Natural Resource Restoration Project Proposal for the
Southeast Missouri Lead Mining District

Taum Sauk Mountain and
Johnson’s Shut-Ins State Parks:
Parcel Acquisitions
Iron and Reynolds Counties, Missouri

Submitted by the Missouri Department of Natural Resources
September 2016
**Introduction and Background**

The federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) authorizes claims for “damages for injury to, destruction of, or loss of natural resources” as a result of the release of a hazardous substance. 42 U.S.C § 9607(a)(4)(C). Any compensation received as a result of resolving a claim for natural resource damages must be used for “the restoration, rehabilitation, or replacement or acquisition of the equivalent of” any lost natural resources or their services. 42 U.S.C. § 9611(i). This CERCLA process is referred to as natural resource damage assessment and restoration (NRDAR), the goal of which is to compensate the public for the loss of resources and their services resulting from a release of a hazardous substance.

**Missouri Trustees and the Trustee Council**

CERCLA, and its implementing regulations, designated federal and state authorities to act on behalf of the public as trustees for natural resources, including supporting ecosystems, belonging to, managed by, controlled by, or appertaining to such state, or by the United States. 42 U.S.C. § 9607(f); 40 C.F.R. § 600 and § 300.605. Under this authority, the Governor of the State of Missouri has appointed the director of the Missouri Department of Natural Resources (MDNR) as the designated state trustee. The U.S. Fish and Wildlife Service (FWS) is acting as the trustee on behalf of the U.S. Department of the Interior in the Southeast Missouri Lead Mining District (SEMOLMD). The U.S. Forest Service is acting as the trustee on behalf of the U.S. Department of Agriculture (collectively the “Trustees”). The Trustees formed a Trustee Council by a Memorandum of Understanding. The Trustee Council coordinates activities for both assessing injuries to natural resources and their services and the restoration, replacement, rehabilitation of acquisition of the equivalent of the lost natural resources and their services upon receipt of compensation from potentially responsible parties.

**Restoration Plan**

In 2009, MDNR and FWS successfully resolved a claim for natural resource damages against the American Smelting and Refining Company (ASARCO) resulting in the recovery of over $41 million for the SEMOLMD. Pursuant to CERCLA, the Trustees developed the Southeast Missouri Ozarks Regional Restoration Plan (SE MORRP) which provides a process framework that governs the approach for restoration project identification, evaluation, selection and implementation. 42 U.S.C. § 9611(i). (The SEMORRP is available at [http://dnr.mo.gov/env/hwp/sfund/docs/nrd-final-semorrp.pdf](http://dnr.mo.gov/env/hwp/sfund/docs/nrd-final-semorrp.pdf).) As part of the restoration process, an agency member of the Trustee Council may submit proposal(s) for restoration projects to be evaluated by the larger Trustee Council in accordance with the factors discussed in the SEMORRP.
Project Proposal
In its role as a Trustee, MDNR submits the following restoration project proposal to the Missouri Trustee Council. The proposed restoration action is to purchase a number of parcels in and around Taum Sauk Mountain and Johnson’s Shut-Ins State Parks using NRDAR funds as means to acquire the equivalent of natural resources and their services lost as a result of releases of hazardous substances at facilities formerly owned and operated by ASARCO, namely the Glover Smelter Site and the West Fork Mine and Mill (See Figure 1).

MDNR proposes holding title to the properties pursuant to its statutory authority to accept and acquire lands pursuant to Section 253.040, RSMo. If approved by the Trustees, the purchase and restoration would be funded by funds received from the settlement in ASARCO.

MDNR’s ownership of surrounding lands, as well as the importance of the current ecological character of these properties, support this acquisition. MDNR’s management goals and objectives for this property are fully supportive of the goals of NRDAR providing a compelling case for acquisition.
I. **Natural History Assessment**

a. **Taum Sauk Mountain State Park parcels**

MDNR has identified a number of parcels adjacent or in close proximity to Taum Sauk Mountain State Park. Acquisition of these acres would ensure the perpetual restoration and protection of lands substantially similar to that which was injured by releases of hazardous substances from mining operations. The acquisitions provide for increased connectivity between existing public lands and eliminate the threat of development on the parcels to be acquired.

i. **Eastern properties**

MDNR has identified four parcels along the eastern boundary of the park—referred to as the Hinds, Shaul, Flowers, and Stephenson properties. *(See Figure 2).*

![Figure 2: Location of four properties, including glade communities.](image)

Sandwiched between lands owned by MDNR to the west and the Missouri Department of Conservation lands to the east, these properties represent a great opportunity to secure high-quality natural communities and to continue the theme of landscape-scale restoration activities in the biodiverse St. Francois Mountains of the Ozark Highlands. Much of the property adjacent to highway CC to the north has been subdivided into small 5-20 acre parcels, a theme which may continue over time without securement of large tracts of land such as these.
Combined, the properties total 467 acres of high quality igneous glade, woodland, forest and stream natural communities. The natural community quality matches or in some cases exceeds those found within Taum Sauk Mountain State Park with its overlying St. Francois Mountains State Natural Area. Furthermore, these properties provide spectacular views of the St. Francois Mountain landscape and the park’s eponymous mountain, with a different perspective than views that can be found in the existing Taum Sauk Mountain State Park to the west.

- **Hinds Property (106 Acres):** This property shares its northwest borders with Taum Sauk Mountain State Park. Dry igneous woodlands, many of which have scattered old growth shortleaf pine (Missouri’s only native pine species) of large diameter, can be found throughout the property.

  The property is also in the Claybaugh Creek drainage unit, a significant stream that flows east from Taum Sauk Mountain and through the Royal Gorge Natural Area, a multiagency designation that recognizes native landscapes as exemplary quality. Claybaugh Creek is of good quality here with stream bank communities rich in flora such as Ozark witch hazel, eastern witch hazel, red maple and other characteristic vegetation including some restricted sedges.

- **Shaull Property (61 Acres):** Only a tenth of a mile away from Taum Sauk Mountain State Park, the Shaull property shares a common border with the Hinds property. The property also hosts approximately ½ mile of the Ozark Trail in addition to several incredible views from the property’s many igneous glades.

  The Shaull property contains several large expanses of igneous glades in addition to dry-igneous woodlands. Occurring just off the broad summit of the Taum Sauk Mountain, the glades here are of a unique character given the gently sloping topography relative to the steeper glades found throughout the region. The relatively gentle terrain produces a level, prairie-like feeling to the area with a deep soil layer that was once characteristic, but has been largely destroyed by anthropogenic forces throughout the region.
The northern portion of the property contains pockets of upland flatwoods interspersed with dry-igneous woodlands. These flatwoods communities and their adjacent dry-igneous woodlands would respond well to a regime of careful and selective ecologically based thinning in conjunction with prescribed fire to restore the historic open landscape and rich herbaceous layer found in similar, higher quality tracts within the state park.

- **Flowers Property (formerly Stewart) (177 Acres):** Of the four properties, the Flowers property contains some of the widest array of highest quality natural communities.

  The igneous glades on the property were observed to be intact, floristically diverse, and very similar to glades found on Weimer Hill of Taum Sauk Mountain State Park located to the west; it is on Weimer Hill that the park’s greatest concentration of the federally threatened Mead’s milkweed (*Asclepias meadii*) exists. Given the similar structure and intact soil profile of the igneous glades of the property, the Flowers property has the highest potential of hosting Mead’s milkweed. Documentation for this property indicates the presence of the assortment of perennial and annual forbs and grasses indicative of good quality igneous glades. The glades on the central portion of the property just north of Claybaugh Creek are of the best quality, surrounded by large diameter shortleaf pine stands.
Dry igneous woodland communities typically surround igneous glades in this region, and feather into an open character of widely spaced mature trees that are capable of withstanding frequent fire regimes. The igneous knobs in the St. Francois Mountains are known for serving as vectors of lightning-induced wildfires historically and well into modern times. These areas are dominated by shortleaf pine, white oak, post oak, black oak and some scattered black hickories and gum. The understory yields a flora typical of these woodland communities including little bluestem, asters, a variety of sedges, and forbs tolerant of these relatively acidic soil communities.

The extreme southern portion exists on a north facing aspect of an unnamed hill which is of a forested character of dry-mesic igneous woodland communities. Portions of the hillside were impacted by a severe windstorm in 2009, leaving in its wake a matrix of debris and young deciduous hardwood and pine regeneration. The matrix of open woodlands and grassland-shrublands that have developed after the windstorm and in the absence of fire provide significant habitat for birds once thought loyal only to clear-cuts, such as Kentucky Warblers and Prairie Warblers.

Separating the glades and dry-igneous woodlands to the north and the dry-mesic woodlands to the south is Claybaugh Creek. The creek flows through the Hinds property
to the west, but begins to widen and develop as it courses through the Flowers tract. The stream is restricted by igneous toe slopes of talus communities and stream bank communities. While Claybaugh Creek was not thoroughly inventoried for aquatic fauna, a variety of small fishes were observed in the swift coursing waters and aquatic invertebrates normally associated with similar igneous-based streams were seen.

- **Stephenson Property – 123 Acres:** The Stephenson property contains many of the same attributes found on the Flowers property.

  The southeast portion contains a greater expression of the stream bank natural communities along Claybaugh Creek, as well as a well-developed dry-mesic bottomland woodland community. The dry igneous woodlands located on the dry knob have typical vegetation of farkleberry thickets under a canopy of shortleaf pine.

  Like the other properties, the tract contains several high-quality pockets of igneous glade communities with a rich array of grasses, sedges and forbs. East facing slopes on the property contain a large band of dry-mesic igneous woodland which is relatively steep in some zones.

**Quality and Character:**

All four properties have maintained their natural quality having escaped any logging within the last half-century and are all relatively free of exotic species encroachment or other degradation; such a large landscape indicating minimal anthropogenic damage is rare in the Ozarks. The flora indicative of these natural communities was notably diverse and abundant relative to depauperate flora typical of abused natural communities in the region. Furthermore, this intact landscape undoubtedly provides ample habitat for sensitive species such as neotropical migrant birds dependent on largescale landscapes, rare herpetofauna, and other characteristic species found in these intact landscapes. The primary threat to the long term viability of these properties is the presence of invasive feral hogs and the absence of a prescribed burning regime. Although there was no observed evidence of feral hogs within Claybough Creek or its tributaries as they exists on the properties, they are a known presence in the area and are destructive to riparian corridors and streambeds. This is especially true in the Ozarks where streams are characterized by substrates with high infiltration rates through which contaminants may be rapidly conveyed into groundwater resources.

The variable topography replicates and even exceeds the majestic views provided by Taum Sauk Mountain State Park to the west, a park recognized for its position on the landscape as the highest point in Missouri and possessing breathtaking vistas of intact St. Francois Mountains landscapes. On a local scale, the large, scattered igneous boulders interspersed with these intact natural communities and their associated flora and fauna augment the beauty of this St. Francois Mountain landscape which is unique to the
eastern deciduous biome for being the center of the vulcan caldera of the Ozark Highlands of Missouri.

**Conservation Value/Restoration of Ecological Resources:**
Each of the four properties contain igneous-substrate stream communities. These unique natural communities vary in their flow regime depending on their location on the landscape. The smaller streams of the uplands are generally ephemeral yet host rare flora such as *Carex torta*, alder, witch hazel and other stream species. Neotropical migrants such as the Louisiana waterthrush were observed frequently amongst these natural communities.

All of the properties with the exception of the Shaul tract host Claybaugh Creek, which is similar in scale to that of Taum Sauk Creek, a State Outstanding Resource Water of high quality, protected entirely by state park property.

![Scenic view of Taum Sauk Mountains from properties.](image)

The Shaul property may host the best examples of upland flatwoods which are generally found on broad ridgetops where subsoils are thick and stunt the growth of woody vegetation, potentially creating a very open, prairie-like woodland community. Some of these gently sloping upland communities may actually be dry igneous woodlands with slopes exceeding 3%, but they also maintain a structure and flora very similar to the flatwoods found in the state park.

Each of the properties host dry-igneous woodlands, characteristically occurring adjacent to igneous glades, that are comprised of post oak, black oak and shortleaf pine. These dry-igneous woodlands are highly restorable natural communities, harboring a high abundance of shortleaf pine and pine regeneration.

The Terrestrial Natural Communities of Missouri (P. Nelson, 2010) describes two ‘sub-types’ of dry-igneous woodlands including the ‘Shortleaf pine, white oak, lowbush blueberry subtype’ and the ‘Post oak, black jack oak, little bluestem subtype’, both of which were observed on the properties. These communities also host a rich understory of grasses, sedges and forbs including *Aster anomalous*, *Panicum linearifolium*, *Carex virescens*, *Scutellaria elliptica* and *Solidago hispida*. 
Dry-mesic igneous woodlands, which occur on steep slopes and foot slopes, are found throughout most of the properties. The north-facing slope on the southern portion of the Flowers property and the east facing slope of the Stephenson property are the best representative examples of this natural community. These woodlands are generally more productive with trees attaining greater heights than that of the dry igneous woodlands above. Species include red maple, white oak, and occasional shortleaf pine.

The eastern edge of the Flowers property and southern portion of the Stephenson property hosts dry-mesic bottomland woodlands, which occur between stream communities and dry-mesic igneous woodlands and contain rich understory grasses, sedges and forbs. Primarily these communities were found where Claybaugh Creek widens considerably.

Igneous glades are some of the highest quality natural communities on the properties. These natural communities are open, grassy areas with abundant bedrock and boulders on the surface. Glades were found in pockets throughout the properties, with the largest being found on the Shaul, Flowers, and Stephenson tracts. Based on observation 85% of the glades are of high quality and have avoided damage from development, feral hogs, grazing or off road vehicles.

The glade band on the western portion of the Hinds and Shaul properties, which extends on to state park property, is of very high quality with a rich assortment of flora including Indian grass, blazing star, prairie dropseed, and big bluestem. This glade may host the federally threatened Mead’s milkweed (*Asclepias meadii*).

Igneous Talus are natural communities sparsely vegetated communities with piles of unconsolidated igneous stones. The strewn rocks provide refuge for a variety of animals including small mammals, a variety of reptiles and others. These communities are rich in lichens which can cover many of the rocks. Talus communities are found throughout the properties but are best expressed along toe slopes near Claybaugh Creek on the Flowers and Stephenson property. On the other properties they can be found along small tributaries leading to Claybaugh Creek.

ii. Taum Sauk—Brawley tracts
The Taum Sauk—Brawley tracts are adjacent to the northwestern boundary of Taum Sauk Mountain State Park. With their proximity to Department of Conservation lands (Ketcherside Mountain) and a prior restoration purchase (Hennessey Tract), these 240 acres expand the overall contiguous landmass of state and federal land in this area further benefitting the natural resources in the area. (See Figure 3) Additionally, given the proximity of the tracts to Highway N, one of the main thoroughfares through this area, securing public ownership buffers the threats from development and enhances the ability of MDNR to mitigate the intrusion of invasive species.
Several glades exist on the higher portions of these tracts and the steeply graded hillsides contain a woodland ecosystem typical for this area of the state. Of the parcels discussed in this proposal, these tracts are most in need of restoration and management from the impacts of the 2009 wind storm and subsequent timber removal. The areas that were impacted are now thickly covered with new growth from stump sprouting.

![Figure 3: Taum Sauk—Brawley Tracts.](image)

**b. Johnson’s Shut-Ins State Park Parcels**

MDNR has identified three parcels in the northern portion of Johnson’s Shut-Ins State Park. These parcels total 155 acres and are inholdings within the state park and adjacent to the ‘Jost’ parcel, a restoration acquisition previously funded by the Trustees.

**i. Johnson’s Shut-Ins-Brawley tracts**

These three tracts are located between Bell Mountain Wilderness (managed as part of the Mark Twain National Forest) and Goggins Mountain Wild Area (managed as part of Johnson’s Shut-Ins State Park). Acquisition would:

1. Consolidate the connection between existing State and Federal wilderness areas;
2. Provide for wilderness backcountry recreation and public use of the Ozark Trail, which crosses the tracts; and
3. Preserve the quality and extent of the tracts’ forest and glades, thus providing scenic and ecosystem continuity across the wilderness areas.

Additionally, this acquisition would further goals of the previously approved Wilderness Connection and Watershed Protection for the East Fork of the Black River proposal submitted by the Mark Twain National Forest and approved by the Trustees in early 2016. That project, in part, consisted of the purchase of over 900 acres of critical inholdings in and around the wilderness areas. The previously acquired parcel (Jost) is contiguous with the Brawley tracts’ eastern and southern boundaries. Together the Brawley and Jost tracts span most of the private lands gap in the wilderness complex. (See Figure 4)

**Quality and Character**

These tracts occupy the high, wild and scenic St. Francois mountainside surrounded entirely by state and federal public land. From every border and panorama, the view from these tracts is of unbroken natural landscape. The tracts span ruggedly steep and varied
terrain, capturing both the heights near the summit of Goggins Mountain and the steep hillsides and bottoms of narrow headwater valleys. The tracts contain several natural environments: dry igneous woodlands; very dry, bedrock dominated igneous glades; deep soil glades; dry igneous forests; dry mesic chert forests; and riparian zones.

The geology is equally representative of the St. Francois Knobs and Basins Ecological Section (Atlas of Missouri Ecosystems, Nigh and Schroeder 2002), spanning Pre-Cambrian volcanic terrain in higher portions, and Ordovician-aged sedimentary formations across the lower sections. The mountain is itself the rim of an ancient volcano caldera, one of several that dominated the landscape nearly 1.5 billion years ago.

The tracts are entirely forested, interspersed with glades on the higher portions. The trees are a mix of oaks, hickories and shortleaf pine according to the respective natural community. The mountaintop woodlands are dominated by post and blackjack oak surrounding glade openings. Below the glades, both igneous and chert substrates support dry communities of white oaks interspersed with individuals or groves of shortleaf pine. Throughout the tracts, the canopy trees are mature or maturing, without recent logging impact. Portions of the tracts were affected by the 2009 derecho wind storm. The drainages present are high-gradient wet weather waterways through dry or dry-mesic forest. They do not hold water, nor is there a developed riparian forest. The ground flora is entirely native and generally of good diversity and condition, except that feral hogs continue to harm the glades by their repeated rooting and wallowing.

**Conservation Value/Restoration of Ecological Resources**
The proposed acquisition offers long-term conservation protection for the forests and glades on the properties, and secures landlocked inholdings of the Goggins-Bell wilderness complex. With the high quality of resources present on the parcels, they may be added to the Goggin’s Mountain Wild Area of the park, further securing wilderness continuity and preserving the wild scenery along the popular segment of the Ozark Trail that crosses it.

Under Missouri State Park management, the properties’ suite of high quality natural forest and glade communities will continue supporting the richness of native species and the extent of high quality habitat that characterizes Goggin’s and Bell mountains. Missouri’s Comprehensive Wildlife Strategy identified Conservation Opportunity Areas (COA’s) across the state, including the St. Francois Knobs and Basins of which the Brawley Tract is contained. COA’s are established by the Missouri Conservation Department as among the best areas to conserve native wildlife and their habitats. Igneous glades, forests and woodlands are the primary COA conservation targets that the acquisitions would further protect.
The tracts also lie within the geography of Audubon’s Black River Watershed Important Bird Area (IBA). The woodlands provide good nesting habitat for forest-interior songbirds, possibly facilitating source populations.

c. **Benefits and restoration to natural resources**

**Benefit to federal/state listed species; Missouri Species of Concern:** The proposed properties have not been thoroughly surveyed for species of conservation concern or rare, threatened, or endangered species. However, the intact natural communities are of significant quality and the igneous glades may prove to possess populations of the federally threatened Mead’s milkweed. Uncommon native plants including dwarf dandelion, prairie parsley and three-leaved sundrops are restricted in the region to the igneous glades with deeper soils; it is the deep soil layer on the glades that may allow for Mead’s milkweed and notable prairie plant populations that are not seen on overgrazed igneous glades dominated by lichens and moss. Whitlow grass, a spring blooming mustard that is tracked by the Natural Heritage Program, has been seen on the igneous glades throughout the parks.

Taum Sauk Mountain and the immediately surrounding areas are noted in Missouri for having a large, highly concentrated population of timber rattlesnakes. While timber rattlesnakes are known to exist outside of the St. Francois Mountains, the proposed parcels, combined with the rest of the intact St. Francois Mountains, prove valuable for sustainability of this charismatic rattlesnake by allowing for denning spaces, ample food sources, and open glades for basking. The presence of feral hogs in this area threatens this population, as well as native plant and other ground-dwelling organisms. The addition of these properties would allow for more comprehensive management of the feral hog population and other ecosystem protection measures that support the goals and mission of the Missouri State Parks system.

Dry-igneous woodlands on the properties vary from the more closed subtypes (*left*) to stunted communities with a brushy understory of Vaccinium shrubs (*photo right*).
mission of the parks system is to preserve and protect Missouri’s outstanding native landscapes through the prioritization of natural community-based restoration through the implementation of natural processes, exotic species management, and preservation of natural features.

**Benefit to Migratory Birds:** The additional acreage will benefit migratory birds. Over 200 species of birds depend on habitat in the Ozarks during some period of their life cycle. In a 2011 breeding bird survey at Taum Sauk Mountain State Park and Johnson’s Shut-Ins State Parks, researchers documented 70 species of woodland and grassland-shrubland birds utilizing the area in a six week survey period. While the properties are not directly located on a major migratory flyway, the large, contiguous forested blocks adjacent to the Mississippi River Flyway provide supportive habitat and resource availability for migratory and resident birds. These properties house not only an intact forested canopy, but also clear, fast-moving Ozark streams and a rich invertebrate population necessary for fledgling success. It has been documented that long-lived white oaks, black cherry, hickories and native forbs attract suites of insects whose larvae provide nesting birds with much needed fat and protein for their young. Warblers, in particular, are common on Taum Sauk Mountain, with large populations of Black and White Warblers. Louisiana Waterthrush that inhabit the stream banks, and a source population of Red-eyed Vireos often seen gleaning insects high in the canopy. Kentucky Warblers, Wood Thrush, Chuck Will’s-widow and Eastern Whip-poor-will are four of 26 species of birds recognized as obligate breeding birds from the eastern deciduous forest. These are listed on the Yellow Watch List as in decline in the North American Bird Conservation Initiative’s *The State of the Birds 2014 Report* (North American Bird Conservation Initiative, US Committee. 2014. US Department of the Interior, Washington DC). All four of these are documented breeding birds on Taum Sauk Mountain, with three more of the 26 Yellow Watch List birds documented from nearby Wildcat Mountain, located in Taum Sauk Mountain State Park. Based on the proximity to the other public lands and the similarity of habitat, these same bird species certainly frequent and make use of Johnson’s Shut-Ins State Park.

The St. Francois Mountains and Taum Sauk Mountain, in particular, are significant landscapes for the Central Hardwoods Joint Venture Bird Conservation Region precisely because of the high quality intact native landscapes that exist there. Many birds breed or overwinter in the
area, while others stop during migration between breeding and wintering grounds. Some species are doing quite well, but populations of others are less stable or are more vulnerable to long-term declines. Birds identified in the Central Hardwoods Joint Venture Priority Birds List include grassland-shrubland birds like Prairie Warbler, Yellow-breasted Chat and Blue-winged Warbler, all three of which are known from the glades on Taum Sauk Mountain and likely present on the similar landscapes within Johnson’s Shut-Ins. Woodland and Forest Interior birds in the greatest need of conservation typically have a combination of relatively small ranges, small population sizes, declining trends, and reliance on threatened or already degraded habitats. Many of these species are documented with high numbers throughout the Bird Conservation Region with strongholds in the Ozark Highlands. The contiguous tracts of native landscapes in the St. Francois Mountains support birds that depend on deciduous leaf litter for nesting (e.g., E. Whip-poor-will) as well as those recognized as declining due to lack of natural disturbance, namely fire, such as Eastern Wood Pewee and Prairie Warbler.

**Surface water benefits:** Acquisition of these parcels will prevent possible adverse impacts to water quality. The proposed tracts contain flowing water bodies and high-gradient, wet-weather drainages that are capable of conveying contaminants or soils to water bodies. Soils on the steep terrains of the St. Francois Mountains are held in place by existing vegetative cover, which is mostly mature or maturing forest with embedded natural glade grasslands. The soils are susceptible to even small disturbances such as from logging, logging access routes, agricultural development, feral hogs or clearing for house sites. Precipitation then mobilizes and rapidly conveys those materials and any surface contaminants to receiving waters. Also, because the bottomland soils below these tracts and connecting into the parks have a high infiltration rate, any contaminants reaching surface waters can easily be conveyed into groundwater.

The Johnson’s Shut-Ins State Park tracts are located wholly or predominantly in surface watersheds of the East Fork Black River, conveying runoff into the river either directly or via Shut-Ins Creek. Just downstream of the state park, the East Fork Black River is designated a Missouri Outstanding State Resource Water for its outstanding aquatic community structure and high-quality habitat for aquatic biota. Acquisition of these parcels will protect the existing forest and natural cover of these tracts, thereby preventing adverse impacts to water quality.

The parcels proposed for acquisition on the east side of Taum Sauk State Park all contain portions of Claybaugh Creek or its immediately adjacent uplands drainage area. Acquisition and resource management by MDNR will similarly protect the existing vegetative cover on these high quality properties and ensure that any feral hog presence is quickly addressed. Additionally, the properties are situated near the park entrance road and could potentially become home sites if not acquired. Because the soils on these tracts are poorly suited for wastewater treatment, subdivision and development would almost certainly cause a corresponding adverse impact to surface waters.
On the parcels acquired around Taum Sauk State Park, MDNR will incorporate them into the existing burn regime of the adjacent Missouri Natural Area. The resulting increase in herbaceous groundcover density and root mass will improve soil condition and water infiltration. Surface runoff will be reduced as the vegetation slows and intercepts precipitation, resulting in increased soil retention and reduced siltation of water bodies.

Context for purchase: Taum Sauk Mountain State Park, Johnson’s Shut-Ins State Park, Ketcherside Conservation Area, and the Mark Twain National Forest are all near or adjacent to the properties. Purchase of the properties would provide perpetual protection from development and associated impacts as well as support resource connectivity. The properties would be incorporated into existing management plans and, if eligible, be included within the nearby St. Francois Mountains Natural Area (for the Taum Sauk parcels) and the Goggins Mountain Wilderness Area (for the Johnson’s Shut-Ins parcels). These parcels would be added to a publicly held land area comprising tens of thousands contiguous acres.

The proposed acquisitions would expand Taum Sauk Mountain and Johnson’s Shut-Ins State Parks. The properties and the parks lie in a region that experiences a high flow of tourists because of the quality of the public lands. The state parks are only a 30 minute drive from Farmington, MO and ten minutes from Ironton, MO. The population of Iron County is approximately 11,000. Most of the visitation to these areas comes from larger populations such as St. Louis (97 miles). However, many visitors come from all around the state and even surrounding states. With collectively around 400,000 visitors a year, this area is one of the most visited park systems in the state. Through MDNR’s efforts to facilitate appropriate recreation, these parks allow visitors the opportunity to experience the native landscape of the Missouri Ozarks. The Taum Sauk section of the Ozark Trail, and the Ozark Trail through Goggins Mountain Wild Area and the Bell Mountain Wilderness, are among the most heavily visited segments of the trail network. Three of the tracts contain segments of the trail, and all are in near proximity and comprise part of the wilderness viewshed for the trail.

Project Benefits: Acquisition of the properties will enhance the mission of Missouri State Parks to preserve and interpret the state’s most outstanding natural landscapes and cultural landmarks, and to provide outstanding recreational opportunities compatible with those resources. These properties present an opportunity to secure land for conservation landscape-scale restoration efforts that would benefit all wildlife and natural communities. Through planned restoration efforts, the purchases will also provide the opportunity to increase the quality of natural resource services provided by the properties. MDNR’s stewardship of the purchased lands will ensure that the Trustees’ goals of adequately compensating the public for the loss of natural resources and services in the SEMOLMD are furthered.

Geographic Nexus: The project lies within the restoration boundaries of SEMORRP. The tracts are located less than 12 miles from the Glover Smelter Site and the West Fork Mine and Mill natural resource injury sites. The proximity provides a conservation and restoration opportunity with a direct nexus to the injuries from which the current proposed restoration
project funds are derived. Through exposure, releases of toxic heavy metals from mining and milling operations have caused direct biological injury to terrestrial and aquatic life. Indirect biological injury has also occurred via contamination of aquatic and terrestrial habitats on which the Trust resources depend. Additional information regarding natural resource injuries from mining activities may be found at: http://dnr.mo.gov/env/hwp/sfund/nrda.htm. The proximity of the tracts to the site of the injury provides direct compensation to the public for those lost resources.

**Ecological Benefit and Nexus:** This project will allow preservation of high quality dry igneous woodlands and glades, restoration for other glades, regenerating woodland on non-native fields, protection of adjoining lands owned by the state that are part of the St. Francois Mountains Natural Area, promote proper stewardship of this tract with high quality natural resources and prevent further clearing or development that fragments and reduces the expansive woodlands of Taum Sauk and Goggins mountains. Numerous small tracts in this area have been sold for housing lots and these properties are all vulnerable. These tracts would be managed consistent with the surrounding lands within the state park boundaries as defined in the park’s ecological stewardship area.

**Threat of Development:** Property in the St. Francois Mountains is in increasing demand due to the abundance of natural resources protected through public ownership of lands. Property adjoining public lands has continued to be developed along roads with housing that is affecting the resources and is fragmenting habitat. These properties may be developed for housing in the future if offered on the open market. This would disrupt the continuity of the forest system, fragment habitat and interrupt ecological connectivity. According to the Partners In Flight Bird conservation Plan, some birds may be responding more to the total amount of core area (i.e. the area of forest>100m from a forest edge), even relatively large tracts with small interior-to-edge ratios may be unattractive to some species (Temple 1986). If not acquired by MDNR, possible development, logging and/or mining could occur on the property and threaten the connectivity of the system and the continuity of habitat for Neotropical migrants and other obligate species that depend on this system.

If added to the park, the tracts would remain undeveloped and would be maintained as the native ecosystem with the exception of potential trails for recreation and the public’s enjoyment, including potential expansion connected to the Ozark Trail.
d. **Project Goals and Objectives**

The fundamental goal of this project is ecosystem restoration and long-term protection. The old growth structure and intact wooded landscapes, rugged in nature and having been spared much of the degradation from anthropogenic forces, represents significant opportunities for the largescale protection of biodiversity. The restoration objectives of this project include implementation of prescribed fire across the gradients which will be vital in the protection and restoration of all suites of biota that exist in the immediate and near areas. Although not dominated by riparian corridors, the proposed properties do include areas with significant hydrologic connections to streams. Given the high infiltration rates known in stream beds in this area, restoration and preservation of the riparian corridors will accompany the resource management efforts. The goals for management of this area include restoring the resilience of the herbaceous ground flora, which includes an uncommon association of herbaceous plants and overstory species restricted to igneous bedrock communities in the Ozarks. Across the woodland matrix of the project area, signature plants such as wild crocus, American ipecac, and low bush blueberry exist under a canopy of white oak, shortleaf pine, and black hickory with scattered black gum in the understory. This association is common in igneous woodlands and glades, but high quality examples such as the project area do not exist on a widespread landscape in the Missouri Ozarks.

The purchased tracts will be managed as native landscapes with no development with the exception of potential hiking trails to allow the state park’s many visitors an opportunity to experience this primeval landscape. Vegetation surveys and faunal population research will be ongoing in these areas to better document occurrence, sustainability and to identify rare, threatened, or endangered species that may exist and demand further attention from threats such as feral hog invasion.

The management and long-term stewardship goals for this property include, but are not limited to:

- Allowing for the long-term sustainability and resiliency of glade-woodland complexes and watershed protection of Claybaugh and Big Creek as well as the Imboden Fork of the Black River through active management including prescribed fire and thinning of invasive Eastern red cedar.
- Monitoring and research to identify elements of conservative biota and track response to active management activities.
- Feral hog eradication projects are ongoing throughout the St. Francois Mountains and similar projects to remove this invasive and highly destructive threat will be implemented on the project area to protect the viability of native ecosystems especially the glades and riparian areas.
- Assess and survey all tracts for eligibility as wild or natural areas within Missouri’s State Parks System.
Long-Term Monitoring and Management:
The proposed properties will be owned by the State of Missouri and operated by the MDNR’s Division of State Parks. The intention is to add these properties to the adjacent existing parks and protect and enhance of the natural communities found on the sites. Missouri State Parks will include the acquisitions in the Ecological Stewardship Management Plan (ESMP) for each park that outlines restoration activities, timelines, metrics for determining successful preservation and restoration efforts and monitoring protocols. The Natural Resource Management Section in Missouri State Parks possesses long-tenured institutional knowledge and expertise regarding restoration efforts in the Ozark Highlands. This management and monitoring framework will protect the properties in perpetuity in a manner consistent with and supportive of the goals of NRDAR.

II. Proposed Budget:
The proposed budget includes costs related to the acquisition of the tracts and restoration costs. The state’s Environmental Improvement and Energy Resources Authority will act as the buying agent for the state. Their costs are included below.

<table>
<thead>
<tr>
<th>Land Purchase Price</th>
<th>Taum Sauk Properties</th>
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<tbody>
<tr>
<td></td>
<td>Shaul Property (61 ac) $55,000</td>
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<tr>
<td></td>
<td>Hinds Property (106 ac) $99,355.92</td>
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<tr>
<td></td>
<td>Flowers Property (177 ac) $141,600</td>
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<tr>
<td></td>
<td>Stephenson Property (123 ac) $96,000</td>
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<tr>
<td></td>
<td>Brawley 4 &amp; 5 (240 ac) $298,574</td>
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| Johnson’s Shut-Ins Properties (155 ac) | $192,829 |

<table>
<thead>
<tr>
<th>Land Transaction Fees</th>
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<tbody>
<tr>
<td>Closing and EIERA costs</td>
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<tr>
<td>Land survey and boundary marking</td>
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<tr>
<th>Restoration Implementation Salary</th>
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<tbody>
<tr>
<td>Prescribed burn equipment and supplies</td>
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<tr>
<td>Contract Work--AmeriCorps</td>
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<tr>
<td>Feral Hog control</td>
</tr>
</tbody>
</table>

| TOTAL | $1,170,358.92 |
MDNR is actively negotiating acquisition of these tracts. If agreement cannot be reached with the owners, MDNR will substitute other properties in the general vicinity containing similar resources and restoration needs.