

# How to Relate Forensics to EcoRisk

**Dennis Caputo, REM, CEP, QEP**  
**Quest Consulting, Inc., 4747 Bellaire Blvd.**  
**Suite 310, Bellaire, Texas 77401**  
**[www.QuestEHS.com](http://www.QuestEHS.com) 713-667-6323**

# What is an Ecologic Risk Assessment (ERA)?

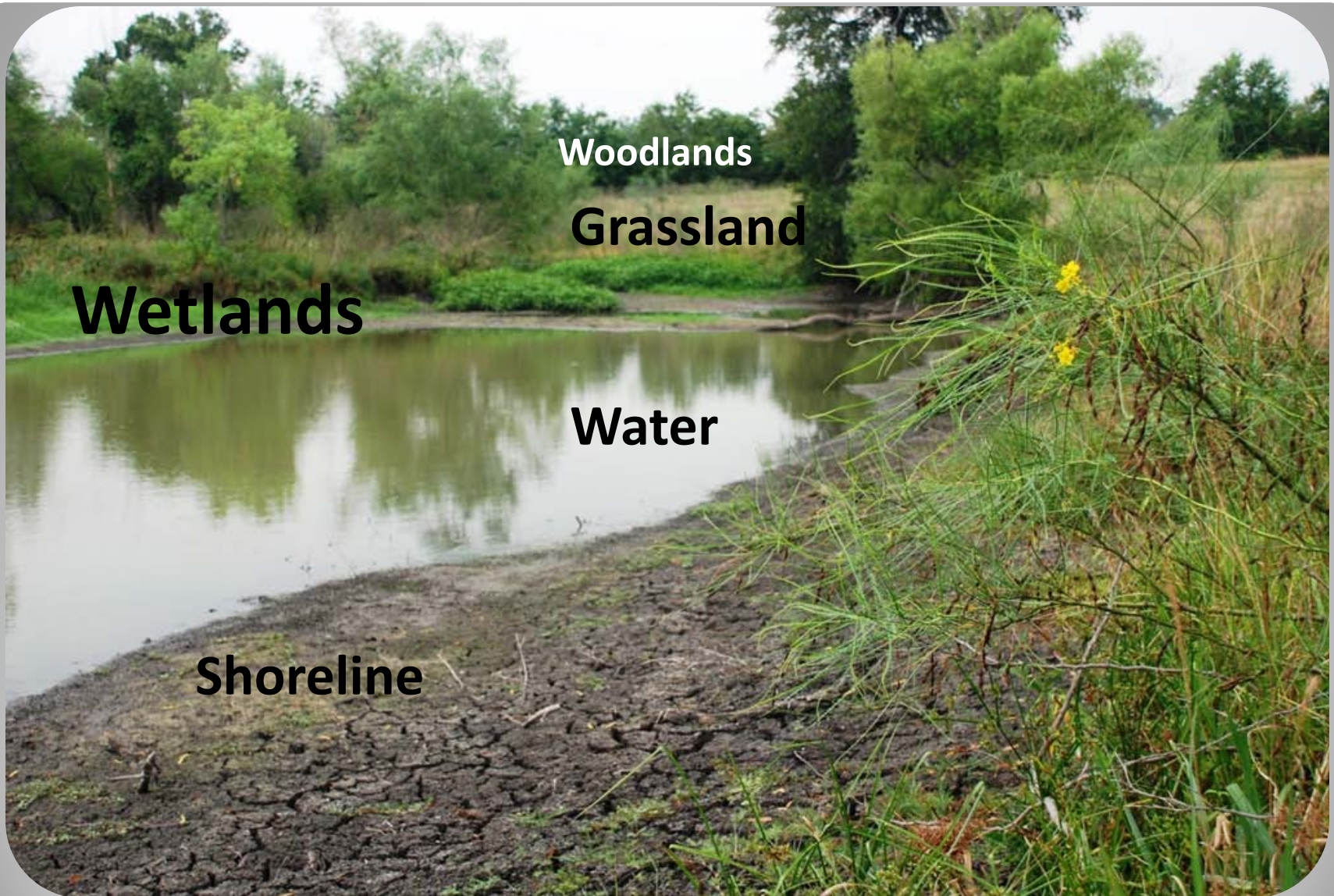
- **Quantitative assessment of risk to key, selected or indicator organisms in the habitats as a result of a chemical release or other impact**

# Steps in a Forensic Science Approach to ERAs

- 1. Field Survey: Identify the habitat(s) that may be impacted**
- 2. Sample the habitat(s) to quantify the impact (if any)**
- 3. Select receptor organisms in each impacted habitat**

# Steps in a Forensic Science Approach to ERAs

4. Quantify risk to each receptor organism using a realistic dose
5. Take actions to mitigate risk to receptor(s) which have a hazard quotient or hazard index  $> 1$



Woodlands

Grassland

Wetlands

Water

Shoreline

**First Step: Identify Habitat(s)**



**Second Step: Identify which habitat(s)  
have been impacted**



**Habitat not impacted**



**Third step: select receptor organism(s)**





**Fourth Step: Quantify risk to each  
receptor organism**

## **Fourth Step: Quantify risk to each receptor organism by:**

- **Determine realistic dose that the receptor organism receives**
- **Calculate risk by comparing dose to Toxicity Reference Value (TRV) termed Hazard Quotient**
- **Organism with ratio of dose to TRV  $> 1$  are at risk**

## **Fifth Step**

**Finally: Take actions to mitigate risk to receptor(s) which have a hazard quotient or hazard index  $> 1$  such as:**

- Eliminate or reduce source**
- Remediate impacted media**
  - Soil**
  - Sediment**
  - Surface water**

# Keys to a successful Eco-Risk Assessment

- Understand the regulations
- Use a Forensic approach
  - Understand the chemistry, geo-chemistry and biochemistry
- Work with the agency as part of the team
- Write reports in a style that is legally and regulatorily appropriate

