A Summary of Herbicide Effects to Wildlife

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Overview

- **Reviewed and analyzed data on herbicide effects to terrestrial wildlife**
- **Results for some herbicides were surprising**
- **Results were used, along with other data, to establish standards for use on National Forests**
- **Results can help inform treatment decisions**

Analysis

- **Analysis conducted to support Invasive Plant Program EIS**
- **Used Forest Service Risk Assessments as basis for analysis**
  - **Risk Assessments prepared by SERA, Inc.**

Glyphosate -
Human Health and Ecological Risk Assessment
Final Report

Analysis

- **12 herbicides**
  - **Chlorsulfuron**
  - **Clopyralid**
  - **Dicamba**
  - **Glyphosate**
  - **Imazapic**
  - **Imazapyr**
  - **Metsulfuron methyl**
  - **Picloram**
  - **Sethoxydim**
  - **Sulfometuron methyl**
  - **Triclopyr**
  - **2,4-D**

Analysis

- **Lowered some thresholds to account for rare species in the PNW**
- **Used most sensitive effect from most sensitive species to set threshold**
  - **Not lethal doses**

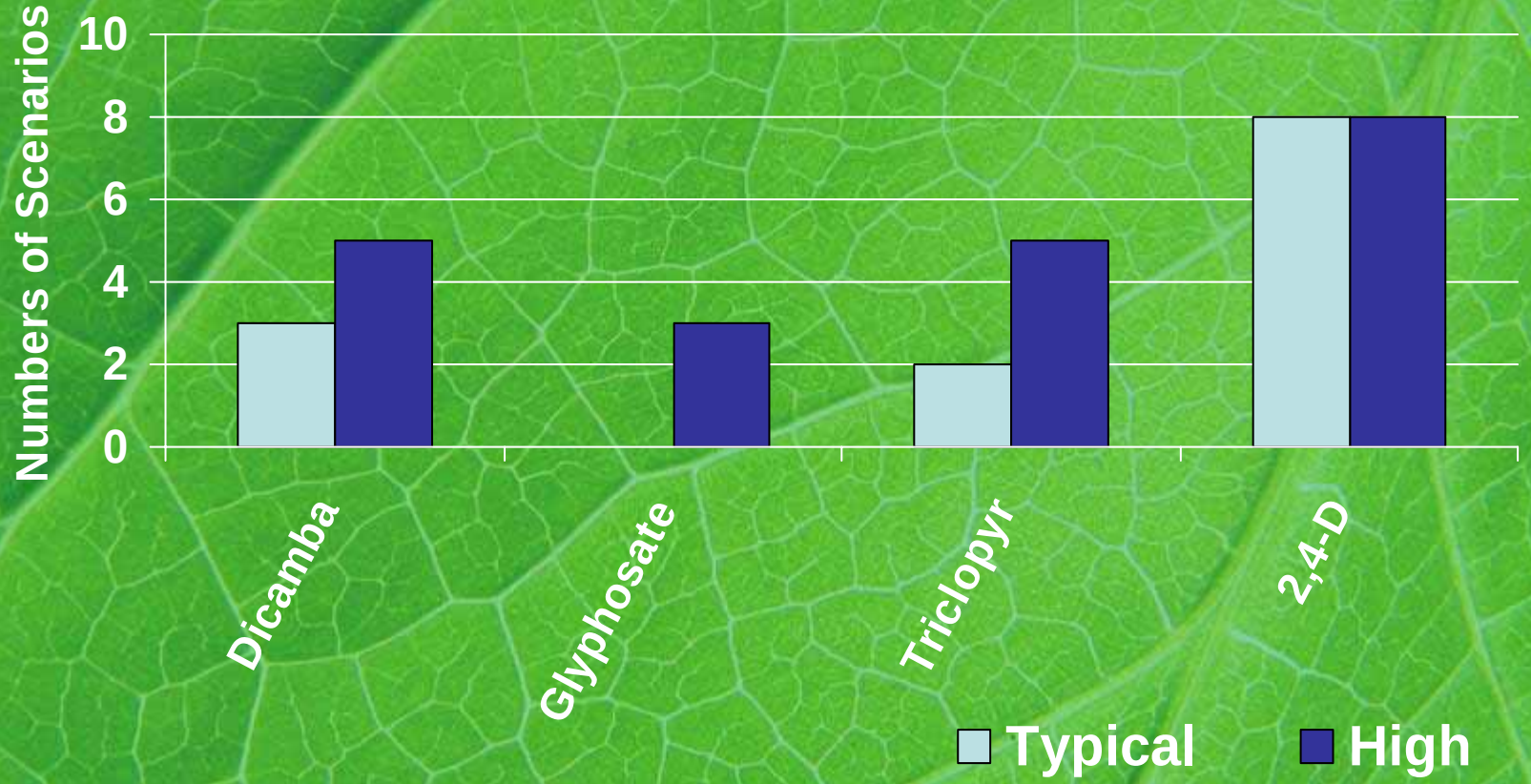
Analysis

- **“Worst case scenarios” used to quantify dose at typical and high application rates**
- **Scenarios used species groups: “large herbivorous mammal”, “small insectivorous bird”**

Results

- **Focus on effects from acute exposures**
- **Some herbicides have potential for adverse effects; four were notable:**
  - **2,4-D (Weedone, “Weed ‘n Feed”)**
  - **Dicamba (Banvel, Vanquish)**
  - **Triclopyr (Garlon, Pathfinder)**
  - **Glyphosate (Round Up, Aquamaster)**

Results


Number of acute scenarios exceeding thresholds
Numbers of Scenarios
10
8
6
4
2
0
Dicamba
Glyphosate
Triclopyr
2,4-D
Typical
High

Results

- **2,4-D**
  - **Exceeded thresholds in more scenarios than any other herbicide**
  - **At typical application rates, damage to internal organs is <u>expected</u> for herbivorous mammals**

Results

- **2,4-D continued**
  - **At high rates, mortality may occur to large mammals**
  - **Doses exceed 0.1 of LD_{50} for herbivorous and insectivorous birds**

Results

- **Dicamba**
  - **At high rates, some doses substantially exceeded thresholds**
  - **Adverse effects to reproduction are likely at typical rates and expected at high rates**

Results

- **Triclopyr**
  - **Low risk to mammals at typical rate**
  - **Dose to birds exceeded 0.1 LD_{50}**

Results

- **Triclopyr**
  - **At highest application rates**
    - **malformed fetuses possible for herbivorous and insectivorous mammals**
    - **doses to herbivorous birds exceeded the LD_{50}**

Results

- **Glyphosate**
  - **No likely risk to birds or mammals at typical application rates**

Results

- **Glyphosate**
  - **At high application rates**
    - **Large herbivore dose equaled that which caused mortality to pregnant rabbits**
    - **Doses to insectivorous birds exceeded the "no-observable-adverse-effect-level" (NOAEL)**

Results

- **Several herbicides did not exceed any thresholds of concern for birds or mammals**

Clopyralid
Chlorsulfuron
Imazapic
Imazapyr
Sulfometuron methyl
Metsulfuron methyl

Results

- **No herbicide tested exceeded any thresholds for fish-eating or mammal-eating birds.**

Results
Herptiles

- **Data insufficient for quantitative estimates of risk for other groups of wildlife**
- **There are practically no data on potential effects to reptiles**

Results
Herptiles

- **More data is coming in for amphibians, but is still limited**
- **Glyphosate, picloram, and sethoxydim may pose a risk to amphibians**

The Caveats

- These results are unlikely to actually occur in the field under most circumstances
  - Highest application rates rarely used
  - Animal behavior and more diverse diets
  - Seasonal presence
  - Requires large area broadcast spray
- However, some situations could create exposures of concern
  - E.g. Large area broadcast spray over territories held by insectivorous birds

Conclusions

- **Risks to wildlife from herbicide use are not well-known**
- **Risk assessments can highlight groups of species at risk and in what situations**

Conclusions

- **Results of this analysis were used to establish standards for invasive plant treatments on National Forests in Oregon and Washington**
  - **No dicamba or 2,4-D**
  - **No broadcast spray of triclopyr**
  - **Projects must have design criteria to reduce risk**

Conclusions

- **Results can be used to modify treatment timing, techniques, or herbicide choice to reduce risk to free-ranging wildlife**

Questions?