

Tiered approach to the use of best available data on species locations in pesticide assessments on endangered species

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Abstract

The U.S. Environmental Protection Agency Office of Pesticide Programs (EPA OPP) must consider the impact of registration actions under the Endangered Species Act. Over ten years, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Endangered Species Task Force (FESTF) has developed data supporting the EPA OPP assessment process: a system to house, compare and retrieve assessment information (the FESTF Information Management System (IMS)) and a resource for specific location data on endangered species (via a licensing agreement with NatureServe). Species assessments may be approached at the national, sub-county, and local levels. Given the currently available and electronically-compiled species location data sources, different data sets serve as the "best available information" for the level of investigation required. Logistically, a national level species assessment cannot consider every individual species location point, and instead must work from the best available data on species location at the county level. Even at this level, thousands of crop-species-use "intersections" must be resolved within the IMS. For those intersections not easily resolved at the county level, more detailed spatial assessment may be necessary. At the national level, a best available portrayal of "species presence by county" is practical for the assessment process. At the sub-county level over multiple jurisdictions, where pesticide use, species attributes, and other factors do not resolve assumptions about risk at the county or national level, a nationally aggregated spatial database, the best available considered to be that from NatureServe, provides the necessary data. When site-specific evaluation is needed, the NatureServe data may be further honed by the use of highly specific data within a single jurisdiction, if available. An example of such data might be those from individual state data collection programs or the U.S. Fish and Wildlife Service. The data sources, and their use in a tiered assessment to support the evaluation of the three levels of species assessment, are examined here.

Introduction

In support of Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) product registration, the FIFRA Endangered Species Task Force (FESTF) has developed an endangered species assessment process based on evaluation of the co-occurrence of threatened and endangered species and use sites (typically crops) at the county-level (McGaughey *et al.*, 2005). For each permutation of species, site, and location for a given active ingredient and application method, a determination must be made in keeping with the overall goal of ensuring that pesticide registrations (federal 'actions') do not adversely affect threatened or endangered species or adversely modify their designated critical habitat (EPA OPP, 2004). This determination expresses how endangered species concerns may be addressed, along with supporting reference details and comments. Determinations may be developed at three assessment levels: national, sub-county, and local depending on the availability of suitable use site and species data. The focus of this poster is the best-available species data and its use at the three assessment levels.

Use of Species Data within the Tiered Endangered Species Assessment Process

National Level

The FESTF endangered species assessment process is implemented at the first of the three levels, the national level, by means of the FESTF Information Management System (IMS), a web-based system that facilitates efficient development of determinations at the county level and helps ensure consistency in determination development between assessments. Species data stored in the IMS originate from the U.S. Fish and Wildlife Service (FWS), but are provided by the U.S. Environmental Protection Agency Office of Pesticide Programs (EPA OPP) and consist of taxonomic unit, genus, and species name, along with listing status of counties in which the species are found. Use site (i.e., crop) data from the U.S. Department of Agriculture Census of Agriculture are also stored at the county level in the IMS. The county-level identification of designated critical habitat can be, but is not yet, incorporated into data available to the IMS.

In the IMS, a determination is expressed within an entity known as an "association", which links the details of the determination, including supporting documentation and references (Figure 1), to the situations to which it applies (i.e., permutations of species, crop, location, and application method, for a given active ingredient) (Table 1). In some cases, determinations can be made at the national (county) level on the basis of descriptions of the relationship between species occurrence and crop locations from, for example, the NatureServe explorer website (<http://www.natureserve.org/explorer>). In other cases, an attempt must be made to develop a determination at the sub-county level.

Table 1. IMS species, site, location, and application method records selected for the association shown in Figure 1.

Taxon	Species	Site Group	Site	State	County	Acreage	Application Method Type
Dicots	Sunflower, Eggert's (<i>Helianthus eggertii</i>)	Corn Field	Corn for grain or seed-harvested	AL	Blount	1630	Ground
Dicots	Sunflower, Eggert's (<i>Helianthus eggertii</i>)	Corn Field	Corn for grain or seed-harvested	KY	Barren	8929	Ground
Dicots	Sunflower, Eggert's (<i>Helianthus eggertii</i>)	Corn Field	Corn for grain or seed-harvested	KY	Edmonson	2472	Ground

Sub-County Level

Assessment at the sub-county level is supported by data from NatureServe under a license agreement that allows FESTF members and EPA OPP access to detailed biological and spatial data for the sole purpose of conducting pesticide endangered species assessments. As the developer of the only fully-aggregated national dataset on species distribution in the U.S., NatureServe is considered by FESTF to provide the "best available data" on threatened and endangered species. A detailed evaluation of the NatureServe data was conducted by FESTF to improve understanding of the data and help provide guidance to data users with respect to data interpretation and quality. This evaluation showed the database to be stable over time and confirmed the thesis that it provides a reliable source of high quality species data for the United States.

In order to simplify access to the data, FESTF has developed a secure website, referred to as the "FESTF MJD" (from the NatureServe acronym for multi-jurisdictional database). An example of an MJD page is shown in Figure 2 and illustrates the concise nature of the data presentation. The MJD also includes access to spatial data for use in a geographic information system (GIS) and, for those without GIS capabilities, allows simple viewing of the data using a map window (Figure 3). With these tools, a knowledgeable assessor may be able to make a determination by simply viewing this good quality species location data.

Local Level

The NatureServe data described for the sub-county level also supports assessment at the local level, but may be complemented by additional information obtained directly from experts in, for example, FWS field offices. Details of such sources may be stored in the IMS to ensure accurate and consistent referencing and to satisfy EPA OPP demands for strong documentation.

At the local level, determination development may involve complex spatial analysis, considering landcover, hydrology, meteorology, and terrain. The IMS does not provide functionality for this type of work, but the results of local assessments may be imported into the system as part of the overall assessment.

Conclusion

A three-tier approach is presented for the use of species data in the endangered species assessment process. The approach builds on the success of the FESTF IMS and includes the use of new tools to access detailed species data provided by NatureServe.

Figure 2. FESTF MJD (NatureServe) species details for the Large-fruit Sand-verbena. [Non-sensitive Example]

Figure 1. IMS association entity, including determination details, supporting references, and uploaded documentation.

Figure 3. FESTF MJD map window. [false data]

References

- EPA OPP. 2004. *Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs, US Environmental Protection Agency, Endangered and Threatened Species Effects Determinations*. Office of Prevention, Pesticides, and Toxic Substances, Office of Pesticide Programs. Washington, DC.
- McGaughey, B.D., Shaw, J., and Hall, A. 2005. *Endangered Species Risk Assessment and Pesticide Regulation: The Species Assessment Process*. Society of Environmental Toxicology and Chemistry (SETAC) North America Annual Meeting, Baltimore, MD, November 2005.

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