

Biological Evaluation of

Aquatic Regional Forester Sensitive Species

Cave Hill, Dennison Hollow, and Stoneface Research Natural Areas, and Simpson Township Barrens Ecological Area Vegetation Management.

Hidden Springs Ranger District, Shawnee National Forest

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I. Introduction

This Biological Evaluation analyzes the potential effects of the prescribed burning of Cave Hill, Dennison Hollow, Stoneface, Research Natural Areas, Simpson Township Barrens Ecological Area and Adjacent Forest Communities. The primary purpose of this Biological Evaluation is to document any potential significant effects on the human environment, which would require further NEPA analysis.

Formal objectives of this Biological Evaluation include:

- 1) Identify sensitive species that would be affected by the proposed project (FSM 2672.42).
- 2) Ensure that Forest Service actions do not result in the loss of viability of any native or desired non-native plant or animal species, or create significant trends toward Federal listing of any species (FSM 2672.41).
- 3) Provide a process and standard that ensures that sensitive species receive full consideration in the decision making process (FSM 2672.24b-2676.17e).
- 4) Make certain that best management practices, as per the Shawnee National Forest Land and Resource Management Plan (USDA 2006), are followed.

II. Current Management Direction

Current policy as stated in the Forest Service Manual (FSM 2672.1) includes the following: Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing. The management direction specified by the Shawnee National Forest Land and Resource Management Plan (Forest Plan; USDA 2006) is to protect and/or manage habitat to ensure the continued existence of these species on the Forest.

An analysis of the project area indicated that only one Regional Forester Sensitive Species, the Indiana crayfish (*Orconectes indianensis*) was known to occur within Saline and Johnson Counties. Upon further review, this species was not found to occur directly within the project area, nor was habitat for any of the species known to exist in the project area.

III. Description of the Proposed Project

Purpose and Need: The purpose of this action is to reduce understory component of shade tolerant tree species (maples, elms, etc.), which will result in an increase of sunlight to the barren and glade plant communities, and potentially undiscovered populations or individual plants of the shade intolerant Mead's Milkweed, a federally listed plant species. The project will also provide for plant and animal community diversity by encouraging regeneration of oak-hickory forest communities and associated herbaceous and shrub species adjacent to the barren communities.

Proposed Action: The proposed action is to prescribe burn approximately 3602 acres. The burn is divided into two areas; one burn is about 3108 acres, located in the Cave Hill, Stoneface, and Dennison Hollow Research Natural Area's vicinity and the other is about 494 acres, located in the Simpson Township Barrens Ecological Area vicinity. The proposed action also includes the cutting of trees and shrubs to release any new discoveries of Meads Milkweed plants where they occur. The proposed action will include associated fire lines as needed to contain the prescribed burn. Roads, trails, creeks, and other existing barriers will be utilized as firebreaks when possible.

Analysis of the proposed projects effects on the Indiana crayfish assumes the following Design Criteria are incorporated into project implementation. These design criteria will minimize soil disturbance and greatly reduce movement of sediment into intermittent and perennial streams.

- (1) Maintain a minimum filter strip width of 100 feet along perennial streams, 50 feet along intermittent streams and 25 feet along ephemeral streams (greater filter strip widths for intermittent and perennial streams will be needed when slope exceeds 10%).
- (2) Ensure that bare soil exposure limits (ten percent of each 150-foot linear segment of filter strip width) are not exceeded.
- (3) Construct fire lines by hand on any crossings of ephemeral, intermittent, or perennial streams.
- (4) Restore all disturbed areas (e.g., fire lines) promptly to limit impairment of downstream water resources.

Description of Alternatives:

Alternative 1. Under the No Action Alternative, current management would continue to guide activities in the project area. No management activities would be implemented to encourage establishment and maintenance of barrens herbaceous and tree species. The 4 natural areas would not be managed with fire or tree and shrub removal and the succession of each to a forest-type community would be allowed to continue.

Alternative 2. Under this alternative the Forest would manage the 4 natural areas with prescribed fire, and tree and shrub removal where necessary. As in the past, each of the 4 natural areas would be managed based on a site-specific assessment of vegetative conditions and management needs. Management will be applied as necessary to enhance, maintain or restore an area and would occur over a multi-year period with prescribed burns repeated on appropriate cycles. The burns would be implemented when weather and site conditions are conducive to

meet site-specific management objectives. Burns would be planned and implemented during the most optimal periods, depending on the natural community. Roads, trails, streams and ravines will be used as natural fire-control lines whenever possible. Other fire-control lines—areas cleared of vegetation by leaf blowers, raking, mowing or other mechanical means—would be prepared before burning, as necessary.

Location:

Saline County, Illinois

- T9S, R7E, Sec 34 and 35
- T10S, R7E, Sec 2, 3, 9, 10, 15, 16, 21 and 22.

Johnson County, Illinois

- T12S, R4E, Sec 10, 11, 14, and 15

Duration and Timing: A decision is expected by May 2008.

IV. Existing Environment

The project area is each located within three watersheds. The project area includes both ephemeral and intermittent streams in these watersheds.

- Simpson Township Barrens (Cedar Creek)
- Dennison Hollow and Stoneface (Eagle Creek)
- Cave Hill (Lower Saline River and Eagle Creek).

Indiana Crayfish

The Indiana crayfish has a limited range in the lower Ohio River Valley, where it occurs in southeastern Illinois and southwestern Indiana. In Illinois the Indiana crayfish is found in the following counties and streams: Gallatin County-Eagle and Robinette Creek; Hardin County-Honey Creek, Sheridan Branch, and Rock Creek; Johnson County-Clifty Creek and Sugar Creek; Pope County-Burden Creek; Saline County-Little Saline River and Rocky Branch; Williamson County-Brushy Slough; and Williamson County-South Fork Saline River and Sugar Creek. (Page 1985; Taylor 2003). This species is listed as endangered by the State of Illinois.

Habitat for the Indiana crayfish is rocky riffles and pools of small to medium-sized streams (Page 1985). Other important habitat components include rocks and woody debris, which provide interstitial space for cover. The primary threat to this species is habitat alteration, including impoundment of streams, removal of cobble and gravel substrate and woody debris from streams, and loss of preferred habitat via sedimentation (Taylor 2003).

At present, there is little information on habitat availability and distribution and abundance of this species on the National Forest. Taylor (2003) stated that populations of this species likely occur on the Shawnee Forest in headwater tributaries of Eagle Creek. Surveys conducted by the Shawnee Forest in the upper portion of the Eagle Creek Drainage in September of 2004 found no crayfish and poor habitat (i.e., steep gradient, ephemeral streams) in tributaries flowing north into Eagle Creek from the Garden of the Gods (Saline and Gallatin counties). A second survey conducted by the Forest in 2006 did find the Indiana Crayfish in Eagle Creek, Saline County.

Other known sites on the Shawnee Forest include Rocky Branch (tributary to Battleford Creek; Saline County) and Sugar Creek in Johnson County. Good quality habitat also likely exists in the upper portion of the Little Saline River. Although this species is found within the Eagle Creek drainage, it has not been observed in any areas that would be directly affected by the prescribed burn. The only known location would be upstream of the project area in the Eagle Creek Drainage (near Herod).

Cumulative Effects Area (CEA)

The Cumulative Effects Area (CEA) for aquatic species includes all the ephemeral and intermittent streams within the project boundary. In addition, the CEA for the Stoneface and Dennison Hollow sites will extend downstream to the confluence with Eagle Creek. The CEA for the Cave Hill site will extend downstream to Glen O' Jones Lake. And, the CEA for the Simpson Barrens site will extend downstream to the confluence with Cedar Creek. This CEA represents a landscape surrounding the project area where past, present, and future management actions by humans have and/or will occur. Cumulative effects analysis includes all known past actions, the proposed action, present actions, and reasonably foreseeable future actions which could impact the analyses areas.

Past practices that have affected stream habitat and aquatic communities include a reduction in vegetative stream corridors and increased sedimentation from agricultural activities (Hite et al. 1990). During the mid 1800's much of the forested land in southern Illinois was cleared for agricultural production, resulting in an increase in sediment load to streams. Conversely, since the mid 1900's much of this land has been reforested, leading to a reduction in sediment load. Although reforestation has improved conditions, these streams continue to be affected by past management practices as they revert back to more stable and natural states (Kandl 1987).

Present management practices affecting stream habitat and fish communities include agricultural activity on private land and recreational activity on the Shawnee National Forest. Erosion resulting from pastures and row crop production is evident on lands within these watersheds (Hite et al. 1990) and does influence downstream habitat on the Shawnee National Forest. Perhaps the greatest present day impact to stream habitat may be recreational activity. Recreational pressure is relatively high within these watersheds, because nearly 40% of the land lies within the Shawnee National Forest. The relatively high percentage of Forest Service ownership leads to more intense recreational pressure. The effect of dispersed recreation on roads and trails, including hiker, equestrian, and all terrain vehicle traffic, exerts the greatest impact to watersheds (Hite et al. 1990; Widowski and Fitch 2000).

The effect of sediment on stream habitat and aquatic communities is well documented. Sedimentation decreases pool habitat, lessens available spawning substrate for fish, inhibits macroinvertebrate production, reduces food availability and feeding activity for fish, and may interrupt spawning and reduce spawning success (Waters 1995; Bryan and Rutherford 1995). Sedimentation and associated changes in habitat have been shown to negatively affect warmwater fish communities (Waters 1995). Although many warmwater fishes are adapted to more turbid conditions, a great variation exists among these species in tolerance to suspended sediment and some species may be lost from an otherwise viable fish community. Sedimentation has also been shown to have negative effects on mussel and crustacean communities and declines

in relative abundance of species have been linked to increased siltation (Page 1985; Cummings and Mayer 1992).

Present and future activities within the CEA that may have impacts on aquatic resources include the following: (1) an increase in recreational activity, including hikers, equestrians, and all terrain vehicle traffic; (2) prescribed burning and brush disposal for hazardous fuel reduction, (3) agricultural activity on private land; (4) housing development on private land; (5) watershed and habitat improvement projects, and (6) timber management.

Cumulative effects analyses takes in to account all known past actions, the proposed action, present actions, and reasonably foreseeable future actions which could or will impact the analyses areas.

V. Effects of the Proposed Action

Indiana Crayfish

Direct/Indirect Effects: Given that this species is not found within the project area, there will be no direct effects to the species or their habitat. One potential indirect effect would be increased sedimentation within the Saline River watershed from activities upstream that are associated with the prescribed burn (e.g., soil disturbance from fire line construction and use of heavy equipment). Because these species are know to occur within the watershed downstream of the project area, increased sedimentation would negatively affect habitat outside the project area. However, the use of hand tools to build lines across ephemeral, perennial, and intermittent streams, combined with rehabilitation (e.g. disking and seeding) of fire lines, should minimize the potential for increased sedimentation. In addition, stimulation of growth of grasses and forbs will likely reduce future sedimentation, resulting in a slight positive indirect effect.

Cumulative Effects: Since there are no RFSS found within the project area, there are no direct or indirect effects. Thus, there will be no cumulative effects on RFSS.

VI. Determination

As a result of this evaluation, it is my professional determination that implementation of this prescribed burn will not impact individual Indiana crayfish populations or existing habitat. Thus, it will not contribute to a trend toward Federal listing or cause a loss of viability to the population or species.

VII. Management Recommendations

No recommendations were identified for this project for sensitive aquatic species.

VIII. Literature Citations

- Bryan, C. F. and D. A. Rutherford, editors. 1995. Impacts on warmwater streams: guidelines for evaluation, second edition. Southern Division, American Fisheries Society.
- Cummings, K. S. and C. A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey Manual 5. 194 pp.
- Hite, R. L., C. A. Bickers, and M. M. King. 1990. An intensive survey of Shawnee National Forest Region Streams of Southern Illinois. IEPA/WPC/90-171. Illinois Environmental Protection Agency, Springfield.
- Kandl, E. J. 1987. The effects of land-use change on the hydrology and channel morphology of eight streams in the Shawnee Hills of Southeastern Illinois. M.S. Thesis, University of Illinois, Champaign. 72 pp.
- Page, L. M. 1985. The crayfishes and shrimps (Decapoda) of Illinois. Illinois Natural History Survey Bulletin, Vol. 33, Art. 4 p. 335-448.
- Taylor, C. A. 2003. Conservation assessment for the Indiana crayfish. Center for Biodiversity, Illinois Natural History Survey, Champaign.
- USDA Forest Service. 2006. Land and Resource Management Plan, Shawnee National Forest. Harrisburg, Illinois.
- Waters, T. F. 1995. Sediment in streams: sources, biological effects, and control. American Fisheries Society Monograph 7. Bethesda, Maryland.
- Widowski, S. and B. Fitch. 2000. A watershed assessment for the Shawnee National Forest. U.S. Department of Agriculture, Shawnee National Forest, Vienna.