BEFORE THE U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF SURFACE MINING

In re Designation of Certain Lands	)
Within the North Cumberland	)
Wildlife Management Area and the	)
Emory River Tracts Conservation	)
Easement, Anderson, Campbell, Morgan	)
and Scott Counties, Tennessee as	)
Unsuitable for Surface Coal Mining	)
Operations	)

REQUEST TO INTERVENE IN SUPPORT OF STATE OF TENNESSEE'S PETITION

Introduction

Pursuant to 30 C.F.R. §764.15(c), the Southern Environmental Law Center, on behalf of the proposed intervenors, the National Parks Conservation Association ("NPCA"), the Warioto Chapter of the National Audubon Society ("Audubon"), the Tennessee Ornithological Society ("TOS"), the Tennessee Environmental Council ("TEC"), the Natural Resources Defense Council ("NRDC"), Defenders of Wildlife ("Defenders"), and the Sierra Club, and their members [hereinafter collectively, "Intervenors"], requests that the United States Department of the Interior, Office of Surface Mining ("OSM"), grant Intervenors the right to intervene in support of the petition filed by the State of Tennessee on 1 October 2010 [hereinafter "State Petition"].

Under 30 C.F.R. §764.15(c), "any person may intervene in the proceeding by filing allegations of facts describing how the designation determination directly affects the intervenor, supporting evidence, a short statement identifying the petition to which the allegations pertain, and the intervenor's name, address and telephone number." Part I below identifies the Intervenors and their contact information, and describes their interests and how designation

would directly affect those interests and the interests of Intervenors' members. Part II provides supporting evidence and identifies those sections of the petition to which the Intervenors' allegations pertain.

The State Petition seeks designation as unsuitable for surface coal mining operations the area within 600 feet of the ridge lines lying within the North Cumberland Wildlife Management Area ("WMA"), comprising the Royal Blue WMA, the Sundquist WMA, and the New River WMA (also known as the Brimstone Tract Conservation Easement), and the Emory River Tracts Conservation Easement, and encompassing approximately 67,326 acres [hereinafter referred to as the "Petition Area"].[1] The State Petition relies on two of the designation criteria set forth in section 522 of the Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. §1272 ("SMCRA"), asserting that 1) surface mining operations in the Petition Area would be incompatible with numerous State land use plans and programs under 30 U.S.C. §1272 (a)(3)(A),[2] and that 2) the Petition Area meets the definition of "fragile lands," under 30 U.S.C. §1272 (a)(3)(B), and surface mining would significantly damage the natural systems and esthetic, recreational, cultural, and historic values of the ridge lines and their viewsheds that exist within these fragile lands.[3]

As set forth below, Intervenors fully support the allegations included in the State Petition. In addition, Intervenors assert that surface mining operations in the Petition Area would be incompatible with the National Park Service's ("NPS") General Management Plan for the Big South Fork National River and Recreation Area ("NRRA") [hereinafter referred to as the "Big South Fork NRRA"], and the specific purposes for which Congress established the NRRA. Further, Intervenors assert that surface mining in the Petition Area would significantly damage

[1] State Petition at 1.
[2] *See id.* at 3-4, 8-20.
[3] *Id.*at 4, 20-28.

the "fragile lands" that provide vital habitat for numerous endangered, threatened, and vulnerable species that exist in and downstream of the Petition Area, including in the fragile lands of the Big South Fork NRRA.[4] As the State's Petition recognizes, surface mining in the Petition Area would directly damage "wildlife and wildlife habitat within, surrounding, and downstream from the mined areas."[5] Because Intervenors' interests would be directly and adversely affected by mining in the Petition Area,[6] Intervenors urge OSM to designate the Petition Area as unsuitable for surface coal mining operations for the reasons set forth in the State Petition and for the additional reasons elaborated herein.

I. IDENTIFICATION OF INTERVENORS AND THEIR INTERESTS AND DESCRIPTION OF HOW MINING IN THE PETITION AREA MAY ADVERSELY AFFECT THOSE INTERESTS

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[4] A map of the Petition Area showing the watersheds and nearby lands is attached hereto as Exhibit 1. The State's Petition also recognizes the Big South Fork NRRA as a "fragile land." *See* State Petition at 21.

[5] State Petition at 11.

[6] Intervenors NPCA and Audubon filed a lands unsuitable petition in 2005 [hereinafter "2005 petition"] seeking designation of state-owned lands on the Northern Cumberland Plateau in Tennessee, which overlapped with the current Petition Area, as well as all lands lying within the Tennessee portion of the New River watershed, for a total area of approximately 283,834 acres. In a Statement of Reasons dated 13 January 2006 ("2006 SOR"), OSM found that NPCA and Audubon met the standing requirement. 2006 SOR at 2. However, OSM rejected the 90-page petition as incomplete, despite the fact that the statute and regulations require simply that the petition set forth information and evidence that "tends to establish" the allegations. *See* 30 U.S.C. §1272(c); 30 C.F.R. §764.13(b)(1)(v). This document refers herein to the 2005 petition and the 2006 SOR as appropriate.

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Intervenor NPCA is America's only private, nonprofit citizens' organization dedicated solely to protecting, preserving, and enhancing the U.S. National Park System. Founded in 1919, NPCA has over 337,000 members nationwide, including 5,457 active members who reside in Tennessee. Many of these members, including Joel Fairstein, Daniel E. Williams, and Hiram Rogers, use and enjoy the Big South Fork NRRA and other lands on the Cumberland Plateau, including in the Petition Area, for recreation. NPCA's Southeast Regional office in Knoxville specifically works to protect the Big South Fork NRRA, which Congress designated to protect the NRRA's cultural, historic, fish and wildlife, scenic, recreational, and other values, and to protect water quality, 16 U.S.C. §460ee(a),(h)(i). The New River and Clear Fork in Tennessee join to form the Big South Fork of the Cumberland River ("Big South Fork"), which flows through the NRRA. As a result, NPCA has a specific interest in protecting the lands in the Petition Area that are part of the New River watershed to safeguard water quality, the fish and wildlife, and the scenic and recreational values of the NRRA and surrounding area.[7]

Historically, surface mining within the New River watershed has adversely affected the NRRA and the Big South Fork through sediment loading, acid mine drainage, and other impacts. The cumulative impacts from past, existing, and any new surface mining in the Petition Area could impair water quality in the New River and the Big South Fork, impacting pollution-sensitive aquatic species and the natural and aesthetic values of the NRRA.

[7] *See* map Exhibit 1 showing the Petition Area and the New River, Clear Fork, and the Big South Fork of the Cumberland River watersheds.

NPCA's interest in preserving the congressionally-recognized values of the NRRA would be directly and adversely affected by destruction of the ridgetops and damage to streams from surface mining in the Petition Area. Likewise, surface mining in the Petition Area will directly and adversely affect the interests of NPCA members in protecting and enjoying the lands and viewsheds of the NRRA and the Petition Area. Joel Fairstein has been a member of NPCA since April 2010. He grew up in Oak Ridge, Tennessee, adjacent to the North Cumberland area that is the subject of the State of Tennessee's petition. His family goes back several generations on the Cumberland Plateau where he regularly visited his grandparents as a child. Mr. Fairstein has been an avid hiker, traveler, and amateur photographer for over 40 years and has a particular fondness for the natural beauty of the Cumberland Mountains and their watersheds. He particularly values the richness of wildlife in the Petition Area, its clear streams, as well as its uninterrupted ridge lines, which he believes are among the most scenic in the world.

As a photographer and musician, Mr. Fairstein places a very high value on the aesthetic beauty of an intact, natural landscape. Over the years, he has also hiked regularly in Frozen Head State Park and Natural Area ("Frozen Head"), including to the observation tower that overlooks many of the ridge lines that comprise the Petition Area, and he intends to hike and photograph these lands in the future. Any future surface mining in the Petition Area would alter these ridge lines and diminish his enjoyment of hiking and photography there. Mr. Fairstein has also hiked in the Big South Fork NRRA, downstream from the Petition Area, many times (15-20) since the 1970s and has canoed the river twice, and he intends to use the area for recreation in the future. Surface mining in the Petition Area would diminish his enjoyment of the Big South Fork NRRA as a result of increased sediment in the Big South Fork. Mr. Fairstein has also traveled through nearby areas in Claiborne and Campbell Counties in Tennessee that have

been heavily mined, and he was very disturbed by the devastating damage to the landscape from mining. Similar mining in the Petition Area would profoundly affect his enjoyment of these lands.

Daniel Williams has been an NPCA member since around 2008, and he enjoys hiking, camping, fishing, canoeing, and observing nature. He has enjoyed these outdoor recreational activities (at least annually) in many areas of the Cumberland Mountains region including Frozen Head and the Big South Fork NRRA. In Frozen Head, Mr. Williams has hiked to the observation tower overlooking many of the ridge lines that are the subject of the State Petition. His interest in viewing an intact, scenic landscape will be harmed by the inherent damage that would result from mining these ridge lines. He intends to hike and enjoy the scenic beauty of these mountains at least once a month from March through October as long as his health continues to allow it.

Mr. Williams has also canoed the river in the Big South Fork NRRA downstream from the Petition Area and is very concerned about the impact of surface mining (siltation, acid mine drainage) on the recreational experience and on the biological health of the river. As a contractor working for the U.S. Environmental Protection Agency ("EPA") for 12 years (in Cincinnati) assessing fish and benthic invertebrate populations, Mr. Williams has witnessed first-hand the impacts to aquatic life from siltation and acid mine drainage. Mr. Williams also understands the importance of headwater areas to preserve biological diversity, and he is concerned about the impacts of surface mining in the Petition Area on downstream biological diversity, including in the Big South Fork. Mining in the Petition Area would greatly diminish his enjoyment of lands in the Petition Area and the Big South Fork NRRA for recreational purposes and his interest in preserving and protecting the biodiversity and water quality of these areas.

Hiram Rogers has been an NPCA member since September 1994 and enjoys hiking, backpacking, mountain biking, and trail running, and he has been exploring the Cumberland Mountains since 1993. Mr. Rogers donated to the "Connecting the Cumberlands" fund raising efforts through The Nature Conservancy. He has led hiking trips to Frozen Head, the Emory Tract, and on the Cumberland Trail State Scenic Trail and State Park (the "Cumberland Trail") in the North Cumberland WMA for the Smoky Mountains Hiking Club. Since the mid-2000s, he has been a trail maintenance volunteer at Frozen Head and was a volunteer in 2009 and 2010 at the Cumberland Trail 50K Race, which is a fundraiser for the Cumberland Trail. Since the opening of the Emory Tract, he and his wife have systematically explored the new state lands in the upper Emory River Watershed. Mr. Rogers has also explored the North Cumberland WMA by mountain bike, primarily using ridgetops routes that would be protected by the State Petition. He values the area for its scenery and for the richness of its flowers and trees. He intends to continue his exploration of the area on foot and by bike, plans to lead two hikes into the Petition Area in 2011, and will continue with volunteer trail work in Frozen Head and on the Cumberland Trail.

Mr. Rogers places particular value on the scenic beauty of the Cumberland Mountains, which are currently threatened by the potential for surface mining. His many visits in the Cumberlands have provided numerous examples of un-reclaimed land disturbance, acid mine drainage and erosion, and water quality impacts from past mining operations. The diversity of plant species on the ridgetops of the Cumberlands is also important to Mr. Rogers and his wife, who especially appreciate the richness of the spring wild flower bloom and the diversity of the hardwood forests. Surface mining would result in the destruction of significant forest tracts in the Petition Area. A new era of surface mining on the ridgetops of the Cumberland Mountains in

the Petition Area would severely restrict his enjoyment of the recreational opportunities afforded in and around the Petition Area.

Intervenor the Warioto Chapter of the National Audubon Society is an organization of approximately 130 members who frequently engage in the activity of recreational bird-watching. Its mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. Members of the Warioto Chapter of Audubon, including Joseph R. Schiller, Ph.D., use and enjoy the Petition Area, including Royal Blue and Sundquist WMAs, for bird-watching. These lands are important refuges for a number of high-priority, migratory songbirds, and they further serve as a core breeding area for some of these bird species that are facing a precipitous decline in numbers, such as the Cerulean Warbler, the Louisiana Waterthrush, and the Worm-eating Warbler. By clearing the forested ridgetops and fragmenting the contiguous tracts of old growth forest that are important to the continued propagation of these species, surface mining in the Royal Blue and Sundquist WMAs will threaten the continued survival of these rapidly declining songbirds. As a result, the interests of Audubon and its members in viewing and conserving these birds will be directly and adversely affected.

Dr. Schiller makes regular visits to Knoxville, Tennessee, and often takes advantage of the city's proximity to the Sundquist and Royal Blue WMAs to go bird-watching there. He enjoys visiting these two WMAs because of the high density of Cerulean and other warbler species that exist there. Lands in the Cumberland Mountains of eastern Tennessee support some of the highest nesting densities of the Cerulean Warbler found in its breeding range; the Petition Area supports Cerulean and other warblers that are observed across the southeastern U.S. during these species' spring and fall migrations. Dr. Schiller's interests will be harmed by surface

mining in the Petition Area because it will result in far fewer Cerulean and other rare warblers to be enjoyed.

Intervenor TOS is a statewide organization of 11 chapters and over 1,000 amateur and professional ornithologists who frequently engage in the activity of recreational bird-watching. TOS was founded in 1915 to promote the enjoyment, scientific study, and conservation of birds. Members of TOS, including Melinda Welton, regularly visit and enjoy the Petition Area, including the North Cumberland WMA, for bird-watching and bird study. The North Cumberland WMA provides important breeding habitat for a number of forest bird species of high conservation concern, and annual spring field trips focus on the opportunity to see species such as the Worm-eating Warbler, Swainson's Warbler, Louisiana Waterthrush, Kentucky Warbler, and especially the Cerulean and rare Blackburnian Warbler. Mountaintop removal mining destroys the forested ridgetops and fragments the contiguous tracts of old growth forest that these species require for successful breeding. As a result, mining in the Petition Area will directly and adversely affect the interests of the Tennessee Ornithological Society and its members in viewing, studying, and conserving these birds.

Melinda Welton, TOS member and a professional ornithologist, regularly studies birds in the North Cumberland WMA, Frozen Head, and the adjoining Brimstone and Emory Conservation Easement areas. She has hiked the length of the Cumberland Trail in the Cumberland Mountains and often camps in this area. The Tennessee Wildlife Resources Agency's interest in managing the North Cumberland WMA for high-priority forest bird species, and the Cerulean Warbler in particular, has led them to fund studies that Ms. Welton has conducted, in collaboration with Dr. David Buehler at the University of Tennessee Knoxville, to better understand Cerulean Warbler distribution and breeding habitat requirements. (See, for

example, Buehler, D. A., M. J. Welton, and T. Beachy, *Predicting cerulean warbler habitat use in the Cumberland Mountains of Tennessee*, Journal of Wildlife Management 70(6): 1763-1769 (2006) [hereinafter "Buehler et al. 2006"] (Exhibit 2). Ms. Welton's professional and recreational interests will be harmed by surface mining activity in the Petition Area, because it will result in the destruction of prime Cerulean Warbler breeding habitat, and habitat for other rare migrant and resident bird species, and destroy the magnificent vistas found in the Cumberland Mountains.

Intervenor TEC is a 40-year old organization whose mission is to educate and advocate for conservation and the improvement of Tennessee's environment, communities, and public health. Among other activities, since 2007 TEC has sponsored a Summit for a Sustainable Tennessee, bringing together more than 200 different organizations and over five hundred individuals to draft and implement the Tennessee Sustainability Agenda designed to conserve Tennessee's environment, public health, and communities. For the past three years, the Summit's policy agenda has included as one of its top priorities passage of legislation to stop mountaintop removal coal mining in Tennessee. Mining in the Petition Area would be directly contrary to TEC's organizational goals. Members of TEC, including Board Chair Don Safer and individual member Sandra Goss, often recreate in the Petition Area and in the Big South Fork NRRA, downstream from the Petition Area, and in Frozen Head, just outside the Petition Area. Mining in the Petition Area would directly and adversely affect these members' recreational interests.

TEC Board Chair Don Safer is an avid paddler and is also a board member of the Tennessee Scenic Rivers Association. Mr. Safer often kayaks in the Big South Fork, which he describes as one of his "absolute favorite rivers to paddle." He was on the river twice in 2010

from the confluence of Clear Fork and the New River to Leatherwood Ford and would have paddled it more but it was at flood stage. Mr. Safer is also concerned about water quality and habitat of the NRRA. He has noted the difference in water quality between the two tributaries that come together to make up the Big South Fork: the New River has significant water quality issues, including turbidity and coal debris, while Clear Fork is notably true to its name and has a higher degree of clarity. Mr. Safer's interests in recreation in, and the water quality and habitat of, the NRRA would be damaged by further destruction of the ridgetops and damage to streams by coal surface mining in the Petition Area.

TEC member Sandra Goss hikes and otherwise recreates in the Royal Blue and Sundquist WMAs, the Cumberland Trail, and Frozen Head. In her hikes, she enjoys the view of the ridgetops, the most widely visible parts of the Northern Cumberlands. Her interests in recreating in this area and her enjoyment of the view of the ridgetops would be harmed by further surface mining and the consequent destruction of the viewshed in the Petition Area.

Intervenor NRDC's purpose is to safeguard the Earth: its people, plants and animals, and the natural systems on which life depends. NRDC works to restore the integrity of the elements that sustain life -- air, land, and water -- and to defend endangered natural places. NRDC seeks to establish sustainability and good stewardship of the Earth and to protect nature in ways that advance the long-term welfare of present and future generations. NRDC has 3,995 members in Tennessee, of which a total of 123 live in Anderson, Campbell, Morgan, and Scott Counties, the four counties encompassed by the Petition Area.

In 2003, NRDC designated the Cumberland Plateau as an NRDC BioGem, one of twelve most biologically outstanding and at-risk regions in the Americas. Consequently, the protection of the Cumberland Plateau is one of NRDC's top institutional land protection priorities. The

Cumberland Plateau is biologically unique; it represents one of the largest temperate hardwood plateau systems in the world. It hosts the densest concentration of imperiled species in North America, and is home to at least 3,000 native plant species, including more than 165 tree species; the most diverse collection of freshwater animal species in the United States; 260 species of fish; and nearly 1,000 animal species, hundreds of which are found nowhere else on the planet.

The "crown jewels" on the Cumberland Plateau are the Royal Blue, Sundquist, and New River WMAs, which collectively comprise the North Cumberland WMA. Over the past decade, NRDC has undertaken a concerted effort to protect these areas from commercial and industrial pressures that include mountaintop removal mining, paper industry logging, and other damaging land use practices. NRDC's many campaign activities include, among others:

- Research carried out in collaboration with the Conservation Biology Institute, Tennessee Forest Watch, and the Dogwood Alliance, documenting the unique biological characteristics of the Sundquist and Royal Blue areas, and concluding that paper industry-related logging and surface mining in those areas would have irreversible impacts.

- Collaboration with the Bowater Paper Company and the Dogwood Alliance to develop an approach to forestry on the Cumberland Plateau that would protect the Royal Blue, the Sundquist, and the New River WMAs.

- Generated support from members and others for Governor Bredesen's 2007 land acquisition, the "Connecting the Cumberlands" project.

- Advocating in numerous ways for the elimination of mountaintop removal mining in the northern Cumberland region, including in the Petition Area.

Mining in the Petition Area would thus directly and adversely affect the interests of NRDC and its members in protecting the Cumberland Plateau.

Jessica Neary has been a member of NRDC since September 2006. Ms. Neary and her husband have owned property in Rugby, Tennessee for six years. Five years ago, the Nearys built a vacation home on the property. The property is located near Clear Fork, part of the

Cumberland River drainage basin. Rugby itself sits between the Big South Fork NRRA, through which the Big South Fork flows, and the Rugby State Natural Area on the Cumberland Plateau. The area is known for its gorges, waterfalls, and pristine rivers.

Ms. Neary and her family visit their vacation home once or twice a month and often spend a week there in the summer. She and her family swim, fish, and canoe in Clear Fork, and they enjoy hiking on the many trails in the area. Ms. Neary is very much aware of the damage to water quality caused by mining, as her husband is a water resources engineer. Her husband has opposed some nearby environmentally damaging surface mining at Zeb Mountain, just outside of the Petition Area. She is concerned that, if mining is allowed to occur upstream in the Petition Area in the Clear Fork watershed, the water will become polluted, killing the fish, and making the water unsafe for swimming.

A major asset of Ms. Neary's property is the surrounding pristine streams and trails. If the streams become polluted by mining, it would ruin her and her family's enjoyment of their second home. Additionally, the value of her property is very much tied to its pristine natural setting. Ms. Neary believes that any environmental damage to the area caused by mining would significantly decrease the value of her property. Barring surface mining in the Petition Area would help assure that the naturally beautiful areas and streams surrounding her property are protected from pollution associated with mining.

Intervenor Defenders is a national non-profit organization dedicated to the protection and restoration of all native wild animals and plants in their natural communities. Based in Washington, D.C., and with offices from Florida to Alaska, Defenders has over 400,000 members across the nation, including 4,094 members in Tennessee. Defenders is a leader in the conservation community's efforts to protect and recover imperiled species, including species

listed as threatened or endangered under the Endangered Species Act. The Cumberland Plateau is one of the most biologically diverse temperate forest ecosystems in the world and is important habitat for many rare species, including the endangered Indiana bat, the Cumberland darter, and the Cerulean Warbler. As one example of Defenders' activities, Defenders, in conjunction with other conservation organizations and agencies, reintroduced fishers into the Catoosa WMA on the Cumberland Plateau.

Many of Defender's members, such as Lacy Gray, use and enjoy the public lands on the Cumberland Plateau for hiking, camping, wildlife viewing, and other recreational, aesthetic, and scientific pursuits. By clearing forested ridge lines on the Cumberland Plateau, fragmenting contiguous tracts of forests, and impairing the water quality of the region's streams and rivers with runoff from mining sites, surface mining will threaten the continued survival of imperiled species and destroy the region's recreational and aesthetic values. As a result, the interests of members of Defenders of Wildlife in observing and studying the region's rare species and enjoying its unspoiled forests, streams, and rivers will be directly and adversely affected.

Lacy Gray has been a member of Defenders since May 2008 and is originally from the community of Hebbertsburg, Tennessee, located on the Cumberland Trail near the Petition Area. She returns to Hebbertsburg often, and she has hiked on the Cumberland Trail on many occasions and especially enjoys doing so with her family. Several times each year she enjoys the hiking, camping, bird-watching, and other wildlife-viewing opportunities offered by the Big South Fork NRRA, the Cumberland Trail, or Frozen Head, and intends to continue to visit these places regularly in the future. The State of Tennessee's establishment of the North Cumberland WMA in 2007 protected important habitat for the region's rare species and created new opportunities for Ms. Gray to explore the landscape and wildlife of the Cumberland Plateau. Ms.

Gray's aesthetic and recreational interests will be harmed by surface mining operations in the Petition Area because of the damage such operations will do to habitat for the Cerulean Warbler and other wildlife, and the recreational and cultural values of the area. As a native Tennessean, whose family has lived on the Cumberland Plateau for generations, her interests will further be harmed by the damage to the quality of life for those living in the Petition Area.

Intervenor Sierra Club is a nonprofit organization incorporated in California with more than 1.3 million members and supporters nationwide. Approximately 6,000 members reside in Tennessee and belong to the Sierra Club's Tennessee Chapter, including David Reister. The Sierra Club is dedicated to exploring, enjoying, and protecting the wild places of the Earth; to practicing and promoting the responsible use of the Earth's resources and ecosystems; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. The Sierra Club's concerns encompass the exploration, enjoyment, and protection of natural areas and surface waters in Tennessee.

The Sierra Club's members will suffer injury to their aesthetic, recreational, environmental and/or economic interests as a result of surface mining in the Petition Area. The Sierra Club has members that live in and frequently travel throughout eastern Tennessee to enjoy the natural beauty of the area, including the mountains, forests, rivers and streams, and the extraordinary array of wildlife living in the area. These members observe and experience the adverse impacts of surface mining activities, including changes to the landscape, deforestation, impaired or destroyed streams, and discharges of air and water pollutants in or near areas where Sierra Club's members live, travel, and recreate.

David Reister has been a Sierra Club member since 1970 and is the current vice-chair of the Harvey Broome Group of the Tennessee Chapter. He has lived in Anderson County or Knox County for 36 years, and for 15 years has been actively involved with efforts to build, maintain, preserve, and promote the Cumberland Trail. The Cumberland Trail passes through the Royal Blue, New River, and Sundquist WMAs, encompassed by the State's petition. Mr. Reister was a leader in building this portion of the Cumberland Trail and has hiked it on many occasions, has taken photographs in the area, and intends to return to this area in the future. He is concerned about maintaining high water quality in the watersheds of the North Cumberlands, including the Emory River, New River, Cumberland River, and the Clinch River. He has owned 40 acres on the Emory River in Morgan County for 22 years. Mr. Reister has witnessed the destructive impacts of surface mining in Tennessee, specifically through many visits to the Zeb Mountain area and other mining sites. His interests in hiking, photography, water quality, and in preserving the Cumberland Trail would be harmed by surface mining in the Petition Area because of the deforestation and the severe water and air pollution associated with mining.

II. ALLEGATIONS OF FACT AND SUPPORTING EVIDENCE

A. The Petition Area Should Be Designated Unsuitable For Surface Coal Mining Operations Because Mining Would Be Incompatible With Existing State And Federal Land Use Plans Or Programs.

1. Surface Mining Would Be Incompatible with the State Plans and the "Connecting the Cumberlands Project." (State Petition Allegations in Part I, Sections A-D at pages 8-20.)

As the State Petition alleges, surface mining in the Petition Area would be incompatible with the State's "Connecting the Cumberlands" project;[8] Tennessee's plans for the Cumberland Trail, the Tennessee Greenways and Trails Plan, and the Tennessee State Parks;[9] the State

[8] State Petition at 8-13.
[9] *Id.* at 15-17.

Management Plans for the WMAs;[10] and with Tennessee's Comprehensive Wildlife Conservation Strategy ("CWCS").[11] As the State Petition asserts, these plans "have at their core the preservation and improvement of wildlife habitat and recreational opportunities, and these goals would be seriously compromised by the inherent impacts of surface mining" in the Petition Area.[12] The "very purpose and vision" of Tennessee's "Connecting the Cumberlands" project is "to ensure the integrity and protection" of the public lands on a landscape level.[13] Further, the State's policy for these lands "is to preserve them in large blocks in order to protect habitat and diversity and to avoid landscape fragmentation."[14] The landscape level protection provided by the "Connecting the Cumberlands" acquisition and the state's other plans and strategies is critical to the habitat needs of species that require large, undisturbed forested areas to survive, for protection of aquatic habitat and water quality, and for preserving the recreational uses and values that Intervenors and their members enjoy.

In addition, as the State Petition provides, surface mining in the Petition Area would conflict with the management objectives for Tennessee's State Parks and would be "in direct conflict with the State's mission to preserve and protect in perpetuity" the resources of the Cumberland Trail and the public's recreational use of the North Cumberland WMA.[15] As set forth above in Part I., Intervenors' members frequently use the Cumberland Trail and the North Cumberland WMA for recreational purposes, as well as Frozen Head, and they also enjoy the scenic vistas of the Petition Area both from within and outside the Area.

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[10] *Id.* at 13-15.
[11] *Id.* at 17-20. The CWCS, Tennessee's State Wildlife Action Plan (Sept. 2005), is available at http://www.state.tn.us/twra/cwcs/tncwcs2005.pdf [hereinafter "CWCS"].
[12] State Petition at 3-4.
[13] *Id.* at 11.
[14] *Id.*
[15] *Id.* at 16. *See id.* at 24-25 (mining in the Petition Area will adversely impact the recreational value of the Smoky Mountain segment of the Cumberland Trail).

Surface mining within the Petition Area is also incompatible with Tennessee's management plans for the Sundquist and Royal Blue WMAs, which include, among other goals, protection of wildlife habitat, preservation of biological diversity,[16] and the maintenance or improvement of water quality.[17] The Plan indicates that "the major stream systems that are part of the Cumberland River System" have fair to poor water quality due largely to past mining activities, including from acid mine drainage.[18] As the State asserts, mining in the North Cumberland WMA cannot be done so as to meet Royal Blue's goals of ensuring that wildlife habitat and water quality are not adversely impacted.[19]

As OSM has recognized and as Tennessee's petition points out, surface mining, even conducted in full compliance with SMCRA, adversely impacts water quality.[20] In the Statement of Reasons ("SOR") for the lands unsuitable designation for Fall Creek Falls, OSM stated that "[e]levated levels of total dissolved solids" and "[i]ncreased sedimentation" are among the "inherent impacts" of surface mining that degrade water quality and suitability for aquatic wildlife.[21] In addition, OSM stated in the SOR that acid- and toxic-forming materials create a serious threat of "significant" to "severe" water quality impacts "even with state-of-the-art-predictive and preventive techniques."[22] In areas without the potential for acid mine drainage, OSM stated that surface mining can lead to "significant increases in alkalinity, total dissolved solids, [and] pH, resuspension of iron from previously weathered overburdens or spoils, and

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[16] *Id.* at 14.
[17] Tennessee Wildlife Resources Agency, A Management Plan for the Royal Blue Wildlife Management Area at 4-5 (1992) (cited in State Petition at 13-14) [hereinafter "Royal Blue Plan"].
[18] Royal Blue Plan at 28.
[19] *See* State Petition at 14.
[20] Fall Creek Falls Statement of Reasons, 65 Fed. Reg. 39,178, 39,183 (23 June 2000) (discussing "inherent impacts" of surface mining). *See* State Petition at 11, 21-22, 23, 25, 26.
[21] Fall Creek Falls Statement of Reasons, 65 Fed. Reg. at 39,183.
[22] *See id.* at 39,185-86.

generation of manganese."[23] These inherent impacts of surface mining would further impair aquatic habitat within the WMA, contrary to the habitat recovery and watershed restoration goals set forth in the Royal Blue Plan.[24] Mining in the Petition Area would directly and adversely affect the interests of Intervenors and their members in protecting water quality and wildlife habitat, and enjoying the recreational values of the Royal Blue WMA and other lands in the Petition Area.

With respect to the incompatibility of surface mining with Tennessee's CWCS, as the State Petition indicates, the "primary goal of the CWCS is to prevent nongame wildlife within the state from declining to the point of endangerment."[25] The CWCS identifies coal mining operations as a significant stressor adversely affecting wildlife in the Cumberland region.[26] As Tennessee states, the "CWCS finds that preventing surface mining by designating the most valuable habitats in the state" – such as the Petition Area – as "'lands unsuitable for mining' is the best action for combating mining's serious adverse impacts on these habitats and GCN species,"[27] i.e., species deemed to have the greatest conservation need. Mining in the Petition Area is thus incompatible with the CWCS and would directly and adversely affect the interests of Intervenors and their members in enjoying and conserving wildlife and wildlife habitat, and at risk species in particular. In addition, the CWCS makes clear that the implementation of the conservation actions "*must be a collective endeavor*" of Tennessee's conservation partners. A primary goal of the CWCS is to provide a workable conservation tool for agencies, organizations, industries, academics, *and other conservation partners* across the state.[28] Thus,

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[23] *Id.* at 39,185.
[24] *See* Royal Blue Plan at 27-29 (describing watershed protection and management plans to restore native fish and other aquatic life).
[25] State Petition at 17-18. *See* CWCS at 30, 43, 205.
[26] *See* CWCS at 118-19,134-36; State Petition at 18.
[27] State Petition at 19.
[28] *See* CWCS at i-ii, 22.

Intervenors and their members likewise have a recognized role in the specific conservation action at issue, designation of the Petition Area as lands unsuitable for surface mining.

2. Surface Mining in the Petition Area is Incompatible with the 2005 General Management Plan for the Big South Fork NRRA and the Outstanding National Resource Water Designations for the Big South Fork. (See State Petition at 11, 21.)

As the State asserts, "[s]urface mining, together with the clearcutting of forest that precedes it, directly damages wildlife and wildlife habitat within, surrounding, *and downstream from* the mined areas."[29] In addition to the plans and strategies to which the State Petition refers, surface mining within the New River watershed portion of the Petition Area is also incompatible with the authorizing legislation for the Big South Fork NRRA, downstream of the Petition Area, and with the 2005 Big South Fork General Management Plan [hereinafter "2005 Big South Fork GMP"].[30] The specific purposes for which Congress established the NRRA are:

> conserving and interpreting an area containing unique cultural, historic, geologic, fish and wildlife, archeologic, scenic, and recreational values, preserving as a natural, free-flowing stream the Big South Fork of the Cumberland River, major portions of its Clear Fork and New River stems, and portions of their various tributaries for the benefit and enjoyment of present and future generations, the preservation of the natural integrity of the scenic gorges and valleys, and the development of the area's potential for healthful outdoor recreation.[31]

The Big South Fork GMP acknowledges that the NRRA "provides a broad range of natural and cultural resource-based outdoor recreation and education opportunities."[32] The GMP also makes clear that the recreational and economic values for which the Big South Fork is protected are tied to a broader area than simply the NRRA boundaries. Elaborating on the recreational purpose of the NRRA, the GMP refers to the goal of managing the NRRA "to

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[29] State Petition at 11 (emphasis added).
[30] NPS, Big South Fork General Management Plan (Feb. 2005) [hereinafter "2005 Big South Fork GMP"], *available at* http://www.nps.gov/biso/parkmgmt/generalmanagementplan.htm.
[31] 16 U.S.C. §460ee(a).
[32] 2005 Big South Fork GMP at 19.

provide healthful outdoor recreation for the enjoyment of the public and for the benefit of the *regional economy*."[33] The recreational uses of the NRRA and the attendant economic benefits to the region, discussed more fully below in Part II.B.2, are dependent upon high water quality of the Big South Fork, and would be undermined by renewed surface coal mining operations in the New River portion of the Petition Area.[34] As such, surface mining in the Petition Area would directly and adversely affect the interests of Intervenors and their members who recreate in the Big South Fork NRRA and enjoy the NRRA's scenic attributes.

Another goal of the NRRA authorizing legislation and the 2005 GMP is to preserve the unique fish and wildlife habitat of the Big South Fork NRRA. As the GMP recognizes, the NRRA's "waters provide habitat for a world-class freshwater mussel assemblage and are an important refuge for many endangered mussel species. Few other river systems support this level of mussel diversity."[35] As discussed below in Part II.B.3, surface mining in the New River watershed portion of the Petition Area, which forms the headwaters of the Big South Fork, presents a significant ongoing threat to this valuable aquatic habitat and to the rare, threatened, and endangered species it supports.[36] Therefore surface mining in the Petition Area is

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[33] *Id.* (emphasis added). One of the goals of the State Petition is to assure the protection of the recreational values and long-term economic sustainability of the Petition Area. *See, e.g.*, State Petition at 11, 13. The NRRA's recreational and economic goals are in turn tied to the fulfillment of these goals in the larger Cumberland Plateau region.

[34] *Cf.* Statement of Reasons on Fern Lake Lands Unsuitable Petition, 61 Fed. Reg. 49,793, 49,797-98 (23 Sept. 1996) (finding that aesthetic impacts associated with surface coal mining operations would be incompatible with the goals of the master plan of a national park, "which are to preserve the park's natural resources and minimize adverse effects on these resources and visitation"); Statement of Reasons on Flat Fork Lands Unsuitable Petition at 10 (24 April 1990) (concluding that "potential alteration of the physical and chemical character of receiving streams flowing into [state park and natural area] and the resulting effects on the biological communities of Big Cove Branch and Flat Fork is in direct conflict with the mission statement of the park to protect and preserve the natural resources within the park.") (Exhibit 3).

[35] 2005 Big South Fork GMP at 19.

[36] *See, e.g.*, NPS, Big South Fork National River and Recreation Area, Water Resources Management Plan at 2, 22 (1997) (recognizing ongoing threat to the NRRA from acid mine drainage and sediment from upstream surface mining) [hereinafter "Big South Fork WRMP"] (Exhibit 4); *see also* Steven A. Ahlstedt et al., *Status of Freshwater Mussels in the Coal Mining Basin of the New River (Big South Fork Cumberland River Drainage) in Portions of Scott, Anderson, Morgan and Campbell County, Tennessee (2006-2008)* at 24 (11 Sept. 2008) (noting importance

incompatible with the habitat goals for the NRRA. In addition, Congress also specifically charged the Secretary of the Interior with developing a plan to "minimize siltation and acid mine drainage."[37] Because mining in the New River watershed has already contributed to increased levels of sedimentation in the Big South Fork, *see* Part II. B.3., mining in the New River watershed portion of the Petition Area likewise is inconsistent with these goals, and would directly and adversely affect the interests of Intervenors and their members in protecting and enjoying the wildlife and wildlife habitat and water quality of the Big South Fork NRRA.

Surface mining in the Petition Area is also incompatible with the designations by Tennessee and Kentucky of the Big South Fork as an Outstanding National Resource Water ("ONRW"), apart from the river's special designation by Congress as an NRRA. This designation is reserved for high quality waters that have "exceptional recreational or ecological significance."[38] As discussed below in Part II.B.3., surface mining in the Petition Area could significantly affect the water quality, and therefore the recreational and ecological values, of the Big South Fork, and thereby adversely affect the recreational interests of Intervenors and their members.

B. OSM Should Designate the Petition Area as Unsuitable for Surface Coal Mining Operations Because Such Operations Would Affect Fragile or Historic Lands, Resulting in Significant Damage to Important Historic, Cultural, Scientific, and Esthetic Values and Natural Systems Within the Meaning of §522(a)(3). (State Petition Allegations, Part II at 20-28.)

The lands within the Petition Area are renowned for their globally significant natural resources, as the State petition attests.[39] The Petition Area lies within the larger Cumberland

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of protecting water flowing from the New River into the Big South Fork for maintaining the NRRA's rare species) [hereinafter "Ahlstedt et al. 2008] (Exhibit 5).

[37] 16 U.S.C. §460ee(h).

[38] *See* Tenn. Comp. R. & Regs. R. 1200-4-3-.06(5); Tenn. Code 69-3-105(a)(1); 401 Ky. Admin. Regs. 5:002(103).

[39] State Petition at 20.

Plateau region, one of the most biologically rich regions in the world.[40] The Cumberland Plateau also comprises the world's largest hardwood-forested plateau,[41] and has the highest concentration of endangered species on the continent.[42] According to The Nature Conservancy, the plateau contains numerous unique species, especially in its waterways.[43]

As Tennessee asserts, the Petition Area also contains valuable habitat for priority migratory songbirds as well as species that Tennessee has ranked as being in the greatest need of conservation ("GNC species"), whose habitat would be significantly harmed by surface mining as a result of fragmentation of forested areas.[44] Part II.B.1 below elaborates on the impacts that surface mining in the Petition Area would have on vulnerable migratory songbirds that depend on large, mature and unfragmented forest habitat. Intervenors Audubon, TOS, and Defenders, and their members, in particular use and enjoy the Petition Area for bird-watching and study of migratory songbirds such as the Cerulean Warbler, and their interests would be directly and adversely affected by mining in the Petition Area.

The Petition Area also has exceptional value as "environmental corridors containing a concentration of ecologic and esthetic features," and as "areas of recreational value due to high environmental quality," fitting within the fragile lands criteria under §522(a)(3).[45] Likewise the

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[40] *Id.*
[41] *See id.*
[42] *See* The Nature Conservancy, Tennessee: A Big Deal to Connect the Cumberlands, http://www.nature.org/wherewework/northamerica/states/tennessee/features/art23012.html (last visited 25 Oct. 2010); The Nature Conservancy, Northern Cumberlands, http://www.nature.org/wherewework/northamerica/states/tennessee/preserves/art10172.html (last visited 25 Oct. 2010).
[43] The Nature Conservancy, The Cumberland Plateau, http://www.nature.org/wherewework/northamerica/states/tennessee/preserves/art19942.html (last visited 12 Nov. 2010).
[44] *See* State Petition at 21.
[45] State Petition at 22 (quoting 30 C.F.R.§762.5). The SMCRA regulations define the term 'fragile lands' as "areas containing natural, ecologic, scientific, or esthetic resources that could be significantly damaged by surface coal mining operations. Examples of fragile lands include valuable habitats for fish or wildlife, critical habitats for endangered or threatened species of animals or plants, uncommon geologic formations, paleontological sites, National Natural Landmarks, areas where mining may result in flooding, environmental corridors containing a

Big South Fork NRRA, downstream of the Petition Area, also has exceptional value for recreation, as discussed below in Part II.B.2. Mining in the Petition Area would directly and adversely affect the interests of Intervenors and their members in preserving the ecologic, aesthetic, and recreational values of the Petition Area and the Big South Fork NRRA.

The rivers and streams in the Petition Area, including the New River, and the rivers they feed, such as the Big South Fork, are part of a unique natural aquatic system and contain valuable habitat for sensitive aquatic species, including endangered and threatened mussel and fish species. Surface mining in the Petition Area would significantly affect this valuable habitat by impairing water quality in the New River, the Big South Fork of the Cumberland River, and the Upper Clinch River, as described in Part II.B.3 below, thereby directly and adversely affecting the interests of Intervenors and their members in protecting wildlife and habitat, natural systems, and the water quality of the Petition Area. Moreover, a plethora of recent studies, described in Part II.B.4 *infra*, document and confirm the adverse impacts of surface mining operations on water quality, valuable habitat, and natural systems.

1. Surface Mining in the Petition Area Would Significantly Damage Important Habitat for the Cerulean Warbler and Other Migratory Songbirds. (See State Petition at 9-10, 13-14, 21-23.)

As Tennessee indicates, the Petition Area provides vital habitat for priority migratory songbirds,[46] as well as GCN species, thus qualifying as "fragile lands." As a result, the Petition Area offers unique opportunities for bird-watching and study for Intervenors and their members.[47] In addition, as the State petition indicates, the Royal Blue WMA has been

concentration of ecologic and esthetic features, and areas of recreational value due to high environmental quality." 30 C.F.R. §762.5.

[46] State Petition at 21-22 and sources cited therein.

[47] *See id.* at 22.

designated by the American Bird Conservancy as one of its Globally Important Bird Areas in Tennessee.[48] Further, the conservation easements that are part of the State's "Connecting the Cumberlands" project, and included in the Petition Area, are specifically intended to protect the "Conservation Values" of those lands, which include, among others, "neotropical migrant songbirds."[49]

Partners in Flight ("PIF") has identified numerous songbirds within the upland forests of the Northern Cumberland Plateau as priority species for conservation, including the Cerulean Warbler, Swainson's Warbler, Louisiana Waterthrush, Worm-Eating Warbler, Wood Thrush, Acadian Flycatcher, and Kentucky Warbler.[50] The lands of the Petition Area are particularly important to the Cerulean Warbler, a songbird whose populations have plummeted in the last four decades.[51] The International Union for the Conservation of Nature ("IUCN") has listed this species as "Vulnerable," signifying that the Cerulean Warbler is facing a high risk of extinction, stemming from its rapid population decline and continuing loss and fragmentation of habitat.[52] The 2009 report of the State of the Birds, United States of America [hereinafter "2009 State of the Birds"] lists the Cerulean Warbler as a "bird in trouble" because "the Cerulean Warbler is

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[48] *Id.*

[49] *Id.* at 10 (citing Sustainable Forestry Conservation Easement, "Brimstone Property" at 7; Conservation Easement, Emory Tract at 1-3).

[50] EPA, Draft Programmatic Environmental Impact Statement on Mountaintop Mining/Valley Fills in Appalachia, App. E, Vertebrate Study at 19, 38 (2003) [hereinafter "2003 MTM PEIS"], *available at* http://www.epa.gov/region03/mtntop/eis2003.htm. The 2005 Final PEIS incorporates by reference the Draft PEIS. EPA, Final Environmental Impact Statement on Mountaintop Mining/Valley Fills in Appalachia at 1 (2005) [hereinafter 2005 MTM PEIS], *available at* http://www.epa.gov/Region3/mtntop/pdf/mtm-vf_fpeis_full-document.pdf. The Cumberland Plateau is also important habitat for a number of other species including the Red-eyed Vireo, Indigo Bunting, Scarlet Tanager, Hooded Warbler, and the Ovenbird. All of these species require heavily forested landscapes.

[51] A map showing the preferred habitat of the Cerulean Warbler on the Cumberland Plateau is attached as Exhibit 6.

[52] International Union for the Conservation of Nature ("IUCN"), Red List of Threatened Species, 2008, *available at* www.iucnredlist.org/details/149817. Similarly, PIF has listed the Cerulean Warbler as a Species of Continental Importance and as one of the 100 Watch List species "most in need of conservation attention" because "they are declining and/or threatened throughout their range." PIF, *North American Landbird Conservation Plan: Part I, The Continental Plan* at 16-18 (January 2004) *available at* http://www.pwrc.usgs.gov/pif/cont_plan/PIF2_Part1WEB.pdf.

threatened by mountaintop removal coal mining along Appalachian ridges and clearing of riverine forests."[53] As the State Petition asserts, surface coal mining would result in significant damage to the Petition Area lands that provide vital habitat for priority songbirds, and other wildlife that depend on unfragmented, mature mountain forests.[54] This section elaborates on these basic facts.

Data from the Breeding Bird Survey show that the Cerulean population has decreased approximately 80% since 1966, with an average rate of decline of -4.1% per year from 1966 to 2007.[55] The U.S. Fish and Wildlife Service's ("FWS") Cerulean Warbler Status Assessment concluded that this "precipitous" population loss represented the largest decline among any warbler species and one of the most significant declines among neotropical migratory birds.[56] Much of this decline has occurred in the species' core breeding range, with a decline of approximately 70% in both the Cumberland Plateau and Ohio Hills physiographic regions (-2.8% per year and -2.6 per year, respectively).[57] Together, these regions contain an estimated 70% of Cerulean Warbler breeding pairs.[58] Within Tennessee, the Cerulean Warbler declined at

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[53] North American Bird Conservation Initiative, *The State of the Birds, United States of America* at 14 (2009) [hereinafter "2009 State of the Birds"], *available at* http://www.stateofthebirds.org/2009/pdf_files/State_of_the_Birds_2009.pdf.

[54] State Petition at 21 (surface mining would result in "significant harm to this habitat, and the species that depend on it, by fragmenting large tracts of contiguous forest and denuding ridgetops" in the Petition Area).

[55] J. R. Sauer et al., *The North American Breeding Bird Survey, Results and Analysis 1966-2007*, Version 5.15.2008 (updated 15 May 2008) [hereinafter "BBS 1966-2007"], *available at* www.mbr-pwrc.usgs.gov/bbs/bbs.html. *See also* U.S. Fish and Wildlife Service, Cerulean Warbler Status Assessment at 117-18 (April 2000) [hereinafter "FWS 2000"], *available at* http://library.fws.gov/Pubs3/statusass/ceruleanwarbler.pdf.

[56] FWS 2000 at *vii*. A recent study focused on detection distances indicates that the total number of Cerulean Warblers may be greater than previous estimates. *See* Hamel, P. B., M. J. Welton, C. G. Smith, III, and R. P. Ford, *Test of Partners in Flight Effective Detection Distance for Cerulean Warbler* at 328-333 (2009), *in* T. D. Rich, C. Arizmendi, D. Demarest, and C. Thompson, eds., Proceedings of the 4th International Partners in Flight Conference: Tundra to Tropics (13-16 Feb. 2008), *available at* http://www.partnersinflight.org/pubs/McAllenProc/TOC.cfm. However, this study in no way alters the fact, based on Breeding Bird Survey data, that the population trends have shown a precipitous decline, and continue to show the steepest decline of any eastern songbird in North America, making the protection of core Cerulean Warbler habitat an urgent priority, as co-author Melinda Welton has confirmed.

[57] BBS 1966-2007.

[58] Letter from K. Rosenberg, Cerulean Atlas Project, to FWS at 2 (20 Jan. 2003) [hereinafter "2003 Rosenberg"] (Exhibit 7).

an average rate of -4.9% per year between 1966 and 2007.[59] Dramatic habitat loss to mining, development, and logging throughout the Cerulean's breeding range, as well as loss of habitat in its winter range, are the primary causes of this decline.[60]

The Cerulean Warbler is an "area sensitive," forest-interior species, dependent on large tracts of mature forest to breed successfully.[61] EPA's 2003 Mountaintop Mining EIS ("2003 MTM PEIS") stated that Cerulean Warblers require a minimum forested area of 700 hectares to sustain a viable population.[62] In a Tennessee study, Ceruleans were found only in forest tracts greater than 800 hectares (2,000 acres).[63] Another study found that the probability of encountering a Cerulean reached its maximum when the area consisted of 3,000 or more unfragmented hectares (7,500 acres) of forest.[64] A study of Cerulean ecology that focused on the Tennessee Cumberland Mountains stated that "[p]oints where Cerulean Warblers were present tended to have larger trees, greater sapling cover, and occur on mesic rather than xeric sites."[65]

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[59] BBS 1966-2007. In the FWS's Southeast Region, which contains an estimated 51% of the total breeding population of Cerulean Warblers in the United States, the species has declined at a rate of 5% per year. *Id.*; FWS 2000 at 36.

[60] FWS 2000 at 49-50; Paul B. Hamel et al., *How We Can Learn More About the Cerulean Warbler (Dendroica Cerulea)*, Auk 121(1): 7, 9 (2004) (Exhibit 8).

[61] Chandler S. Robbins et al., *A Warbler in Trouble: Dendroica cerulea* at 555-56, 559-60, Manomet Symposium (1989) [hereinafter "Robbins et al. Warbler 1989"] (Exhibit 9); Nicholson, C.P. 2004, *Ecology of the Cerulean Warbler in the Cumberland Mountains of East Tennessee* at 1, Dissertation, University of Tennessee, Knoxville [hereinafter "Nicholson 2004"] (Exhibit 10). *See also* C. Oliarnyk & R. Robertson, "*Breeding Behavior and Reproductive Success of Cerulean Warblers in Southeastern Ontario*," Wilson Bulletin 108(4): 673 (1996) (Exhibit 11); R. Askins et al., *Relationship Between the Regional Abundance of Forest and the Composition of Forest Bird Communities*, Biological Conservation 39(1987): 129, 144 Table 5 (1987) (Exhibit 12); *see* R. Connor and J. Dickson, "*Relationships Between Bird Communities and Forest Age, Structure, Species Composition and Fragmentation in the West Gulf Coastal Plain*," Texas J. Sci. Suppl. 49(3): 131 (1997) ("Cerulean Warblers ...are perhaps the most area-sensitive bird in this region and are likely the most vulnerable species to the forest fragmentation in this region") (Exhibit13); Cathy A. Weakland & Petra Bohall Wood, "*Cerulean Warbler (Dendroica Cerulea) Microhabitat and Landscape-Level Habitat Characteristics in Southern West Virginia*," *Auk* 122(2): 497, 498, 506 (2005)[hereinafter "Weakland and Wood 2005"] (Exhibit 14).

[62] 2003 MTM PEIS at III.F-15, *available at* http://www.epa.gov/region03/mtntop/pdf/III_affected-envt-consequences.pdf.

[63] Robbins et al. Warbler 1989 at 555.

[64] Chandler S. Robbins et al., *Habitat Area Requirements of Breeding Forest Birds of the Middle Atlantic States*, 103 Wildlife Monographs at 25 (1989) (Exhibit 15).

[65] Nicholson 2004 at 57. This study also found that Cerulean territories were characterized by fewer and larger trees, greater basal area, and greater shrub cover. *Id.* at 57-58. Another study found that Cerulean densities were highest

The petition lands are one of the few remaining areas in the United States that harbor large concentrations of Cerulean Warblers during their breeding season in the late spring. Within the Cerulean Warbler's core breeding range, "[t]he Northern Cumberland Plateau region of Tennessee represents the single largest concentration of this species reported from anywhere within [its] range,"[66] supporting approximately 20% of the global population.[67] The American Bird Conservancy has included Royal Blue and Frozen Head in Tennessee in its guide to the globally most important bird areas because of the Cerulean Warblers.[68] Thus, the public lands in the Cumberland Mountains, including the Royal Blue and Sundquist WMAs, are critical to the continued survival of the Cerulean Warbler.[69]

A study of Cerulean Warblers in Tennessee's Cumberland Mountains found a mean density of 84.4 Cerulean breeding pairs/100 ha on the publicly owned lands,[70] which is nearly double the mean range-wide density documented in the FWS's Cerulean Status Assessment.[71] The Cornell Laboratory of Ornithology's Cerulean Atlas Project found that the Royal Blue WMA had the largest number of Cerulean Warblers reported on any single site during the entire

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in forests with a higher percentage of canopy cover, taller trees (greater than 24 m), and varied vertical distribution of foliage. Weakland and Wood 2005 at 505-06.

[66] Cornell Lab of Ornithology, An Atlas of Cerulean Warbler Populations, Final Report to the FWS: 1997-2000 Breeding Seasons at 42 (December 2000) [hereinafter "CEWAP"], *available at* http://www.birds.cornell.edu/cewap/cwapresultsdec18.pdf.

[67] *See* Buehler et al. 2006 at 1768.

[68] *See* American Bird Conservancy, Globally Important Bird Areas in Tennessee, *available at* http://www.abcbirds.org/abcprograms/domestic/iba/tennessee.html (last visited 10 Nov. 2010). The National Audubon Society has also recognized the Cumberland Mountains, including Morgan, Anderson, Scott, and Campbell Counties, as an Important Bird Area ("IBA"), containing significant populations of several species of high conservation concern. Audubon, Tennessee Important Bird Areas, http://iba.audubon.org/iba/stateIndex.do?state=US-TN (last visited 26 Oct. 2010).

[69] Currently, about 59% of the Royal Blue WMA is suitable Cerulean Warbler habitat, and about 50% of the Sundquist WMA is suitable habitat. Buehler et al. 2006 at 1767.

[70] Nicholson 2004 at 18. This study also found Cerulean Warblers at 50% of all point counts in the Cumberland Mountains. *Id.*

[71] FWS 2000 at 25; *see* Nicholson 2004 at 27.

project.[72] The high density of Cerulean Warblers in the Cumberland Mountains is attributable to the "high proportion of interior forest and low level of fragmentation" in the Cumberland Plateau.[73]

Surface mining destroys the contiguous tracts of mature forests needed by the Cerulean Warbler and other interior forest songbirds, both by clearing and leveling lands for mines and valley fills, and by fragmenting the forests that remain. The 2003 MTM PEIS estimated that surface mining will clear over 760,000 acres, or 6.8% of forested land within the nearly 12 million-acre Appalachian study area (Tennessee, Virginia, West Virginia, and Kentucky) by 2012.[74] This assessment reflected only those lands that would actually be deforested by surface mining. The losses are even more profound, however, because the Cerulean Warbler and other declining forest interior birds avoid the fragmented forest landscape left by surface mining.[75] Thus, even in forest fragments of sufficient residual size theoretically to provide adequate habitat, in fact Cerulean Warblers suffer additional loss of habitat to surface mining because they avoid the hard edge between forests and mine sites.[76]

In addition, Cerulean Warblers are at greater risk from surface mining, even as compared to other fragmentation-sensitive forest species, because Ceruleans strongly favor the steep slopes

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[72] CEWAP at Table 2. The FWS's Status Assessment for the Cerulean Warbler also recognized that Frozen Head State Park and Natural Area in Tennessee supports a "substantial population" of Cerulean Warblers. FWS 2000 at 41.

[73] Nicholson 2004 at 2. *See id.* at 3.

[74] 2003 MTM PEIS at IV.D-2, *available at* http://www.epa.gov/region03/mtntop/pdf/IV_envtl-consequences.pdf.

[75] *See, e.g.*, Buehler et al. 2006 at 1768. The 2009 State of the Birds report also notes that fragmentation of forests can increase risk of predation for forest interior birds, such as the Wood Thrush, the Kentucky Warbler, and the Cerulean Warbler, and "can contribute to nest failures from increasing numbers of cowbirds, which lay their eggs in these birds' nests." 2009 State of the Birds at 30.

[76] *See* Weakland and Wood 2005 at 505-06; Wood et al., "*Cerulean Warbler Abundance and Occurrence Relative to Large-Scale Edge and Habitat Characteristics*," Condor 108:154, 155, 161-62 (2006) [hereinafter "Wood et al. 2006"] (Exhibit 16); Hamel, Paul B, *Adaptive Forest Management to Improve Habitats for Cerulean Warbler* (2006) ("potentially useful habitat is not occupied because it is too close to the hard, external edge of existing forest patches") (citation omitted), *in* Proceedings of Society of American Foresters National Convention 2006 at 4, *available at* http://www.srs.fs.usda.gov/pubs/ja/ja_hamel009.pdf.

and mountain ridge tops that are destroyed by surface mining.[77] A 2006 study of Cerulean Warbler habitat in the Cumberland Mountains of Tennessee found that Ceruleans selected higher elevation areas, which occurred more on ridgetops, upper slopes, and steep slopes.[78] The MTM PEIS acknowledged that habitat destruction for the Cerulean Warbler and other declining forest interior birds "*has extreme ecological significance* in that habitats required by these species for successful breeding are limited in the eastern United States."[79] Ken Rosenberg, lead researcher on the Cerulean Atlas Project, has stated that "[t]he most serious threat, by far, within the breeding range of the Cerulean Warbler is the practice of mountaintop-removal-valley fill mining. . . . As much as 10-20% of the known Cerulean population may be directly eliminated by proposed, permitted mountaintop mines alone."[80] Thus, designation of the ridge lines in the Petition Area is essential to protect the habitat of this species.

All available evidence, as set forth above, shows that surface mining devastates vital habitat for the Cerulean Warbler and other declining migratory songbird species, and such evidence cannot credibly be disputed.[81] In addition, the evidence shows that the devastating

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[77] Wood et al. 2006 at 160-61; *See* Weakland and Wood 2005 at 507; Buehler et al. 2006 at 1766. In one study, Ceruleans were found in plots with ridgetops at 8 times the density of plots without ridges. Weakland and Wood 2005 at 503, Table 2. The study concluded that this "[p]reference for ridges could result in significant effects on Cerulean Warbler populations in the MTMVF region, because ridges are removed during mining." *Id.* at 507.

[78] *See* Buehler et al. 2006 at 1767. Similarly, a study of Cerulean habitat in West Virginia found that "[t]erritories occurred more often than expected on ridges," and noting that preference for ridges had been documented in multiple other studies. Weakland and Wood 2005 at 507.

[79] 2003 MTM PEIS App. I Report at 91(emphasis added), *available at* http://www.epa.gov/region03/mtntop/eis2003.htm.

[80] 2003 Rosenberg at 2-3.

[81] OSM claimed that allegations in Intervenors NPCA's and Audubon's 2005 petition regarding impacts on the Cerulean Warbler did not "include evidence of impacts from surface mining operations that are not preventable." 2006 SOR at 15. The evidence recited herein, together with the limitations of the SMCRA regulations described below, more than satisfy the requirement for designation based on impacts to the Cerulean Warbler. A petition must show that mining would "affect fragile or historic lands in which such operations *could result in* significant damage to important historic, cultural, scientific, and esthetic values and natural systems." 30 U.S.C. §1272(a)(3)(B) (emphasis added); *see also* 30 C.F.R. §762.11(b)(2). Similarly, fragile lands are "areas containing natural, ecologic, scientific, or esthetic resources that *could be* significantly damaged by surface coal mining operations," and examples of such include "valuable habitats for fish and wildlife." 30 C.F.R. §762.5 (emphasis added). The use of the word "could" plainly indicates that a petition need not prove beyond question that the resources will be significantly damaged.

impacts from surface mining operations in fact are not preventable, especially when mountaintop removal or cross ridge mining is used.[82] Researchers specifically have studied post-SMCRA reclaimed mine sites and found all the negative impacts described above from these sites.[83]

Neither the SMCRA regulations nor the Tennessee Federal Program addresses the serious, long-term impacts of coal mining on the large blocks of mountain forests that Ceruleans and other wildlife require for survival. The SMCRA regulations do not require reforestation. SMCRA requires only that the operator establish a "diverse, effective, and permanent vegetative cover of the same seasonal variety native to the area of land to be affected and capable of self-regeneration and plant succession at least equal in extent of cover to the natural vegetation of the area."[84] This provision does not require the re-establishment of large blocks of mature forest. In addition, SMCRA requires operators only to "restore the land . . . to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses."[85] This restoration requirement includes returning the mined land to its approximate original contour ("AOC").[86] Even if the operator can imitate the original contour,[87] the AOC provision cannot and does not re-create the ridges, steep slopes, and mature forest habitat that existed prior to mining.

As Tennessee asserts in the petition: "Surface mining, together with the clear-cutting of forest that precedes it, directly damages wildlife habitat within, surrounding, and downstream

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[82] As the 2009 State of the Birds report indicates, "coal mining that blasts mountaintops to reveal coal seams below has removed large areas of eastern forests and buried nearby streamside habitats under tons of debris. This contributes to the decline of birds that breed in interior forests, such as Cerulean Warblers." 2009 State of the Birds at 31.

[83] *See* Wood et al. 2006 at 156.

[84] 30 U.S.C. §1265(b)(19); *see also* 30 C.F.R. §816.111(a)(2009).

[85] 30 U.S.C. §1265(b)(2).

[86] 30 U.S.C. §1265(b)(3).

[87] *See* 30 U.S.C. §1291(2) (AOC means surface configuration that "closely resembles the general surface configuration" before mining). Moreover, there are also several exceptions to SMCRA's AOC requirement, including an exception for various types of mining on steep terrains, such as mountaintop removal mining, or for steep slope mining when the variance would improve watershed control and facilitate an equal or better use of the land. 30 U.S.C. §§1265(c)(2),(d),(e)(1)-(2).

from the mined areas. Surface mining also fragments forests, directly conflicting with one of the State's explicit goals for the newly acquired areas. *Such impacts occur even when mining is carried out in full compliance with SMCRA's permitting requirements and performance standards.*"[88] In sum, mining in the Petition Area would be devastating for the Cerulean Warbler and other vulnerable bird species, and would therefore directly and adversely affect the interests of Intervenors and their members in preserving, studying, and viewing these species.[89]

2. Surface Mining in the Petition Area Would Damage Important Environmental Corridors and Areas That Are of Recreational Value Due to High Environmental Quality. (State Petition, Part II.A.,B. at 22-28.)

Intervenors fully support the allegations in Part II.A. of the State Petition regarding damage to important environmental corridors, recreational areas, and historic and cultural values in the Petition Area.[90] As Tennessee asserts, the lands that constitute the Petition Area have exceptional value as environmental corridors, within the meaning of the regulations, containing a concentration of ecologic and esthetic features, and as areas of recreational value due to their high environmental quality,[91] and thus qualify as "fragile lands." In addition, as the petition indicates, the Petition Area qualifies as "fragile lands" in part because of the recreational benefits and the historic and cultural significance of the Big South Fork NRRA, itself a "fragile land" and located downstream of the Petition Area.[92] Further, as the state alleges, the "adverse environmental effects and risks associated with surface mining in the petition area could significantly affect these fragile lands in and downstream of the petition area and result in

[88] State Petition at 11 (emphasis added).
[89] *See id.* at 22-23 (surface mining in the Petition Area would diminish wildlife viewing opportunities by destroying valuable habitat).
[90] *Id.* at 22-28.
[91] *Id.* at 21.
[92] *Id.*

significant damage to important historic, cultural, scientific, and esthetic values and natural systems within the meaning of §522(a)(3)."[93]

Congress expressly established the NRRA in part for the specific purpose of conserving, among other values, the unique cultural, historic, scenic, and recreational values and to foster "the development of the area's potential for healthful outdoor recreation."[94] Surface coal mining in the Petition Area will also negatively impact the Big South Fork NRRA as an area "of recreational value due to high environmental quality."[95]

Approximately 850,000 people visit the NRRA each year and enjoy the unique water resources they find there, including Intervenors' members. This recreational use also provides a tremendous economic benefit to the region. According to the detailed economic analysis that the NPS conducted as part of its 2005 General Management Plan for the Big South Fork NRRA, non-local tourism to the NRRA generates about $7-$13 million annually for the region (Fentress, Scott, McCreary, Morgan, and Pickett Counties).[96] The 2005 GMP noted that in fiscal year 2002, the NRRA's operating budget included $2.9 million for salaries and benefits, much of which was returned to the local economy, $75,000 for utilities and $150,000 for supplies procured from local sources.[97] It also noted that the NRRA received tens of thousands of dollars in special project funding; that $6.5 million in sales were generated for motels and restaurants in the local area; and that 181 jobs were created for local communities, all of which resulted in significant benefit to the local economy.[98] The GMP concluded: "All told, the economic benefit

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[93] *Id.*
[94] 16 U.S.C. §460ee(a). As stated above in Part II.A.2, the 2005 GMP makes clear that the recreational and associated economic goals of the NRRA are for the benefit of the broader "regional economy." 2005 Big South Fork GMP at 19.
[95] 30 C.F.R. §762.5.
[96] *See* 2005 Big South Fork GMP at 193, 336 (based on total economic benefit to the region of $10 - $16 million, minus benefits from payroll and spending).
[97] *Id.*
[98] *Id.*

to the region from National Area payroll, spending, and tourism totals $10-$16 million annually."[99]

The negative impacts of surface mining in the Petition Area on the NRRA's water quality, discussed below, could severely undermine its recreational and economic value to the region by harming its aquatic systems and by impairing visitors' enjoyment of the NRRA's water resources, including Intervenors' members. OSM has already recognized in the lands unsuitable designation for Fall Creek Falls that increased sedimentation to receiving streams is an inherent impact of surface mining operations, even those conducted in compliance with SMCRA.[100] OSM found that this and other inherent impacts of surface mining in areas outside Fall Creek Falls State Park presented an unacceptable risk of damage to the Park, even if the chance of causing significant harm was relatively unlikely. Similarly, surface mining in the New River portion of the Petition Area poses an unacceptable risk to the Big South Fork NRRA through the addition of sediment and the potential for acid-mine drainage and other pollutants associated with surface mining.[101] As a result, surface mining in the Petition Area would therefore directly and adversely affect the recreational interests of Intervenors and their members.[102]

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[99] *Id.* at 193, 336.

[100] Statement of Reasons on Fall Creek Falls Lands Unsuitable Petition, 65 Fed. Reg. 39,178, 39,183 (23 June 2000).

[101] In response to Intervenors NPCA's and Audubon's 2005 petition, OSM did not dispute the significant recreational, esthetic, and economic values of the NRRA, but claimed that the sediment-laden waters "can not be specifically attributed to surface mining activities." 2006 SOR at 17. This conclusion is contrary to the evidence that mining is a significant contributing factor. *See, e.g.*, FWS, Recovery Plan for Cumberland Elktoe, Oyster Mussel, Cumberlandian Combshell, Purple Bean and Rough Rabbitsfoot at 35 (4 May 2004) [hereinafter "2004 FWS Mussel Recovery Plan"], *available at* http://ecos.fws.gov/docs/recovery_plans/2004/040524.pdf; Steven A. Ahlstedt et al., *Current Status of Freshwater Mussels in the Big South Fork National River and Recreation Area*, 14 Walkerana 33, 74 (2003-04) [hereinafter "Ahlstedt 2003-04"] (Exhibit 17); Ahlstedt et al. 2008 at 24 (noting importance of protecting water flowing from New River into Big South Fork for maintaining NRRA's rare species); and additional sources cited in Part II.B.3. *infra. See generally* OSM, Final Environmental Impact Statement for Excess Spoil Minimization and Stream Buffer Zones at IV-147 to 149 (Sept. 2008) (discussing indirect impacts of surface mining operations on downstream water quality) [hereinafter SBZ FEIS"], *available at* http://www.regulations.gov/search/Regs/home.html#documentDetail?R=09000064807416b7; Takashi Gomi et al., *Understanding Processes and Downstream Linkages of Headwater Systems*, 52 BioScience No. 10 at 905, 906 (Oct. 2002) (general discussion of downstream linkages) (Exhibit 18).

[102] As the State Petition notes, the impacts of surface mining on water quality would also adversely impact the recreational values of the Petition Area by deterring hikers and campers who use the area's waters for drinking water

3. Surface Mining in the Petition Area Could Significantly Damage Water Quality and Important Aquatic Habitat for Threatened and Endangered Mussel and Fish Species. (State Petition at 4, 7, 9-11, 14, Part I.D. at 17-20, Part II. at 20-22.)

The biodiversity of the Southern and Central Appalachians is nationally, and even globally significant. The Cumberland region is particularly renowned for its freshwater mussel biodiversity.[103] The streams in and downstream of the Petition Area provide valuable habitat for a number of rare, threatened, and endangered mussel and fish species, including designated critical habitat for federally endangered mussels, and thus qualifying as "fragile lands" under the SMCRA criteria.[104] Surface mining in the Petition Area could result in significant harm to these species and their habitat. As a result, the interests of Intervenors and their members in protecting wildlife and downstream aquatic habitat for these species would be directly adversely affected by mining in the Petition Area.[105]

Mining in the Petition Area would also be inconsistent with the State lands and programs identified in Tennessee's petition. The petition recognizes that mining "has the potential to destroy . . . vital habitat for numerous sensitive species" that exist in the Petition Area.[106] Further, as Tennessee asserts, surface mining, "together with the clear-cutting of forest that precedes it, directly damages wildlife and wildlife habitat within, surrounding, and downstream from the mined areas."[107] In addition, the petition expressly recognizes not only the impact on

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and fishing. State Petition at 23, 25. The recreational interests of Intervenors' members who hike and camp in the Petition Area, including on the Cumberland Trail, would likewise be directly and adversely impacted.

[103] 2004 FWS Mussel Recovery Plan at 1-2.

[104] Fragile lands include, among other areas, "valuable habitats for fish or wildlife," and "critical habitats for endangered or threatened species." 30 C.F.R. §762.5.

[105] A map showing federally and state listed aquatic species and species of concern in the Petition Area lands and watersheds is attached as Exhibit 19.

[106] State Petition at 4.

[107] *Id.* at 11.

water quality in and downstream of the Petition Area, but also the impacts on "pollution-sensitive species."[108]

One of the specific aims of the conservation easements of the "Connecting the Cumberlands" project is to protect "threatened and endangered animal species," "aquatic habitats," and "biological diversity."[109] Likewise, as the petition asserts, the Royal Blue management plan indicates that mining should not be undertaken if it cannot be done so as to ensure that habitat and water quality are not adversely impacted.[110] Another specific purpose of the "Connecting the Cumberlands" acquisition is to "help preserve the purity of streams and rivers."[111] In addition, the primary goal of Tennessee's CWCS "is to prevent nongame wildlife within the state from declining to the point of endangerment."[112] As the petition notes, the CWCS identifies coal mining activities as a major source of stress affecting GCN species and water quality in the Cumberland region.[113]

a. Threatened and Endangered Freshwater Mussel Species Would Be Adversely Impacted by Surface Mining in the Petition Area. (See State Petition at 4, 7, 9-11, 14 (water quality and protection of habitat and sensitive species), 17-20 (Incompatibility with CWCS).)

The impacts of surface mining in the Petition Area on water quality, discussed more fully below, is of particular concern because of the presence of federally threatened and endangered mussel species downstream of the Petition Area, in the New River, the Big South Fork of the Cumberland River, and the Emory River. The Big South Fork, one of the last large, free-flowing river sections on the Cumberland Plateau, provides habitat for seven species that are federally

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[108] *Id.* at 7.
[109] *Id.* at 10 (citing Sustainable Forestry Conservation Easement, Brimstone Property at 7; Conservation Easement, Emory Tract at 1-3).
[110] State Petition at 14.
[111] *Id.* at 9.
[112] *Id.* at 17-18. *See* CWCS at 30, 43, 205.
[113] *See* State Petition at 18; CWCS at 118-119, 134-36.

listed as endangered: the Cumberland Elktoe (*Alasmidonta atropurpurea*);[114] Cumberlandian Combshell (*Epioblasma brevidens*); Cumberland Bean (*Villosa trabalis*); Tan Riffle Shell (*Epioblasma florentina walkeri*); Little-wing Pearly (*Pegias fibula*); Clubshell (*Pleurobema clava*); and Oyster Mussel (*Epioblasma capsaeformis*).[115] The Big South Fork also supports one species that is a federal candidate for listing, the Fluted Kidneyshell (*Ptychobranchus subtentum*), and one endangered state-listed species, the Tennessee Clubshell (*Pleurobema oviforme*).[116] In addition, the FWS has designated twenty-seven miles of the main stem of the Big South Fork and nine miles of the New River as critical habitat for the Cumberlandian Combshell, Cumberland Elktoe, and Oyster Mussel.[117] These critical habitat areas lie downstream from the Petition Area and, by definition, are essential to the conservation of the species.[118]

Though they once existed in the hundreds (Cumberland Elktoe) and thousands (Oyster Mussel, Cumberlandian Combshell), these imperiled mussel species now exist in only a few small, isolated populations.[119] Because these mussel species are also highly restricted in range and are habitat specialists, they are particularly vulnerable to extinction. In fact, more mussel and fish species in the Cumberland and Tennessee River systems are at risk than in any other

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[114] The Cumberland Elktoe also occurs in portions of the New River in Scott County, Tennessee. FWS, Designation of Critical Habitat for Five Endangered Mussels in the Tennessee and Cumberland River Basins, 69 Fed. Reg. 53,136, 53,137 (31 Aug. 2004) [hereinafter "2004 Mussel Critical Habitat"].

[115] NPS, Big South Fork National River and Recreation Area, Environmental Assessment, Plug and Reclaim Eleven Abandoned Wells at Big South Fork National River and Recreation Area at 34 (June 2008) [hereinafter "2008 NPS, Big South Fork NRRA EA"] (Exhibit 20). The Clubshell and Oyster Mussels are believed to have been extirpated from the Big South Fork and Cumberland River system; however, as a result of a reintroduction project that took place in the spring of 2008, a number of individuals now inhabit the Big South Fork. Interview with Steve Bakaletz, Wildlife Biologist, Big South Fork NRRA (14 Jan. 2009).

[116] 2008 NPS, Big South Fork NRRA EA at 34.

[117] 2004 Mussel Critical Habitat, 69 Fed. Reg. at 53,151-52. A map of the mussel critical habitat designated by the FWS is attached as Exhibit 21.

[118] 2004 Mussel Critical Habitat, 69 Fed. Reg. at 53,148.

[119] 2004 FWS Mussel Recovery Plan at 1.

region in the country.[120] The Big South Fork NRRA, in particular, has more federally endangered fish and imperiled mussel species than any other National Park Service unit in the country.[121] Further, according to Steven Ahlstedt, a prominent mussel biologist for the U.S.G.S., the imperiled mussel populations of the Big South Fork represent the richest remaining mussel faunas in the Cumberland River system.[122] Because the Cumberlandian Region supports some of the most significant imperiled aquatic resources, including at-risk fish and mussel species, the FWS has ranked it first nationwide as a priority watershed for protection.[123]

Significantly, in designating critical habitat for the five endangered mussel species, the FWS identified mining as an activity that could destroy or adversely modify critical habitat in a manner likely to result in jeopardy to the species through the addition of sediment and acid-mine drainage to the watershed.[124] FWS further indicated that mining can lead to increased sedimentation and degradation of water quality to levels that are beyond the tolerances of the mussels or their fish host.[125] In 2004, Ahlstedt also found that continued deposition of silt and coal fines washing out of the New River drainage into the Big South Fork NRRA is a significant factor threatening the mussels and other imperiled species of the Big South Fork.[126] Thus, surface mining in the Petition Area could adversely affect these fragile lands and thereby directly

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[120] *Id.* at 3.
[121] Ahlstedt 2003-04 at 74.
[122] *Id.*.
[123] *See* 2004 FWS Mussel Recovery Plan at 57. The Cumberlandian Region is defined as the Cumberland River and its tributaries, downstream to the vicinity of Clarksville, Montgomery County, Tennessee; the Tennessee River and its tributaries, downstream to the vicinity of Muscle Shoals, Colbert and Lauderdale Counties, Alabama; the Duck River (Tennessee River system), downstream to just below Columbia, Maury County, Tennessee; and the Buffalo River. *Id.* at 2.
[124] 2004 Mussel Critical Habitat, 69 Fed. Reg. at 53,153-54. In addition, FWS specifically noted that acid-mine drainage from active mining practices is a particular threat to the successful recruitment of the endangered Cumberland Elktoe. 2004 FWS Mussel Recovery Plan at 35.
[125] 2004 Mussel Critical Habitat, 69 Fed. Reg. at 53,153-54.
[126] Ahlstedt 2003-04 at 74. A 1992 study stated that there is "no evidence that current surface mining of coal is compatible with the existence of rare and endangered species that are endemic to the upper Cumberland River drainage," concluding that only a total moratorium on mining in the watershed can prevent the extinction of these species. James Layzer and Robert Anderson, *Impacts of the Coal Industry on Rare and Endangered Aquatic Organisms of the Upper Cumberland River Basin* at 97-98 (1992) (Exhibit 22).

and adversely affect the interests of Intervenors and their members in conserving and enjoying the at-risk species and their habitat.

In addition, all of the mussel species listed above are included in Tennessee's CWCS as GCN species.[127] The CWCS indicates that "aquatic species constitute the majority of federally and state listed species, led by mussels and fish."[128] As a result, the potential adverse impacts from mining on these species and their habitat are also incompatible with the CWCS, and, as discussed above, with the "Connecting the Cumberlands" project, and the plans and purposes of the WMAs.

b. Threatened and Endangered Fish Would Be Adversely Impacted by Surface Mining in the Petition Area. (See State Petition at 4, 7, 9-11, 14 (water quality and protection of sensitive species and habitat), 17-20, (Incompatibility with CWCS).)

The streams in and downstream from the Petition Area provide valuable habitat for a number of endemic and rare, threatened, and endangered fish species, including the duskytail darter (*Etheostoma [Catonotus] sp.)*, a federally endangered species; the palezone shiner (*Notropis albizonatus*), a federally endangered species; the blackside dace (*Phoxinus cumberlandensis*), a federally threatened species; the ashy darter (*Etheostoma cinereum*) and Emerald Darter (*Etheostoma baileyi*), both rare and either uncommon or imperiled within Tennessee;[129] and the Cumberland johnny darter (*Etheostoma susanea*), a federal candidate for listing.[130]

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[127] CWCS, App. A at 8/15, *available at* http://tennessee.gov/twra/cwcs/tncwcs2005app.pdf.
[128] CWCS at 39.
[129] 2008 NPS, Big South Fork NRRA EA at 35; FWS, Recovery Plan for Palezone Shiner at 7 (7 July 1997) [hereinafter "Recovery Plan for Palezone Shiner"], *available at* http://www.fws.gov/ecos/ajax/docs/recovery_plan/970707.pdf.
[130] 2008 NPS, Big South Fork NRRA EA at 35. On 24 June 2010, the FWS proposed to list the Cumberland darter (*Etheostoma susanae*) as endangered. 75 Fed. Reg. 36,035 (24 June 2010). The FWS indicates that the species is known in only 12 streams in Kentucky and Tennessee (Campbell and Scott counties) in the upper Cumberland River system. *See id.* at 36,036.

Mining in the Petition Area could adversely impact these species. According to the FWS, sediment from coal mining operations remains an ongoing threat, in particular, for the endangered duskytail darter and palezone shiner.[131] In fact, the FWS stated in the 1997 Recovery Plan for the palezone shiner that, "if the toxic discharge [from surface mining] is not curtailed, much of the aquatic fauna of the [Little South Fork of the Cumberland], including the palezone shiner, is imperiled."[132] As OSM has recognized, the federally threatened blackside dace is also highly susceptible to increased sedimentation and dissolved solids, as well as alteration of riparian vegetation that occurs as a result of surface mining.[133] Specifically, mining activity contributes sediment to the watershed, which reduces benthic macroinvertebrate populations, an important food source for fish, and decreases spawning success and recruitment in many fish species.[134] The CWCS also lists the above species as GCN species.[135] As a result, as set forth in the preceding section, mining in the Petition Area could damage fragile lands and is incompatible with Tennessee's CWCS, the "Connecting the Cumberlands" acquisition, and the plans and purposes of the WMAs of protecting water quality and vital habitat for vulnerable and listed species.

In addition, the recent scientific literature discussed below in Part II.B. 4 demonstrates that macroinvertebrate and fish communities downstream of mountaintop mining are consistently

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[131] FWS, Recovery Plan for Duskytail Darter at iii, 5 (30 Mar. 1994), *available at* http://ecos.fws.gov/docs/recovery_plan/duskytaildarter_RP.pdf; Recovery Plan for Palezone Shiner at 1, 9.
[132] Recovery Plan for Palezone Shiner at 9.
[133] OSM's Statement of Reasons published in response to the lands unsuitable petition submitted for the Fern Lake watershed found that increases in sedimentation and changes to water chemistry from mining in that watershed would adversely affect the blackside dace, a finding that weighed in favor of OSM's decision to declare the entire petition area unsuitable for surface mining operations. *See* 61 Fed. Reg. 49,793, 49,795 (23 Sept. 1996).
[134] *See* 2003 MTM PEIS at IV.D-5 (citing Jay R. Stauffer, Jr. and C. Paola Ferreri, School of Forest Resources Pennsylvania State University, *Characterization of Stream Fish Assemblages in Selected Regions of Mountain Top Removal/Valley Fill Coal Mining* (Oct. 2002) (finding numbers of fish and benthic species in mined streams lower than in unmined streams) [hereinafter "2002 Stauffer and Ferreri"], *available at* http://www.epa.gov/Region3/mtntop/pdf/appendices/d/fisheries-study/staufferferreri-oct2002.pdf; *id.* at III.C-7 (macroinvertebrate communities serve as a food base for higher trophic organisms (i.e., fish)).
[135] CWCS, App. A at 7/15-8/15.

and significantly degraded. Mountaintop mining and creation of valley fills has a harmful effect on the composition of stream fish communities, in terms of abundance and species richness.[136] In addition, numerous studies have shown severe effects of selenium on fish reproduction.[137] Protecting the Big South Fork and New River watersheds from the impacts of surface mining is critical for the survival and successful recovery of many protected fish species. Because surface coal mining in the Petition Area would negatively impact water quality and valuable aquatic habitat for a host of sensitive fish and mussel species, the interests of Intervenors and their members in protecting these resources would be directly and adversely affected.

4. Recent Studies Further Document the Adverse Environmental Impacts from Surface Mining on Aquatic Systems. (See State Petition at 4, 7, 9-11, 14 (water quality and protection of sensitive species and habitat), Part I.D. at 17-20, Part II. at 20-22.)

Tennessee's petition expressly recognizes the impacts on aquatic habitat in and downstream of the Petition Area as a result of pollution from mining activities. As the petition indicates, surface mining in the New River watershed has adversely impacted the Royal Blue and Sundquist WMAs "through sediment loading, acid mine drainage and other impacts."[138] Tennessee asserts that, "[b]ased upon recent trends at surface mining operations that have been fully regulated pursuant to the requirements of SMCRA, the impacts that would occur as a result of continued and renewed surface mining within the petition area can be expected to adversely affect the wildlife habitat within the New River watershed and adjacent areas through alterations

[136] *E.g.*, 2002 Stauffer and Ferreri; Fulk et al., *Ecological assessment of streams in the coal mining region of West Virginia* (2003), *in* 2005 MTM EIS, *available at* http://www.epa.gov/Region3/mtntop/pdf/mtm-vf_fpeis_full-document.pdf.
[137] *See infra* Part II.B.4.
[138] State Petition at 6-7.

of the soil and geologic structure, an elevated level of conductivity in surface water, noise, dust and vibration."[139]

Several recent studies demonstrate the severity of harm that current mining practices pose to aquatic systems, not only by adding sediment and acid-mine drainage to the watershed but also by otherwise altering water chemistry, water temperature, and flow regime. A 2008 in-depth study by EPA [hereinafter "2008 Pond study"], found numerous adverse aquatic impacts from coal mining operations.[140] The 2008 Pond study found that coal mining operations in southern Appalachian watersheds, are "strongly related to downstream biological impairment," including diminished biodiversity that otherwise characterizes unmined Appalachian streams,[141] and with pronounced adverse effects on stream chemistry,[142] including the near elimination of "entire orders of benthic organisms (*e.g.*, Ephemeroptera)," showing that "the aquatic life use is being impaired."[143] The findings of this and other studies are particularly significant because mayflies are a key component of headwater stream communities.[144] Headwater streams support

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[139] *Id.* at 7. Further, Tennessee recognized that the cumulative impacts of past, present, and future surface mining in the Petition Area will significantly impair wildlife habitat in the North Cumberland WMA. *Id.* As noted above, the state also asserted that surface mining in the Petition Area would directly damage "wildlife and wildlife habitat within, surrounding, and *downstream* from the mined areas". *Id.* at 11.

[140] Gregory J. Pond, et al., *Downstream Effects of Mountaintop Coal Mining: Comparing Biological Conditions Using Family- and Genus-Level Macroinvertebrate Bioassessment Tools*, 27 J.N. Am. Benthol. Soc, 717, 717-37 (8 July 2008) [hereinafter "2008 Pond study"], *available at* http://www.epa.gov/region3/mtntop/pdf/downstreameffects.pdf. *See also* SBZ FEIS at IV-147 to 149.

[141] 2008 Pond study at 724.

[142] *Id.* at 725.

[143] *Id.* at 724. Citing the Pond study, two researchers noted that this loss "has ecosystem scale importance since these mayfly taxa often account for 25 to 50% of total macroinvertebrate abundance in the least disturbed Central Appalachian streams." M.A. Palmer and E.S. Bernhardt, *Mountaintop Mining Valley Fills and Aquatic Ecosystems: A Scientific Primer on Impacts and Mitigation Approaches* at 17 (2009) [hereinafter "2009 Palmer and Bernhardt"], *available at* http://wvgazette.com/static/mtrwhitepaper.pdf. An earlier 2004 study by the Kentucky Department of Environmental Protection similarly documented the wholesale loss of mayflies (Ephemeroptera) at mined sites. Kentucky Department of Environmental Protection, Division of Water, *Effects of Surface Mining and Residential Land Use on Headwater Stream Biotic Integrity in the Eastern Kentucky Coalfield Region* at 2 (July 2004) [hereinafter "2004 Kentucky DEP study"] (Exhibit 23).

[144] *See* EPA, *Detailed Guidance: Improving EPA Review of Appalachian Surface Coal Mining Operations Under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order* at 5 (1 April 2010) [hereinafter "2010 EPA Guidance"], *available at* http://www.epa.gov/owow/wetlands/guidance/pdf/appalachian_mtntop_mining_detailed.pdf.

unique and ecologically valuable species such as insects, fish, and salamanders,[145] and they "contribute to critical biogeochemical processes."[146] Headwater streams are also critical to downstream functions and values. In addition to providing habitat or feeding grounds "for a unique and diverse assemblage of organisms," headwater streams also are conduits within the river network for transporting water, sediments, and dissolved materials from mountain tops to large river ecosystems.[147] The loss of headwater streams thus also impacts "hydrologic processes, chemistry, and stream biota in downstream waters."[148]

Mountaintop removal mining degrades downstream reaches by fundamentally altering the magnitude, timing, and composition of water flow. Since the flow regime "is one of the key variables determining what types of fish, insects, and other aquatic organisms can live in a stream," altering the flow regime results in dramatic changes in the biological community.[149] The evidence shows that "[s]tream structure and function are both impacted by mountain top mining."[150]

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[145] 2009 Palmer and Bernhardt at 2 (citing Meyer et al., *The Contribution of Headwater Streams to Biodiversity in River Networks*, J. of the Am. Water Resources Ass'n 43(1): 86-103 (2007) [hereinafter "2007 Meyer et al."] (Exhibit 24)).

[146] 2009 Palmer and Bernhardt at 2 (citing Stout and Wallace, *A Survey of Eight Aquatic Insect Orders Associated With Small Headwater Streams Subject to Valley Fills From Mountaintop Mining* (2003), *available at* http://www.epa.gov/region03/mtntop/pdf/appendices/d/StoutWallaceMacroinvertebrate.pdf; Davic and Welsh, *On the Ecological Roles of Salamanders*, Annual Review of Ecology, Evolution, and Systematics 35:405-435 (2004) (Exhibit 25); 2007 Meyer et al.).

[147] 2009 Palmer and Bernhardt at 2. The authors note that the role of headwater streams "in supporting high levels of biodiversity has been emphasized in a great deal of scientific research." *Id.* at 9 (and sources cited therein).

[148] *Id.* at 2 (citing Wipfli et al., *Ecological Linkages Between Headwaters and Downstream Ecosystems: Transport of Organic Matter, Invertebrates, and Wood Down Headwater Channels*, J. Am. Water Resources Ass'n 43(1): 72-85 (2007) (Exhibit 26)).

[149] Testimony of Margaret A. Palmer, Ph.D., Before Subcommittee on Water and Wildlife of U.S. Senate Committee on Environment and Public Works at 3 (2009) [hereinafter "2009 Palmer Testimony"], *available at* http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=66fea6d0-9bce-4a9b-be47-aa264a471a89; *see also* 2009 Palmer and Bernhardt at 6.

[150] 2009 Palmer and Bernhardt at 2 (and sources cited therein). The authors state that "[h]eadwater streams (ephemeral, intermittent, or perennial) that are buried or degraded by [mountaintop mining and valley fills] represent a major loss from a structural and functional perspective." *Id.* at 9. "Structural attributes include biodiversity, habitat, and channel properties while functional attributes include all those ecological and hydrogeomorphic processes that support healthy headwater streams." *Id.* at 2.

Downstream water quality and biota are also severely degraded from surface mine drainage. Certain lands within the Petition Area are vulnerable to impacts from acid mine drainage from surface mining.[151] In areas without the potential for acid mine drainage, studies of mountaintop mining show that streams and rivers below valley fills receive alkaline mine drainage,[152] which includes highly elevated concentrations of sulfate (SO_4), bicarbonate, calcium and magnesium ions,[153] and resulting in significant increases in conductivity and total dissolved solids.[154] Numerous studies "have shown that high levels of conductivity, dissolved solids, and sulfates are a primary cause of water quality impairments downstream from mine discharges," and that "[d]issolved solids contained in waters draining from valley fills are a primary cause of biological impairment resulting in changes from benthic species richness and diversity."[155] The resulting high conductivity and high sulfates can persist long after mining activities cease, and scientists have found no empirical evidence documenting recovery of macroinvertebrate communities in streams impacted by alkaline mine drainage.[156]

Selenium concentrations are also elevated downstream of valley fills. Researchers have found that selenium bioaccumulates, in some freshwater food webs at four times the toxic level,

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[151] *See, e.g.*, Royal Blue Plan at 27-28 (streams impacted by mining activities including acid mine drainage).
[152] Effluent waters from valley fills often are not acidic and are characterized by increases in pH.
[153] *See* 2009 Palmer and Bernhardt at 13-14 (and sources cited therein); Palmer, et al., *Mountaintop Mining Consequences*, 327 Science at 148 (8 January 2010) [hereinafter "2010 Palmer et al."], *available at* http://www.bio.unc.edu/faculty/white/Reprints/palmer-science-01-08-10.pdf; 2010 EPA Guidance at 5-6.
[154] *See, e.g.*, 2009 Palmer and Bernhardt at 3, 13-18; 2010 EPA Guidance at 5-6.
[155] 2010 EPA Guidance at 5 (citing Soucek and Kennedy, *Effects of Hardness, Chloride, and Acclimation on the Acute Toxicity of Sulfate to Freshwater Invertebrates*, Environmental Toxicology and Chemistry, 24:1204-1210 (2005) (Exhibit 27); 2008 Pond study). EPA cites numerous other studies that have linked elevated conductivity levels in coal effluent to the impairment of aquatic life. *See* 2010 EPA Guidance at 5-6 (citing Kennedy, A.J., D.S. Cherry, and R.J. Currie, *Field and Laboratory Assessment of a Coal Processing Effluent in the Leading Creek Watershed, Meigs County, Ohio,* Archives of Environmental Contamination and Toxicology 44, 324–331(2003)(elevated conductivity levels in coal effluent impairing sensitive aquatic fauna) (Exhibit 28)); 2004 Kentucky DEP study (finding loss of mayflies below mined streams)); Kennedy A. J., D.S. Cherry and C.E. Zipper, *Evaluation of Ionic Contribution to the Toxicity of a Coal-Mine Effluent Using Ceriodaphnia dubia*, Archives of Environmental Contamination and Toxicology 49, 155-162 (2005) (linking impairment of aquatic life to elevated levels of Total Dissolved Solids) (Exhibit 29); Pond, G.J., *Patterns of Ephemeroptera Taxa Loss in Appalachian Headwater Streams (Kentucky, USA)*, Hydrobiologia 641:185-201(2010) (finding specific conductance as the most strongly correlated factor to a reduction of Ephemeroptera in streams impacted by mining) (Exhibit 30).
[156] *See, e.g.*, 2009 Palmer and Bernhardt at 3-4, 13-18.

which can cause teratogenic deformities in larval fish and reproductive failure in fish and in birds (when they eat fish with selenium).[157] Organisms such as salamanders and mayflies are not adapted to the dramatic changes in water chemistry that result from valley fills.[158]

In sum, mountaintop removal mining and valley fills directly result in numerous key alterations of stream ecosystems:

1. Removal or burial of headwater streams by valley fills causes permanent loss of the biota and the functions of the headwater stream ecosystem. These functions are lost not only to the headwater stream, but also to downstream ecosystems and habitats.[159] Headwater streams play critical roles in ecological processes such as nutrient cycling and production of organic matter for downstream food webs.[160]

2. Concentrations of major chemical ions are persistently elevated downstream.

3. Downstream of mountaintop mined sites, specific conductance and component ions can be elevated 20 to 30 times over the background observed at unmined sites.[161] Selenium in streams downstream of valley fills also bioaccumulates, resulting in widespread impacts to stream life in downstream rivers and streams.[162]

4. Macroinvertebrates and fish communities are consistently and significantly degraded. The EPA 2008 Pond study found that 93% of waters downstream of surface mining operations exhibit significant impacts to aquatic life.[163]

In addition, deforestation associated with surface mining further stresses "water quality and the ecological viability of watersheds," and "has been linked to significant changes in aquatic

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[157] 2010 Palmer et al. at 148.
[158] *See* 2010 EPA Guidance at 5-6; 2009 Palmer and Bernhardt at 2.
[159] *See* 2009 Palmer and Bernhardt at 2-3, 5-13.
[160] *See id.* at 2-3, 23.
[161] 2008 Pond study at 725-26.
[162] EPA, *Guidance Summary: Improving EPA Review of Appalachian Surface Coal Mining Operations Under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order* at 2 (1 April 2010) [hereinafter "2010 EPA Guidance Summary"], *available at* http://www.epa.gov/owow/wetlands/guidance/pdf/appalachian_mtntop_mining_summary.pdf. EPA released the guidance on 1 April 2010 and it adopts benchmarks for dissolved solids as measured by conductivity in Appalachian streams. The draft document upon which these benchmarks are based makes clear that because the selected benchmark is not protective of all genera, and because it only protects against extirpation rather than reduction in abundance, this level is not fully protective of rare species or waters designated by state and federal agencies as exceptional. *See A Field-based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams* at xii (Mar. 2010 Draft), *available at* http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=220171. As such, the aquatic life benchmark for conductivity in the EPA Guidance will not adequately protect the federally threatened and endangered species in the Big South Fork NRRA that are already impacted by upstream surface mining operations, or the Big South Fork NRRA's exceptional characteristics as an ONRW.
[163] 2008 Pond study at 731; 2010 EPA Guidance Summary at 3.

communities" in Appalachia.[164] Surface mining in the Petition Area thus would severely damage aquatic ecosystems in and downstream of the Petition Area, directly and adversely affecting the interests of Intervenors and their members in protecting and enjoying these resources.

Moreover, as the State Petition asserts, surface mining in the Petition Area, even in full compliance with SMCRA requirements cannot protect against the "inherent" damage to aquatic ecosystems from mining operations.[165] The scientific studies confirm that, despite SMCRA regulatory requirements, the impacts of mountaintop removal mining with valley fills "are immense and irreversible,"[166] including the permanent loss of headwater streams through burial under valley fills, the reduction of biodiversity, and the severe degradation of downstream water quality and fauna. Further, the scientific evidence shows that mitigation strategies cannot compensate for lost stream habitat and functions.[167] Palmer and Bernhardt state, based on their extensive work, that they "do not know of a single case in which building streams in the manner outlined in mitigation plans have been shown to work, much less fully compensate for ecological functions lost when a stream is destroyed."[168] There is thus no substantive evidence in the literature that onsite mitigation can ever replace the lost functions and biodiversity of Appalachian headwater streams.

In sum, as the extensive evidence cited in this and the previous section (Part II.B.3.) overwhelmingly shows, SMCRA permitting and performance requirements are not sufficiently protective of water quality or aquatic species and habitat.[169] As a result, the impacts from

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[164] 2010 EPA Guidance at 3 (and sources cited therein).
[165] *See* State Petition at 6-7, 11, 14, 21-22, 25-26.
[166] 2009 Palmer Testimony at 2.
[167] *See id.* at 2, 7-10; 2009 Palmer and Bernhardt at 19-25.
[168] 2009 Palmer and Bernhardt at 22.
[169] *See, e.g.*, SBZ FEIS at IV-147 to 149 (discussing mining as contributor to the sedimentation of headwater streams); 2004 Kentucky DEP study at 5 (finding that acid and non-acid mine drainage from surface mining threatens aquatic habitat and can have long lasting effects, "curtailing re-colonization and recruitment of sensitive invertebrate populations."); Statement of Reasons on Fall Creek Falls Lands Unsuitable Petition, 65 Fed. Reg.

surface mining in the Petition Area would directly and adversely affect the interests of Intervenors and their members in protecting and enjoying water quality, and aquatic life and habitat in the watersheds of the Petition Area.

CONCLUSION

For the reasons set forth above, Intervenors assert that they meet the criteria for intervention, and accordingly move to intervene in support of the State Petition. Intervenors urge OSM to designate the Petition Area as unsuitable for surface mining.

Respectfully submitted this 24th day of November.

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39,178, 39,186 (23 June 2000) (even with "state-of-the-art" prediction and prevention techniques for acid mine drainage, mining operations can still produce it and thereby adversely affect natural resources).

Exhibit List
(Documents included on CD)

1. Map of the Petition Area and nearby lands.

2. Buehler, D. A., M. J. Welton, and T. Beachy. 2006. *Predicting cerulean warbler habitat use in the Cumberland Mountains of Tennessee*, Journal of Wildlife Management 70(6):1763-1769.

3. Statement of Reasons on Flat Fork Lands Unsuitable Petition (24 April 1990).

4. National Park Service, Big South Fork National River and Recreation Area, Water Resources Management Plan (1997) ("Big South Fork WRMP").

5. Ahlstedt et al., *Status of Freshwater Mussels in the Coal Mining Basin of the New River (Big South Fork Cumberland River Drainage) in Portions of Scott, Anderson, Morgan and Campbell County, Tennessee (2006-2008)* (11 Sept. 2008) ("Ahlstedt et al. 2008).

6. Map showing the preferred habitat of the Cerulean Warbler.

7. Letter from K. Rosenberg, Cerulean Atlas Project, to FWS (20 Jan. 2003).

8. Paul B. Hamel et al., *How We Can Learn More About the Cerulean Warbler (Dendroica Cerulea)*, Auk 121(1): 7-14 (2004).

9. Chandler S. Robbins et al., *A Warbler in Trouble: Dendroica cerulea* at 549-62, Manomet Symposium (1989) ("Robbins et al. Warbler 1989").

10. Nicholson, C.P. 2004, *Ecology of the Cerulean Warbler in the Cumberland Mountains of East Tennessee*, Dissertation, University of Tennessee, Knoxville, USA ("Nicholson 2004").

11. C. Oliarnyk & R. Robertson, *Breeding Behavior and Reproductive Success of Cerulean Warblers in Southeastern Ontario,* Wilson Bulletin 108(4): 673-84 (1996).

12. R. Askins et al., *Relationship Between the Regional Abundance of Forest and the Composition of Forest Bird Communities*, Biological Conservation 39 (1987): 129-52 (1987).

13. R. Connor and J. Dickson, *Relationships Between Bird Communities and Forest Age, Structure, Species Composition and Fragmentation in the West Gulf Coastal Plain,* Texas J. Sci. Suppl. 49(3): 123-38 (1997).

14. Cathy A. Weakland & Petra Bohall Wood, *Cerulean Warbler (Dendroica Cerulea) Microhabitat and Landscape-Level Habitat Characteristics in Southern West Virginia,* Auk 122(2): 497-508 (2005) ("Weakland and Wood 2005").

15. Chandler S. Robbins et al., *Habitat Area Requirements of Breeding Forest Birds of the Middle Atlantic States*, 103 Wildlife. Monographs at 3-34 (1989).

16. Wood et al., *Cerulean Warbler Abundance and Occurrence Relative to Large-Scale Edge and Habitat Characteristics* Condor 108:154-65 (2006) ("Wood et al. 2006").

17. Steven A. Ahlstedt et al., *Current Status of Freshwater Mussels in the Big South Fork National River and Recreation Area*, 14 Walkerana 33- 77 (2003-04) ("Ahlstedt 2003-04").

18. Takashi Gomi et al., *Understanding Processes and Downstream Linkages of Headwater Systems*, 52 BioScience No. 10 at 905-16 (Oct. 2002).

19. Map showing federally and state listed species and species of concern in the Petition Area lands and watersheds.

20. U.S. Department of the Interior, National Park Service, Big South Fork National River and Recreation Area, Environmental Assessment, Plug and Reclaim Eleven Abandoned Wells at Big South Fork National River and Recreation Area (June 2008) ("2008 NPS, Big South Fork NRRA EA").

21. Map showing mussel critical habitat designated by the FWS.

22. James Layzer and Robert Anderson, *Impacts of the Coal Industry on Rare and Endangered Aquatic Organisms of the Upper Cumberland River Basin* (1992).

23. Kentucky Department of Environmental Protection, Division of Water, *Effects of Surface Mining and Residential Land Use on Headwater Stream Biotic Integrity in the Eastern Kentucky Coalfield Region* (2004) ("2004 Kentucky DEP study").

24. Meyer et al., *The Contribution of Headwater Streams to Biodiversity in River Networks*, J. of the Am. Water Resources Ass'n 43(1): 86-103 (2007) ("2007 Meyer et al.").

25. Davic and Welsh, *On the Ecological Roles of Salamanders*, Annual Review of Ecology, Evolution, and Systematics 35: 405-34 (2004).

26. Wipfli et al., *Ecological Linkages between Headwaters and Downstream Ecosystems: Transport of Organic Matter, Invertebrates, and Wood Down Headwater Channels*, J. Am. Water Resources Ass'n 43(1): 72-85(2007).

27. Soucek and Kennedy, *Effects of Hardness, Chloride, and Acclimation on the Acute Toxicity of Sulfate to Freshwater Invertebrates*, Environmental Toxicology and Chemistry, 24:1204-1210 (2005).

28. Kennedy, A.J., D.S. Cherry, and R.J. Currie, *Field and Laboratory Assessment of a Coal Processing Effluent in the Leading Creek Watershed, Meigs County, Ohio,* Archives of Environmental Contamination and Toxicology 44, 324–31(2003).

29. Kennedy A. J., D.S. Cherry and C.E. Zipper, *Evaluation of Ionic Contribution to the Toxicity of a Coal-Mine Effluent Using Ceriodaphnia dubia*, Archives of Environmental Contamination and Toxicology 49, 155-62 (2005).

30. Pond, G.J., *Patterns of Ephemeroptera Taxa Loss in Appalachian Headwater Streams (Kentucky, USA)*, Hydrobiologia 641:185-201(2010).