Vegetation Resources Working Paper
Broken Wheel Ranger Recreation Special Use Permit
Mississippi Bluffs Ranger District
Shawnee National Forest

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Non-native Invasive Plant Species

Non-native invasive plant species (NNIS) are recorded from in and around the project area. Floristic surveys of system trails in the proposed project area detected the presence of various species of NNIS. NNIS vary in rate of invasion and spread. Humans and animals are very effective at facilitating their spread. Trail impacts include the introduction of exotic species (Marion 1994). Benninger-Truax et al. (1992) indicate that the number of exotic species is higher along trail corridors than in the forest interior. Benninger (1989) cites several studies as well as her own research that indicates trail corridors are important in the distribution of exotic species.

Trails may provide access for NNIS, such as garlic mustard, into the forest interior. Horse manure collected along local trails contained viable seed (Campbell 1996). Horse can carry NNIS seeds off of a trail and spread NNIS to other areas. Trail problems attributed to horse use include exotic NNIS seed-containing manure although NNIS seeds may also be introduced from horse feed, equipment and mud stuck to horses hooves (Marion 1994). Deer dung can contribute to the spread of NNIS; however, Campbell (1996) found that many exotic species were found germinating in horse dung samples but were rare in the deer dung in southern Illinois. Seed carried on human clothing and footwear are also known as vectors for the spreading of NNIS. Equipment and vehicles may also potentially spread NNIS from one site to another. NNIS seed can also be easily spread by wind, water and other animals.

For consideration of the effects of trail use on the Mississippi Bluffs Ranger District and in southern Illinois, floristic surveys in the project area have indicated that Japanese stiltgrass (*Microstegium vimineum*) and garlic mustard (*Allaria petiolata*) are aggressive NNIS associated with trail development and use. Both of these exotic species are shade-tolerant herbs that threaten the integrity of native communities. They can form dense stands that reduce native diversity and can potentially eliminate desirable native species. Both of the above NNIS as well as autumn olive were identified on the trail system proposed for use as part of the Broken Wheel Ranch O&G permit.

NNIS species already exist on most of the non-system and system trails on the Forest. Without implementation of weed prevention practices (see below under effects on natural areas) and integrated pest management at existing NNIS locations, trails offer opportunities to spread NNIS in the project area.

Natural Areas

There are three natural areas adjacent to the proposed permitted trails for the Broken Wheel Ranch Outfitter and Guide (O & G) proposed permit. These are Clear Springs Geological Area, Hutchison Zoological Area, and LaRue/Pine Hills Ecological Area and Research Natural Area. Existing designated trails proposed for use as part of the O & G permit do not go through any of the three areas. They do border all three areas. Two non-system trails (user developed) go through Clear Springs geological area and are connected to the proposed

permitted trails. There is evidence of past horse traffic/equestrian use on these non-system trails in this natural area. Proper maintenance of the existing trail adjacent to the Clear Springs Natural Area should eliminate trail use in the natural area and the associated trail use and maintenance impacts.

There is evidence of non-native invasive plant species along a few small sections of the proposed permitted trails. NNIS plants on the trails include garlic mustard on the Godwin Trail, and autumn olive and Japanese stilt grass on the northernmost trail in the Clear Springs Wilderness. Autumn olive should not increase with increased trail use and maintenance. However, increased trail use can allow the other two species of NNIS to increase along the trail and in adjacent natural areas. Seed of both garlic mustard and Japanese stilt grass can be spread in horse dung, animal hooves including horses, human clothing and human boots/footwear. Seeds of both species are also spread by wind, water and other animals. Both of these species are shade tolerant herbaceous species that can threaten the integrity of native communities.

The reduction of native plant diversity indirectly associated with the increased chances of the spread of NNIS into the three adjacent natural areas is the proposed, indirect negative effects of planned actions on natural areas.

The following mitigation measures can reduce the chances and volume of NNIS spread into adjacent natural areas:

- To increase awareness, public education and participation in NNIS prevention and control, the Forest will post awareness, prevention, and control messages at the River-to-River trailhead.
- The Broken Wheel Ranch will provide clients with NNIS information pamphlets provided by the Forest.
- Encourage weed-free forage and weed-free grazing by the permittee and his clients.
- The Broken Wheel Ranch will encourage recreationists to inspect, remove and properly dispose of weed seed and plant parts found on their clothing and equipment.
- As part of the permit process the Forest will work with the Broken Wheel Ranch to annually inspect trailheads, trails, and staging areas open to the public for NNIS.
- As part of the permit process the Forest will work with the Broken Wheel Ranch to encourage NNIS treatment on privately-owned lands.

Implementation of these mitigation measures and monitoring of their implementation as well as NNIS populations in the project area should result in lessened, indirect, negative effects of the proposed action on the three adjacent natural areas.

Native Vegetation

Native vegetation in the two wildernesses would be indirectly affected by NNIS similar to natural areas above. The mitigation recommended for natural areas would be the same as recommended for native vegetation resources in the wilderness to reduce possible negative effects of the proposed action that most likely will increase with recreational trail use in both areas.