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Attorney for Plaintiffs

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF KENTUCKY
PADUCAH DIVISION

FOREST SERVICE EMPLOYEES FOR)
ENVIRONMENTAL ETHICS, and)
PAUL SCHAEFER,)

Plaintiffs,)

vs.)

UNITED STATES FOREST SERVICE,)
an agency of the U.S. Department)
of Agriculture,)

Defendant.)

Case No: 5:06-CV-92-TBR

**DECLARATION OF
DR. KEITH PECOR**

(Electronically Filed)

I, Keith Pecor, declare:

I am a Faculty Fellow in the Department of Biology at Rhodes College in Memphis, TN. I hold Ph.D. and M.S. degrees in Biology from the University of Michigan and a B.S. in Biology from the University of Memphis. I study the behavioral and evolutionary ecology of animals, and my work often has a conservation component. As part of these investigations, I study the ways in which environmental contaminants affect the development and behavior of aquatic organisms, such as larval amphibians. I also teach undergraduate courses in general biology,

evolution, and vertebrate zoology at Rhodes College. While at the University of Michigan, I taught a variety of courses, including four semesters of a lab on the biology of amphibians and reptiles.

2. I have been asked by plaintiffs in this case to explain the potential impacts that corn and soybean farming at Land Between the Lakes (LBL) could have on amphibians. Corn is a non-native, domesticated plant indigenous to Central America. Soybean is a non-native, domesticated plant indigenous to Asia. However, the varieties of these plants grown in cultivation are quite different in many ways from their native varieties. The corn and soybean plants currently farmed are the result of a combination of artificial selection by plant breeders and genetic engineering. The results of these processes have been increased yield, compatibility with commercial herbicides (e.g., Roundup Ready crops), and improved resistance to insect damage.

3. Under natural circumstances corn and soybeans would not be found at LBL. Although non-native plants are not uncommon at LBL, neither corn nor soybeans could compete with LBL's native flora. Thus, their presence at LBL requires substantial modification of the natural environment.

4. Successful corn or soybean farming at LBL requires that farmers create environmental conditions that promote the growth of the desired crop and suppress all other plant competition. Using tillage and/or pesticides (the term "pesticide" is used broadly here to include herbicides, insecticides, or fungicides), farmers create a clean slate free from plant competitors, parasites, and predatory insects. Tillage and/or pesticides remove competing organisms from the land. This tilled and/or sprayed ground is quite different from the natural environment. In place of the native organisms is a monoculture of the crop plant.

5. Planting of the crop is often followed by further pesticide use. For example, if Roundup Ready corn and soybeans are planted, Roundup herbicide may be sprayed following germination to further eliminate competition from non-crop plants. Fertilizers and additional pesticides may

also be used. At the end of the growing season, the crop is harvested. The process begins anew the following spring, or in some cases, the land is left fallow for a year before re-cropping.

6. As a result of the procedures described above, farming at LBL could severely impact the resident amphibian populations through loss of habitat. Less appreciated are the effects on amphibians from degradation of habitats adjacent to the farmlands. Amphibians are often considered “biological indicators,” because of their unique life cycle and physiology. Although variation exists, the typical amphibian life cycle involves both aquatic and terrestrial phases. Amphibian embryos develop in the water within shell-less eggs, which are permeable to a wide variety of toxins. After hatching, an aquatic larval stage is followed by terrestrial juvenile and adult stages. The juveniles and adults have a moist, permeable skin used in respiration, and this skin is sensitive to environmental toxins. The adults return to the water to breed, so they are re-exposed to the aquatic environment. Thus, these animals are susceptible to both aquatic and terrestrial pollution.

7. Independent research has shown that a variety of fertilizers and pesticides have negative effects on amphibians, ranging from slowed development to death. For example, application of Roundup at recommended concentrations is lethally toxic to certain amphibian species. The severity of the effects of exposure to agricultural chemicals can vary depending upon the pH of water, the presence or absence of ultraviolet light, and other environmental factors. The effects of these chemicals also vary depending upon the stage of the amphibian life cycle under consideration. Chemicals found to be relatively harmless for adult animals may be quite harmful for embryos or larvae. These points underscore both the complexity of this system and the need for research that considers agricultural chemicals in a variety of contexts.

8. We are just beginning to better understand the effects of agricultural chemicals on amphibians. Much remains to be discovered, but research to date suggests that amphibians face substantial risks from exposure to these chemicals. The risks to amphibians from farming of corn and soybeans at LBL are significant and should be fully assessed before continued commercial farming is permitted. LBL is a regionally-significant biological reserve. Its

function as a refuge for species sensitive to development pressures should not be compromised without a full investigation of the risks and consequences of this drastic land use.

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 8th day of December, 2006.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that on December 11, 2006, I electronically filed this document through the ECF system, which will send a notice of electronic filing to Jeffrey Dillen, United States Department of Justice (Jeffrey.Dillen@usdoj.gov).

s/ Marc D. Fink

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