

FinnPRIO: A Model for Ranking Invasive Plant Pests Based on Risk

Salla Hannunen¹, Juha Tuomola¹, Jaakko Heikkilä²

¹Finnish Food Safety Authority Evira, ²Natural Resources
Institute Finland

FinnPRIO is a tool for carrying out quick, well structured, **semiquantitative expert assessments**, that use **consistent criteria** and hence **enable comparison** of different pests

Basic structure

Probability of Invasion

=

Entry

×

Establishment &
Spread

Impact of Invasion

=

Economical
Impacts

+

Environmental &
Social Impacts

Manageability of Invasion

=

Preventability

&

Controllability

Uncertainty - questions

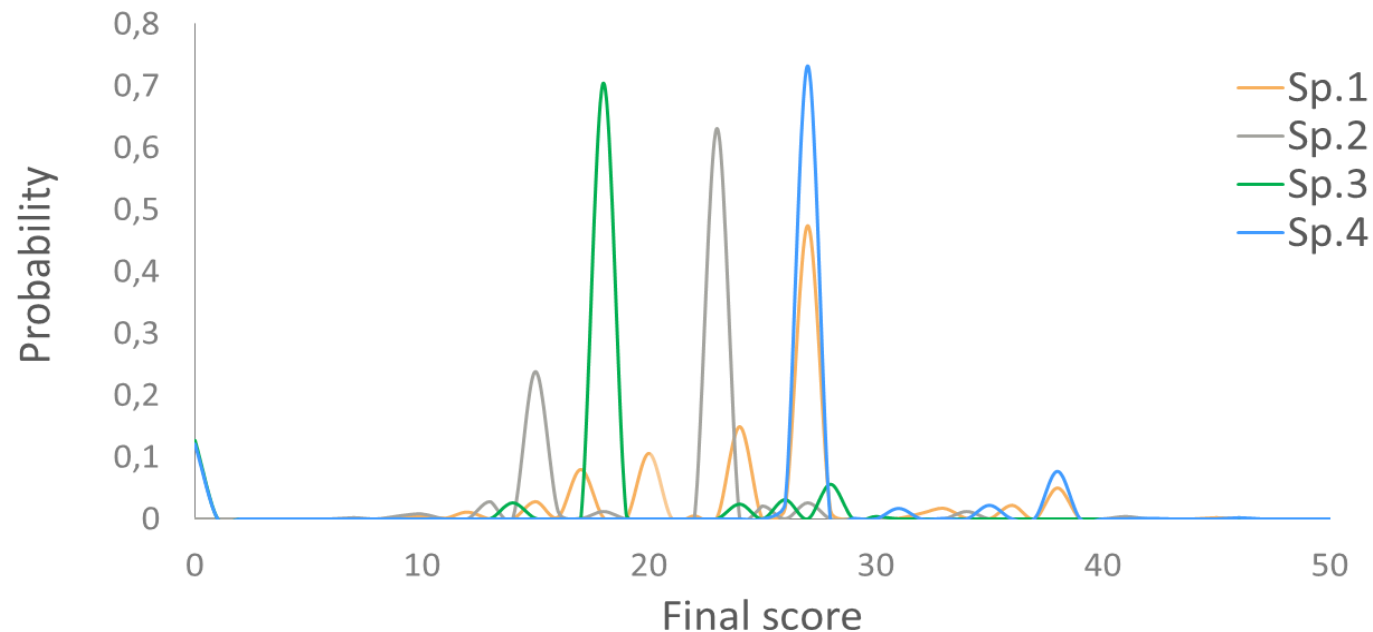
FinnPRIO consists of **18 questions** with answer options yielding a different number of points

For each questions the **most likely, minimum** and **maximum** answer option is selected

These are used to define a PERT **probability distribution that describes the uncertainty of the answer**

Uncertainty - final scores

The answers are aggregated into section scores by specifically designed formulas, using **Monte Carlo simulation to produce probability distributions of the scores**



Ranking the pests

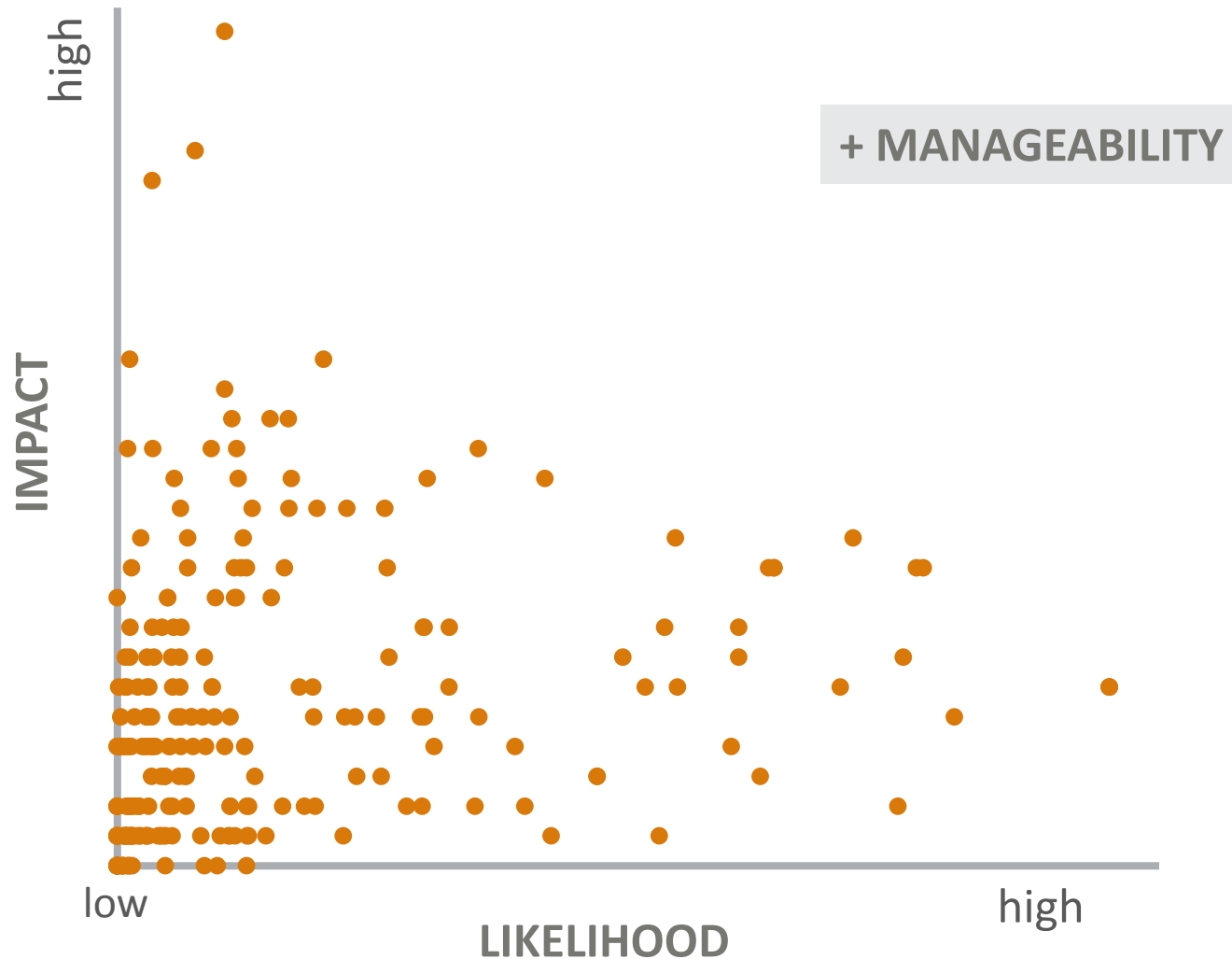
Based on **summary statistics** (e.g. median, min, max) of the probability distributions of the section scores

Based on **the whole probability distributions** of the scores using stochastic ordering techniques

⇒ ordinal ranking or ranking that expresses also the distance between the ranked groups



Prioritizing species for action



Applications

About 240 pests have been assessed

Selection of priority pests for inspections

- Quarantine pests of fruit, berry, landscaping plants and greenhouse production
- Surveys required and co-financed by the EU commission

Decision on whether to eradicate outbreaks

- Cucumber green mottle mosaic virus
- Groundnut ringspot virus

Development of plant health legislation

- The protected zone status of tospoviruses
- Suggestions for quarantine pests whose regulation may need to be reviewed
- Suggestions for priority pests of the new EU plant health legislation

FinnPRIO highlights

- Uncertainty is considered in each question, and expressed in the results
- Has been tested by simulations and expert workshops
- About 240 pests have been assessed and the results are used in risk management
- May be modified to be applicable in other countries

A full description of the model and guidance is available in Heikkilä et al. 2016. Biological Invasions, 18: 1827-1842