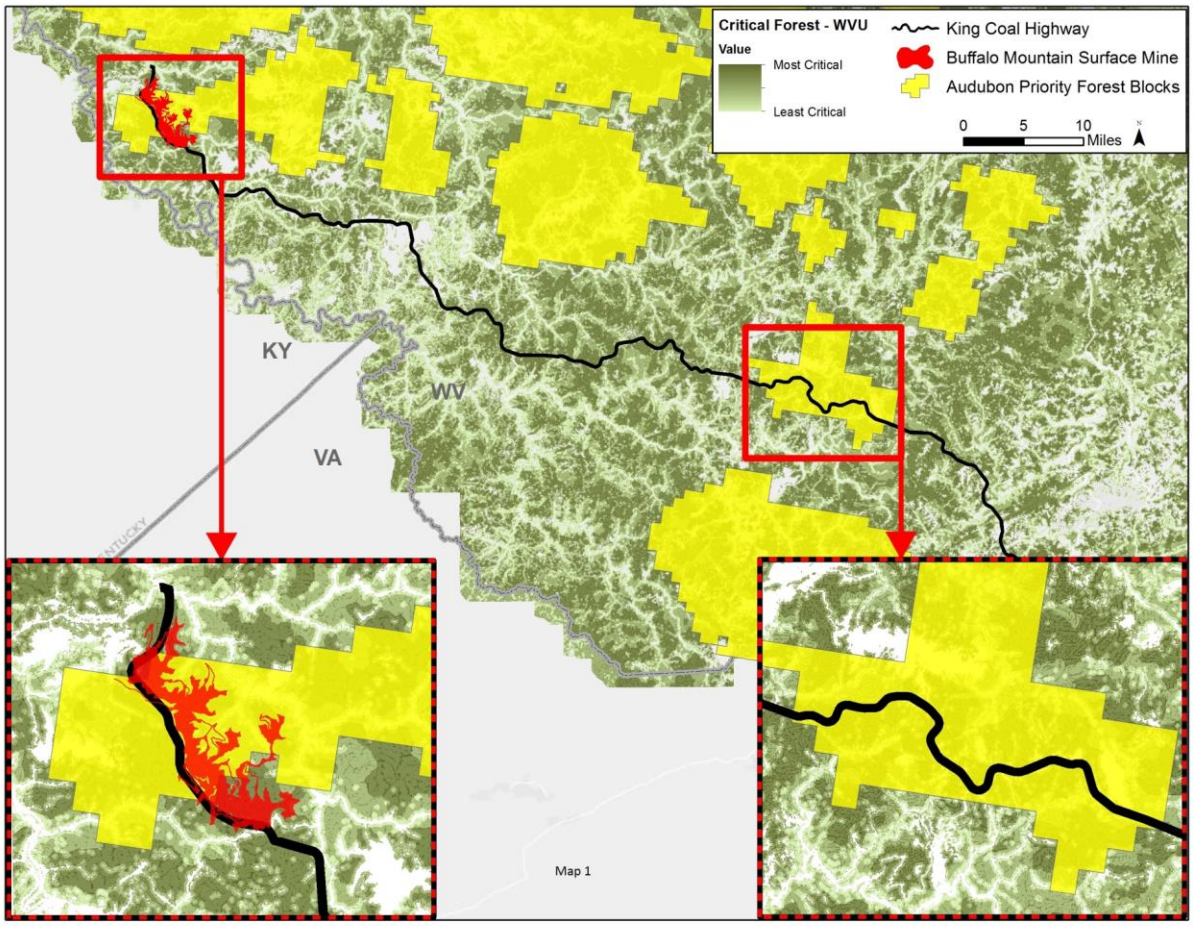
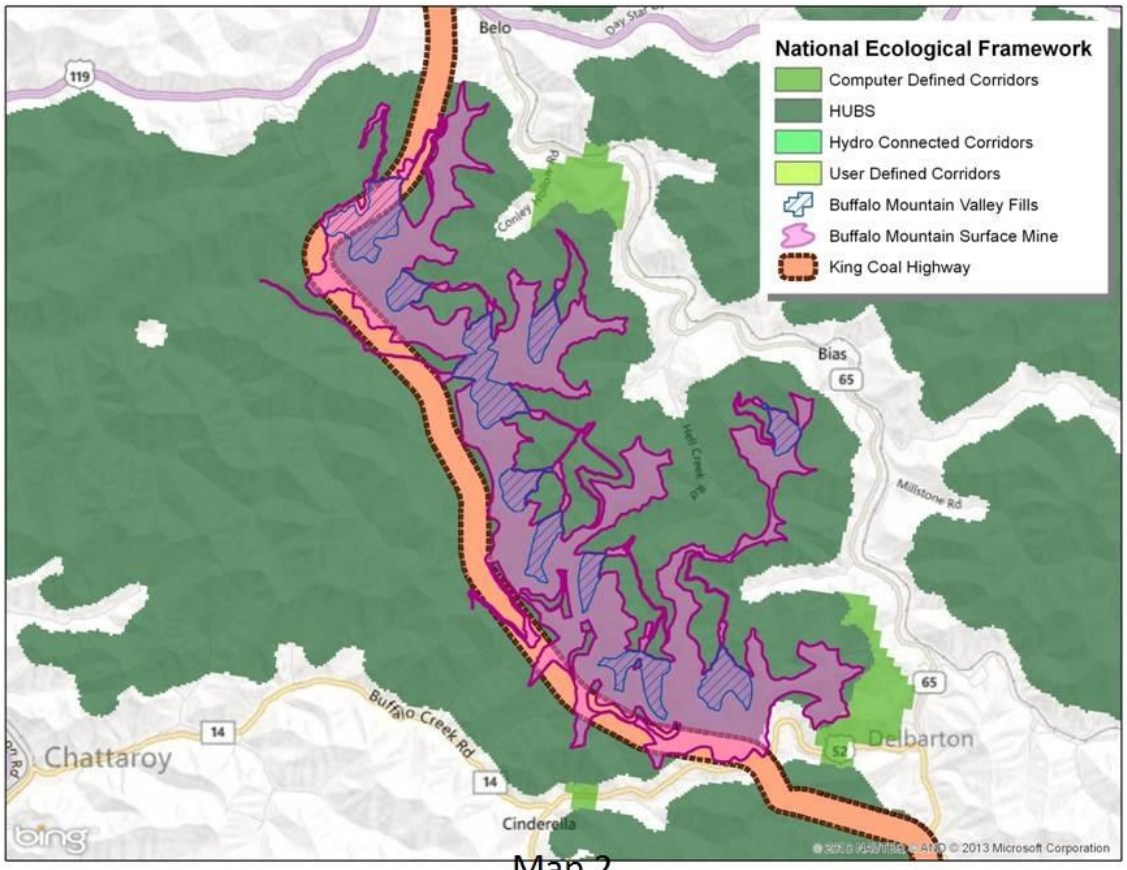
**Enclosure 2a**

**Maps, Tables and Figures for the**

**Additional Technical Comments/Bullets**
**for the King Coal Highway Delbarton to Belo Project and Buffalo Mountain Surface Mine**
**Clean Water Act Section 404 Permit Application**
**Draft Supplemental Environmental Impact Statement**




Map 1. Audubon Priority Forest Blocks and WVU Critical Forests


National Ecological Framework
Computer Defined Corridors
HUBS
Hydro Connected Corridors
User Defined Corridors
Buffalo Mountain Valley Fills
Buffalo Mountain Surface Mine
King Coal Highway
Belo
Bias
Chattaroy
Delbarton
Cinderella
Buffalo Creek Rd
Hell Creek Rd
Millstone Rd
Conley Branch Rd
119
65
14
52
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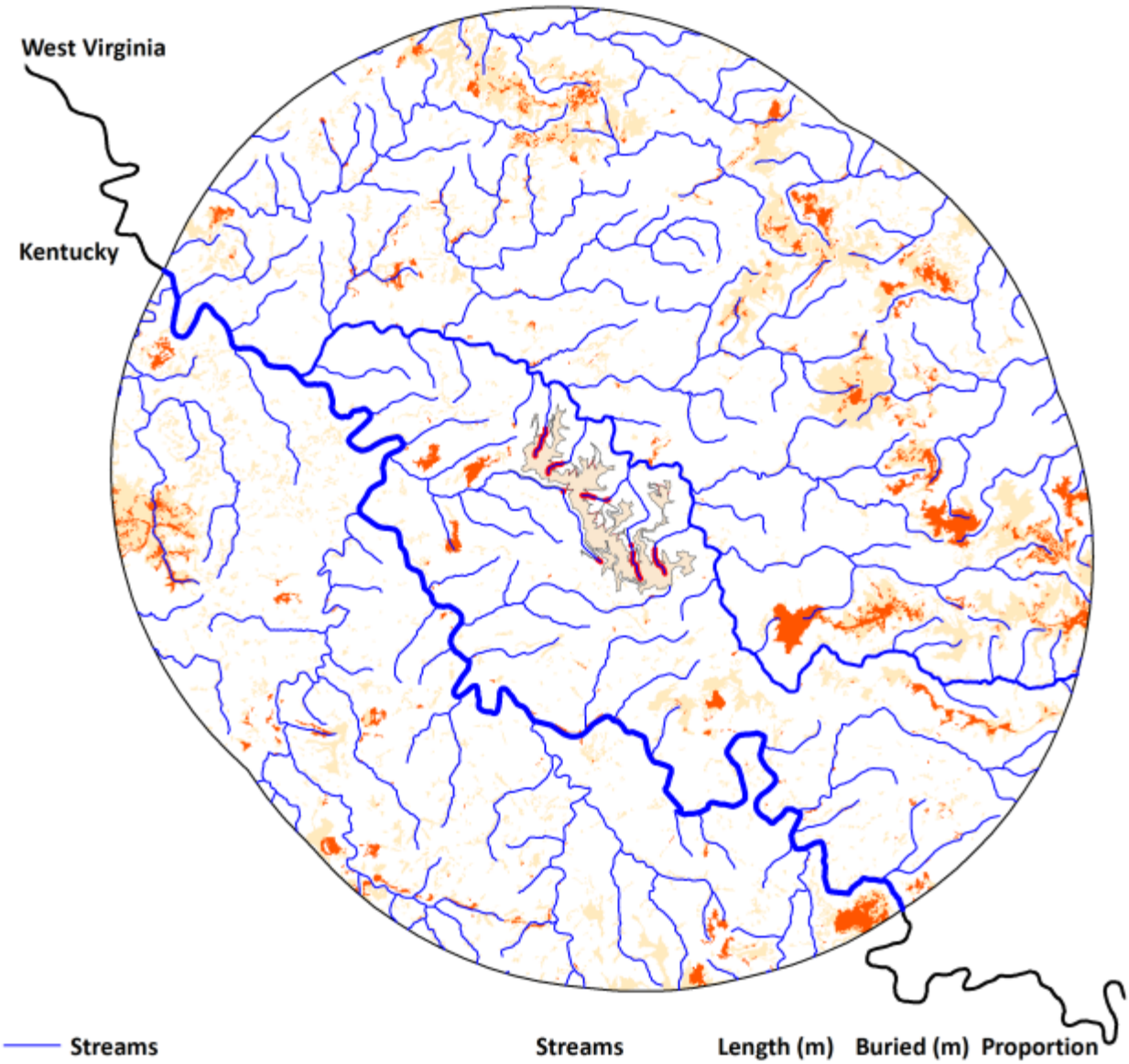
Map 2

**Figure E: Streams buried by Buffalo Mountaintop Mine**




- Streams
- Pigeon Cr.
- Tug River
- Streams buried by mines & valley fills
- Buffalo Mountain mine & valley fills
- Other mountaintop mines
- Mountaintop mine scrubland

| Streams | Length (m) | Buried (m) | Proportion |
|---|---|---|---|
| Ruth Trace | 2867 | 2058 | 0.72 |
| Conley Br. | 2820 | 1232 | 0.44 |
| Left Frk., Hell Cr. | 2141 | 880 | 0.41 |
| Hell Cr. | 5097 | 1860 | 0.36 |
| Pigeonroost Cr. | 2831 | 1860 | 0.66 |
| Miller Cr. | 11488 | 150 | 0.01 |
| Total | 27244 | 8040 | 0.30 |

Map 3. Streams Buried by Buffalo Mountain Mine Complex

| | HUC_12 | HU_12_NAME | % CRITICAL |
|---|---|---|---|

| | | | FOREST |
|---|---|---|---|
| CURRENT | 050702010401 | Headwaters Pigeon Creek | 67.67 |
| | 050702010403 | Outlet Pigeon Creek | 71.87 |
| | 050702010506 | Miller Creek-Tug Fork | 61.18 |
| | | | |
| BUFFALO | 050702010401 | Headwaters Pigeon Creek | 66.78 |
| | 050702010403 | Outlet Pigeon Creek | 67.31 |
| | 050702010506 | Miller Creek-Tug Fork | 59.78 |
| | | | |
| ALL MINES | 050702010401 | Headwaters Pigeon Creek | 58.85 |
| | 050702010403 | Outlet Pigeon Creek | 61.17 |
| | 050702010506 | Miller Creek-Tug Fork | 54.11 |

Table 1: Comparison of critical forest in the HUC 12 Subwatersheds impacted by the project under current conditions, with Buffalo Mountain, and with all permitted mines. Mining data based on WVDEP Permit Boundary GIS files accessed 8/29/12.

| | HUC_8 | HUC_8_NAME | % CRITICAL FOREST |
|---|---|---|---|
| CURRENT | 05070201 | Tug Subbasin | 69.33 |
| | | | |
| BUFFALO MTN | 05070201 | Tug Subbasin | 68.97 |
| | | | |
| ALL MINES | 05070201 | Tug Subbasin | 64.99 |

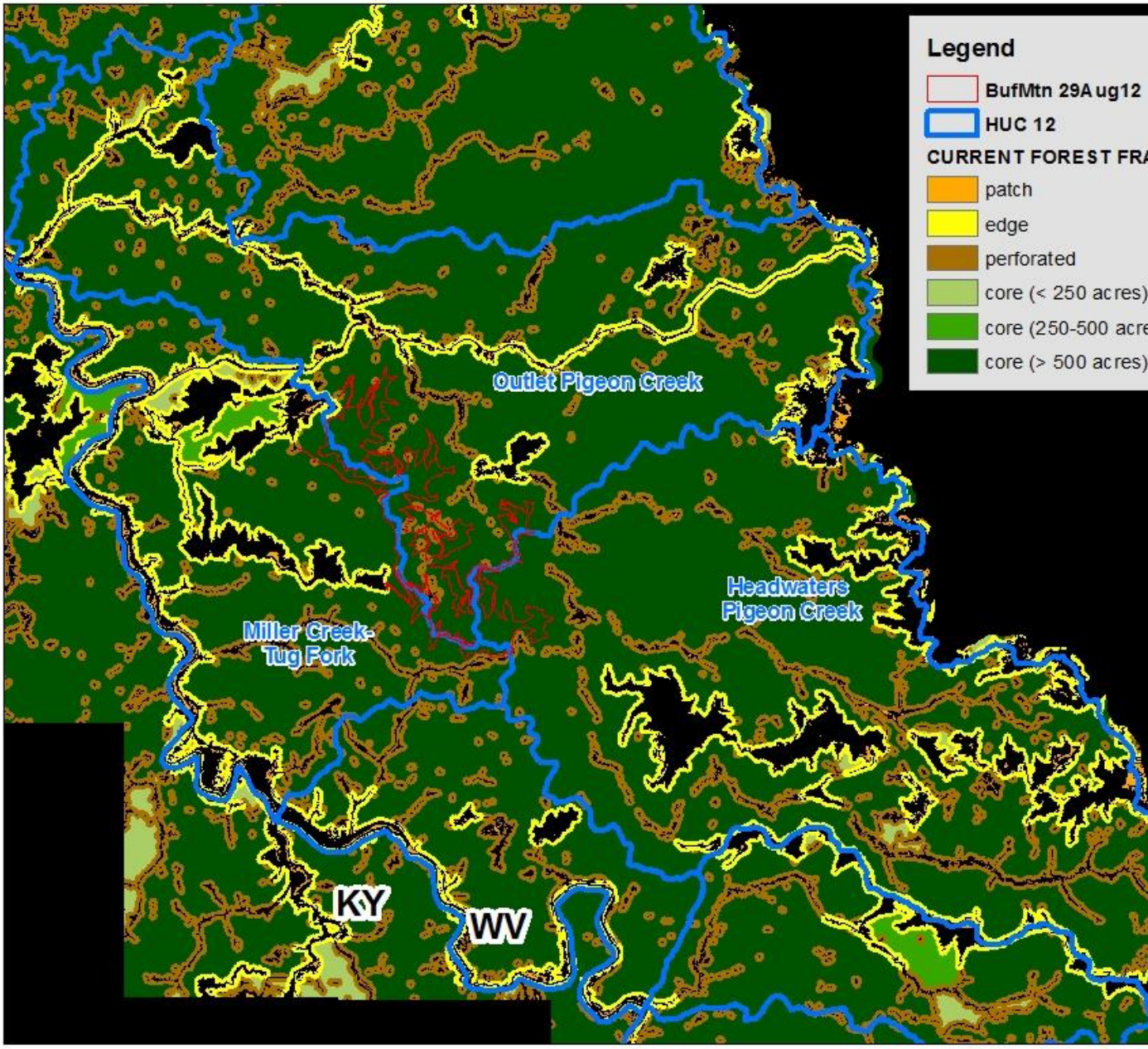
Table 2: Comparison of critical forest in the Tug HUC 8 Subbasin impacted by the project under current conditions, with Buffalo Mountain, and with all permitted mines. Mining data based on WVDEP Permit Boundary GIS files accessed 8/29/12.

| | HUC_12 | HUC_12_NAME | % PATCH | % EDGE | % PERFORATED | % CORE < 250AC | % CORE 500 |
|---|---|---|---|---|---|---|---|
| CURRENT | 050702010401 | Headwaters Pigeon Creek | 0.38 | 10.22 | 14.82 | 0.31 | |
| | 050702010403 | Outlet Pigeon Creek | 0.29 | 8.56 | 12.13 | 0.12 | |
| | 050702010506 | Miller Creek-Tug Fork | 1.29 | 13.77 | 12.02 | 0.62 | |
| | | | | | | | |
| BUFFALO | 050702010401 | Headwaters Pigeon Creek | 0.60 | 12.01 | 18.46 | 1.62 | |
| | 050702010403 | Outlet Pigeon Creek | 0.71 | 13.36 | 15.87 | 1.07 | |
| | 050702010506 | Miller Creek-Tug Fork | 1.57 | 16.88 | 18.42 | 3.21 | |
| | | | | | | | |
| ALL MINES | 050702010401 | Headwaters Pigeon Creek | 0.83 | 19.12 | 12.28 | 5.49 | |
| | 050702010403 | Outlet Pigeon Creek | 1.49 | 17.58 | 13.08 | 2.89 | |
| | 050702010506 | Miller Creek-Tug Fork | 2.36 | 23.15 | 15.01 | 4.67 | |

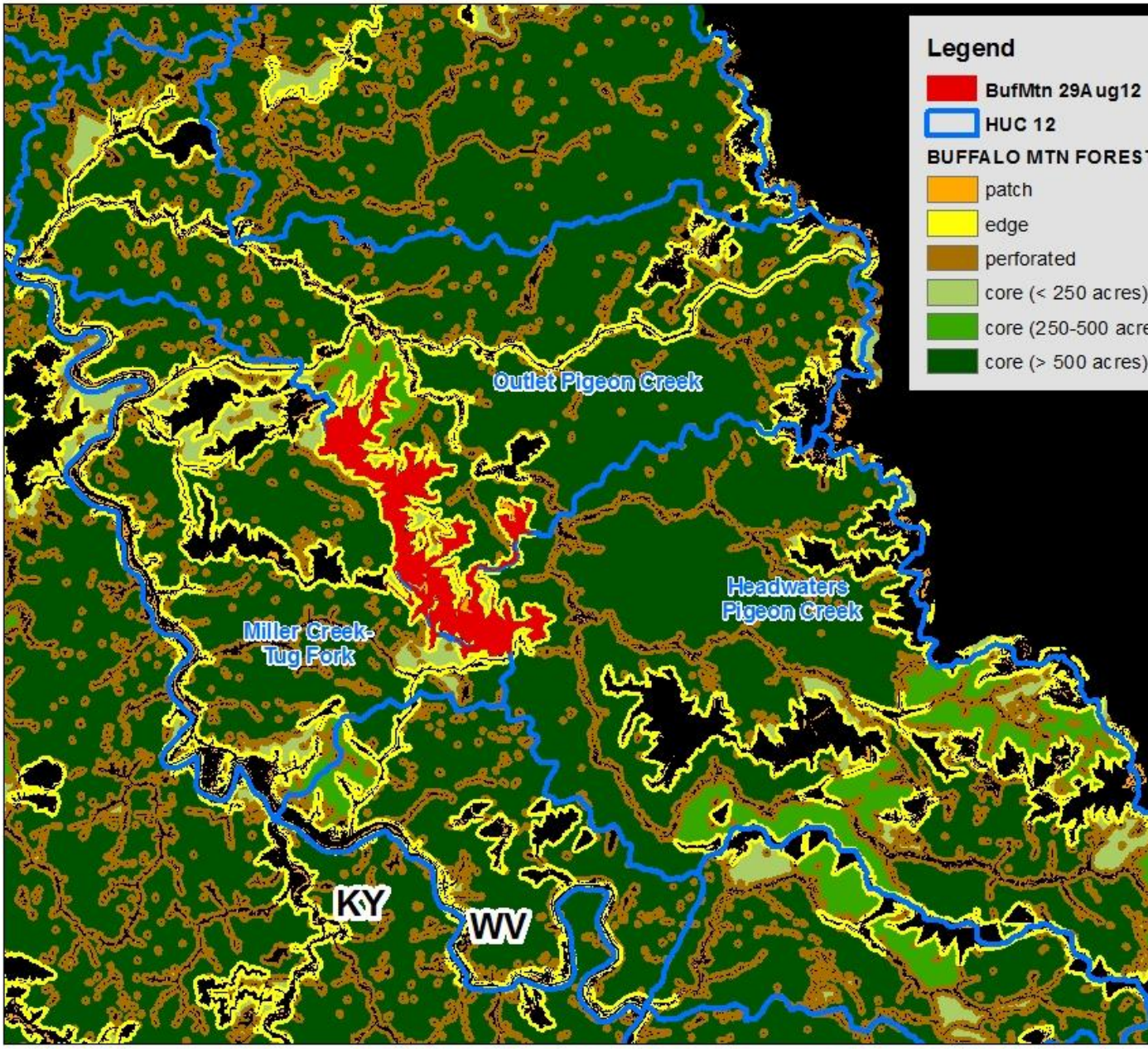
Table 3: Comparison of critical forest in the HUC 12 Subwatersheds impacted by the project under current conditions, with Buffalo Mountain, and with all permitted mines. Mining data based on WVDEP Permit Boundary GIS files accessed 8/29/12.

| | HUC_8 | HUC_8_NAME | % PATCH | % EDGE | % PERFORATED | % CORE < 250AC |
|---|---|---|---|---|---|---|
| **CURRENT** | 05070201 | Tug Subbasin | 0.00* | 5.44 | 15.97 | 0.33 |
| | | | | | | |
| **BUFFALO MTN** | 05070201 | Tug Subbasin | 0.47 | 6.52 | 24.27 | 1.43 |
| | | | | | | |
| **ALL MINES** | 05070201 | Tug Subbasin | 0.87 | 12.17 | 21.10 | 3.12 |

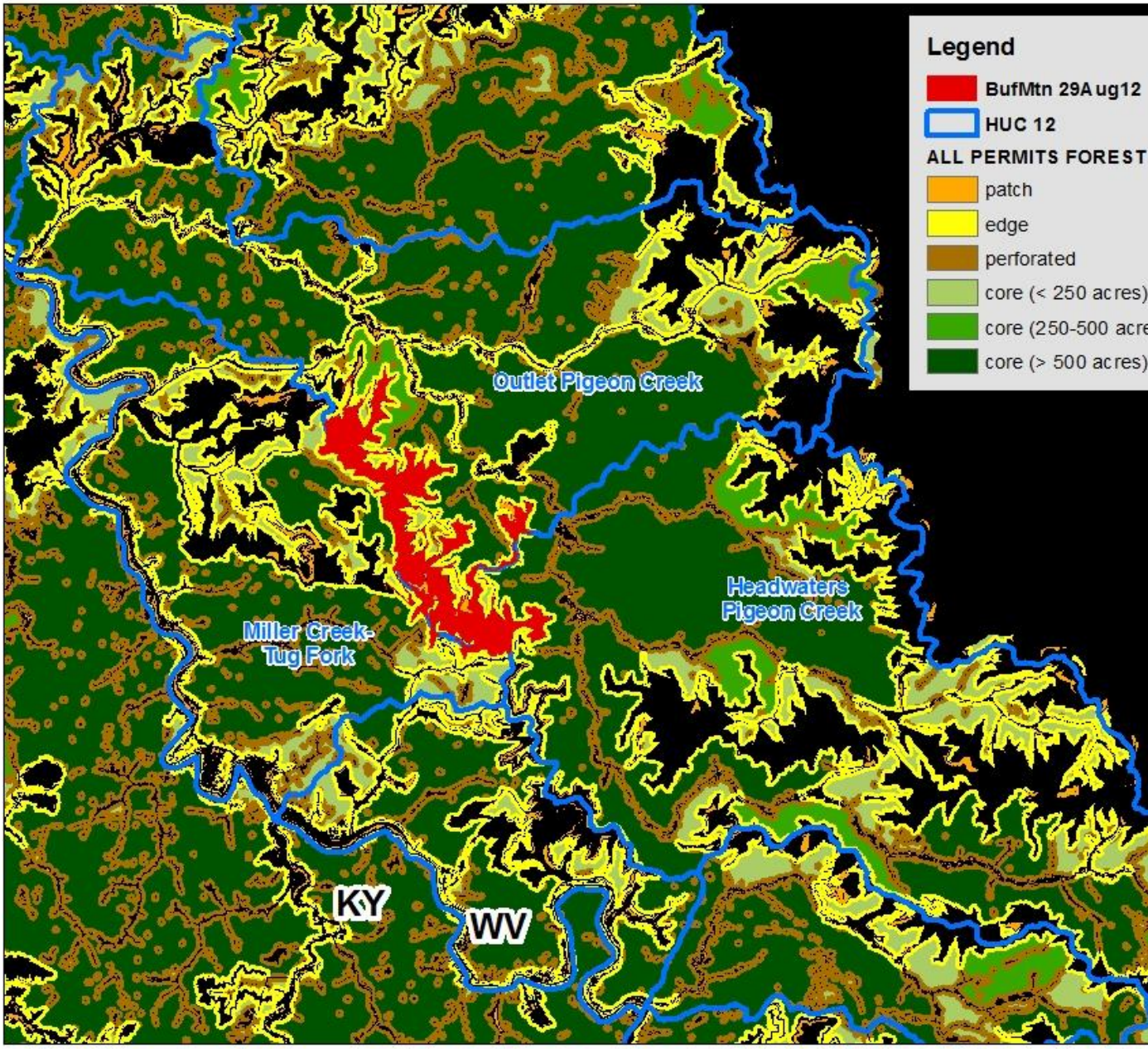
Table 4: Comparison of forest in the HUC 8 Subbasin impacted by the project under current conditions, with Buffalo Mountain, and with all permitted mines. Mining data based on WVDEP Permit Boundary GIS files accessed 8/29/12. (*Value is not zero but such a small number that when formatted it shows up in the table as zero. Most likely a result of the methodology of original data – see http://wvgis.wvu.edu/data/dataset.php?ID=451)




Map 4. Current (2011) forest core areas, edges and perforations.




Map 5. Potential future forest condition if Buffalo Mountain permitted.




Map 6. Potential future forest condition based on all permitted mines.

**Table 5. Federally Listed Species occurring in counties associated with the Tug Fork Subbasin (8-digit Hydrologic Unit).**

| | | | | WV | | | KY | | | VA | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Species | Status | Group | Mingo | McDowell | Wayne | Lawrence | Martin | Pike | Buchanan | Tazwell |
| Percina burtoni | Blotchside darter | SOC | Fish | | | | | | | | X |
| *Cottus* sp. 1 | Bluestone sculpin | SOC | Fish | | | | | | | | X |
| *Cottus* sp. 4 | Clinch sculpin | SOC | Fish | | | | | | | | X |
| *Etheostoma osburni* | Candy darter | SOC | Fish | | | | | | | | |
| *Cryptobranchus alleganiensis* | hellbender | SOC | Amphibian | X | X | | | | | | |
| *neotoma floridana* | eastern woodrat | SOC | Mammal | X | X | | | | | | |
| *Myotis sodalis* | Indiana bat | E | Mammal | X | X | | | | | X | X |
| *Corynorhinus townsendii virginianus* | Virginia big-eared bat | E | Mammal | | | | | | | | X |
| *Myotis leibii* | Eastern small-footed bat | U | Mammal | | | | | | | | X |
| *Corynorhinus rafinesquii* | SE big-eared bat | SOC | Mammal | X | X | | | | | | |
| *Setophaga cerulea* | Cerulean warbler | SOC | Bird | X | X | | | | | | |
| *Cambarus veteranus* | Crayfish | SOC | Invertebrate | X | X | X | | | | | |
| *Speyeria diana* | Diana fritillary butterfly | SOC | Invertebrate | X | X | | | | | X | X |
| *Juglans cinera* | Butternut | SOC | Plant | X | X | | | | | | |
| *Saxifraga caroliniana* | Gray's saxifrage | SOC | Plant | X | X | | | | | | |
| *Paxistima canbyi* | Canby's mountain-lover | SOC | Plant | | | | | | | | X |
| *Monarda fistulosa ssp. brevis* | Smoke hole bergomot | SOC | Plant | | | | | | | | |
| *Spirea virginiana* | Virginian spirea | T | Plant | | | | | | | X | X |
| *Cyprogenia stegaria* | Fanshell mussel | E | Invertebrate | | | | X | | | | |
| *Speyeria idalia* | Regal fritillary | SOC | Plant | | | | | | | X | |
| *Saxifraga careyana* | Carey saxifrage | SOC | Plant | | | | | | | X | |
| *Paravitrea mira* | Funnel suprcoil | SOC | Invertebrate | | | | | | | X | |
| *Isoperla major* | Beartown perlodid stonefly | SOC | Invertebrate | | | | | | | | X |
| *Pseudanophthalmus hotulanus* | Burkes Garden cave beetle | SOC | Invertebrate | | | | | | | | X |
| *Pseudanophthalmus vicarius* | Cave beetle | SOC | Invertebrate | | | | | | | | X |
| *Litocampa sp. 5* | Cave dipluran | SOC | Invertebrate | | | | | | | | X |
| Stylodrilus beattiei | Cave lumbriculid worm | SOC | Invertebrate | | | | | | | | X |
| *Kleptochthonius regulus* | Cave psuedo-scorpion | SOC | Invertebrate | | | | | | | | X |
| *Nesticus tennesseensis* | Cave spider | SOC | Invertebrate | | | | | | | | X |
| *Arrhopalite commorus* | Cave springtail | SOC | Invertebrate | | | | | | | | X |
| *Sphalloplana chandleri* | Chandler's planarian | SOC | Invertebrate | | | | | | | | X |
| *Villosa trabalis* | Cumberland bean pearly mussel | E | Invertebrate | | | | | | | | X |
| *Fusconaia cuneolus* | Fine-rayed pigtoe | E | Invertebrate | | | | | | | | X |
| *Ptychobranchus* | Fluted kidneyshell | C | Invertebrate | | | | | | | | X |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***subtentum*** | | | | | | | | | | | |
| ***Pseudanophthalmus virginicus*** | **Maiden Spring cave beetle** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Buotus carolinus*** | **Millipede** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Dixioria fowleri*** | **Millipede** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Pseudotremia alecto*** | **Millipede** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Pseudotremia armesi*** | **Millipede** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Pseudotremia tuberculata*** | **Millipede** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Epioblasma capsaeformis*** | **Oyster mussel** | **E** | **Invertebrate** | | | | | | | | **X** |
| ***Speyeria idalia*** | **Regal fritillary** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Cumberlandia monodonta*** | **Spectacle case** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Io fluvalis*** | **Spiny riversnail** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Epioblasma florentina walkeri*** | **Tan riffleshell** | **E** | **Invertebrate** | | | | | | | | **X** |
| ***Pleurobema oviforme*** | **Tennessee clubshell** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Lasmigona holstonia*** | **Tennessee heelsplitter** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Fusconaia barnesiana*** | **Tennessee pigtoe** | **SOC** | **Invertebrate** | | | | | | | | **X** |
| ***Cimicifuga rubifolia*** | **Appalachian bugbane** | **SOC** | **Plant** | | | | | | | | **X** |
| ***Poa paludigema*** | **Bog bluegrass** | **SOC** | **Plant** | | | | | | | | **X** |
| ***Euphorbia purpurea*** | **Glade spurge** | **SOC** | **Plant** | | | | | | | | **X** |
| ***Ilex collina*** | **Long stalked holly** | **SOC** | **Plant** | | | | | | | | **X** |
| ***Buckleya distichophylla*** | **Piratebush** | **SOC** | **Plant** | | | | | | | | **X** |
| ***Carex schweinitzii*** | **Schweinitz's sedge** | **SOC** | **Plant** | | | | | | | | **X** |

**Table 6. Species occurring within the Upper Tug Subbasin that are rated as Globally Vulnerable or Imperiled by Nature Serve and associated conservation status within West Virginia. Species without a state status are not**