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

Onondaga Cave State Park:
Horvat Tract

Crawford County, 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 (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-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 40 acre parcel using NRDAR funds as means to acquire the equivalent of natural resources and their services lost as a result of releases of hazardous substances from ASARCO’s facilities associated with the Big River Mine Tailings site. MDNR proposes holding title to the property pursuant to its statutory authority to accept and acquire lands; §253.040 RSMO. If approved by the Trustees, the purchase and restoration would be funded by funds received from the settlement.

MDNR’s ownership of surrounding lands and the presence of other public lands in close proximity, as well as the importance of current ecological character of this property, supports this acquisition. MDNR’s management goals and objectives for this property are fully supportive of the goals of NRDAR. Additionally, a logging contract exists for the property and will be exercised if this acquisition does not occur. MDNR seeks NRDAR funding for the three primary components of this project:

1) Purchase of the logging contract;
2) Purchase of the property; and
3) Restoration implementation.

**Natural History Assessment**

**General Description:** The 40 acre Horvat tract is situated along the northern boundary of Onondaga Cave State Park, a 1,317 acre state park containing one of Missouri’s most visited cave complex (Figure 1).

The property is surrounded on the west, east and south by the park. In addition to providing viewshed protection and general buffering for the park, the presence of sinkholes on this tract as well as its proximity to the Meramec River make this a priority acquisition. Additionally, the state park is connected along its southern boundary to the over 6,000 acre Huzzah Conservation Area which is itself adjacent to Forest Service lands (Figures 2 & 3). Acquisition would further expand the connected landmass of publicly-held lands, enhancing the overall resource benefits.
Quality and Character: The parcel itself, although relatively small in size, harbors a rich mix of natural communities including forest communities, mesic dolomite woodlands, dry/mesic dolomite woodlands, dry chert woodlands and bands of dolomite glade. The forested aspect
of the parcel contains mature post oak, white oak, red oak and other common Ozark woodland hardwood species. Ground flora includes a variety of legumes and other common woodland forbs that would likely respond well with management such as prescribed fire.

**Conservation Value/Restoration of Ecological Resources:** The primary goals of the property purchase are to protect Onondaga Cave State Park’s cave/karst resources, protect the integrity of the Meramec River and protect the terrestrial natural communities on site.

The tract is situated just north of the primary cave entrance and observed to harbor several sinkhole features that likely feed directly to the Onondaga Cave complex below. If logging were allowed to proceed here it may negatively affect the cave fauna through input of sediment and other pollutants.

**Benefit to federal/state listed species; Missouri Species of Concern:**

**Bats:** Onondaga Cave State Park and the greater Onondaga Cave complex has numerous records of the federally endangered Indiana Bat and Gray Bat in addition to the federally threatened Northern Long Eared Bat. Beginning in 2013, bat populations in the cave and the region have seen a dramatic decline following infection from White Nose Syndrome (WNS), a disease caused by an exotic fungal agent. The chart below indicates the precipitous decline in bat counts for a variety of species including the federally endangered Indiana Bat and Gray bat, the federally threatened Northern Long Eared Bat in addition to other species.

Acquisition of the tract would provide additional buffer from the standpoint of hydrologic inputs to the cave system. As mentioned previously additional siltation and other contaminants from logging activities and future development could further stress bats recovering from the WNS outbreak.

Additionally logging could directly impact potential roost tree habitat. Indiana bats, northern long eared bats, red bats and little brown bats have all been documented utilizing trees as maternity roosts and bachelor colonies.

![Figure 1 – The chart above indicates the mass die-offs of various bat species from WNS – based on five years of winter bat counts in Onondaga Cave.](image-url)
Park staff and volunteers assist with winter bat surveys in Onondaga Cave.

Little Brown bats displaying signs of White Nose Syndrome (WNS).

Among the Yellow Watch List species for the Continental U.S. from the 2014 report, seven are documented breeding birds in the Meramec River Watershed’s woodland and forest natural communities. These include: American Woodcock, Eastern Whip-poor-will, Red-headed Woodpecker, Prairie Warbler, Kentucky Warbler, Cerulean Warbler, Wood Thrush and Chuck Will’s-widow. The logging of this property, which will occur if not acquired by MDNR, will 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 >100 meters from a forest edge), meaning that even relatively large tracts with small interior to edge ratios may be unattractive to some species (Temple 1986).

The Meramec River Valley and the other streams feeding into it harbor an abundance of records for the Cerulean Warbler, a state listed species of Conservation Concern. Cerulean warblers prefer high quality forested corridors along high quality stream communities for breeding and foraging.

**Mussels:** The Meramec River, with its limestone and dolomite rich bedrock, host some of the greatest diversity in terms of freshwater mussels in the state. In particular the federally endangered mussels scaleshell (*Leptodea leptodon*), Sheepnose (*Plethobasus cyphyus*), Spectaclecase (*Cumberlandia monodonata*) all are recorded for the Meramec River in Crawford County – in close proximity to Onondaga Cave State Park.
Mussel species are highly susceptible to water impairment – chief among them sedimentation due to grazing, development or logging activities. The Meramec River Conservation Action Plan lists excessive sedimentation as one of the biggest threats to the Meramec River. See http://www.nature.org/media/missouri/meramec-river-conservation-action-plan.pdf. The federally endangered species listed above are most susceptible dropping out before other generalist species.

**Context for purchase:** The property will be added to the existing park and would protect it in perpetuity from development and associated impacts as well as support the connectivity and existing management of adjacent lands by also incorporating it into the greater natural resource stewardship of the park.

**Project Benefits:** Acquisition of the properties 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 property presents an opportunity to secure land for conservation and provide the opportunity for increasing habitat connectivity and management efforts that would benefit all wildlife and natural communities. The acquisition of the Horvat tract would provide 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 logging, 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.

**Surface water benefits:** The property occupies steep riverfront hills that directly overlook the Meramec River, with two headwater drainages traversing downslope directly through it and into the Meramec floodplain. In its current mature forest condition, the Horvat property provides direct and significant surface runoff protection for the river and its exceptional aquatic features. Because of the highly karstic nature of the underlying bedrock with numerous sinkholes and groundwater portals, the current Horvat forest also protects from the risk that increased surface water runoff would present by its potential to introduce contaminants into the groundwater that would harm the quality and resources of the area’s caves and springs. The proposed acquisition and purchase of the logging contract will prevent the planned cutting of this forest, and preclude associated soil disturbance from access and skid routes. It will also prevent post-logging development that might become a chronic nonpoint source for soil and contaminants into the Meramec River, and the groundwater resources important to its caves and springs. Management by MDNR will preserve the intact mature forest, and facilitate its development into old growth stature and character. Light prescribed surface fires will be applied periodically to nurture herbaceous plant density and diversity in its understory, that will further reduce water runoff and improve infiltration beneath the forest canopy, and improve condition and stability of its forest soils.
Threat of Logging/Development: Property in the outlying St. Louis/Rolla region is in increasing demand due to a growing population in the region. The imminent logging of the property would not only threaten the park and surrounding resources, through erosion and sedimentation, but would also open this property up for potential housing or livestock development which would make permanent the environmental threat to the park and natural communities.

If added to the park, the property would remain undeveloped and would be maintained as the native ecosystem.

Project Goals and Objectives:

The fundamental goal of this project is the ecosystem restoration and long-term protection of Onondaga Cave State Park and its associated forest, woodland, glade and cave/karst natural communities.

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

- Restoring the property’s terrestrial natural communities through active management including prescribed fire and thinning of invasive Eastern red cedar.
- Protecting the cave/karst communities, by identifying and protecting sinkhole features and other conduits to the cave system.
- Managing the natural resources in a way that protects and enhances the features of the property that benefit terrestrial and aquatic endangered species, either directly or indirectly.

Long-Term Monitoring and Management: The Horvat tract will be owned by the State of Missouri and operated by MDNR’s Division of State Parks. The property will be managed according to the natural resource management goals and objectives with the protection of biodiversity across all suites of biota as the primary driver. This management framework will protect the property in perpetuity in a manner consistent with and supportive of the goals of NRDAR.

As part of the state parks system, Missouri State Parks will include the acquired parcel within the Ecological Stewardship Management Plan (ESMP) that will outline 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.
Proposed Budget:
The proposed budget includes costs related to purchasing the logging contract, acquiring the property and implementing glade and woodland restoration. The Environmental Improvement and Energy Resources Authority will act as the buying agent for the state; their costs are included below.

<table>
<thead>
<tr>
<th><strong>Land Purchase Price</strong></th>
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<tr>
<td>Horvat Property - Land purchase price</td>
<td>$40,000</td>
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<tr>
<td>Horvat Property – Appraised timber value price</td>
<td>$57,730</td>
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<th><strong>Land Transaction Fees</strong></th>
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<td>Closing Fees (estimated)</td>
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<th><strong>Land Surveying and Boundary Marking</strong></th>
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<th><strong>Restoration Implementation</strong></th>
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<td>Stewardship Equipment</td>
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<tr>
<td>AmeriCorps Labor – Glade/Woodland Restoration</td>
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| **TOTAL** | **$115,130** |

Dry/Mesic Dolomite Woodland
Dry woodland with restoration potential

Timber of this size will most likely be logged if the property is not acquired.
Onondaga Cave is the most visited cave in the state park system.