



Science For A Better Life

The Endangered Species Act, Monarch Butterfly, and the Crop Protection Industry

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Bayer: *A Life Science Company*



Pharmaceuticals

- Prescription drugs

➤ Recently spun off Material Science business: Covestro



Consumer Health

- Over-the-counter products,



Crop Science

- Crop protection and seeds



CropScience

Crop Protection

- Insecticides
- Fungicides
- Herbicides
- SeedGrowth
- Biologics

Seeds

- Vegetables seeds
- Seeds for agricultural crops (canola / oilseed rape, cotton, rice, soy)
- Traits

Environmental Science

- Professional Products
- Consumer Products





Pesticide Regulation Basics

FIFRA 1972 (Federal Insecticide, Fungicide and Rodenticide Act)

- US EPA Office of Pesticide Programs is the primary regulatory agency
 - Each state also regulates pesticides, typically in Departments of Agricultural
- A risk / benefit statute
 - No "...unreasonable adverse effects on the environment..."
 - "(1) any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide, ..."
 - Less precautionary than the Endangered Species Act (ESA)
 - Do not follow the NEPA process

National scale, environmental and human health risk assessments are performed

- Detailed and standardize data requirements
 - Define properties (physical, chemical, toxicological) of the compound
- Conservative exposure models



ESA & Pesticides: Background

For over 30 years EPA has struggled to meet their statutory ESA obligations for pesticide registration decisions

- EPA, Fish and Wildlife Service (FWS), and National Marine Fisheries Service (NMFS) have historically disagreed on how to implement
- The federal action that falls under ESA, is the pesticide product “label”, which allows the use of our products by growers and other customers
 - While product labels are quite detailed (rates, pests, crops, mitigation measures, etc.), they for the most part
 - do not geographically restrict where a product can be used
- The use sites for a product are not actually known – estimated based on where a crop can be grown
 - Typically starting with a large number (100s) of T&E species based on potential co-occurrences alone

There have been, and continue to be, many lawsuits against EPA for not satisfying ESA in granting pesticide registrations



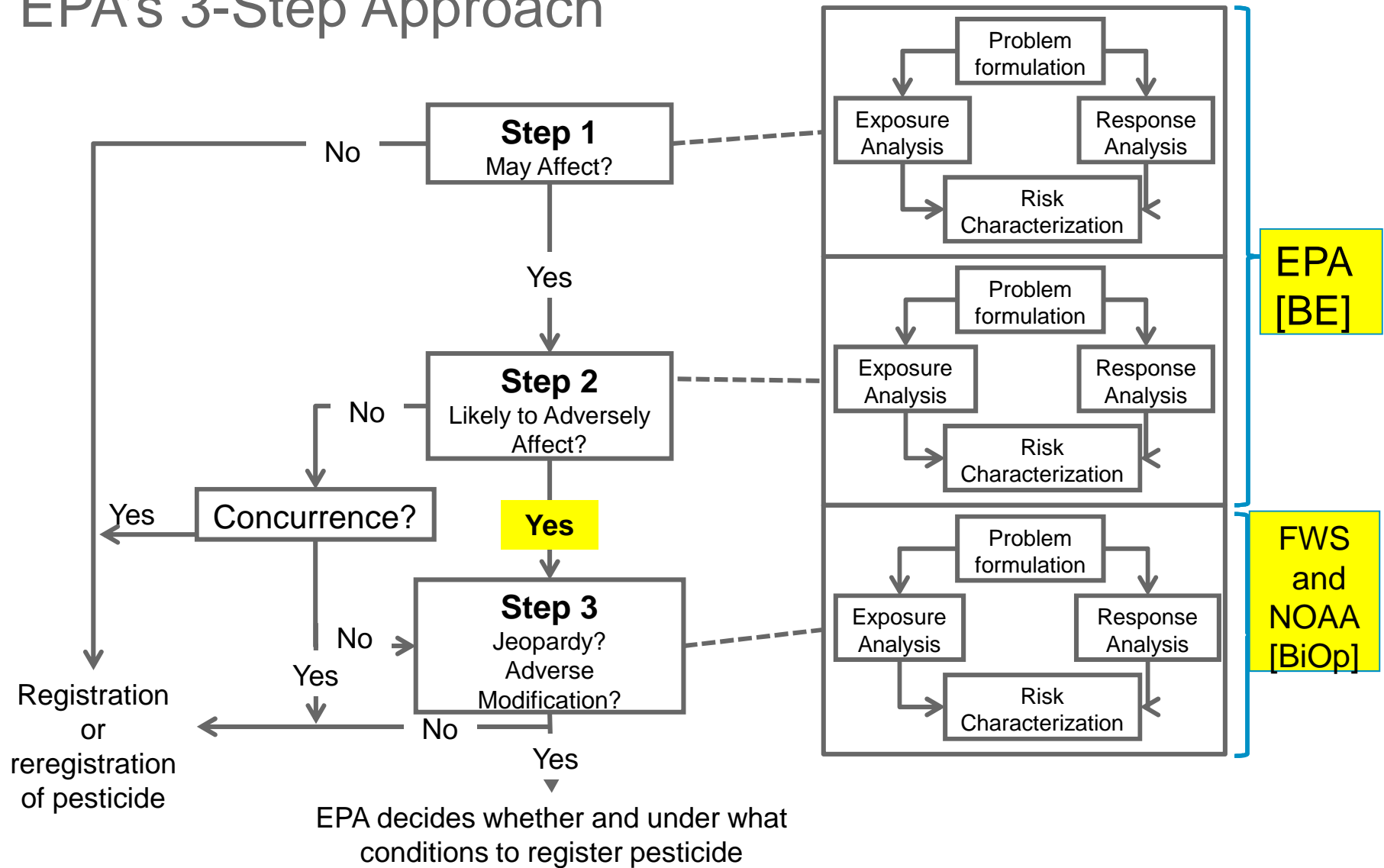
ESA & Pesticides: Where are we today?

Congress in 2011 directed the National Academy of Sciences (NAS) to provide guidance to EPA and the Services on how to perform endangered species assessments for pesticides

- NAS issued their guidance in 2013:
<http://www.nap.edu/catalog/18344/assessing-risks-to-endangered-and-threatened-species-from-pesticides>
- EPA and the Services are implementing the NAS recommendations through the use of pilot projects with 5 compounds that have been subject to litigation
 - EPA published draft exposure and effects assessments for chlorpyrifos, diazinon, and malathion in December 2015 - thousands of pages
 - EPA's full draft Biological Evaluations for these 3 compounds to be released in April

ESA Consultation and Ecological Risk Assessment

EPA's 3-Step Approach





ESA & Pesticides: Where are we going?

Expect a significant level of discussion after the release of the draft Biological Evaluations for the first 3 compounds in the pilot project

- EPA has been working to engage stakeholders throughout the process
- Final Biological Opinions due Dec 2017

The current process, as illustrated by what EPA has released so far does not appear to be practical or sustainable

- There are > 700 registrations, involving over a 1000 pesticide active ingredients, schedule to be completed by 2023
 - The Services are simply not staffed to deal with this workload
 - Estimate it would take at least \$100s of millions dollars and 100s of new staff to meet their consultation obligations under the current process

Lawsuits continue...

- NGOs now suing registration decisions for most new pesticide active ingredients



ESA & Pesticides: What does industry want?

A credible, defensible, predictable process that supports sound regulatory decision making

- Process allows timely registration decisions
- EPA maintains discretion to make the no effect finding
- Assessment reflects the real world
 - Need to move away from “hypothetical risk”
 - Use what is known about the compounds and how they are used to screen out as many uses & species as possible
- Consultations focus on species where a significant risk cannot be excluded
- Need flexibility on how to mitigate risk to species that do not clear the early steps in the assessment
- Manageable impacts on agriculture



Science For A Better Life

The Monarch Butterfly

Got Milkweed?

&

Nectar Sources?

Overwintering Sites in Mexico?



Monarch Butterfly Concerns are Not New!

Many conservation, educational, and scientific groups exist

Monarch Watch: <http://www.monarchwatch.org/>

- Monarch Joint Venture: <http://www.monarchjointventure.org/>
- Monarch Larva Monitoring Project: www.mlmp.org
- US FWS: <http://www.fws.gov/savethemonarch/>
- http://www.trilat.org/index.php?option=com_content&view=article&id=1568&Itemid=209
- USDA, Forest Service:
http://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/index.shtml
- TX Parks & Wildlife:
http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/texas_nature_trackers/monarch/

Also many other groups, with a broader focus, e.g., Pollinator groups involved



An Iconic Species in North America

Range Map

<http://monarchwatch.org/blog/2010/05/13/two-way-monarch-migration-map/>



Monarch Butterfly and ESA

June 2014: Presidential Memorandum

- Creating a Federal Strategy to Promote the Health of **Honey Bees** and Other Pollinators

August 2014 Petition to list the species by

- Center for Biological Diversity (CBD), Center for Food Safety (CFS), Xerces Society and Dr. Lincoln Brower (Monarch Butterfly expert)
- https://www.biologicaldiversity.org/species/invertebrates/pdfs/Monarch_ESA_Petition.pdf

Dec 2014: The U.S. Fish and Wildlife Service agrees to conducting a status review of the monarch butterfly under the Endangered Species Act (ESA)

May 2015: White House Pollinator Health Strategy released

January 2016: CBD and CFS file a Notice of Intent to sue FWS for not meeting 1 year deadline

In addition, a number of petitions and lawsuits were filed by NGOs in this time frame related to specific herbicides and the monarch butterfly against EPA



Eastern Monarch Population

The Monarch Butterfly Population has dropped from a peak of around 1 billion overwintering in Mexico in the mid 1990s, to a low of around 33 million in 2013-2014.

Chart of population in overwintering sites: <http://monarchjointventure.org/news-events/news/2015-population-update-and-estimating-the-number-of-overwintering-monarchs>



Monarch Butterflies and Agriculture

It has been hypothesized by the ESA petitioners that the decline in monarch butterfly populations is due to the decline of milkweed plants **in** corn/soybean **fields** in the Midwest as a result of:

- Widespread adoption of herbicide resistant corn and soybeans
 - *more effective at killing milkweed*
- Expansion of corn and soybean acres – biofuels
- Ongoing lost of prairie and grassland habitat

It has been estimated that a billion stems of milkweed have been lost from the Midwest corn and soybean fields since the late 1990s

A millions stems a year are currently being lost due to land conversion



Response to Monarch Decline

Has been a large push by federal and state agencies, academics, along with private land owners to create habitat and conduct research to better understand the species status and needs

- Federal Task Force working on the issue
- National Fish and Wildlife Foundation (NFWF)
 - Monarch Butterfly Conservation Fund
- I-35 Monarch Flyway
- Trying to utilize Rights-of-ways
 - IVM Partners (<http://www.ivmpartners.org/>) – work Bayer is supporting
- Urban habitat creation
 - National Wildlife Federations' Mayor's Monarch Pledge



Agricultures' Response

Agriculture has in general been supportive of conservation efforts and research

- Iowa Monarch Conservation Consortium
- Keystone Monarch Collaborative
- Efforts to take advantage of existing conservation programs, e.g.,
 - Conservation Reserve Program (CRP)
 - Some NRCS programs
- Monarch habitat in non-production farm land
 - Roadsides, etc.
- Have supported some of the general monarch efforts
- Expanding pollinator (bee) habitat programs (<http://feedabee.com/>) to include milkweed



Monarch Butterfly ESA Status

Currently has no protected status under ESA

- Do not expect a decision from FWS until > 2018

The listing petition is actually controversial among some butterfly enthusiasts

- Want the species to get the attention and resources
- A number of other butterfly species have much lower numbers (thousands vs millions)
- Do not want the potential restrictions
 - Large number of people involved in raising monarch butterflies
 - A science education tool in our schools

A number of groups are working on Monarch Conservation Strategies or Management Plans for their regions

- Something FWS can considering in their decision process
- Could form the basis of Candidate Conservation Agreements

A close-up photograph of several bees on a honeycomb. The bees are in various positions, some facing the camera and others with their backs to it. The honeycomb cells are visible, some containing honey and others empty. The lighting is warm, highlighting the textures of the bees' bodies and the honeycomb.

Bayer Bee Care Center

<https://beecare.bayer.com/home>



Questions?

Focus on stewardship
and sustainability