

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

Prier Tract

***Taum Sauk Mountain State Park
Iron County, Missouri***

Submitted by the Missouri Department of Natural Resources

Revised April 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 (collectively “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, the Trustees successfully resolved a claim for natural resource damages against the American Smelting and Refining Company (ASARCO) resulting in the recovery of over \$8 million for the Viburnum Trend portion of the SEMOLMD. Pursuant to CERCLA, the Trustees developed the Southeast Missouri Ozarks Regional Restoration Plan (SEMORRP) 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-semorrrp.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 the Prier property (198 acres) using NRDAR funds recovered from ASARCO as means to acquire the equivalent of natural resources and their services lost as a result of releases of hazardous substances at the

Glover Smelter Site. MDNR proposes holding title to the property pursuant to its statutory authority to accept and acquire lands; §253.040RSMO. If approved by the Trustees, the purchase and restoration would be funded by funds received from the ASARCO settlement.

MDNR's ownership of surrounding lands, as well as the importance of current ecological character of this property, supports this acquisition. Its management goals and objectives for this property are fully supportive of the goals of NRDAR providing a compelling case for acquisition.

Natural History Assessment

Based on several site visits and GIS data

General Description:

The 198-acre Prier property (See Figure 1) is a partial inholding, but mostly adjacent to the boundary of Taum Sauk Mountain State Park (5,348 Acres) and within seven miles of Johnson's Shut-Ins State Park. The property is primarily wooded with pockets of igneous glades. The property also hosts a few small open pasture regions in addition to a small Ozark stream.

The property is primarily underlain with igneous bedrock which is similar to the majority of the region surrounding the property. The soils derived from these rocks are generally heavy clay soils with a stronger acidity relative to those derived of sedimentary material. A small stream bisects the southeast portion of the property, originating on Taum Sauk Mountain in Taum Sauk Mountain State Park and flowing through Wallace Hollow before emptying into the larger Stouts Creek to the north. The creek is of good quality and has maintained its riparian corridor. A few small springs and seep features are also encountered in an open pasture on the southeast portion of the property.

Quality and Character:

The property is a contrast of ecological functioning, ranging from zones that are recovering from extensive logging over a decade ago, and which would benefit from more intensive restoration activities, to zones that exhibit very high quality igneous glades and dry-igneous woodland natural communities.

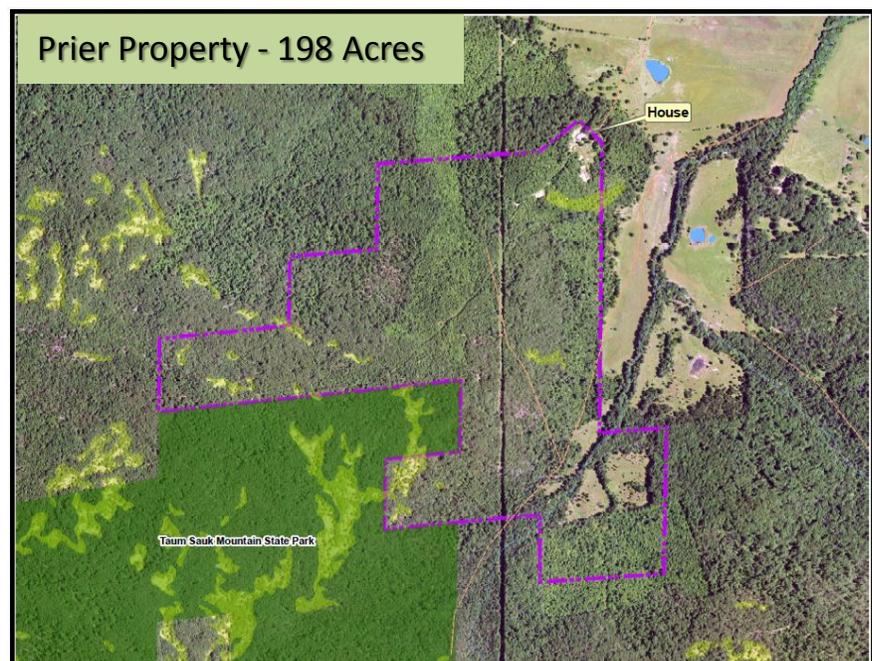


Figure 2: Aerial View of Proposed Acquisition (In Purple Outline.)

The portions of the property that were logged have left many of the trees to re-sprout with dense stands of 2-5" diameter trees. Logging slash is minimal and has been removed or broken down through decay over the years. The soil integrity in the logged zones is acceptable showing minimal signs of damage from skidding activities. The areas that have been logged show great potential for restoration and recovery given the planned application of stewardship activities such as ecological thinning and prescribed fire. Additionally the logging has produced abundant shortleaf pine regeneration which could be managed carefully to restore the historic shortleaf pine component of the woodlands.

The igneous glades and woodlands that escaped logging are of spectacular quality (See Photo 1). All but one of the glades host a rich mosaic of prairie-affinity flora and show potential for hosting the federally threatened Mead's milkweed. The dry igneous woodlands that escaped logging host a component of shortleaf pine and typical woodland understory species such as lowbush blueberry, dittany, and little bluestem.



Photo 1: High quality igneous glade band on the property. This glade band extends on to Taum Sauk Mountain State Park. The glade may host the federally threatened Mead's milkweed. The ridge in the background contains the road leading to the entrance of the high point of Taum Sauk Mountain State Park.

Conservation Value/Restoration of Ecological Resources: The property has a high potential for restoration given the high quality of the igneous glades and woodlands that were not logged. The areas that have been logged show great potential for restoration given that these zones are minimally damaged and are anticipated to respond rapidly to restoration efforts.

With appropriate management and restoration efforts, the communities that include dry igneous woodlands, dry-mesic igneous woodlands, and igneous glades are anticipated to host a variety of flora including little bluestem, and poverty oats grass as well as tree species such as white oak and some shortleaf pine.

The glade band on the western portion of the property, 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.

Over 70 species of woodland birds have been documented within the adjacent Taum Sauk Mountain State Park, where igneous glades together with the woodlands provide a diversity of habitats for lichens, forbs, grasses and trees with little encroachment of exotic species. These kinds of resources extend onto the Prier tract. Purchase of this property would provide access from the north into this portion of the park, enabling restoration for glades on this property as well as the larger bands on state park property. In addition to glade restoration, this access point would provide opportunity for Mead's milkweed surveys, woodland restoration, and feral hog eradication. Located on the north slope of Taum Sauk Mountain (Missouri's highest point), this property will provide protection of the viewsheds from the scenic overlook located upslope within the park.

The property is contiguous to the 6,900-acre St. Francois Mountains Natural Area, which spans portions of Taum Sauk Mountain State Park and Ketcherside Conservation Area. Missouri Natural Areas are designated by a state and federal interagency committee to represent and preserve a selection of the best remaining examples of Missouri's native biologic communities and geologic sites. The glades and un-logged portions of the igneous woodlands on the Prier Property are of the same type and quality as those same community types which are principle features of the St. Francois Mountain Natural Area. With restoration to the logged portions, these areas could become additions to the Natural Area.

Missouri's Comprehensive Wildlife Strategy identified Conservation Opportunity Areas (COA's) across the state. Through a collaborative process the Missouri Conservation Department established these as the best places to concentrate group effort for conserving native wildlife and their habitats. The St. Francois Knobs COA is one such area, and the Prier Tract lies within its geography. Igneous glades, forests, woodlands, fens and creeks are the primary COA habitat features. Conservation strategies include restoring natural processes and habitats by promoting prescribed fire and timber stand thinning, converting non-native grasslands to restored natural communities, and improving water quality and aquatic habitats. With a good



Photo 2: Blue-winged Warbler

provide habitat for Blue-winged (*Photo 2*) and Prairie Warblers. Some opportunity for riparian birds exists along the Stout's Creek tributary through the tract. Cerulean warblers are common along the Black River and in Taum Sauk Mountain State Park, and likely are found on the Prier Tract.

Benefit to federal/state listed species;

Missouri Species of Concern: No intense surveys of the site have been conducted for rare or threatened species such as federally endangered Indiana bats or threatened Mead's milkweed. The igneous glades on the site likely harbor the federally threatened Mead's milkweed (*Photo 3*), a perennial forb that is documented from other glades on Taum Sauk Mountain. Acquisition of this property by MDNR would serve to inventory, restore, preserve, promote and monitor native flora and fauna loyal to high quality igneous communities on the site. In the mid-1990s, an element of occurrence record for an Eastern collared lizard on an adjacent igneous glade was submitted to the Natural Heritage Database; Eastern collared lizards are listed as a Species of Conservation Concern in Missouri due to degradation of glade-woodland complexes in the Ozarks.

quality stream, non-native pasture, regenerating timber and a large expanse of natural area quality glade and woodland, the Prier Tract offers good opportunity towards meeting conservation goals within this COA.

The Prier Tract also falls within the geography of Audubon's Black River Watershed Important Bird Area. Its woodlands provide suitable nesting habitat for forest-interior songbirds, possibly facilitating source populations. Forest birds in the IBA include Acadian Flycatcher, Ovenbird and Worm-eating Warbler. Its glade and shrubby areas



Photo 3: Mead's Milkweed (*Asclepias meadii*)

Given the intact nature of the site and high restoration potential of the pine woodlands, active management including prescribed fire and selective thinning will support biodiversity and enhance floral and faunal populations that may be suppressed by the lack of regularly occurring fires that were once common in the Ozarks. Elements of native diversity including long-lived perennial forbs, native shortleaf pine stands, and a rich suite of woodland birds including Wild Turkey and Red-headed Woodpeckers exist on the site and will be enhanced through the reintroduction of natural disturbance factors. The property will be included in an ecosystem-based restoration program to promote biodiversity across all facets of the existing natural communities and to restore integrity to areas that have been degraded by logging practices. Stouts Creek and Taum Sauk Mountain are in the upper watershed of the St. Francis River where 23 fish species of conservation concern have been documented, with six state endangered. Forty-eight mussel species have been recorded from the upper reaches of the St. Francis River and an endemic crayfish, known as the St. Francis Crayfish, is a species of conservation concern in Missouri.

In Missouri, conservation efforts continue for the restoration of pine-bluestem woodlands in the Ozarks throughout the historic range of shortleaf pine, Missouri's only pine species. Taum Sauk Mountain is well within that range, and in the historic range of the federally endangered Red-cockaded Woodpecker. While the Red-cockaded Woodpecker is extirpated from Missouri due to lack of pine woodland habitat, nearby populations in Arkansas and a record occurrence in the Chicago region provide evidence that these birds, if given an opportunity to breed in Missouri, may do so with continued pine restoration efforts. Shortleaf pine regeneration is presently occurring on the property in the area treated with logging exercises; continued disturbance with fire will support and promote this rare ecosystem that not only supports Red-



cockaded Woodpeckers, but Brown-headed Nuthatches and a diverse understory common to native pine woodlands in the Ozarks and Ouachita Mountains of Arkansas. The Mark Twain National Forest (USFS) is in the process of using grant dollars to restore landscape scale pine-bluestem habitat in the species' range. The pine woodland habitat at Taum Sauk Mountain, combined with the pine woodlands on other igneous knobs in the state park and other public lands in the area, may prove sufficient for the establishment of breeding populations of the Red-cockaded Woodpecker (*Photo 4*).

Photo 4: Red-cockaded Woodpecker

Benefit to Migratory Birds: Much research has been conducted throughout the eastern deciduous forest biome assessing the value of early successional habitat created by logging practices to breeding Neotropical migratory birds. Kentucky Warblers, Worm-eating Warblers, Ovenbirds, and Wood Thrush, in particular, are associated with intact forest canopies, but have

been documented as using shrub lands, such as those found in clear-cuts, for foraging areas. In 2009, a catastrophic wind event created impacts to the canopy of this area that resembled extensive logging. In 2011, research conducted at Taum Sauk Mountain and the adjacent Johnson's Shut-Ins State Parks indicated that areas with a distinct shrub layer, mantled in an intact canopy, provides for more breeding birds than a homogeneous landscape. Diversity in woodland structure on the property, resulting from past logging exercise, supports a variety of birds like Prairie Warbler and Kentucky Warbler, both having been identified as species of concern (Yellow Watch List) by the North American Bird Conservation Initiative's *The State of the Birds 2014 Report* (North American Bird Conservation Initiative, US Committee. 2014. *The State of the Birds 2014 Report*. US Department of the Interior, Washington DC). During the 2011 breeding bird study on state park property, similar habitat as that of the Prier property, researchers documented successful nests of 22 species utilizing this habitat. They include Red-eyed Vireo, Great-crested Flycatcher (*photo 5*), and Worm-eating Warbler, all of which have been identified by the Central Hardwoods Joint Venture and Partners in Flight as migratory birds of conservation concern. This property and its heterogeneity of landscape types will surely support breeding birds that depend on an intact canopy with a distinct structure and herbaceous layer that hosts insects of all suites necessary for fledgling success.



Photo 5: Great-crested Flycatcher

Context for purchase: Purchase of the 198 acre Prier tract, an inholding of Taum Sauk Mountain State Park, which averages 90,000 visitors per year who come to hike the trail system (including the Ozark Trail) and to take advantage of the walk-in campsites and special use areas will allow incorporation of the property within the greater natural resource stewardship of Taum Sauk Mountain State Park and the St. Francois Mountains Natural Area. Taum Sauk Mountain State Park, Johnson's Shut-Ins State Park, Ketcherside Conservation Area, and the St. Francois Mountains Natural Area (which incorporates portions of Taum Sauk Mountain State Park and Ketcherside Mountain Conservation Area) are all near or adjacent to the property. Purchase of the property would protect it in perpetuity from development and associated impacts as well as support connectivity and existing management of adjacent state owned lands.

Photo 6: Trail of Taum Sauk; the viewshed could be impacted by development.



The property borders the greater Taum Sauk Mountain State Park complex as a partial inholding, but more so would be expansion of the park boundary. The property and the park lie in a region that experiences a high flow of tourists frequenting the park, Johnson's Shut-Ins and the local Conservation Areas. Taum Sauk Mountain State Park is a short 30 minute drive from Farmington, MO and 10 minutes from Ironton, MO. The population of Iron County is approximately 11,000.

Most of the visitation to Taum Sauk Mountain and Johnson's Shut-Ins come 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.

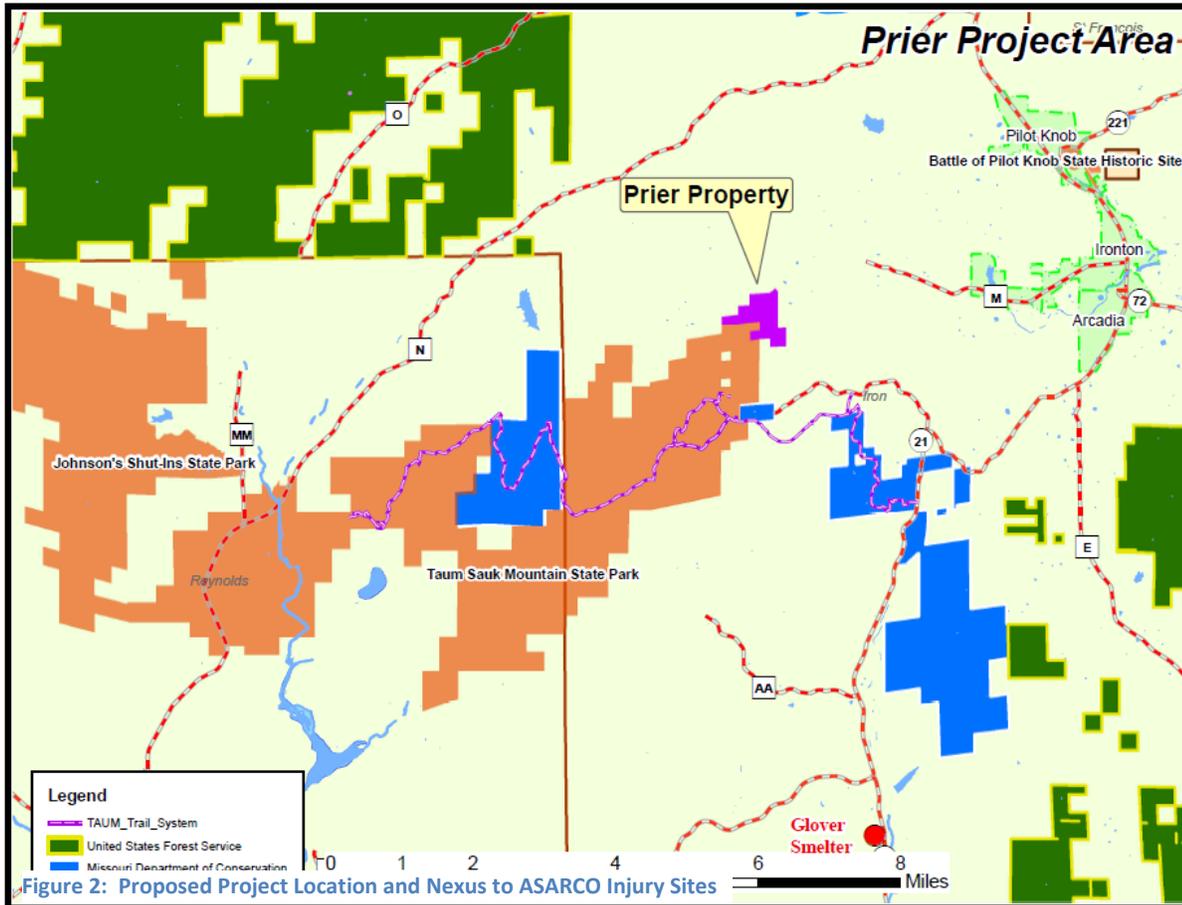
Project Benefits

Acquisition of the Prier tract will enhance the Missouri State Park systems' mission to preserve and interpret the state's most outstanding natural landscapes and cultural landmarks, and to provide outstanding recreational opportunities compatible with those resources. The Prier tract presents a unique opportunity to secure land for conservation and provide the opportunity for landscape-scale restoration efforts that would benefit all wildlife and natural communities. The acquisition of the Prier Tract provides permanent preservation of high quality natural resources, both present and future. Through planned restoration efforts, the purchase also provides the opportunity to increase the quality of natural resource services provided by the property, which are threatened by development, and also ensures those resources are secured for the benefit of the public. State park's stewardship of the purchased lands ensures 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 tract is located roughly 8 miles from the Glover Smelter natural resource injury site. Its proximity provides a conservation and restoration opportunity with a direct nexus to this former ASARCO site where releases of hazardous substances resulted in natural resource injuries. Through exposure, releases of toxic heavy metals from ASARCO's mining and milling operations have caused direct biological injury to terrestrial and aquatic life. Indirect biological injury has also occurred through the contamination of the aquatic and terrestrial habitats on which natural resources rely. Additional information regarding natural resource injuries from ASARCO mining activities may be found at: <http://dnr.mo.gov/env/hwp/sfund/nrda.htm>. The close proximity of the tract to the site of the injury provides direct compensation to the public for those lost resources (*See Figure 2*).

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 Mountain. Numerous small tracts on Taum Sauk Mountain have been sold for housing lots, and the Prier Tract, with its valley setting and road access, is vulnerable. This tract would be managed consistent with the surrounding tracts 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 by state and federal governments. The land adjoining public lands has continued to be developed along roads with housing that is affecting the resource and is fragmenting habitat. This property 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 tract would remain undeveloped and would be maintained as the native ecosystem with the exception of a potential trail for recreation and the public's enjoyment.

Project Goals and Objectives:

The primary goal of the project is the ecosystem restoration and long-term protection of a high quality native landscape that supports the health and vitality of the St. Francis River watershed. In its wooded condition, the property provides ample grounds for suites of biota including rare plants and animals such as Mead's milkweed and the Eastern collared lizard. The intact canopy and development of a pine component, once suppressed by the lack of disturbance factors, will allow for a larger tract of land for breeding migratory birds that inhabit similar neighboring landscapes. Eighteen species of warblers are known from Taum Sauk Mountain State Park including Pine Warbler and the park's most common bird, Red-eyed Vireo. It has been suggested by breeding bird surveys that the St. Francois Mountains provide a source population of the Red-eyed Vireo, likely due to the contiguity of high quality ecosystems across such a large gradient.

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

- Cedar removal plus regularly occurring prescribed fire on the site's igneous glades
- Identification and maintenance of the existing high quality natural communities (through prescribed fire)
- Implementation of a prescribed fire program with rigorous monitoring of fire effects on the landscape and impacts to floral and faunal populations
- Support shortleaf pine regeneration in the previously logged areas as part of a larger pine-bluestem ecosystem restoration effort in the Missouri Ozarks
- Protect plants and animals of conservation concern or endangered species, especially the federally threatened Meads Milkweed, if found on the property
- Implement a non-native invasive species management program focusing initially on the feral hog population which is established on Taum Sauk Mountain
- Establish monitoring transects to track restoration efforts on glade and woodland flora; regularly monitor rare and endangered species
- Seek nomination amendment to include the property in the St. Francois Mountains Natural Area within Missouri's Natural Area System to provide an additional administrative level of protection against ecosystem degradation and development

Long-Term Management:

The Prier Tract will be owned by the State of Missouri and operated by the Missouri Department of Natural Resources' Division of State Parks. The intention is to add this area to the St. Francois Mountains Natural Area so that its management will stress the protection and enhancement of the natural communities found on the site. The property will be managed and

restored according to the natural resource management plan for the park. This management framework will protect the property in perpetuity in a manner consistent with and supportive of the goals of NRDAR (See Figures 3-5).

The Environmental Improvement and Energy Resources Authority will act as the buying agent for the state; their costs and fees are included above.

Costs Description	Unit Cost	Amount	Total
Land purchase price (estimated)	\$1020.20 per acre	198 acres	\$202,000
Title work			
Closing fees and EIERA costs & Tax Escrow			\$3,328.51
Natural Resource Restoration and Management*			
Feral hog control: Traps and bait			\$80,521.49
Prescribed burn management: labor for fire line construction and burn implementation	\$80 per crew member per day;	4 crew members for a 2-week work period, for first three burn years	\$7680
Prescribed burn management: supplies and equipment			\$4,000
Seasonal Natural Resource Labor: A 1000-hr seasonal labor position to help construct fire lines, conduct prescribed burns, initiate woodland restoration, control exotic plants and trap feral hogs	\$10,000 per year, at 1000 hrs.	One year	\$10,000
*Restoration and Management Total:			\$102,201.49
Total Project Cost			\$307,530

The Division of State Parks supports recreational use of state park properties; however, this is not inconsistent with NRDAR requirements. The Prier tract would not see significant development. A few trails, based on existing wildlife trails and best management practices, could be created to support a low level of foot traffic. Over 95% of the property is anticipated to be left undeveloped, supporting the natural resource communities present and those that will be restored. This provides a strong framework for restoration and adherence to the NRDAR goals as included in the SEMORRP.

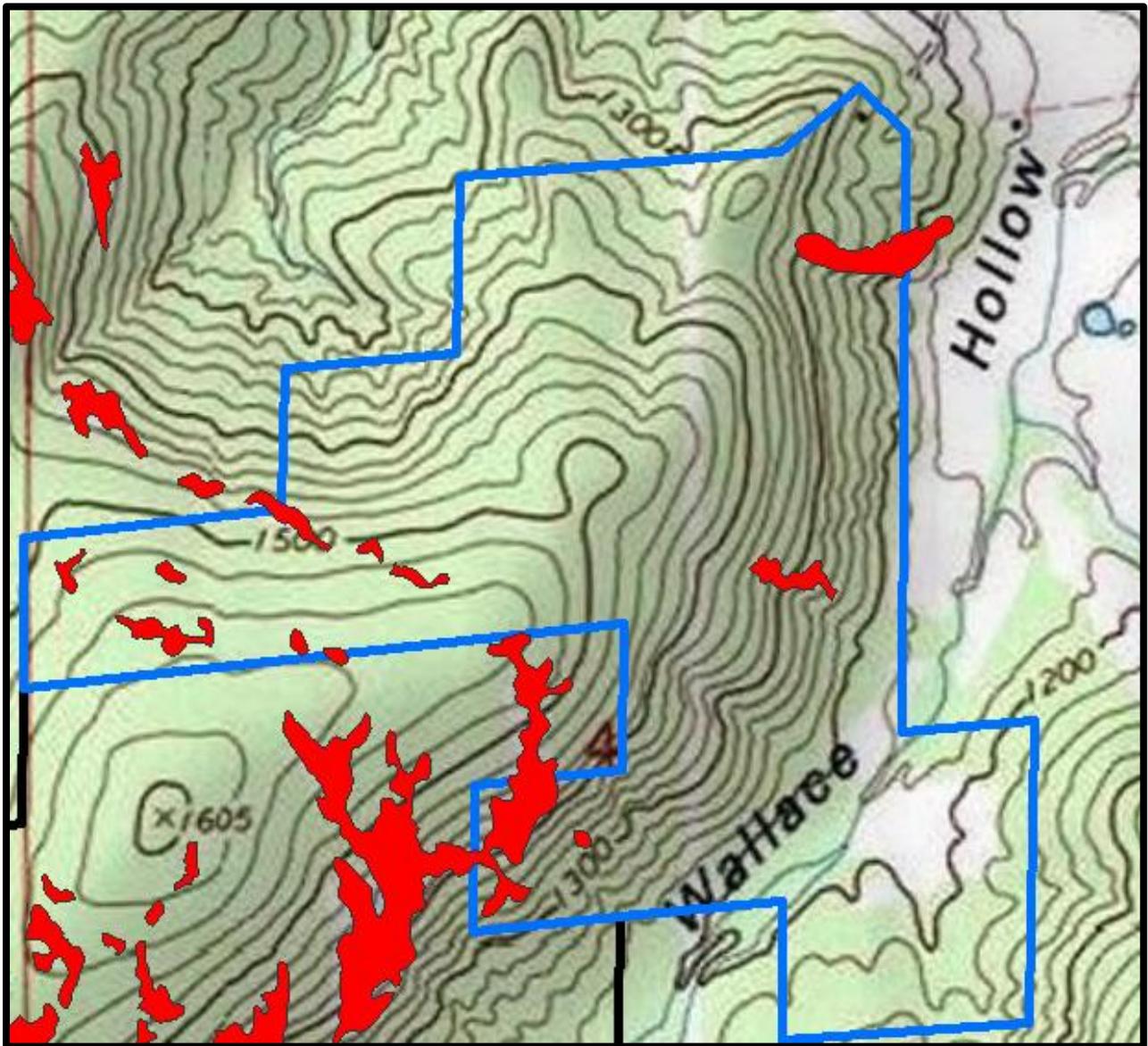


Figure 3: Extent of mapped igneous glades on the property. Note Taum Sauk Mountain State park to the southwest sharing a glade complex with the property.

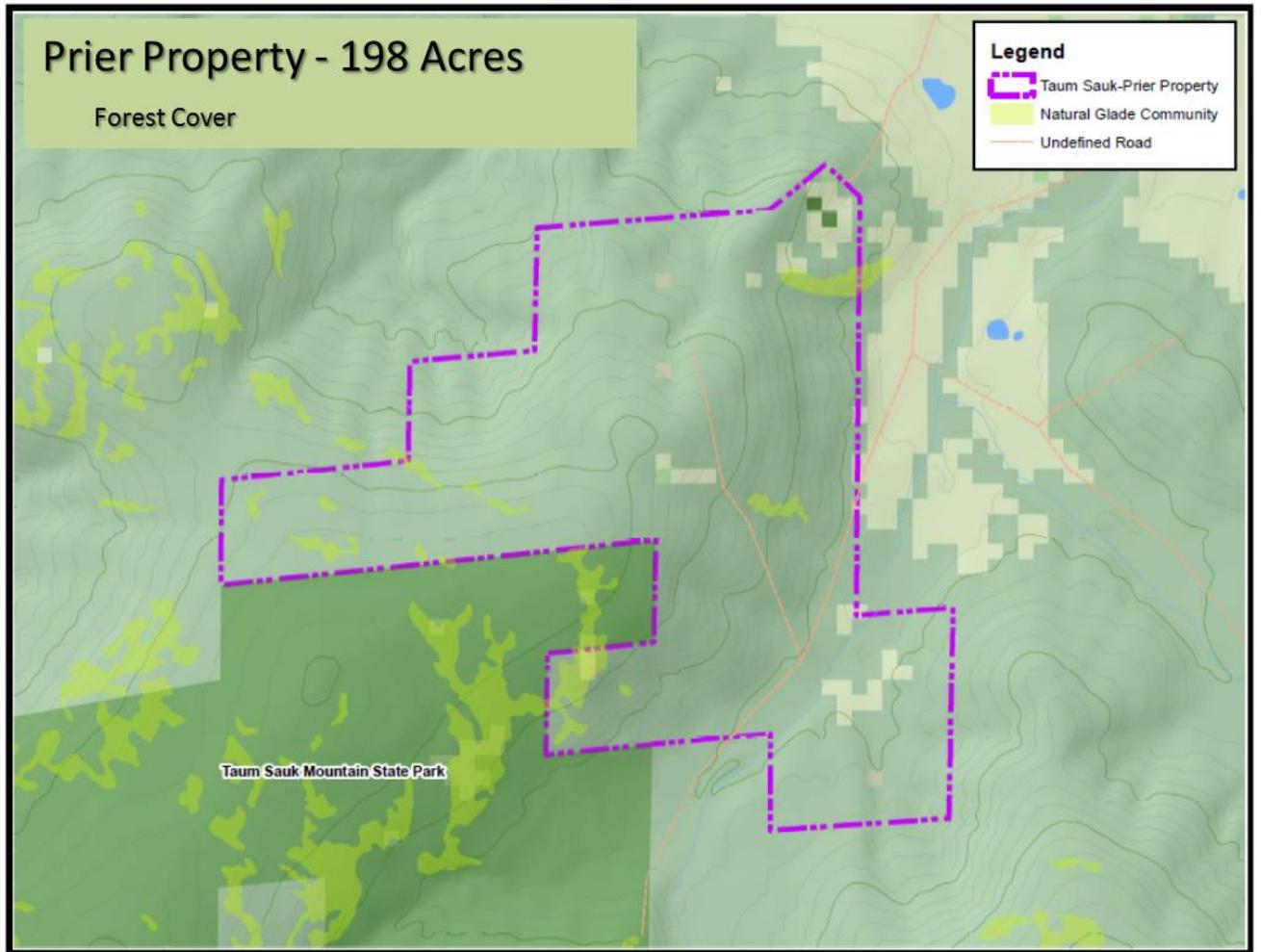


Figure 4: The Prier property is located near the St. Francois Mountain Natural Area at the northeast corner of the park. The property contains heavy forest cover (as shown above) and considerable elevation change. Development here could severely impact the true “wild” feel of the area and the scenic vistas that are observed from local trails.

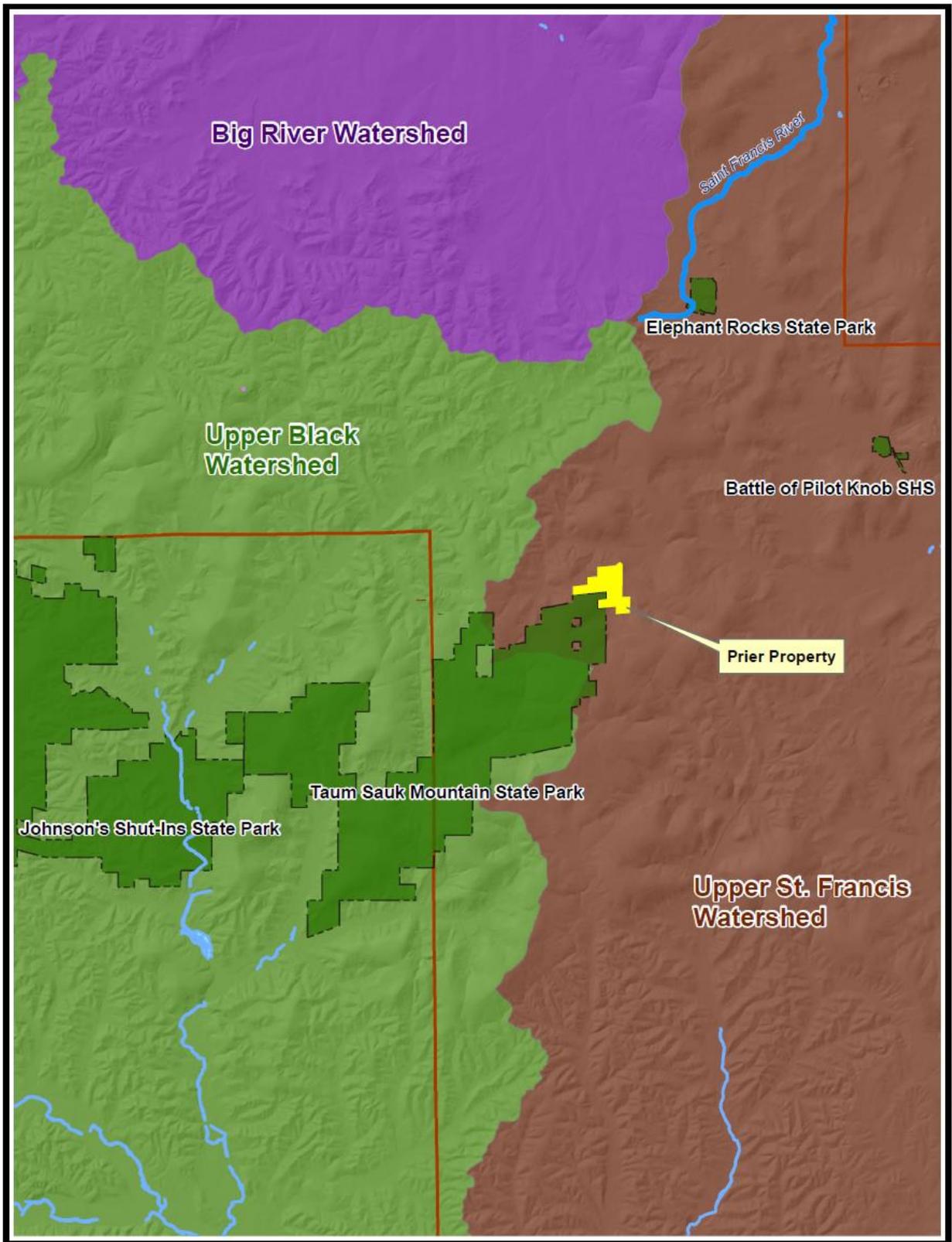


Figure 5: Association of Prier Tract with Major Watershed Boundaries