



Views on Ecological Risk Assessment for Endangered Species

Tilghman Hall
CropLife America
April 15, 2015
ESA Workshop

General situation

- **Dynamic**
 - Interim process using screening level methods
 - Pilot projects
 - Stakeholders offering input
 - Iterative framework for risk assessments
 - Process is evolving and should evolve
- **Resource intensive**
 - Major collaborative effort for government
 - On-going programs demanding attention
 - Long-term commitments
 - Improvements needed for an efficient process



National Scale Evaluation Assessment

RA framework remains the same throughout the process and data used may change with iterations to refine the evaluation (1998 US EPA guidelines for ERA)

- Example – effects thresholds
 - Screening level – interim process thresholds vs taxon specific thresholds
 - Refinement – thresholds relevant for population effects
- Example - Exposure
 - Screening level – aquatic bins
 - Refinement – site specific habitat description

Effects determinations occur when there are sufficient reliable data and/or weight-of-evidence



Screening Level Assessment

- Focus the assessment on taxa where there is potential for exposure at concentrations that could cause adverse effects
- Appropriate screening level exposure assessment that can be taxa specific. Potential example approach for aquatic
 - Selection of appropriate aquatic habitat bins within each HUC2 or other appropriate level of resolution
 - Surface water concentration calculator (SWCC) with appropriate scenario selection
 - Efficient downstream dilution estimates (e.g. NHDPlus v2 and Catchment Attribute Allocation and Accumulation Tool (CA3TV2))
- Simple biological filters (seed treatment = birds that don't eat seeds removed from consideration for direct effects, etc.)

Proximity Analysis – Use and species location

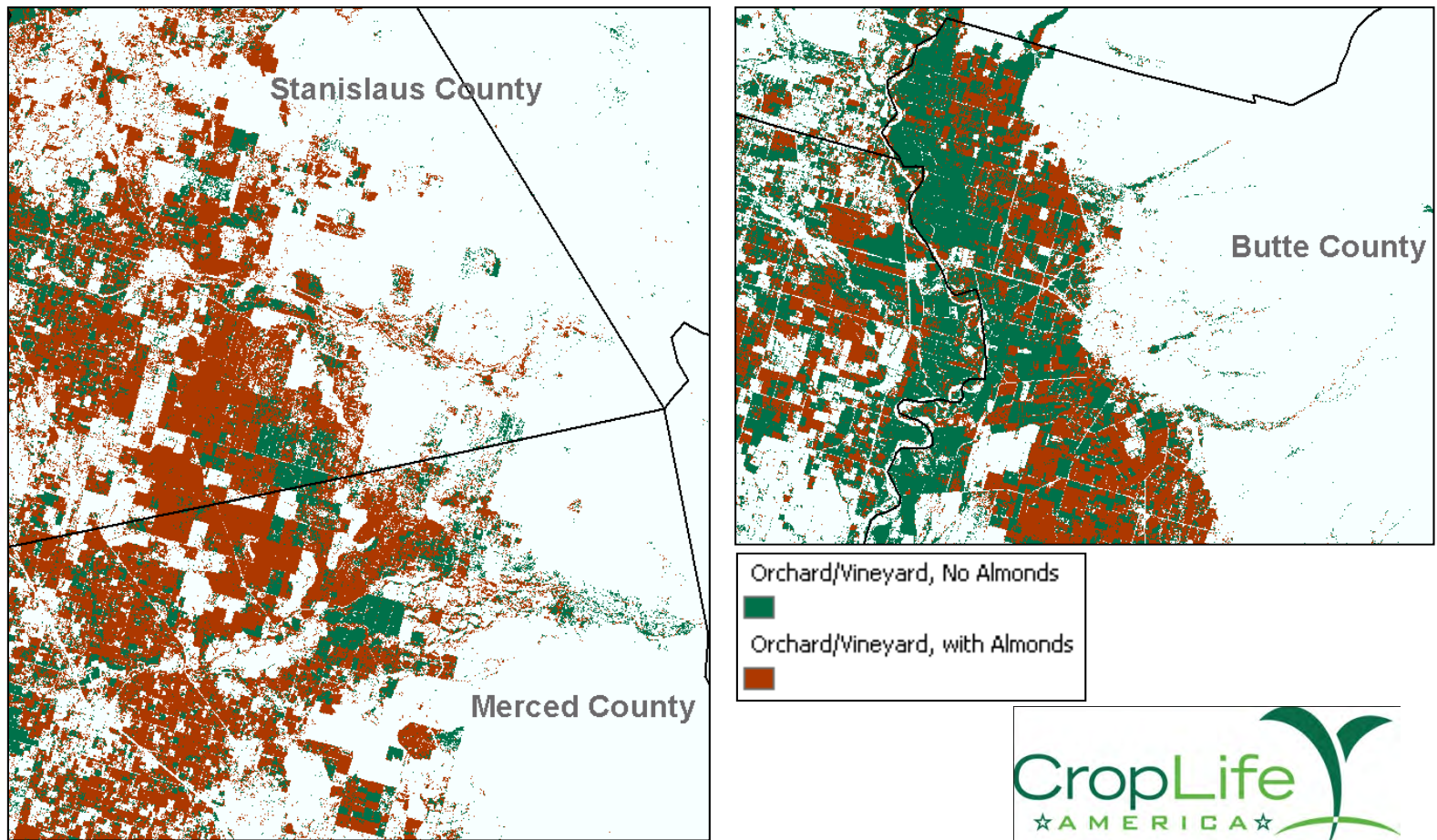
Use Pattern Determination – example databases

- Cropland - Cropland Data Layer (CDL, 5 years); National Land Cover Database (NLCD); USDA AgCensus 2002, 2007, 2012
 - Non-crop - GAP/LANDFIRE, Navteq Transportation, TIGER line, ACDi (TomTom golf course) data
 - Recommend avoid using outdated data sources that may be of lower quality
- Refinements to proposed generic crop groups
 - Determination of best available species location data (county or sub-county)
 - Refinements to species range (temporal, spatial, historical, unique species properties, wide-ranging species)



Generic vs Custom Crop Groupings

- Custom crop groups will be necessary when labels exclude significant crops within a given group.



Proximity Analysis – off site action area

Determine the extent of the off-site action area - distance from a use site where exposure no longer exceeds a toxicity threshold

- Some Considerations
 - Initial crop footprint (developed using spatial layers previously mentioned and custom crop groupings)
 - Appropriate effects metrics – taxon-specific
 - Application of aquatic and terrestrial exposure models
 - Development of appropriate decision criteria (1:10⁶ probability?)
 - Difficult topics, e.g., how to address wide-ranging wildlife species and species with no spatial data; species relationships (obligates – indirect effects); other terrestrial invertebrates



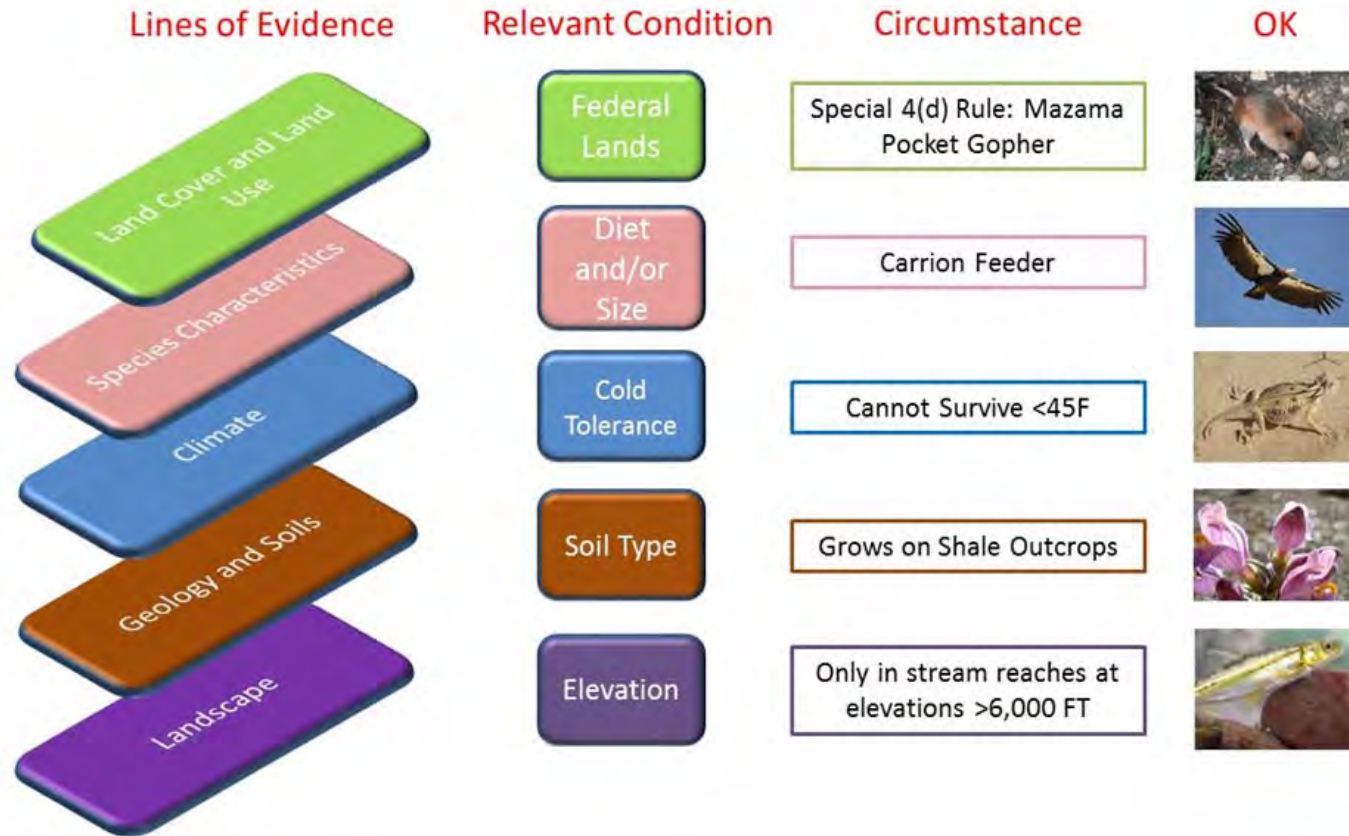
Refined ERA

Refine risk characterization for species where there *is potential for exposure and effects*

- Refined species-specific filters, such as:
 - Diet, habitat, legal and other protections
 - Species with no spatial data may be addressed here
 - Evaluation of data/information reliability and quality
- Effective at reducing the assessment scope (i.e., number of species and use patterns)

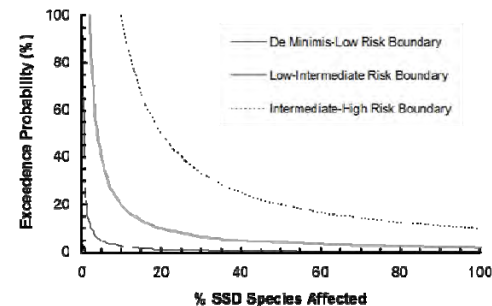


Refined ERA



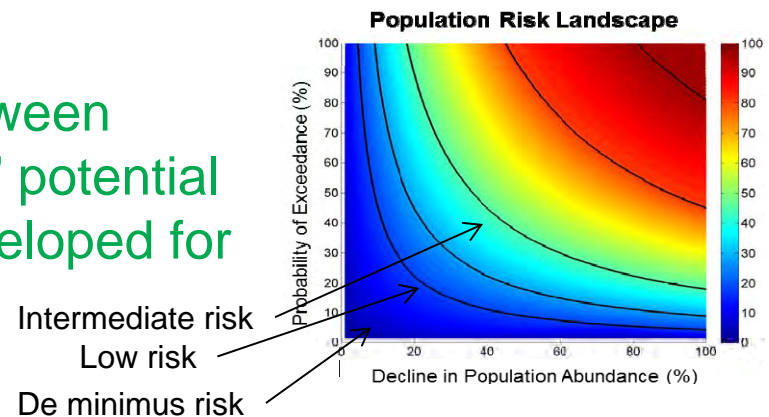
Refined ERA

- Stepwise approach to refine EECs
 - PRAs for entire receptor groups
 - Simple PRAs for listed species
 - Refined PRAs for listed species
- To effectively characterize risk, decision criteria are required to evaluate risk curves against
- Refined ERA should include other lines of evidence in a weight-of-evidence assessment
- Data collection and outputs from refined ERA should feed directly into the next steps
- See slides at end for some details



Population Level Analysis and Informed Decision Criteria

- Population Models
 - Many models available with varying data requirements that need be considered throughout process
 - Recommend workshop specifically on this topic
- Population level decision Criteria
 - How effects to individuals translate to effects at the population level depends greatly on the species under consideration
 - Fecundity rate, age at sexual maturity, dispersal range and rate, level of connectivity, etc. determine its tolerance to perturbation
- To account for differences between species, “population-informed” potential risk categories have been developed for discussion purposes



Weight-of-Evidence Assessment

- Weight-of-Evidence
 - Report to Congress in December 2014 “These determinations will be based on a weight-of-evidence approach that evaluated species and habitat risk hypotheses and associated lines of evidence”
 - Potential lines of evidence (may not be inclusive)
 - Understanding and characterizing the uncertainty
 - Modeling (exposure, effects, population)
 - Incident reports
 - Field and mesocosm studies, etc.
 - Monitoring data
 - Other species stressors
 - Which approach to use? Informal, qualitative? Formal with rigorous scoring system?

Conclusions

- The pesticide ESA landscape is rapidly shifting
 - New models, spatial data, species information, numbers of species/critical habitat are in constant flux
- CropLife America members continue to work towards efficient, scientifically defensible approaches to evaluating potential risks to listed species and their critical habitat
- CropLife America looks forward to greater stakeholder involvement in development of the process





Additional Details on Refined Risk Assessment

Some potential refinements for Aquatic ERA

- Refine the SWCC PRZM scenarios that are relevant for each species
- Species habitat area may not coincide with certain crop groups in each HUC2, and therefore the EECs derived from those crop scenarios will not be relevant to that species' exposure
- Refining the SWCC PRZM scenarios will reduce the number of SWCC scenarios associated with each species
- SWCC simulations using customized PRZM and variable volume water model (VVWM) and more realistic application inputs can be developed that will result in more relevant EECs



Some potential refinements for Aquatic ERA

- Information on actual pesticide use practices as opposed to worst-case practices (i.e., maximum label rates, maximum number of applications, and minimum intervals) can be introduced
- Datasets such as the Gfk Kynetec AgroTrak pesticide use data and discussions with local extension agents and agronomists
- Generic aquatic habitat bins developed by EPA may not be appropriate. SWCC parameterization of the receiving water body can be modified to better reflect the characteristics of the relevant aquatic habitat for a given species.
- Models: Probabilistic SWCC; Soil Water Assessment Tool (SWAT); future – SAM?



Some potential refinements for Terrestrial ERA

- As with aquatic, use actual use patterns and where possible refine knowledge on actual product use
- Probabilistic methods may be employed to account for variability in model input parameters (e.g. diet, body weight, time spent in the field)
- Effect metrics are refined to account for dose-response / concentration-response, species sensitivity distributions
- Appropriate surrogate species are considered
- Spray drift and runoff refinements are applied (e.g. chemical specific drift curves – DRT)
- Risk curves (joint probability risk curves) where possible
- Decision criteria (including probabilistic) are used to characterize risk

